Feb. 23, 1965 L. A. HOLDER 3,170,164

HELMET AND FACE GUARD

Filed March 22, 1962 2 Sheets-Sheet 1

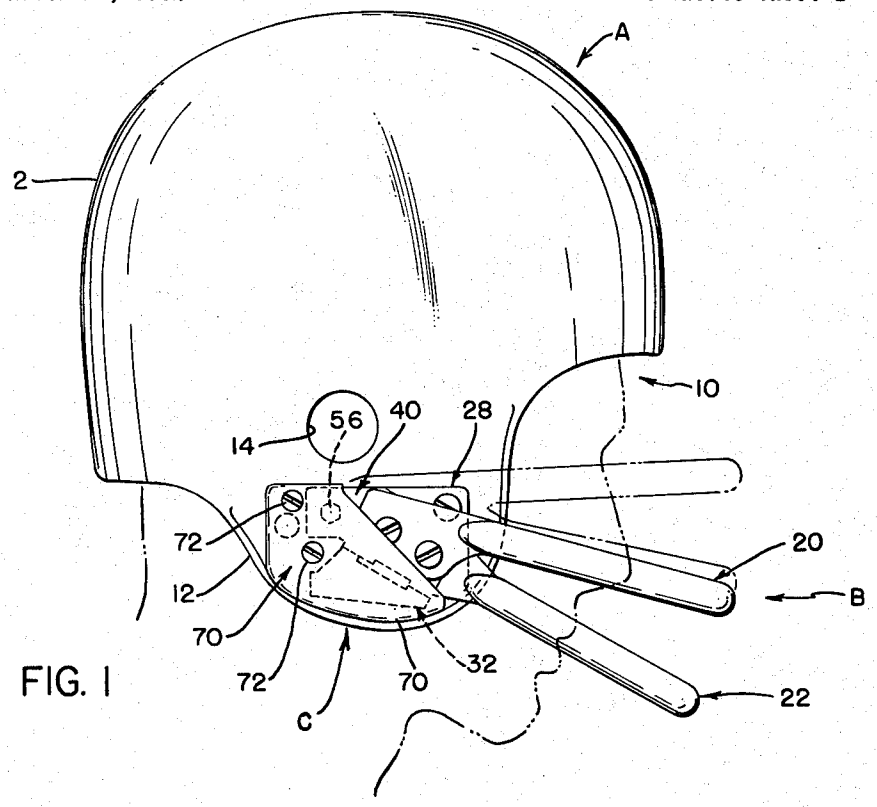


FIG. 1

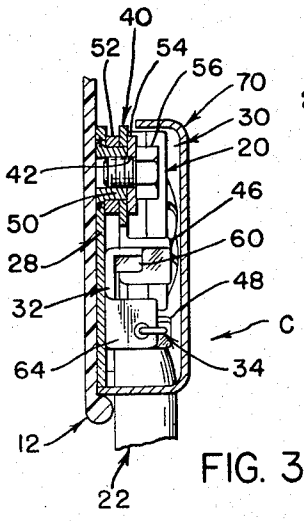


FIG. 3

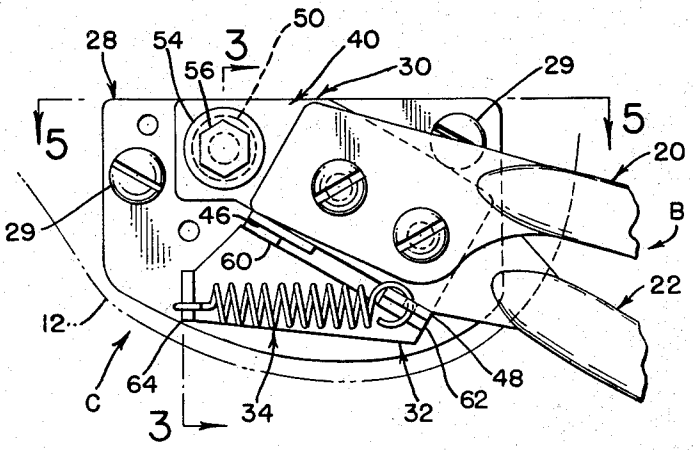


FIG. 2

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Feb. 23, 1965 L. A. HOLDER 3,170,164

