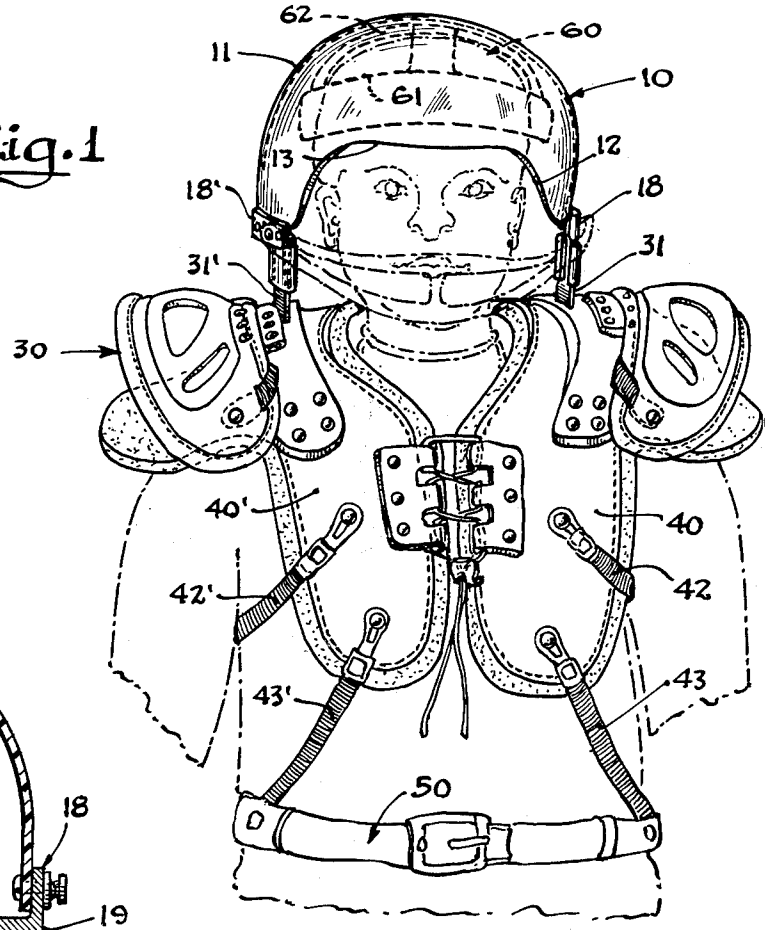
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PROTECTIVE FOOTBALL APPARATUS

