The present invention includes an improved football player's helmet capable of providing improved protection against what is commonly known as "spearing" and face-guard tackles. The safety helmet or football helmet disclosed by the present invention includes a relatively rigid helmet portion formed with a recess for receiving and protecting the upper and side portions of the user's head, a chin strap removably secured to the helmet in order to hold same upon the head of the user, and a face-guard assembly which functions both as an additional protective device as well as being cooperative with the chin strap such that, upon preselected and undesirable movement of the face-guard in a forward direction, the chin strap is rendered inoperative and releases the helmet from the user's head.

8 Claims, 10 Drawing Figures
SAFETY FOOTBALL HELMET

This invention relates generally to safety helmets and, more particularly, to an improved football helmet which possesses novel safety features unknown to the prior art.

There are those among us who not only enjoy witnessing contact-type sports, such as football, but who also are concerned for the safety and well-being of the individuals who find themselves making a living or reputation participating in these sports. Increasing numbers of sports-minded football fans, for example, concede that they are capable of deriving an equivalent amount of pleasure in watching a football game in which one or more of our stars is neither maimed or crippled for life.

I am very much concerned for the safety of not only professional football players, but youngsters who may become the potential victims of overzealous participants whose desire to win may overshadow their concern for the safety of their opponents. Few parents of such youngsters will rejoice in a victorious game in which his or her son has become injured, possibly permanently.

Most football helmets are equipped with a helmet portion which protects the forehead, the top of the head and the rear and sides of the head so as to expose only the face and neck portions of the user. In addition, such helmets are equipped with face masks. In the case of running backfield players, their face-guard usually consists of two bars below the eye level and adapted to protect the nose and mouth of the player.

It has not taken much ingenuity for many players to discover that the very face-guard which is worn by such running backfield players to protect their nose and mouth may be easily grasped and used to tackle the running back. This has resulted in serious neck, head and spinal injuries.

Yet another prevalent feature of the football game involves what is commonly known as "spearng", in which the top of a player's helmet comes into contact with the body of his opponent, usually if not surprisingly with great force. In this case, very often the very party doing the spearng injures himself as well as his opponent.

Thus, we see that safety or football helmets known to the art and used every day are deficient from a safety standpoint. Efforts to improve them have resulted in rather complex and expensive structures capable of doing more harm to the player than the very type of act sought to be protected against.

Accordingly, it is an object of the present invention to provide an improved safety helmet capable of use as a football helmet.

Another object of this invention is to provide a football helmet possessing features which protect the user against injuries sustained during what is commonly known as spearng and face-guard tackling.

A further object of my invention is to provide a football helmet structure in which the chin strap and face-guard cooperate with one another so as to enable the release of the chin strap which ordinarily holds the helmet upon the head of the user upon the occurrence of an undesirable movement of the face-guard.

Yet another object of this invention is to provide a release mechanism for use with a safety helmet, or the like, in which a retaining structure cooperatively meets a movable structure in a region such that, upon a predetermined movement of the movable structure in a preselected direction, the retaining structure will be rendered inoperative from a retention standpoint.

The present invention fulfills the aforementioned objects and overcomes the limitations and disadvantages of prior art solutions to problems associated with conventional football helmets and equipment known to the art, by providing, according to one aspect of the invention, an improved safety football helmet found with a hollow helmet portion capable of receiving and protecting the head of the user. A face-guard suitable for protecting the nose and mouth of the user removably engages and is connected to the helmet portion just described. A chin strap similarly engages and is connected to the helmet portion in a cooperative manner with the face-guard such that, upon predetermined and undesirable forward movement of the face-guard, the chin strap will automatically be released and thereby release the helmet from the head of the user. In a preferred embodiment of my invention, both the chin strap and the face-guard are joined in a novel structure capable of exhibiting this releasing action.

