United States Patent [19]

Ettinger

[11] **3,855,631**

[45] **Dec. 24, 1974**

[54] **PROTECTIVE NECK COLLAR**

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[22] Filed: **Jan. 23, 1974**

[21] Appl. No.: **435,840**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 397,731, Sept. 17, 1973, abandoned.

[52] **U.S. Cl.** **2/2**

[51] **Int. Cl.** **A41d 13/00**

[58] **Field of Search** ..... 2/2, 3; 128/DIG. 20, 75, 128/87 B

[56] **References Cited**

UNITED STATES PATENTS

1,252,173	1/1918	Pritchard	128/DIG. 20
2,994,534	8/1961	Davis et al.	2/2 X
3,164,151	1/1965	Vere Nicoll	128/75
3,189,917	6/1965	Sims	2/2 X
3,497,872	3/1970	Mitchell	2/2
3,765,029	10/1973	Germain	2/2

Primary Examiner—Alfred R. Guest

Attorney, Agent, or Firm—Trask, Jenkins & Hanley

[57] **ABSTRACT**

An inflatable protective neck collar for a football player or the like. The collar extends circumferentially about the player's neck to provide an air cushion between his head and shoulders. Blows to the head and neck are cushioned by the collar to protect the wearer against injury due to extreme neck flexion in any direction.

8 Claims, 5 Drawing Figures

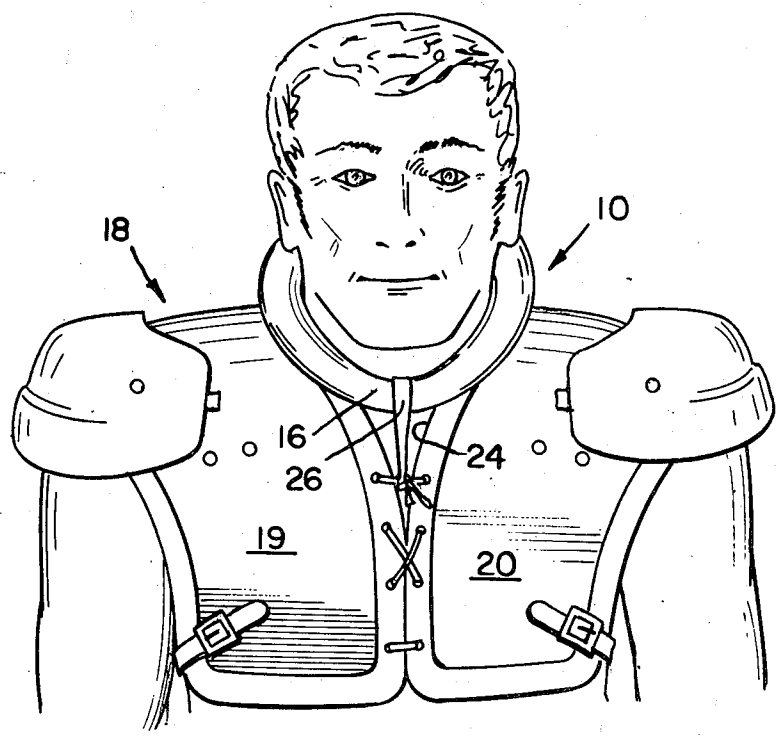
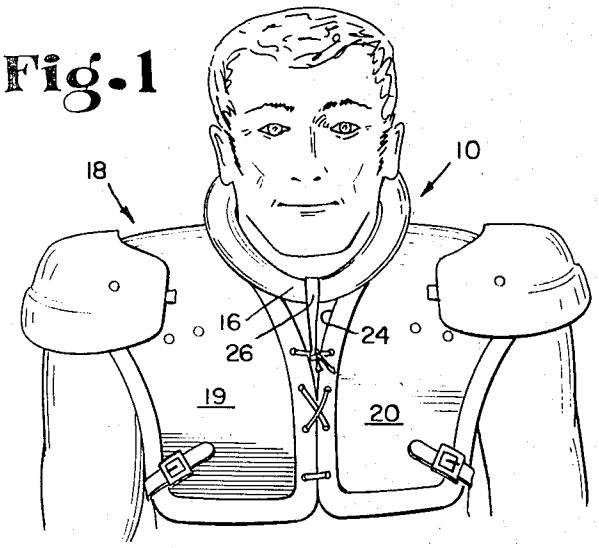


