

June 6, 1967

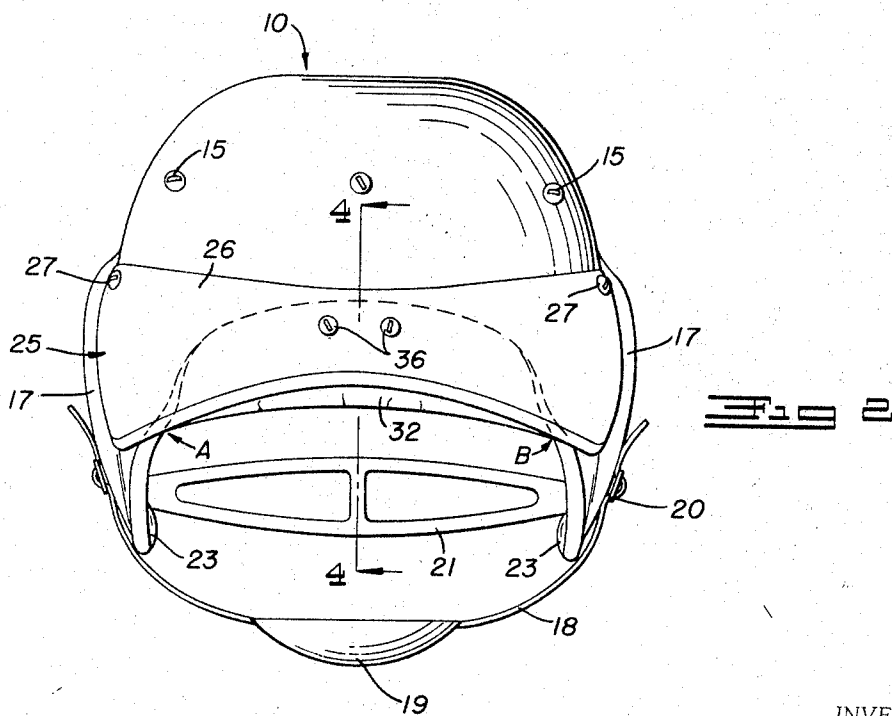
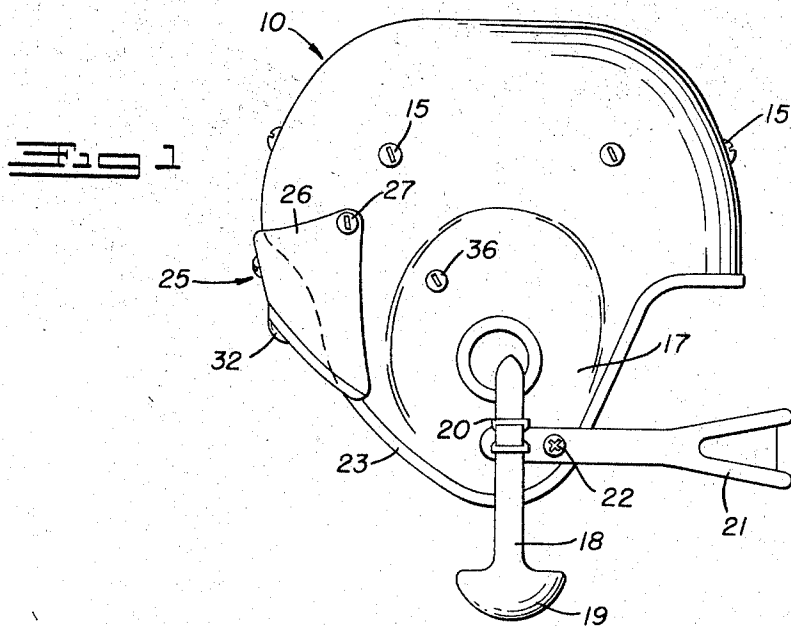
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3,323,134