This invention will be more clearly understood from the following description of specific embodiments of the invention, together with the accompanying drawings, wherein similar reference characters denote similar elements throughout the several views, and in which:

FIG. 1 is a perspective elevational type view illustrating the helmet assembly according to the present invention upon the head of a user;

FIG. 2 is a plan view looking down upon the upper portion of the helmet assembly shown in FIG. 1;

FIG. 3 is an enlarged, fragmentary, exploded perspective view illustrating a releasable channel plate assembly which is shown assembled and in less detail in FIG. 1;

FIG. 4 is a sectional view looking along the line 4-4 of FIG. 1;

FIG. 5 is a sectional view similar to that described for FIG. 4 in which the releasing action according to the present invention is more clearly illustrated;

FIG. 6 is a sectional elevational view looking along the line 6-6 of FIG. 4;

FIG. 7 is an enlarged fragmentary view of a portion of the channel plate assembly described for FIG. 3;

FIG. 8 is a fragmentary sectional view of a slide plate and channel with a modified lock according to the present invention;

FIG. 9 is a partial fragmentary sectional view of a helmet dome according to the present invention;

FIG. 10 is a bottom planned view of expanded foam rubber dome securing pad arrangement possible with the present invention.

It is important here, before referring in more detail to the drawings, to reemphasize the fact that my present invention is specifically directed to providing means by which we are able to improve football helmets to prevent neck, head and spinal injuries from spearng and face-guard tackles. The manner in which this is accomplished is best seen by looking at the drawings in which FIG. 1 illustrates a helmet assembly 10 formed with a crown portion of 11 from which two side pieces 12 and 13 depend. FIG. 1 further illustrates a face-guard assembly 20 which is secured to helmet as-
Assembly 10 by means of channel plate assembly 30. Also shown in FIG. 1 is a chin strap 21 which cooperatively engages and is releasably connected to channel plate assembly 30 in a manner described in more detail below.

Crown portion 11 of helmet assembly 10 is formed with a hole 14 therethrough (FIG. 10) which receives a rubber crown insert 15 (FIG. 2) so as to provide a resilient top to the helmet assembly 10. Rubber crown insert 15 is formed with a crown protrusion 16, best seen in FIGS. 9 and 10, which extends through hole 14 in the top of helmet crown portion 11 so as to retain rubber crown insert 15 within hole 14 and in contact and engagement with crown portion 11. Chin strap assembly 21 is formed with a member 17 which engages the face of the user immediately above the chin, and a member 18, shown in FIG. 1, which engages the underside of the chin so that, together, they firmly grip the chin of the user. Chin strap assembly 21 is formed with a member 19 to which members 17 and 18 dovetail or merge which, in turn includes a female snap member integral therewith and which is capable of receiving male snap member 26 integrally formed as part of a slide bar 23 which, in turn, comprises a rearward portion of face-guard assembly 20. Chin strap assembly 21 holds the helmet assembly 10 securely in place upon the head of the user when snap 22 is engaged with snap member 26.

Looking now in more detail at the channel plate assembly shown in exploded perspective form in FIG. 3, we see that this assembly 30 includes three basic component elements which are adapted to cooperate with slide bar 23 already described as being integral with and forming a rearward most portion of face-guard assembly 20. These three component parts include the channel plate assembly 30 or base plate, a bolt member 40 formed with an internal thread in one end thereof, and a cap screw 41 formed with external threads which are capable of matingly engaging the internal threads formed in bolt member 40.

Looking now at the channel plate 30 in more detail, we see that this plate is made up of a bottom surface of base member 32 which is substantially flat along most of its length and from which two upstanding and right angled flange members 34 and 36 extend in an integral relationship with a rear wall 32' which, in turn, integrally joins both of these upper flange members 34 and 36. Base member 32 is formed with three holes, namely rivet holes 33 and a larger opening 38, best shown in FIG. 3. Rivet holes 33 provide the means by which the entire channel plate assembly 30 may be secured or fixed to each of the depending side pieces 12 and 13 of helmet assembly 10. Opening 38, on the other hand, provides the hole through which bolt member 40 extends, as will be described in more detail below. Base member 32 is further formed with a detent 42. Looking now at the face-guard assembly in a bit more detail, we see that the two bars which guard the nose and the mouth of the user of my invention converge at a thickened portion 24 which, in turn, extends integrally to slide bar 23. Thickened portion 24 is formed with a bottom surface 43 adapted to engage other elements of this invention, as will be described. Slide bar 23 is formed with a relatively central slot 25 which extends longitudinally with respect to the axis of slide bar 23 and which terminates short of male snap member 26. Between male snap member 26 and the rearward most end of slide bar 23, an indent 27 is formed, such as by any conventional means known to the fabricating art. Thus, we see that elements of my channel plate assembly, namely the base member and its integral parts, the bolt member 40 and the cap screw 41 (reference numeral 41' is used to denote the head of cap screw 41) are capable of interengagement in a manner which facilitates the entry of slide bar 23 into channel plate assembly and the recess formed by base member 32 and flanges 34 and 36 which, in turn, form a channel and serve as guides and retainers for the slide plate 23. Bottom plate 32, as already mentioned, is formed with holes 33 which are preferably drilled to accommodate rivets 35 which will hold and secure the channel and track to helmet sides 12 and 13 which, in turn, protect the ears and side of the head of the user.