Fig.1



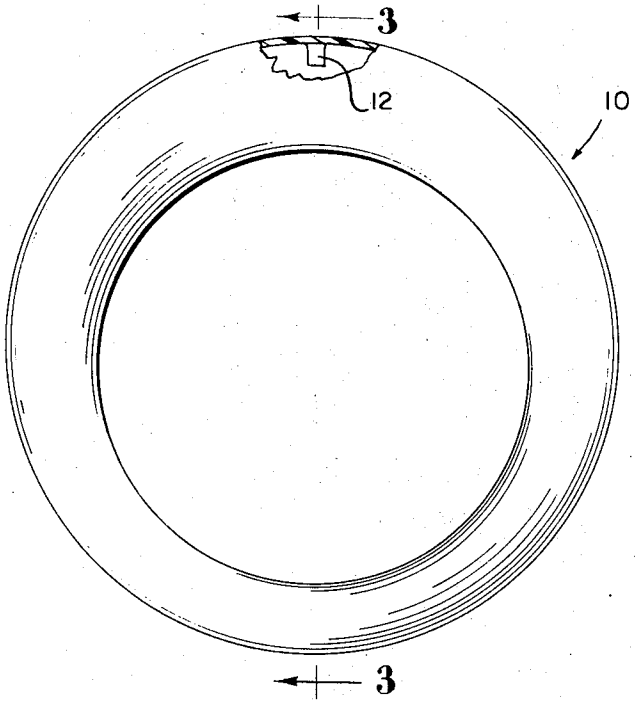


Fig.2

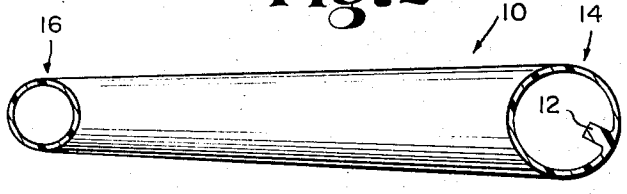


Fig.3

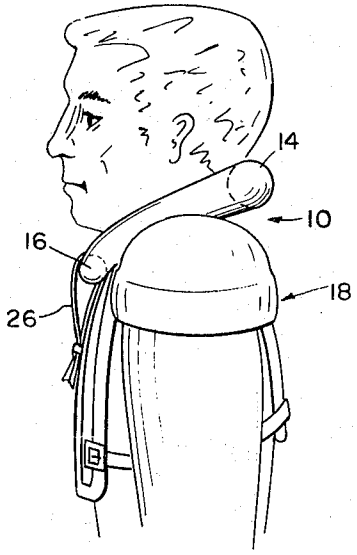


Fig.4

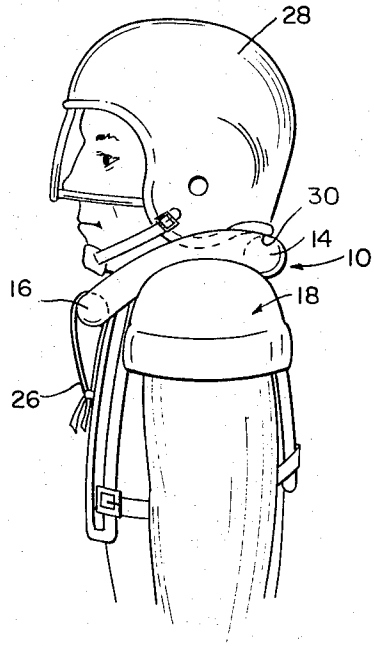


Fig.5

PROTECTIVE NECK COLLAR

BACKGROUND OF THE INVENTION

This application is a continuation-in-part of copending application Ser. No. 397,731, filed Sept. 17, 1973 now abandoned.

This invention relates to a protective neck collar for a football player or the like, and more particularly to an inflatable circumferential neck collar which is removably worn about a player's neck in a manner to reduce injuries due to extreme neck flexion and blows to the neck.

Anyone who has ever played or watched football or any other body contact sport is well aware of the ever-present danger of injury to players. From the early days of football to the present time, injuries have ocurred all too frequently. Unfortunately, the need for improved equipment often becomes known only after serious injuries to players have occurred.