FOOTBALL HELMET CONSTRUCTION

Filed May 24, 1965

2 Sheets-Sheet 1



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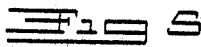
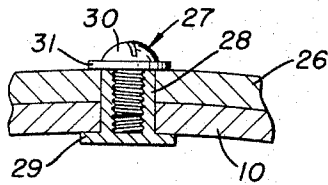
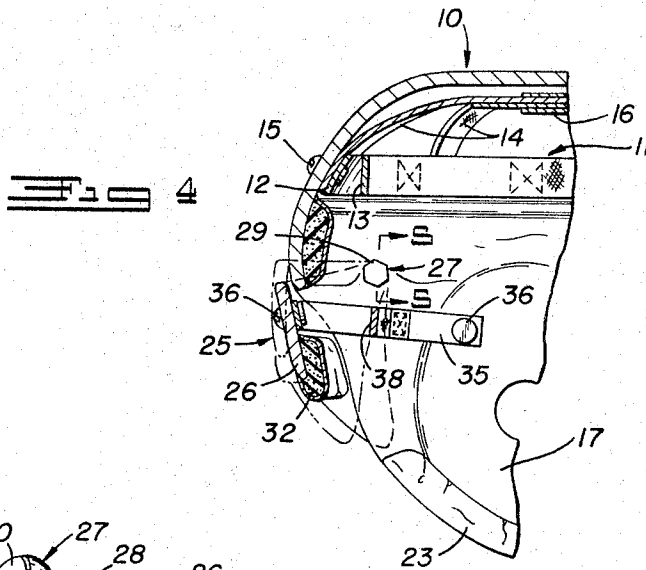
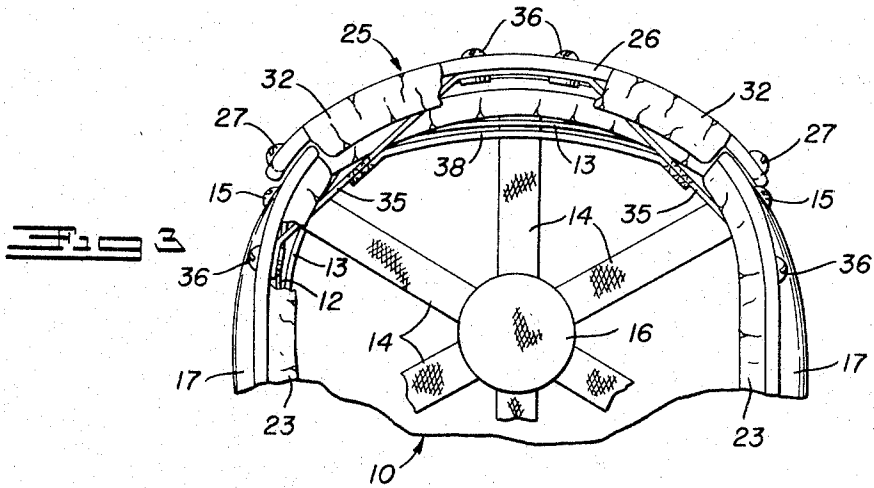
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FOOTBALL HELMET CONSTRUCTION

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2 Sheets-Sheet 2



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FOOTBALL HELMET CONSTRUCTION

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2 Claims. (Cl. 2—3)

This invention relates, in general, to protective headgear. It relates, more specifically, to an improved cervix guard for protective headgear of the football helmet type.

Protective headgear, such as the football helmet type, constructed in accordance with the teaching of the prior art have not been found to be capable of providing adequate protection for the cervix. In the well known helmet constructions utilized in football, the helmet comprises a structurally rigid body shell provided with an internally attached suspension system for supporting the shell in spaced relationship to the wearer's head. A chin-strap secured to the shell is adapted to extend beneath the wearer's chin to maintain the helmet in position. In addition, a forwardly projecting face guard is usually attached to the shell to increase the protection afforded the wearer. Although helmets of this general type of construction are effective in providing a relatively high degree of protection as to external forces, these helmets present an inherent potential danger to the cervix. Many cervical injuries attributable to the helmets of prior art construction are noted each season with several of such injuries being fatal. A cervical injury often results when the head is forcibly tilted rearwardly thereby bringing the lower rear edge of the shell into engagement with the back of the neck. Since the helmet is secured to the wearer's head by means of the chin strap, the lower rear edge of the helmet will act as a fulcrum bearing against the cervix and further rearward tilting of the helmet will exert an extremely large force on the cervix which may result in a serious injury.

