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PROTECTIVE HEAD COVERING

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FIG. 1

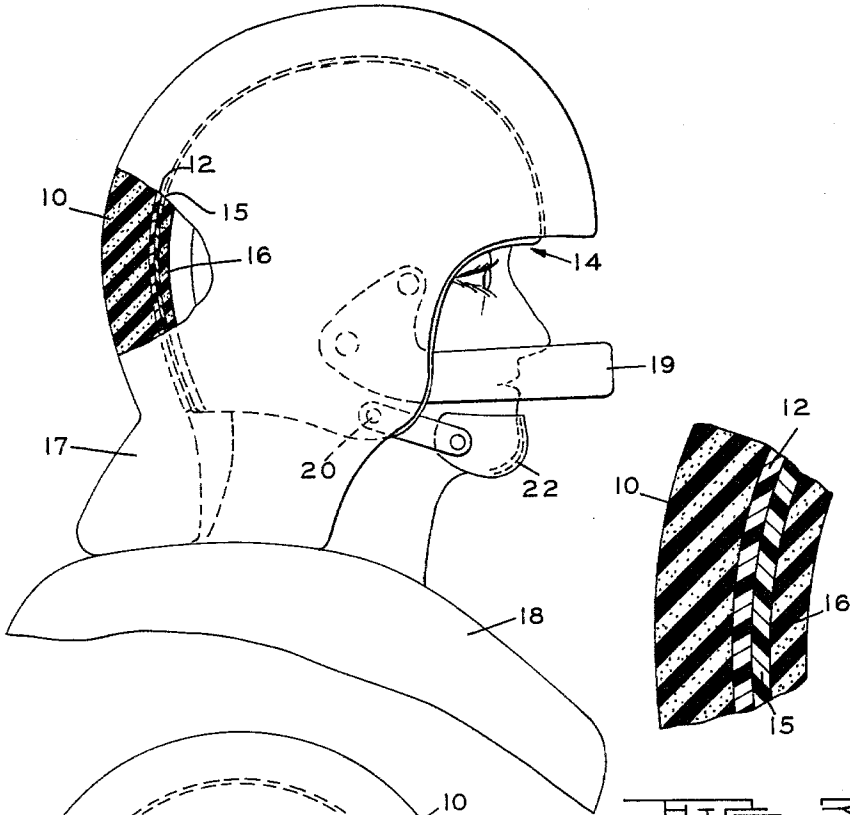


FIG. 3

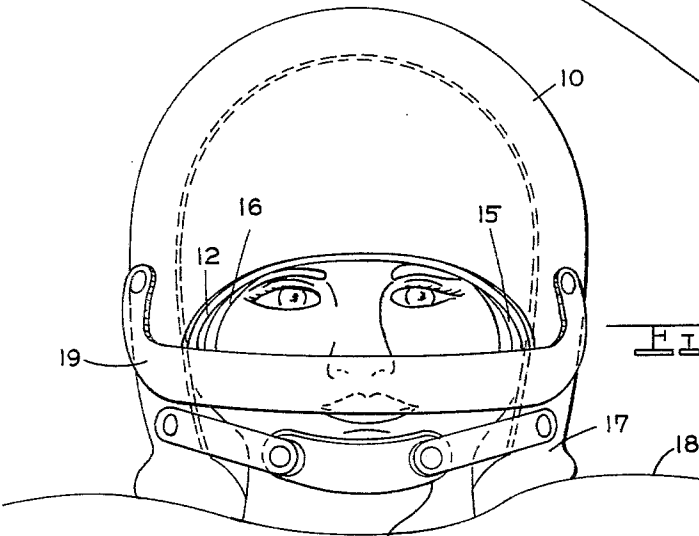


FIG. 2

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3,242,500  
**PROTECTIVE HEAD COVERING**  
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This invention relates to protective head coverings and in particular to a laminated over-covering for protective head gear such as a football helmet.