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Fig. 1



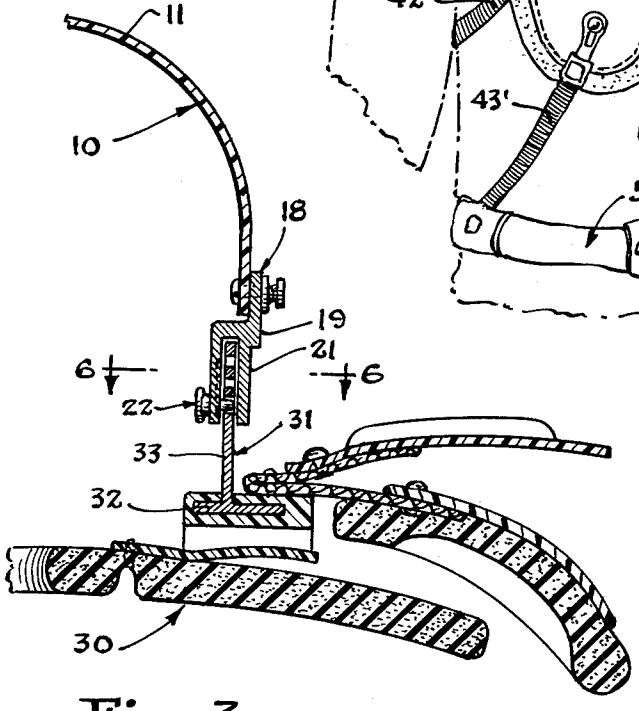


Fig. 3

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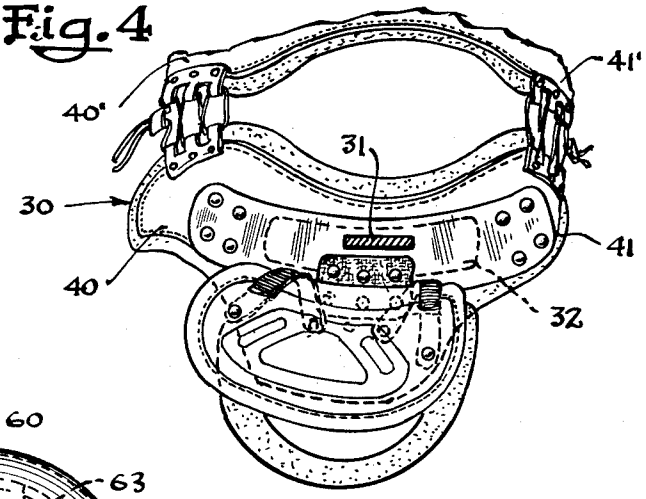
May 26, 1964 A. SHAFFER ETAL 3,134,106