As a result of the inherent danger in the utilization of the conventional prior art helmet constructions, there have been attempts to eliminate or to at least substantially reduce the hazard through modification of the helmet constructions. One helmet modification having this objective is disclosed by Patent No. 3,193,623 issued to Joseph, July 7, 1964. The modified helmet construction shown and described by this patent comprises a rigid helmet shell provided with a flush-fitting, hinged plate at the rear which is designed to swing outwardly when pressure is applied thereto through rearward tilting of the helmet. Although this helmet modification is capable of effecting a reduction in the incidence of cervical injuries in which the helmet construction is a factor, the helmet construction factor will remain as a cause of such injuries. The specific structure of the helmet disclosed by the Joseph patent utilizes a construction which is inherently incapable of realizing the full advantages of a pivotally mounted plate. The plate is retained in a normal protective position by a pair of leaf springs and is mounted whereby the force effecting the swinging movement is applied through a relatively small moment arm and thus requires a relatively large force. Since this pressure is applied through the neck, the neck will continue to be subjected to relatively large, injurious forces.

It is, therefore, the primary object of this invention to provide a protective headgear incorporating an improved cervix guard construction.

It is another important object of this invention to provide a protective headgear having an improved cervix guard which is pivotally mounted on a rigid body shell of the helmet so as to be readily movable from a normal protective position with minimal pressure exerted on the neck.

It is a further object of this invention to provide a protective headgear having an improved cervix guard which is pivotally mounted on a rigid body shell in overlapping relationship and is retained in a normal protective position by fabric-type resilient means to further increase the safety of construction.

It is also an object of this invention to provide a protective headgear having an improved cervix guard which is of economical, rugged construction.

These and other objects and advantages of this invention will be readily apparent from the following detailed description of an embodiment thereof and the accompanying drawings.

In the drawings:

FIGURE 1 is a side elevational view of a football helmet embodying the present invention.

FIGURE 2 is a rear elevational view of the helmet of FIGURE 1.

FIGURE 3 is a fragmentary bottom plan view of the helmet showing the rear portion.

FIGURE 4 is a medial, longitudinal sectional view taken on a vertical plane along line 4—4 of FIGURE 2.

FIGURE 5 is an enlarged sectional detail of the pivot hinge construction taken along line 5—5 of FIGURE 4.

Having reference to the drawings, an embodiment of the invention is shown incorporated in a football helmet construction. The helmet is of well known form comprising a structurally rigid body shell 10 which is adapted to fit over the upper portion of the wearer's head. The body shell 10 is provided with an internal suspension system 11 which is engageable with the wearer's head and supports the shell in spaced relationship thereto. A suspension system of well known form is illustrated and which is seen to include an outer circular band 12, an inner circular band 13 and a number of elongated straps 14 which are arranged to extend diametrically across the interior of the shell 10 at spaced intervals by suitable fasteners such as the screw and nut assemblies 15. The band 12, in the illustrated embodiment, is substantially horizontally disposed and is secured to the shell by eight of the screw and nut assemblies 15. Each of the straps 14 is secured at its end to the outer circular band 12 and is of sufficient length to form a loop extending upwardly from the band 12. A central crown-pad 16 is provided to engage and retain the straps 14 in fixed relationship at approximately the center of the helmet shell. The inner circular band 13, also formed from a fabric webbing, is secured to the outer band 12 intermediate the attachment points of the latter to the shell thereby forming a suspended band for engaging the head. Thus, the inner circular band 13, which is sized to receive the wearer's head, will support the body shell 10 in spaced relationship while the straps 14 with the crown-pad 16 provide the necessary vertical support. The body shell 10 is also formed with depending ear-protecting portions 17 at each side thereof which are molded to provide the necessary space for the ears. A chin-strap 18 comprising an elongated, flexible strap formed with a chin-receiving pocket 19 is secured by adjustable buckle assemblies 20 to the depending ear-protecting portion 17. A rigid face guard 21 is also shown attached to the body shell of the helmet in the illustrated embodiment. The face guard 21 is of the arcuate form and is attached at its ends to the ear-protecting portions 17 by suitable fastening means 22. The fastening means 22 maintain the face guard in fixed relationship to the body shell and provide protection for the face of the wearer. For additional protection, the marginal edge portions of the shell are preferably covered at their inner face with a resilient padding 23 as illustrated about the edge portions.