In the early days of football little, if any, protective equipment was used by the participants. Over the years, however, protective equipment such as helmets, shoulder pads, thigh pads, and face guards have been introduced and their use has become mandatory. Moreover, football protective gear is continually being improved. For example, the close fitting "aviator" type leather helmet of the early days has gradually evolved into the padded, plastic helmet of today which is capable of withstanding heavy blows. In addition, present day helmets are equipped with protective face guards which serve to further reduce injuries. Shoulder pads, too, have evolved from the generally flat, form-fitting padding of the past, to the padded plastic, so-called cantilever pads of today which support at least part of the pads away from the wearer's shoulders to better absorb and diffuse the heavy blows to which they are subjected.

Neck injuries, however, continue to plague football players. This is due at least in part to the fact that advancements in head and shoulder protective equipment have tended to give a player a feeling of security. In fact, this equipment protects a player's head and shoulder areas so well that many players are now using these portions of their anatomy as weapons. Modern head and shoulder protective equipment does not, however, shield or protect the neck area, and the unfortunate result is an ever-increasing occurrence of serious neck injuries due primarily to extreme flexing or stretching of the cervical spine and neck muscles, and also to the multiplicity of direct punches and blows to the neck area which are an inherent part of the violent game of football.

The sponge neck collar is the most commonly used football neck protective device, and that collar normally comprises a horseshoe-shaped roll of sponge rubber which is worn around the rear and the sides of a player's neck. The sponge collar is kept in place by tying it with shoelaces to the player's shoulder pads in both the front and rear, and the collar serves as a stopgap between the player's head and shoulders to prevent flexing or stretching of the neck beyond a predetermined position. In this manner, injuries due to extreme flexion to the rear or to either side may be reduced.

Unfortunately, the conventional sponge collar does not prevent or reduce neck injuries caused when a player's head is violently rammed forwardly and downwardly into his chest, as often happens during a head-on tackle. And the collar does not protect against direct blows to the frontal area of the neck. Moreover, because the collar prevents flexing movement beyond a predetermined position, it is often difficult or impossible for a player such as a lineman to wear a sponge collar and still be able to get his head back and up in order to see his opponent. See U.S. Pat. Nos. 3,189,917 and 3,497,872. For this reason, many coaches do not allow their players to wear one of these collars until after they have received an injury. This, in effect, relegates the conventional sponge collar to a use of preventing aggravation of existing neck injuries rather than preventing the injuries themselves. Clearly therefore, the sponge collar is an unsatisfactory solution to the persisting neck injury problem.

Various other neck protectors have been developed, and some of these are designed to protect a player against injury caused by extreme forward and downward movement of the neck. See, for example, U.S. Pat. No. 3,765,029. While some of these protectors do not greatly restrict a player's head and neck mobility, they are of limited usefulness since they do not protect against extreme neck flexion in all directions.

The present invention overcomes the above-mentioned problems and deficiencies by providing a protective neck collar which helps prevent neck injuries caused by extreme flexing or stretching of the neck in any direction, and which does not restrict a player's normal head and neck movements. Moreover, the present invention provides a neck collar which does not substantially add to the weight or bulkiness of a player's protective equipment, and is both structurally simple and relatively inexpensive to manufacture.

SUMMARY OF THE INVENTION

In accordance with the invention, an inflatable neck collar is provided which fits circumferentially about a player's neck to form an air cushion between his head and shoulders. When partially inflated, the collar has a size and shape effective to absorb and diffuse sharp blows to the head and neck area and thereby prevent extreme flexing and stretching of the neck in all directions. The player's normal head and neck movements are unimpeded as the collar compresses slightly to accommodate such normal movements.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings illustrate the invention. In such drawings:

FIG. **1** is a front elevation of a football player wearing a protective neck collar embodying the invention;

FIG. **2** is an enlarged plan view of a neck collar made in accordance with this invention with portions thereof cut away;

FIG. **3** is a vertical section taken on the line **3—3** of FIG. **2**;

FIG. **4** is a side elevation of a player wearing the collar of FIG. **1**; and

FIG. **5** is a side elevation similar to FIG. **4**, but with the player also wearing a protective helmet.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A protective neck collar embodying this invention is shown in FIG. **1** and generally comprises a circumferentially extending collar **10** which fits about a player's neck.