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Fig. 4



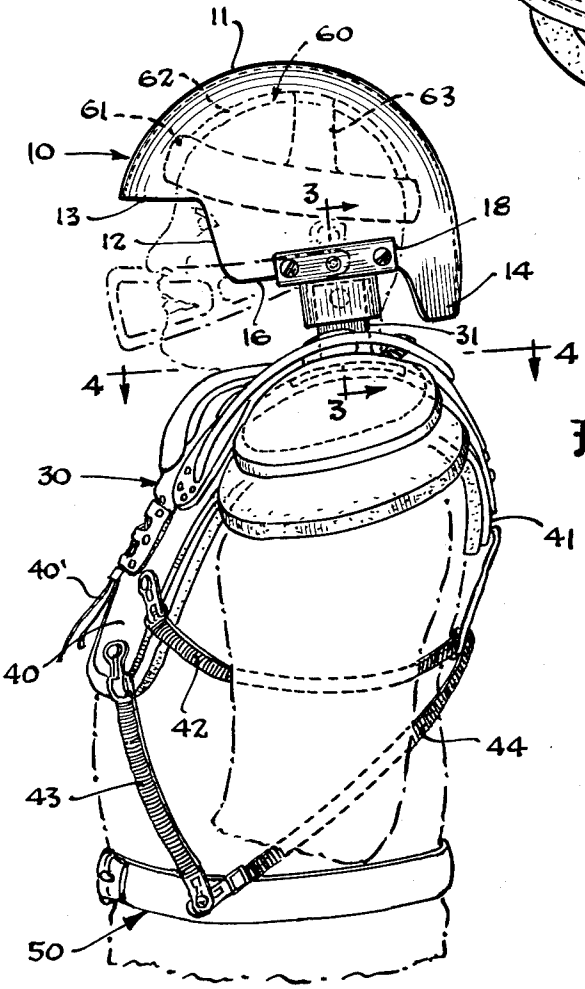


Fig. 2

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Fig. 5

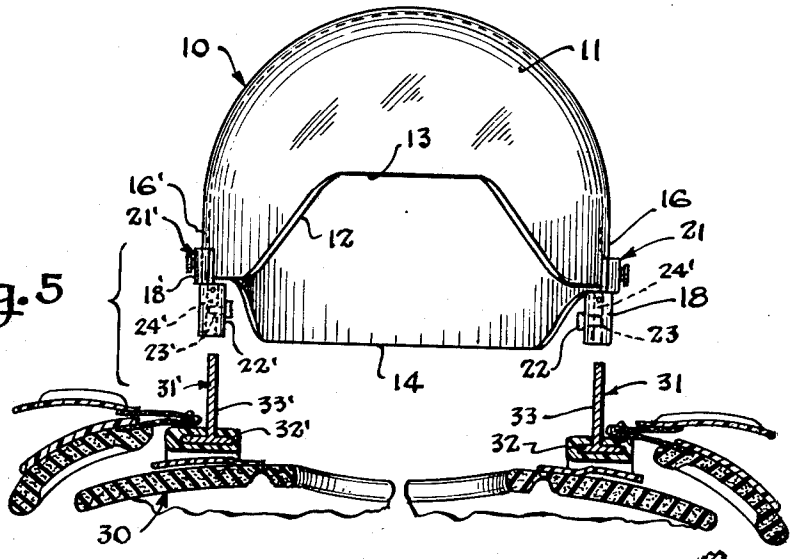


Fig. 7

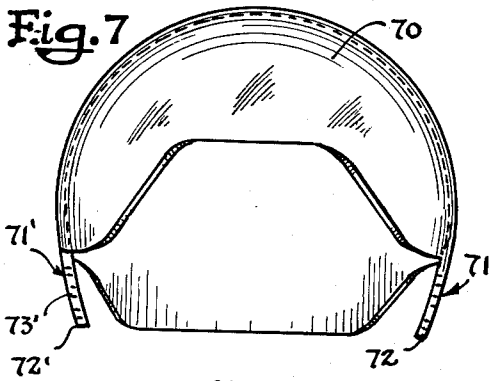


Fig. 6

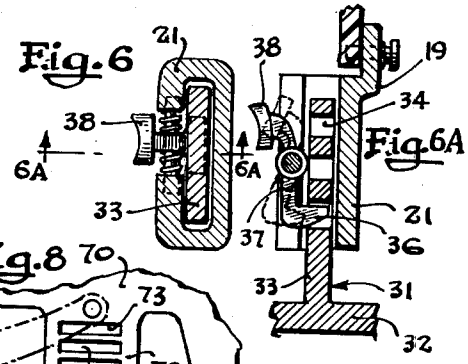


Fig. 6A

Fig. 8

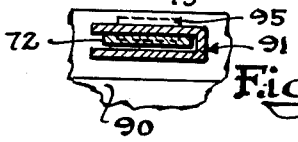
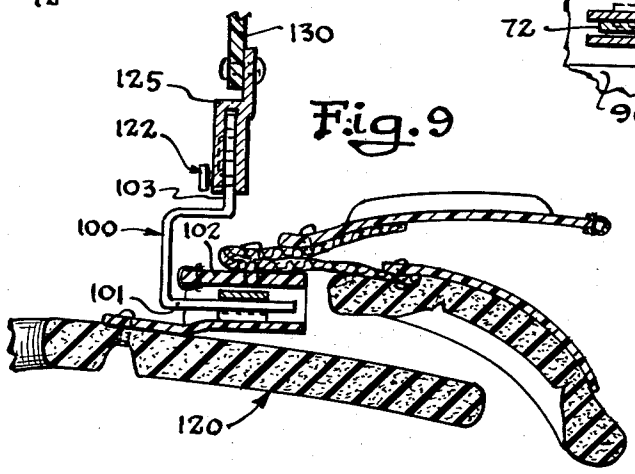


Fig. 8A

Fig. 9



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PROTECTIVE FOOTBALL APPARATUS

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Filed May 1, 1962, Ser. No. 191,496
7 Claims. (Cl. 2—2)

The present invention relates generally to protective apparatus, and more particularly to improved equipment for protecting the head and neck of a football player.

The recent increase in head and neck injuries occurring to football players and the seriousness of these injuries has resulted in considerable effort being directed to providing equipment which offers greater protection to the head and neck of a football player against serious injuries. Changes have been suggested in the form of the football helmet and efforts made to eliminate the face guard presently attached to the football helmet. However, the proposed changes provide only a minor reduction in the amount of force applied to the head and neck of a football player and would not greatly reduce or substantially eliminate the danger of severe head and neck injuries.

It is therefore an object of the present invention to provide improved protective equipment for football players which will substantially reduce serious injuries to the head and neck.