In accordance with this invention, the helmet shell 10 is provided with a cervix guard 25 of improved construction. In general, the cervix guard comprises a rigid plate

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26 which is mounted on the body shell 10 for relative swinging movement. The plate 26 is disposed to extend across the open back portion of the body shell 10 and thereby overlies the lower portion of the wearer's neck. As can be best seen by reference to FIGURE 2, the rear portion of the body shell 10 is cut substantially higher than the conventional helmet constructions which are not provided with a movable cervical guard. The edge of the rear portion of the body shell extending between the depending ear portions 16 is formed to prevent contact with the wearer's neck when the head and helmet are tilted rearwardly. Thus, an open space is formed at the rear of the helmet as is generally defined by the broken line representation of the edge between points A and B in FIGURE 2.

The cervix guard plate 26 is arcuately formed and generally conforms with the exterior surface configuration of the body shell 10. The plate 26 is substantially coextensive with the above defined open space with the marginal end portions thereof extending around the body shell 10 in overlapping relationship. Again referring particularly to FIGURE 2, it will be noted that the lower edge of the plate 26 forms a smooth continuation of the lower edge of the shell 10 and the lower edge is substantially identical with the usual prior art helmet construction. The lower edge portion of the plate 26 which may contact the wearer's neck is also preferably provided with a protective foam rubber padding 32.

A hinge structure 27, which is shown in detail in FIGURE 5, secures each end of the plate 26 to the shell 10. This hinge structure 27 preferably comprises a tubular journal 28 extending through the walls of the body shell 10 and the plate 26 on which the plate may freely swing. The journal 28 is formed with a flanged end 29 which fits against the inner surface of the body shell 10. A cap screw 30 is threaded into the journal 28 and with a washer 31 retains the plate 26 on the journal 28.

Retaining the plate 26 in the lowered or normally protecting position shown in the full lines in FIGURE 4 and FIGURE 2 is a resilient strap 35. The resilient strap 35 is secured at each of its ends to the body shell 10 by suitable fastening means 36 and is centrally secured to the plate 26 by a similar fastening means 36. As is best seen in FIGURE 4, the resilient strap 35 is disposed below the hinge structure 27 and will thus be capable of applying a resilient restraining force regardless of the position of the plate 26. Connected to the resilient strap 35 intermediate the connection thereof to the shell 10 and the plate 26 is an auxiliary strap 38. The strap 38 is fabricated from a nonresilient webbing material and is of a length to engage the back of the wearer's head and functions to assist in maintaining the plate 26 in protective relationship as well as assisting in maintaining the helmet in position on the wearer's head.