HELMET AND FACE GUARD

Filed March 22, 1962 2 Sheets-Sheet 2

FIG. 4

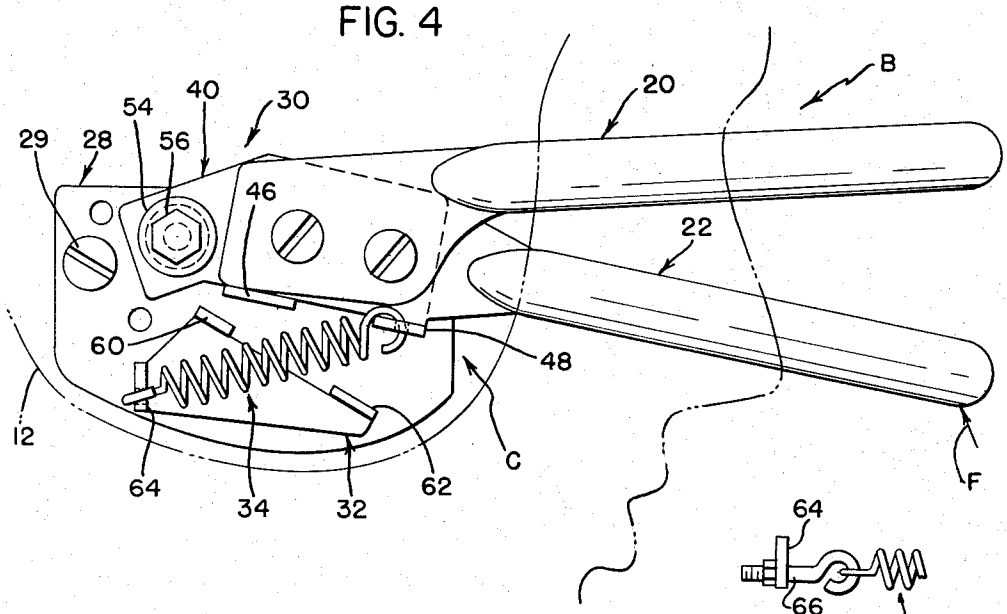


FIG. 7

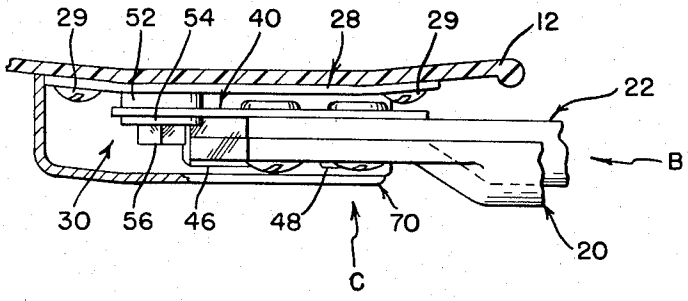


FIG. 5

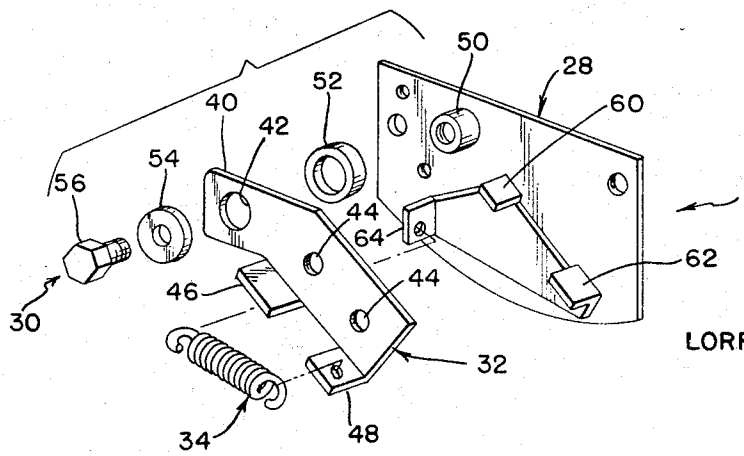


FIG. 6

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United States Patent Office 3,170,164 Patented Feb. 23, 1965

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HELMET AND FACE GUARD

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Filed Mar. 22, 1962, Ser. No. 181,737
4 Claims. (Cl. 2—9)

The present invention pertains to the art of protective helmets, and more particularly to a protective helmet with a face guard extending across the front of the helmet to protect the face of a person wearing the helmet.

The present invention is particularly applicable to a helmet of the type used for protecting the head and face of a football player and it will be discussed with particular reference thereto; however, it is to be appreciated that the present invention has much broader applications and may be used for protective helmets used in various other sports.