A detent 44, similar to detent 42 in that it possesses a substantially rectangular shape, is formed in and extends upwardly from base member 32.

The channel plate assembly is assembled by sliding the slide bar 23 into the channel formed by base member 32 and upper flanges 34 and 36 such that slot 25 coincides and overlies opening 36. Thereafter, bolt member or nut 40 is inserted upwardly through opening 36 and through slot 25 such that cap screw 41 may be screw into the female threads formed within bolt member 40. It must be understood that a channel plate assembly 30 is required for each side of helmet assembly 10 such that what is being described now for one side will exist for the opposite side of the user's helmet.

The face-guard assembly 20 is set in a lock position by exerting a backward or rearward steady or sharp pressure against the front bars such that the slide plates or slide bars 23 will come into contact with the rearward wall 32' already described. This enables a forced friction lock created by the engagement of detent surfaces 42 and 44 against bottom surface 43 and bottom surface 45 similarly formed on slide bar 23 near its end and as a result of the indenting at 27. It should be understood that the detents described are merely formed as a result of indenting the opposite sides of the member from which they extend. Thus, detents 42 and 44 are formed by indenting the base member 32 from the opposite sides of this same base member 32. Similarly, detent 45 is formed as a protrusion as a result of the indenting of the upper surface shown in FIG. 3 as reference numeral 27.

Thus the top surfaces of slide bar 23 are forced against the bottom surfaces or inner surfaces of flanges 34 and 36 by means of these detents 42 and 44 while the cap screw head 41' of cap screw 41 applies pressure in the opposite direction on the upper or outer surfaces of flange members 34 and 36, thereby causing a combined frictional holding of the two members together. In a modified form, a channel plate 30', shown in FIG. 7 as an example, is formed with a strip or downwardly extending protrusion 32'' (see FIG. 8) between flange members 34 and 36 such that additional positive locking is achieved by means of the entry of downwardly extending protrusion 32'' within and in contact with the indent 27 already described for and forming part of slide bar 23. The strip or protrusion 32'' is preferably rolled and resilient in order to allow its displacement while the end of slide bar 23 passes and engages same on its way toward rearward wall 32' during the locking of the slide bar into and within channel plate assembly.
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The dropping of rolled end or strip 32" into indent 27 adds to the friction locking of this mechanism.

The reader is invited to look at FIG. 4 wherein the elements just described are shown in cross sectional view in the locked position. It is to be noted in FIG. 4 that the male snap member 26 has matingly engaged the female snap member 22 due to its protrusion upwardly and through slot 25 formed in slide bar 23. This protrusion of the male snap member through the slot in order to engage the female snap member 22 is facilitated by the upward forcing of slide bar 23 as a result of the detents 42 and 44 against surfaces 43 and 45, respectively. It should be obvious to the reader that, upon the dropping of slide bar 23, the result will be the unlatching or disengagement of male snap member 26 from its female counterpart 22.

Looking now at FIG. 5, we see what will happen with the present invention when a player opposing the player wearing the helmet assembly according to the present invention grabs with some force upon the face-guard assembly 20 and pulls some away from the helmet assembly 10 described. We see in FIG. 5 that such a pulling of the face-guard assembly 20 forward or away from the helmet, or to the left, as shown in FIG. 5, will result in the dropping of slide bar 23 off from the level previously achieved as a result of the support of surfaces 43 and 45 upon detents 42 and 44 such that, upon this dropping of the slide bar 23, female snap member 22 will necessarily disengage from male snap member 26 since the downward movement of female snap member 22 is made impossible as a result of the configuration of the snapping structure surrounding this female snap member. The face-guard will slide and will continue to travel outwardly to the left, as shown in FIG. 5 until the end of slot 25 comes into contact with and abuts against the tubular bolt or nut 40 and, at this point, stops. Continued pulling of the face-guard to the left, as shown in FIG. 5, will result in pulling off both the face-guard and the helmet, together, thereby preventing injury which would normally occur as a result of the twisting of the head and neck of the user.