The helmet provided by this invention is utilized in the conventional manner. A helmet shell 10 is placed on the wearer's head and secured in proper position by the chin strap 18. With the head normally maintained in an erect position, the plate 26 of the cervical guard 25 will be in the lowered protecting position shown in the full lines of the drawings. The nonresilient strap 38 of the retainer will engage the back of the wearer's head and assure maintenance of the plate 26 in the lowered protective position. At any time that the head or the helmet should be tilted rearwardly, as by contact of the face guard 21 with the ground, the resilient strap 35 will yield to the applied force and thereby permit the plate 26 to pivot and prevent injury to the cervix. During a rearward tilting of the helmet, the lower edge of the plate 26 will be brought into engagement with the neck portion through the protective foam rubber padding 32 and will thereby be generally urged in an upward direction. The resilient strap 35 will resist the upward swinging movement but is selected to have a resiliency which permits the plate 26 to swing to an upper position without exerting excessive pressure on the cervix. Since the lower rear edge of the

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body shell 10 is cut to avoid contact with the neck, the possibility of injury to the cervix as a consequence of the helmet construction is substantially completely eliminated. The forces required for displacement of the plate 26 are relatively small and the operation of the guard will, therefore, not inherently injure the neck. The plate 26 is preferably constructed from the same material as the body shell 10 and will have the same structural strength to resist breakage. Mounting the plate on the exterior of the shell 10 provides adequate protection for the base portion of the neck without the danger of being forced inwardly of the helmet shell. The head-contacting portions of the helmet and the guard may be readily provided with the necessary protective padding to avoid any injury through contact therewith. The operating mechanism of the guard such as the hinge structure 27 and fastening means 36 may also be covered with suitable protective material to fully guard the interior of the helmet.

It will be readily apparent that this invention provides a protective headgear incorporating an improved cervix guard construction which is capable of substantially eliminating the possibility of injuries to the cervix. The improved cervix guard is of simple construction which may be readily incorporated in the present types of headgear constructions and is capable of providing adequate protection for the rear portion of the neck.

According to the provisions of the patent statutes, the principles of this invention have been explained and have been illustrated and described in what is now considered to represent the best embodiment. However, it is to be understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

Having thus described this invention, what is claimed is:

1. A protective headgear comprising a rigid shell adapted to receive the wearer's head and to be secured thereto, said shell being formed with an open space at the rear thereof and having an edge shaped to prevent contact with the wearer's neck; and a cervix guard carried by said shell in normally covering relationship to said rear open space, said guard including an elongated, rigid plate formed with a lower, neck-contacting edge and adapted to extend across said open space with the terminal end portions externally overlapping the adjacent marginal edge portions of said shell, said plate being curved in conformance with the exterior of said shell, a hinge structure pivotally connecting said plate at each end to said shell adjacent the upper marginal edge portion of said plate permitting relative, upward swinging movement, an elongated, resilient webbing extending laterally across said open space, and interconnecting said shell and said plate for normally biasing said plate toward said normally covering relationship, means securing said webbing at each end to opposite side walls of said shell and means securing said webbing at an intermediate point to said plate, an elongated flexible strap extending laterally across the back of said shell for engaging the wearer's neck, and means securing each end of said flexible strap to a respective portion of said resilient webbing between the point of said webbing secured to said plate and the point secured to a respective side wall of said shell.

2. A protective headgear comprising a rigid shell adapted to receive the wearer's head and to be secured thereto, said shell being formed with an open space at the rear thereof and having an edge shaped to prevent contact with the wearer's neck; and a cervix guard carried by said shell in normally covering relationship to said rear open space, said guard including an elongated, rigid plate formed with a lower-neck-contacting edge and adapted to extend across said open space, means pivotally securing said plate at each end thereof to said shell for relative, upward swinging movement, an elongated, resilient webbing extending laterally across said open space, and interconnecting said shell and said plate for normally

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biasing said plate toward said normally covering relationship, means securing said webbing at each end to opposite side walls of said shell and means securing said webbing at an intermediate point to said plate, an elongated flexible strap extending laterally across the back of said shell for engaging the wearer's neck, and means securing each end of said flexible strap to a respective portion of said resilient webbing between the point of said webbing secured to said plate and the point secured to a respective side wall of said shell.

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