A suitable means of achieving the foregoing object of the present invention will be apparent to those skilled in the art from the detailed description illustrating certain preferred embodiments of the invention and from the claims to follow when read in conjunction with the accompanying drawing wherein:

FIGURE 1 is a front elevational view of one embodiment of the present invention operatively mounted on a football player,

FIGURE 2 is a side elevational view of the embodiment shown in FIGURE 1,

FIGURE 3 is a fragmentary vertical sectional view taken along the line 3—3 of FIGURE 2,

FIGURE 4 is a fragmentary top plan view taken along line 4—4 of FIGURE 2,

FIGURE 5 is a fragmentary exploded front elevational view partially in vertical section of the embodiment of FIGURE 1,

FIGURE 6 is an enlarged horizontal sectional view taken along the line 6—6 of FIGURE 3,

FIGURE 6A is a fragmentary vertical sectional view taken along the line 6A—6A of FIGURE 6,

FIGURE 7 is a front elevational view of the modified form of apparatus of the present invention,

FIGURE 8 is a fragmentary side elevational view of the modified form of FIGURE 7,

FIGURE 8A is a fragmentary horizontal sectional view of the modified form of FIGURE 7 in an operative position,

FIGURE 9 is a fragmentary vertical sectional view of a still further modified form of the present invention.

The present invention broadly comprises providing a rigid, shock-resistant, protective structure adapted to be maintained in spaced relationship about the head and neck of a football player and supported in shock-transmitting relationship by shoulder pads worn by the football player. As illustrated in the accompanying drawing, one of the preferred embodiments comprises a protective enclosure or helmet member, preferably of transparent material, adapted to be inserted as a unit over the head of a football player and maintained in spaced relationship with the head and neck of the football player which is supported in shock-transmitting relationship by the shoulder pads of a football player. More particularly,

the preferred embodiment of the invention comprises a rigid, shock-resistant, generally semi-spherical helmet member adapted to protectively enclose a portion of the head and neck of a football player in spaced relationship therewith and having the helmet member detachably secured to the shoulder pads of a football player with the shoulder pads being in supporting shock-transmitting relationship with the said helmet member, whereby the helmet member transmits an applied external force to the shoulder pads of a football player rather than to the head or neck of the player. It is preferable to have associated with the shoulder pads means for maintaining the shoulder pads in a predetermined position on the shoulders and torso of the football player against any tendency for the shoulder pads to be moved in an upwardly direction toward the head and neck of the football player, as when an upwardly pulling force is applied to the helmet member. As a further refinement it is also preferable to provide a cap member adapted to be worn on the head of the football player inside the helmet member. The cap member is provided with padding to prevent the head from coming into direct contact with the interior of the helmet member.

With particular reference to FIG. 1 through FIG. 6A of the drawing, the protective helmet member **10** is comprised of a generally semi-spherical member **11** formed of a rigid, shock-resistant, transparent material, such as clear plastic, which is adapted to be disposed in a shock-transmitting detachable engagement with a pair of football player shoulder pads **30**. The helmet member **10** preferably has the front portion thereof cut away, as at **12**, to provide a raised front section **13** which extends to a point just above the eye level of the football player and has a downwardly projecting rear section **14** which extends to about the base of the football player's neck. The side portions **16**, **16'** of the helmet member **10** extends downwardly preferably to a point just below the ear of the football player, and each of the side portions **16**, **16'** has fixedly secured thereto at a point slightly to the rear of the center thereof rigid helmet securement means **18**, **18'** respectively. The securement means **18**, **18'** which are best shown in FIG. 3 and FIGURES 6 and 6A comprise a bracket section **19**, **19'** having extending downwardly from the bracket section **19**, **19'** socket or groove-forming members **21**, **21'**, respectively, which are adapted to receive therein and form a locking engagement with upwardly extending tongue members of the shoulder pads **30**. Spring-loaded latch means **22**, **22'** are mounted on the inner surfaces of the members **21**, **21'** respectively. The latch means **22**, **22'** are biased in the outwardly projecting position, as best shown in FIG. 6A, whereby the locking end **23**, **23'** of the pivotally mounted lever arms **24**, **24'**, respectively, normally extend into the grooves formed by the members **21**, **21'**, respectively. It will be understood that the particular latch means shown is by way of illustration only, and that any other suitable form of latch means can be used on the shock-transmitting connection between the helmet member **10** and the shoulder pads **30**.