It has been known to provide football players with a protective helmet incorporating a metal or plastic face guard extending transversely across the front of the helmet to protect the face of the player from blows in the frontal region of the helmet.

The use of the face guard has substantially eliminated facial injuries of football players; however, upward blows on the guard, which extends outwardly from the helmet, creates a substantial turning moment in the helmet. Consequently, the helmet is thrust backwardly into the base of the skull with such a force that injury to the neck or occipital bone at the base of the skull often results. The possibility of serious neck and skull injury by use of the face guard seriously detracts from the facial protection of the guard.

In view of the possible serious injuries resulting from use of the face guard, there has been a recent movement to completely eliminate the guard from the protective football helmet. Accordingly, the excellent and frequently needed protection of the facial area would be sacrificed to prevent the remote possibility of injuries to the neck and base of the skull because these latter injuries have proven more serious and harmful to the health of the player.

To retain the face guard and still protect the neck and base of the skull from injury caused by uplift forces on the outwardly extending face guard, it is known to provide a protective football helmet with padding and bumpers in the lower rear portion of the helmet so that the forces against the base of the skull had to be transmitted through the padding or bumpers. To provide even nominal protection, the padding in the lower rear portion of the helmet caused the helmet to be bulky and uncomfortable; therefore, the padding did not prove to be satisfactory.

The present invention overcomes the above-mentioned difficulties and others by providing a protective helmet which will not exert a substantial force on the base of the skull on sudden upward blows against the face guard connected to the helmet.

In accordance with the present invention, there is provided, in combination, a protective helmet having a front portion, a face guard attached onto the helmet and extending across the front portion, and means for allowing substantial upward movement of the face guard with respect to the helmet when force exceeding a predetermined value is applied in an upward direction against the face guard.

The primary object of the present invention is the provision of a face guard mounted onto a protective helmet to prevent injury to the wearer from upward impact forces against the face guard.

Another object of the present invention is the provision of a face guard mounted onto a protective helmet and

means for allowing biased, upward movement of the face guard when upward impact forces are directed against the face guard.

Still a further object of the present invention is the provision of a face guard mounted onto a protective helmet and having a spring means for allowing biased, upward movement of the face guard with respect to the helmet when upward impact forces are directed against the face guard.

Yet another object of the present invention is the provision of a face guard mounted onto a protective helmet and having a means for allowing substantial, upward movement of the face guard with respect to the helmet when a force exceeding a predetermined value is applied in an upward direction against the face guard.

These and other objects and advantages will become apparent from the following description used to illustrate the preferred embodiment of the invention as read in connection with the accompanying drawings in which:

FIG. 1 is a side elevational view illustrating the preferred embodiment of the present invention;

FIG. 2 is an enlarged partial view illustrating in detail the preferred embodiment of the present invention;

FIG. 3 is a partial cross sectional view taken along line 3—3 of FIG. 2;

FIG. 4 is a partial side elevational view similar to FIG. 1 showing the face guard in an upward position;

FIG. 5 is a partial cross sectional view taken along line 5—5 of FIG. 2;

FIG. 6 is an exploded view illustrating the preferred embodiment of the present invention; and

FIGURE 7 is a somewhat schematic, partial view illustrating one appropriate adjusting means for the present invention.

Referring now to the drawings wherein the showings are for the purpose of illustrating a preferred embodiment of the invention only and not for the purpose of limiting same, FIG. 1 shows a protective helmet A of the general type used to protect the face and head of a football player and having a crown 2, a front opening 10, a pair of downwardly depending lower portions or ear caps 12, only one of which is shown, and a hole 14 in each ear cap 12. Extending across the front opening 10 is a face guard B having an upper bar 20 and a lower bar 22 which are so formed as to straddle the ear caps 12. In accordance with the invention, the face guard B is joined onto the ear caps 12 by a device C which incorporates a means for allowing substantial upward movement of the face guard with respect to the helmet when a force F, as shown in FIG. 4, which exceeds a predetermined value, is applied in an upward direction against the face guard.

The device C for mounting the face guard onto the helmet holds the face guard in a downward position until a high magnitude uplift force is applied against the face guard, at which time the device C allows substantial upward movement of the face guard B to prevent injurious forces from being transmitted to the neck and skull of the wearer. Forces below the predetermined value are absorbed by the helmet as if the face guard were rigidly attached thereto.