The invention is directed to substantially reduce head and neck injuries due to impact forces, leverage forces, and twisting forces imposed on players in violent contact sports such as football. While some of these injuries are occasioned from direct impact forces, they are occasioned more frequently from the torque and leverage forces involved with face guards on the helmet which twist the head, neck, and shoulders. This may happen when the face guard becomes entangled or is grasped by an opposing player.

In the prior art protective equipment, the head gear or helmet is itself made of cushion material or is made of relatively rigid material and cushion-wise suspended on the wearer's head. In both instances of prior art helmet construction, the face guard is rigidly secured to the helmet so that face guard twisting and leverage is transferred to the wearer. Also when substantially rigid helmet outer surface material is employed, opposing players are sometimes injured by contact with the rigid outer surface of the helmet.

One of the main causes of injury, especially to young players during their period of growth, is the face guard being rigidly secured to the helmet. The face guard becomes entangled or is grasped by an opposing player and the twisting forces on the face guard are directly impinged on the head and neck of the wearer. In this way the wearer's head is snapped backwards or to the side so that the force of the impact is increased by the leverage inherent in the extension of the face guard.

With the foregoing in view, it is a primary object of the invention to provide a laminated over-covering for a helmet which has an outer layer which is made of relatively thick spongy flexible material so that it may absorb the direct impact forces involved in contact and dissipate them over enlarged area, increased thickness, and an interval of time thereby substantially diminishing direct instantaneous impact.

An object of the invention is to provide a laminated over-covering for a helmet which has a stiff but yieldably flexible inner shell providing support for the face guard so that forces directed to the face guard are transferred to flexing and moving the over-covering relative to the helmet thereby dissipating the forces involved through its movement and during an interval of time when flexing and movement is occurring.

An object of the invention is to provide a displaceable and yieldably flexible over-covering cushion and support for a football helmet and face guard which is displaceably mounted on the football helmet so that it absorbs and dissipates forces involved in violent contact and also is displaceably moveable relative to the helmet under excessive forces so as to by-pass the contact force by permitting the over-covering including the face guard to be displaced from the helmet.

An object of the invention is to provide a substantially semi-circular collar on the base of the over-covering which depends below the helmet and head of the wearer into contact with the shoulder pads of the wearer so as to act as a base support which resists head-on and side-on contact relative to the wearer and which also acts as a fulcrum for twisting forces exerted on the face guard thereby relieving the wearer's head and neck of the multi-

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plied forces involved in the leverage exerted by the face guard.

An object of the invention is to provide a severable connection on the over-covering so that it may disconnect when excessive forces are involved to relieve the wearer of the forces.

These and other objects of the invention will become apparent by reference to the following description of a laminated over-covering singly and in combination with a football helmet embodying the invention taken in connection with the accompanying drawing in which:

FIG. 1 is a side elevational view of the laminated over-covering and facing guard mounted on a helmet partially showing a player and shoulder pads; partly in cross-section to show internal construction; showing a severable fastener attaching the laminated over-covering to the helmet, showing the helmet secured to the wearer by an elastic chin strap, and showing the face guard attached directly to the inner shell in dotted lines.

FIG. 2 is a face elevational view of the device such as seen in FIG. 1 but showing the over-cover cushion-support secured by a severable chin strap and showing the face guard connected to the inner shell through the outer cover; and

FIG. 3 is an enlarged view of the cross-sectional portion of FIG. 1 showing the structure in more detail.

Referring now to the drawing wherein like numerals refer to like and corresponding parts throughout several views, the protective laminated over-covering such as for a football helmet comprises an outer layer 10. The outer layer 10 is relatively thick and is made of relatively soft, elastic, resilient, springy material such as sponge rubber, synthetic resin foam, fibrous padding or matting carried in a rubber or synthetic resin binder, and similar materials. An inner layer or shell 12 lies inside the outer layer 10. The outer layer 10 and the inner layer shell 12 are bonded together in a laminate.