The face mask or face-guard assembly is thus still attached to the helmet and cannot cause further injury as a result of its having become completely detached. In order that unnecessary time-outs are done away with, and a penalty incurred for slowing down the game, a player utilizing the present invention is able to have his helmet in playing condition in a few seconds by simply exerting a pushing force on the front bars which will fractionally lock the slide bar 23 into place within channel assembly 30 and the chin strap simply locked by forcing female snap member 22 over and on to male snap member 26.

It is thus seen that by the pulling of face-guard assembly 20, the chin strap is released and made inoperative such that further pulling upon this face-guard assembly will not twist the head which would normally occur if the chin strap were held in place and a firm grip facilitated by the presence of the in-place chin strap.

Foam rubber 50 is shown as lining the insides of depending side pieces 12 and 13 to provide cushioning and comfort for the wearer of the helmet assembly according to the present invention. It is to be noted that rivets 35 are disposed in a concealed manner beneath foam rubber 50 such that these rivets do not come into contact with the face or head of the user.

Turning now to yet another feature of my invention, we look at the means by which I attempt to prevent injury as a result of spearing. As I have already mentioned, my helmet assembly 10 includes a rubber crown insert 15 which is held in place through hole 14 by means of the crown protrusion 16. Hole 14 is approximately 1 1/2 inches to 2 inches in diameter. The rubber crown 15 is preferably tapered to blend with the curvature of helmet assembly 10 and more specifically crown portion 11 and, accordingly, increases in thickness gradually as one travels toward the upper most portions of crown insert 15.

Rubber crown 15 is placed into position by simply forcing and contracting the inside pad 16 through hole 14 in the top of crown portion or dome 11. Once forced past the hole 14, the round rubber pad or protrusion 16 expands to lock the crown insert 15 in position. This is probably best seen in FIGS. 9 and 10 of the drawings. Please note that the crown protrusion 16 serves as a pad which not only locks the rubber crown in place but also protects and cushions the top of the head in case the helmet is jammed downwardly against the head of the user.

Rubber crown 15 is easily replaced by pushing from the inside of the helmet upon the center of protrusion 16 and forcing same out of and through hole 14.

While the present invention has been described with reference to specific embodiments illustrated in the figures of the drawings heretofore described, embodiments and changes coming within the scope of the present invention may occur to those skilled in the art and, as such, are contemplated by this invention. Various changes and modifications may be made by those skilled in the art without departing from the scope of the invention defined by the proper scope of the appended claims.

What is claimed is:

1. A safety helmet, or the like, comprising cover means formed with a recess for receiving and protecting portions of the head of the user; retaining means for removably holding said cover means upon the head, said retaining means comprising a plate assembly having walls that form a slide receiving channel, a substantially unitary slotted face guard slide bar which includes a first snap fastener affixed thereon, a chin strap having at least one second fastener at extremities thereof, said first and second fasteners being cooperatively capable of engaging one another, a bolt member cooperatively secured to said plate assembly, and a cap member removably secured to said bolt member; said retaining means enabling a predetermined disengagement of said chin strap upon forward movement of said slide bar, and a resilient crown member forming an integral unitary part of said safety helmet during use thereof.

2. A safety helmet, according to claim 1, wherein said cover means comprises a football helmet.

3. A safety helmet, according to claim 1, wherein said slide bar is an integral part of a face-guard assembly.

4. A safety helmet, according to claim 1, wherein said channel is adapted to receive said slide bar in frictional substantially mating engagement with one another.

5. A safety helmet, according to claim 3, wherein said face-guard assembly terminates in a releasable assembly to which said chin strap is removably secured, upon forward movement of said face-guard under preselected conditions, said chin strap being incapable of securement to said releasable assembly.
6. A safety helmet, according to claim 1, wherein a crown portion of said cover means is formed with a removable and resilient insert exhibiting cushioning characteristics and comprising said crown member.

7. A safety helmet, according to claim 1, wherein said second snap fastener is a female fastener.

8. A safety helmet, according to claim 7, wherein said second snap fastener is a female fastener.

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