The football shoulder pads **30** which are mounted on the shoulders and torso of a football player, while having the general form and structure of conventional football shoulder pads, have further provided on an upper surface portion thereof spaced football helmet support means **31**, **31'**, preferably formed integrally with the shoulder pads **30**, and adapted to form a detachable engagement with the helmet securement means **18**, **18'** respectively. The helmet support means **31**, **31'** which are preferably formed of metal or other rigid non-breakable material, are comprised of an elongated flat base section **32**, **32'** curved to form with the shape of the portion of the shoulder pads

in which each is embedded or to which each is securely affixed. Upstanding rigid tongue or stud members **33**, **33'** project upwardly from the base section **32**, **32'**, respectively, and are securely attached thereto. Each of the stud members **33**, **33'** is disposed so as to be normally spaced a distance equal to the distance between the helmet securement means **18** and **18'**, so that the stud members **33**, **33'** are in vertical alignment with the groove forming members **21**, **21'**, respectively, when the helmet member **10** is held above the center of the shoulder pads **30** when mounted on the player, as shown in FIG. 5. When the helmet **10** is moved downwardly the stud members **33**, **33'** engage in the grooves of the members **21**, **21'**, respectively. The stud members **33**, **33'** preferably have a plurality of recesses or passages **34** therein with which the projecting ends **36** of the spring-loaded lever arm **37** extend to securely connect the helmet member **10** with the stud members **33**, **33'**, which in turn detachably holds the helmet member **10** on the shoulder pads **30** in shock-transmitting relationship. It will be evident that by pressing outwardly the release end **38** of the lever arm **37** of the latch means **22**, the latch means **22** can be readily disengaged from the shoulder pads **30**.

In order to prevent the shoulder pads **30** being displaced or pulled upwardly as a result of a pulling force being applied to the helmet member **10**, the front sections **40**, **40'** and the back sections **41**, **41'** of the shoulder pads **30** preferably are elonated and are provided with detachable underarm straps **42**, **42'** and are provided with front and rear anchor straps. A pair of front anchor straps **43**, **43'** are mounted adjacent the lower edge of the front sections **40**, **40'** respectively, and are adapted to be detachably secured to an achoring means, such as the pants **50** of the football player, as best shown in FIGURES 1 and 2. Similarly, the rear sections **41**, **41'** of the shoulder pads are provided with rear anchor straps **44**, **44'** respectively, adjacent the lower edge thereof which are adapted to be detachably secured to the anchoring means, such as the football players' pants **50**. A separate anchor belt member can be used as the anchoring means, if desired.

While the football helmet member **10** is formed sufficiently large to be maintained in spaced relationship with the football player's head and neck to permit free and unobstructed movement of the head and neck within the helmet member, it is preferable to also provide a light skull cap **60** for the player's head during use of the protective apparatus of the present invention. The cap **60** can, if desired, be colored to identify a team and is preferably provided with a band **61** of sponge rubber or the like padding which extends circumferentially around the lower edge of the cap **60** to prevent the player's head directly contacting the interior surfaces of the helmet member **10**. Additional strips of padding **62**, **63** extending across the top of the cap **60** may be provided, although the top of the player's head would not contact the top inner surface of the helmet **10**, even though the player were to stand on his head.

In FIGS. 7, 8 and 8A there is shown a modified form of football helmet member which can be used in the present invention and wherein the helmet member **70** is comprised of a unitary section of transparent rigid shock-resistant material, such as plastic, having a configuration somewhat more spherical than the helmet member **10**. Also, the helmet member **70** has the securement means **71**, **71'** formed integrally therewith to avoid the necessity of fastening a separate element to the helmet member **70** by means of bolts, rivets, or the like. The securement means **71**, **71'** are comprised of generally rectangular projections **72**, **72'** which project downwardly in an inwardly curved direction, as best shown in FIG. 7 of the drawing. Each of the projections **72**, **72'** are provided with spaced transversely extending rectangular slots **73**, **73'** respectively along the length thereof for engagement with a latch means mounted on a pair of football shoulder pads in accordance with the present invention.