The protective collar **10** is formed of a strong, lightweight, elastomeric or rubber-based material and is rotationally molded into an annular-shaped tube, as shown in FIGS. **2** and **3.** The collar is sufficiently resilient that it can be pulled over the wearer's head and regain its original circumference and shape about the wearer's neck.

A soft air valve **12,** formed of gum rubber or a like substance, is disposed at or near the outer periphery of the collar **10** to permit the collar to be selectively inflated and deflated. Because of the inherent resiliency of the collar, inflation thereof can be accomplished either before or after the collar is placed about the wearer's neck. A hypodermic needle (not shown) is inserted through the gum valve **12** and a predetermined amount of air blown through the needle to inflate the collar. When the needle is withdrawn from the gum valve, the valve will self-seal and the collar will remain inflated until the needle is re-inserted through the valve for the purpose of bleeding air from the collar. Alternatively, the collar can be equipped with a conventional basketball-type self-sealing valve to permit selective inflation and deflation of the collar.

The size and shape of the collar is such that the inside circumference thereof is slightly larger than that of the wearer's neck, say by about one-half to three inches. This permits the collar to fit closely yet comfortably about the wearer's neck without affecting the wearer's normal side-to-side neck movement. The collar can be manufactured in a variety of sizes, each having a different inside circumference to assure that one size will fit a given user.

The collar is shaped from front to rear to generally correspond to the shape of the wearer's neck and shoulders. To this end, the cross-sectional circumference of the collar varies from a large portion **14** at the back of the player's neck to a relatively smaller portion **16** in the front. In practice, the actual dimensions depend upon the size of the player, but normally the cross-sectional circumference tapers from about 5 inches at the back of the neck to about 3 inches in the front.

As shown in FIGS. **1** and **4,** the collar is desirably used in conjunction with protective shoulder gear such as a set of football shoulder pads **18.** Typically, the pads are formed of complementary halves **19** and **20** which are flexibly joined together at their backsides by webbing (not shown) and in the front by laces **22.** Together, the halves **19** and **20** form an opening **24** through which the player's head extends, with the edges of the opening generally following the contour of the player's neck and shoulders from front to rear. The pads **18** therefore conveniently form a supporting surface upon which the collar can be placed.

After the collar is pulled over the player's head, the smaller portion **14** is centered in the front under the chin. Desirably, the collar is tied as by a spring **26** to the laces **22** on the front of the shoulder pads **18.** This secures the collar against unwanted displacement about the player's neck and retains the smaller portion **14** under the chin to assure that the collar will always be positioned to generally fit the contour of the pads **18** from front to rear. The string **30** also serves to pull the front of the collar downwardly a short distance, as shown in FIG. **4** to cause the front of the collar to more closely fit the sloping frontal contour of the pads. Moreover, this increases the clearance between the player's chin and the upper front surface of the collar to facilitate normal up and down head movement. As shown in FIG. **5,** when the player puts on a protective helmet **28** of the type typically used in football, the lower rear edge **30** of the helmet bears against the upper rear surface of the collar. In effect, the helmet pushes the larger portion **26** of the collar downwardly a short distance to cause the rear portion of the collar to substantially fill the gap between the helmet **28** and the pads **18,** and to also generally conform to the sloping contour of the backside of the pads.

When in place, the collar provides an air cushion encircling the wearer's neck atop his shoulder pads and substantially filling the previously unprotected gap between the head and shoulders. The collar is inflated to an extent such that normal head and neck movements are unimpeded while sharp blows to the head and neck are effectively absorbed and diffused. For example, the collar compresses slightly with little effort to accommodate normal side-to-side and up-down head and neck movement such as is required of an athlete during competition. This permits a player such as a football lineman to get his head back and up to see his opponent as his helmet or head bears against and slightly compresses the air in the collar. However, when a player receives a sharp blow to the head or neck as is often the case in football during a head-on tackle, his head will naturally move with the blow and subject the player to possible injury due to extreme neck flexion. The neck collar of this invention effectively protects against such extreme neck flexion in all directions by absorbing and diffusing the blow as the player's head pinches the collar between his head and shoulders. Additionally, the collar serves to pad the neck area against direct blows to provide even greater protection against neck injury.