The inner layer or inner shell 12 is relatively thin, stiff but flexible, and strong. The inner shell 12 is form-fitted relative to the helmet. The inner shell 12 fits over the outside of a helmet 14. The helmet 14 may have a hard outer surface layer 15 and a soft interior layer 16. The inner shell 12 of the protective laminated over-covering hugs the outer surface layer 15 of the helmet 14. Thus the protective laminated over-covering frictionally engages the helmet. Thus the protective laminated over-covering and the helmet are movably mounted relative to one another and positioned relative to one another in frictional engagement.

A substantially semi-circular somewhat enlarged collar 17 is formed integrally with the outer-covering and depends below the helmet 14 and is adapted to lie substantially in contact with the wearer's shoulder pads 18. A face guard bar 19 is connected to the inner shell 12 of the outer covering, such as by rivets. In FIG. 1 the face guard bar 19 is directly connected to the inner shell 12 by rivets. In FIG. 2 the face guard bar 19 overlies the outer cushion layer 10 and is connected to the inner shell 12 by rivets which extend through the outer cushion layer 10. In mounting the face guard bar 19 over the outer layer 10, FIG. 2, spacer sleeves may be used on the rivets or fasteners. In this regard the spacer sleeves surrounding the rivets prevent the material of the outer layer 10 from being compressed or crushed and provide a firm mechanical connection to the inner shell 12. A chin strap 22 may be used on the helmet 14 to position the head gear on the wearer's head.

A snap fastener 20 may be employed if desired to make a severable mechanical connection between the inner shell 12 and helmet 14. A chin strap 24 connecting to the outer layer 10 may be used, FIG. 2. The chin strap 24 holds the outer layer 10 relative to the helmet 14 and

also to the wearer. Obviously the chin strap 22 on the helmet may be also employed with the modification illustrated in FIG. 2 and the chin strap 23 on the outer layer 10 superposed thereon.

In use, the novel over-covering cushion and support provides the wearer with additional impact dissipating flexible material absorbing direct contact forces in the head and neck area. Additionally, the collar 17 directly impinges on the shoulder pads 18, and in a contact where the head is withdrawn and the shoulders elevated, the collar transfers force of the impact to the shoulder pads 18.

It will also be noted that the collar 17 protects the back and sides of the wearer's neck and reduces the danger of direct impacts to the wearer's neck. This protects the wearer from the rear and sides of the neck which is not possible in a helmet.

Since the face guard 19 is mounted on the inner shell 12, the forces directed to the face bar 19 are transferred to the material of the inner shell 12 and the forces are dissipated in the inner shell 12 over an area and over an interval of time. When twisting and leverage forces are exerted on the face guard bar 19, such as upwardly or sidewardly as seen in FIGS. 1 and 2, the torsional force of the impact is transferred to the resilient inner shell 12 and to the collar 17 which impinges on the shoulder pads 18 thereby relieving the head of the wearer from the full twisting forces and the leverage action of the face guard bar 19.

When the face guard bar 19 is inadvertently grasped by an opposing player or otherwise entangled or acted upon, the leverage of the face guard bar 19 is fulcrumed at the collar 17 and the twisting forces the leverage are directed away from the head of the wearer.

When the excessive forces are involved in excessively violent impacts to the outer shell 10 and/or the face guard bar 19, the flexible inner shell 12 deforms whereby the over-covering is free to be forcibly removed from the helmet 14; this dissipates the forces involved in the removal of the over-covering and its deformation and removal allows an interval of time for the dissipation of such force as well as a camming action occurring which turns the residual force away from the player.

When excessive forces are encountered such as in the embodiment of FIG. 2 wherein the chin strap 24 is secured directly to the over-covering, the over-covering flexibility allows it to deform and twist whereby the chin strap fasteners are cantod or turned so that they un-snap permitting the outer covering and face guard to be driven from the helmet 14 thereby permitting the force to dissipate and bypass the wearer. This also un-snaps the fastener means 20, if used.

Although but a few embodiments of the novel over-covering cushion and face guard flexible support have been shown and described in detail, it is obvious that many changes may be made in the size, shape, detail, and arrangements of the various elements of the invention within the scope of the appended claims.