FIG. 8A shows the helmet supporting means **91** fixedly mounted on a pair of football shoulder pads **90** with the support means **91** adapted to accommodate the projections **72**,**72'** of the helmet member **70**. The supporting means **91** are formed of U-shaped sections with the open end of the U-shaped sections extending forewardly so that the helmet projections **72**, **72'**, respectively, can be inserted into the slots formed by the spaced sides of the U-shaped sections by moving the helmet in a horizontally rearwardly direction. A spring-loaded latch means **95** is mounted on each of the support means **91** to form a detachable locking engagement with the projections **72**, **72'** of the helmet member **70**.

While the football shoulder pads to which the helmet member is detachably secured by means of a suitable helmet support means as shown in FIG. 1—FIG. 5, are of the cantilever-type and have the helmet support means secured to or embedded in an arched or cantilever section of the shoulder pad which is in turn mounted on another section of the shoulder pads, it will be understood that the helmet support means can be mounted on or embedded in any type of football shoulder pad structure, whereby the force of any blow on the helmet member can be transmitted to the shoulder pads of the football player rather than to the head and neck of the player. It should also be understood that, if desired, the present invention can be adapted for use with football shoulder pads of the type which are now in common usage by providing a football helmet support element which is adapted to be inserted under the arched or cantilever member of the football shoulder pads. Thus, in FIG. 9 is shown a helmet support means **100** having a generally horizontal section **101** adapted to be inserted under the cantilever section **102** mounted on the football shoulder pads **120** and be frictionally retained in engagement therewith. The support means **100** is further provided with an upstanding section **103** which is slotted so as to engage a latch means **122** mounted on a securement means **125** of a helmet member **130**.

The rigid transparent helmet member which comprises the preferred form of the present invention is preferably formed from a transparent, tough, shock-resistant, plastic material, such as polycarbonate plastic or polyvinyl butyral plastic. Polyvinyl butyral is a thermoplastic material derived from a polyvinyl ester in which some or all of the acid groups have been replaced by hydroxyl groups and some or all of these hydroxyl groups replaced by butyral groups by reacting with butyraldehyde to form a colorless tough solid. Other tough transparent plastic materials having properties of the above specified plastics can also be used for making the protective structure to be mounted in shock-transmitting relationship with the football shoulder pads in accordance with the present invention.

We claim:

1. A protective football apapratus comprising in combination; a rigid shock-resistant head and neck protective helmet adapted to be detachably mounted in spaced relationship about the head and neck of a football player and having securement means adjacent the lower lateral edge thereof forming a rigid detachable engagement with helmet support means of shoulder protectors of a football player, a pair of football shoulder protectors mountable on the shoulders and torso of said football player for receiving directly external forces and transmitting said forces to said shoulders and torso of said football player without causing injury thereto, and said shoulder protectors having helmet support means rigidly and detachably engaging said securement means of said protective helmet which provides a direct shock-transmitting supporting relationship between said helmet and said shoulder protectors and maintains said protective helmet supported in spaced relationship with said head and neck of said football player; whereby said football apparatus

is adapted to prevent injury to the head and neck of a football player.

2. A football apparatus as in claim 1, wherein said protective helmet is formed of transparent plastic material.

3. A protective apparatus as in claim 1, wherein said securement means and said helmet support means together comprise rigid inter-engaging tongue and groove members having associated therewith latch means forming a readily detachable locking engagement between said helmet member and said shoulder protectors.

4. A protective apparatus as in claim 1, wherein said shoulder protectors have anchor means associated therewith for maintaining said shoulder protectors in a predetermined position on the shoulders and torso of a football player.

5. A protective apparatus as in claim 4, wherein said anchor means comprise elongated front and rear sections of said shoulder protectors which are adapted to engage the lower portion of the torso of a football player.

6. Apparatus as in claim 4, wherein said anchor means comprises straps which extend from said shoulder protectors and are adapted to be secured to the pants of a football player.

7. A protective helmet for a football player comprising; a rigid transparent non-breakable generally semispherical head and neck protective member adapted to be mounted as a unit over the head and neck of a football player and be maintained in spaced relationship with the head and neck of said football player, and said helmet member having on lower edge portions thereof securement means to form a rigid readily detachable engagement with a pair of football shoulder protectors and be maintained in direct shock-transmitting relationship therewith.

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