The protective neck collar of this invention is capable of repeatedly absorbing and dissipating the sharp blows to the head and neck which could otherwise cause severe injury. This collar is compatible with a player's conventional protective armor and adds substantially no weight thereto. Moreover, while this inflatable collar has been described for use primarily by a football player, the collar can be used by any athlete involved in a contact sport and desiring circumferential protection against extreme neck flexion.

I claim:

1. A protective neck collar for use in conjunction with protective athletic shoulder gear which has a head opening formed therethrough, comprising an inflatable annular tube of a pliable material adapted to extend circumferentially about a player's neck between the protective shoulder gear and the player's head, and means for connecting said tube to the protective shoulder gear to prevent displacement of said tube about the player's neck, the size and shape of said tube being such that said tube generally conforms to the front to rear contour of the head opening in the protective shoulder gear and substantially fills the gap between the player's protective shoulder gear and head, said tube forming an air cushion which when inflated encircles the player's neck and compresses slightly with little effort to accommodate normal head and neck movements, and is pinched between the player's head and protective shoulder gear upon sharp blows to the head and neck to absorb said blows and prevent injury due to extreme neck flexion in any direction.

2. A protective neck collar as set forth in claim 1 wherein said tube is stretchable to be pulled over the player's head and regain its original size and shape when about the player's neck and inflated.

3. A protective neck collar as set forth in claim 1 wherein said tube has a generally circular cross section, and the cross-sectional circumference of said tube tapers from about 5 inches at the back of the player's neck to about 3 inches in the front.

4. A protective neck collar as set forth in claim 1 wherein the cross section of said tube tapers from a large portion at the back of the player's neck to a relatively smaller portion in the front.

5. A protective neck collar as set forth in claim 1 wherein said means for connecting said tube to the protective shoulder gear is connected to the portion of said tube at the front of the player's neck, said means being operative to pull downwardly on said portion to cause said tube to closely fit the frontal contour of the shoulder protective gear.

6. A protective neck collar for use in conjunction with protective athletic head gear and protective athletic shoulder gear having a head opening formed therethrough, comprising an inflatable annular tube of a pliable material and a generally circular cross section adapted to extend circumferentially about a player's neck between the shoulder gear and the player's head and head gear, said tube being stretchable to be pulled over the player's head and to regain its original shape about the player's neck, and means for connecting said tube to the shoulder gear to prevent displacement of said tube about the player's neck, said tube having a cross section tapering from a large portion at the back of the player's neck to a relatively smaller portion in the front to generally conform when inflated to the front to rear contour of the head opening in the shoulder gear and to substantially fill the gap between the player's shoulder gear and his head and head gear, said tube forming an air cushion which encircles the player's neck and compresses slightly with little effort upon engagement with the player's head and head gear during normal head and neck movements to accommodate said normal movements, and is pinched between the player's shoulder gear and his head and head gear upon sharp blows to the head and neck to absorb said blows and prevent injury due to extreme neck flexion in any direction.

7. A protective neck collar as set forth in claim 6 wherein said means for connecting said tube to the protective shoulder gear is connected to the relatively smaller portion of said tube at the front of the player's neck, said means being operative to pull downwardly on said smaller portion to cause said tube to closely fit the frontal contour of the shoulder protective gear.

8. A protective neck collar as set forth in claim 6 wherein the cross-sectional circumference of said tube tapers from about 5 inches at the back of the player's neck to about 3 inches in the front.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,855,631 Dated December 24, 1974

Inventor(s) Donald N. Ettinger

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 6, add a comma after "1973"

Column 3, line 56, change "14" to --16--;

line 57, change "spring" to --string--;

line 60, change "14" to --16--;

line 63, change "30" to --22--.

Column 4, line 2, start new paragraph with "As".

line 7, change "26" to --14--.

In the drawings, sheet 1, Fig. 1, the reference numeral 22 should be applied to the laces tying together the front of the complementary halves 19 and 20 of the shoulder pads 18.

Signed and sealed this 8th day of April 1975.

(SEAL)
Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents
and Trademarks

FORM PO-1050 (10-69)

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