I claim:

1. A relatively resilient over-covering member for a relatively rigid protective head gear such as a football helmet comprising
  - a resilient over-covering member;
  - said over-covering member being cushion-wise resilient to absorb the force of impacts due to violent contact to not only protect the wearer but also to protect other players in contact with said flexible over-covering member;
  - said over-covering member having an internal shape substantially complementary to and engageable with a helmet upon which is to be mounted; and
  - a face guard bar mounted on said over-covering member;
  - said over-covering member being relatively strong to provide yieldable support for said face guard bar on the wearing player allowing movement of said

over-covering member and said face guard bar relative to a helmet on which it is positioned under compression, shear, torsion, and tension forces to dissipate normal shock and force and to allow complete displacement of said over-covering member and said face guard bar under excessive force loads; said over-covering member spring-wise resisting forces imposed on said face guard bar to allow spring-like force absorbing movement of said over-covering member and said bar relative to a helmet on which it is positioned to absorb normal force loads and also allowing movement to the point of displacing said over-covering member relative to a helmet on which it is positioned under excessive force loads to relieve the wearer from the imposition of said normal and excessive loads which otherwise would be imposed on the wearer if said face guard could not move relative to a helmet on which it is positioned.

2. In a device as set forth in claim 1, a collar on said over-covering member depending therefrom for contacting the shoulder pads of a wearer providing a fulcrum protecting a wearer's head and neck from accepting leverage force loads imposed on said face guard bar to relieve the head and neck of the wearer of leverage loads.

3. In a device as set forth in claim 1, a severable fastener for disconnectably connecting said over-covering member to a helmet on which it is positioned for holding said over-covering member on a helmet on which it is positioned under ordinary normal impact force loads imposed on said bar and for releasing said over-covering member from a helmet on which it is positioned under excessive impact force loads on said bar to prevent transfer of said excessive loads to a wearer.

4. In a device as set forth in claim 1, a chin strap severably connected on said over-covering member for severably connecting said over-covering member to a wearer.

5. In combination, a football helmet and a laminated over-covering having a resilient outer-cushion layer to absorb the force and shock of violent impacts arising out of sudden forceful contact such as with the ground and between players and a relatively stiff springy inner shell layer to provide a yieldable support for a face guard bar on the wearing player to permit movement of the guard bar and the inner layer relative to the helmet under compression, shear, torsion, and tension forces to dissipate normal shock and force and to allow full displacement of the face guard bar and inner shell layer and the outer layer under excessive force loads comprising,
  - a helmet,
  - an inner shell layer of stiff but flexible material on said helmet having an internal shape substantially complementary to and frictionally engaging said helmet;
  - said inner shell layer fitting over said helmet so as to yieldably hold said shell on said helmet; and
  - a face guard bar mounted on said stiff but flexible inner shell;

- said flexible outer soft cushion layer being spring-wise pliable to absorb the force of normal impacts due to violent contact to not only protect the wearer but also to protect other players in contact with said flexible outer layer;
- said stiff but resilient inner shell layer spring-wise resisting forces imposed on said face guard bar to allow spring-like force absorbing movement of said flexible inner shell and said bar relative to said helmet to absorb normal force loads and also allowing movement to the point of displacing said inner shell relative to said helmet under excessive force loads to relieve the wearer from the imposition of said normal and excessive loads which otherwise would be imposed on the wearer if said inner shell and said face guard could not move relative to said helmet and if said inner shell support for said face guard was not force-absorbently flexible and displaceable.

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6. In a device as set forth in claim 5, a depending collar on said laminated over-covering for contacting the shoulder pads of a wearer for transferring force loads to the shoulder pads and for providing a fulcrum protecting a wearer's head for blocking leverage force loads imposed by said face guard bar to relieve the head and neck of the wearer of said leverage imposed loads.

7. In a device as set forth in claim 5, a fastener disconnectably connecting said over-covering to said helmet holding said over-covering to a helmet under ordinary normal impact force loads imposed and releasing said over-covering from a helmet under excessive impact force loads to prevent transfer of said excessive force loads to a wearer.

8. In a device as set forth in claim 5, a stretchable chin

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strap on said over-covering for elastically connecting said over-covering to a wearer.

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