The device C, best shown in FIGS. 2 and 4, is positioned on each of the ear caps 12 and comprises a mounting plate 28 rigidly secured onto the helmet by appropriate means such as bolts 29; means 30 for pivotally mounting the face guard B onto the mounting plate 28, and thus the helmet A; and abutment 32 adapted to limit the downward pivotal movement of the face guard B; and a biasing means for yieldably forcing the means 30 downwardly against the abutment 32 so that uplift forces greater than a predetermined value will move the means 30 away from the abutment 32.

Referring in more detail to the elements comprising the device C, the means **30** as shown in FIGS. 2, 5 and 6, is provided with a pivot plate **40** having an aperture **42** and apertures **44**, the latter apertures adapted to rigidly secure the bars **20**, **22** onto plate **40**. Extending laterally from the plate **40** are tab **46** and lug **48**. To pivotally secure the plate **40**, and thus the face guard B, onto the helmet A, there is provided a post **50** secured onto plate **28**, a spacer **52**, a washer **54**, and a bolt **56** adapted to be threadably received in post **50** as shown in FIG. 3. In this manner, the plate **40** is pivotally secured onto the helmet.

Fixedly secured onto the outer surface of plate **28** is the abutment **32** having stop tabs **60**, **62** and a spring lug **64**. The biasing means **34** may take a variety of structural embodiments; however, in the preferred embodiment, this means is a coil spring of predetermined elastic characteristics and adapted to be secured between lug **64** of the abutment **32** and lug **48** of the means **30**. In some cases, the spring **34** or other biasing means may extend from the helmet to the face guard without actually being connected between the abutment **32** and pivot means **30**. Spring **34** is pre-stressed to bias tab **46** and lug **48** against stop tab **60** and **62** until an uplift force F which exceeds the pre-stressed force of spring **34** is applied upwardly against face guard B. Means **66**, shown in FIGURE 7, or other appropriate means may be provided for adjusting the pre-stress tension of coil spring **34** to vary the amount of uplift forces necessary to separate the means **30** from the abutment **32**.

To conceal device C, an outer contoured cover or cap **70** is adapted to be secured onto helmet A by appropriate means such as bolts **72** shown in FIG. 1.

In operation, face guard B transmits to the helmet the force of any blows directed inwardly toward the face of the wearer; however, an upward blow on the face guard exceeding the value determined by the amount of prestress on spring **34**, is absorbed by the spring in upward movement of the face guard B. Consequently, high magnitude uplift forces against the face guard are not abruptly transmitted to the neck and skull base of the wearer.

The present invention has been described in connection with the preferred embodiment thereof; however, it is to be appreciated that there is no intention of limiting the invention to the particular structural details forming this preferred embodiment. To the contrary, various structural changes may be made without departing from the spirit and scope of the invention as defined by the appended claims.

Having thus described my invention, I claim:

1. In combination, a football helmet having a front opening, a bar-like face guard mounted onto said helmet and extending across said front opening, means at opposite ends of said face guard for mounting said face guard onto said helmet to have only pivotal movement with respect to said helmet, a first abutment means fixedly positioned onto said helmet, a second abutment means on said face guard for engaging said first abutment means to limit downward pivotal movement of said face guard beyond a predetermined position, and a spring means extending between said pivotable face guard and said helmet for holding said second abutment means against said first abutment means with a predetermined biasing force whereby upward forces on said face guard of a magnitude greater than said biasing force will pivot said face guard upwardly with said second abutment means moving away from said first abutment means.

2. The combination as defined in claim 1 wherein said spring means is a coil spring extending between said helmet and said pivotable face guard.

3. The combination as defined in claim 1 wherein said spring means includes means for adjusting the predetermined biasing force between said first and second abutment means.

4. In combination, a football helmet having a front opening, a bar-like face guard mounted onto said helmet and extending across said front opening, means at opposite ends of said face guard for mounting said face guard onto said helmet to have only pivotal movement with respect to said helmet and about a fixed axis, a first abutment means fixedly positioned onto said helmet and spaced from said axis, a second abutment means on said face guard and spaced from said axis for engaging said first abutment means to prevent downward pivotal movement of said face guard beyond a predetermined position, a coil spring spaced from said axis and extending between said face guard and said helmet to pivot said face guard downwardly with said first and second abutment means engaging each other, said coil spring being under tension to create a predetermined biasing force between said first and second abutment means whereby said face guard will be pivoted upwardly with respect to said helmet only when an upwardly directed force, exceeding said predetermined biasing force, is exerted onto said face guard.

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