Dec. 30, 1969 J. H. RAWLINGS 3,486,169

HELMET COMBINATION SUSPENSION

Filed Jan. 26, 1968 2 Sheets-Sheet 1

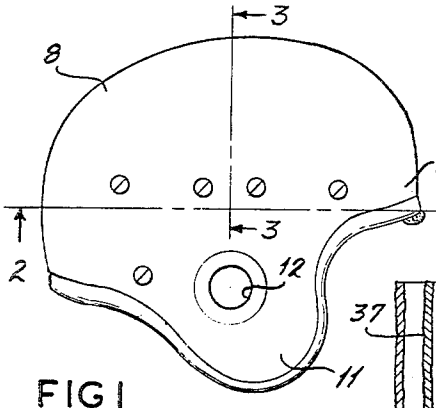


FIG. 1

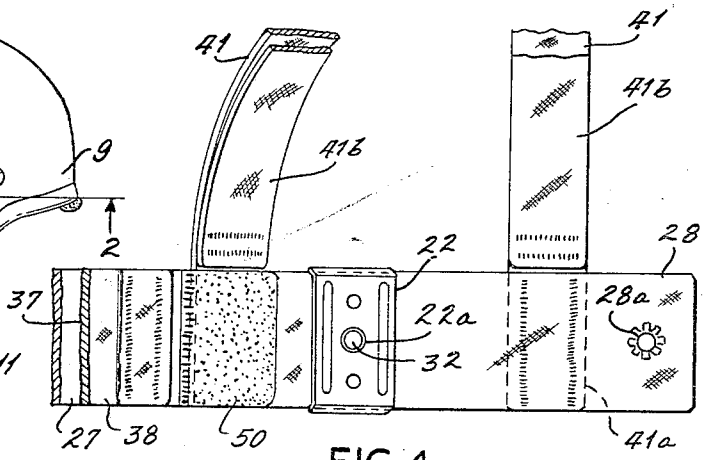


FIG. 4

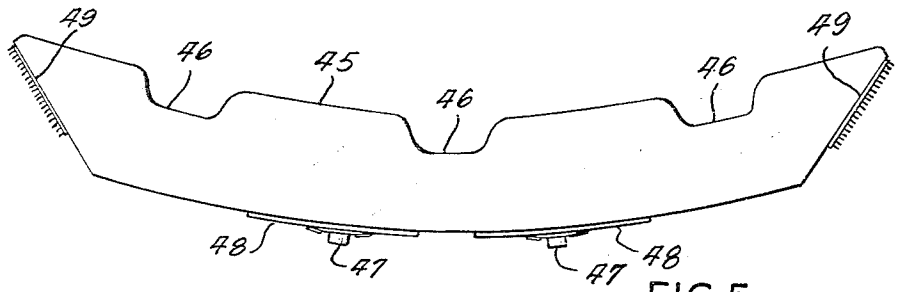


FIG. 5

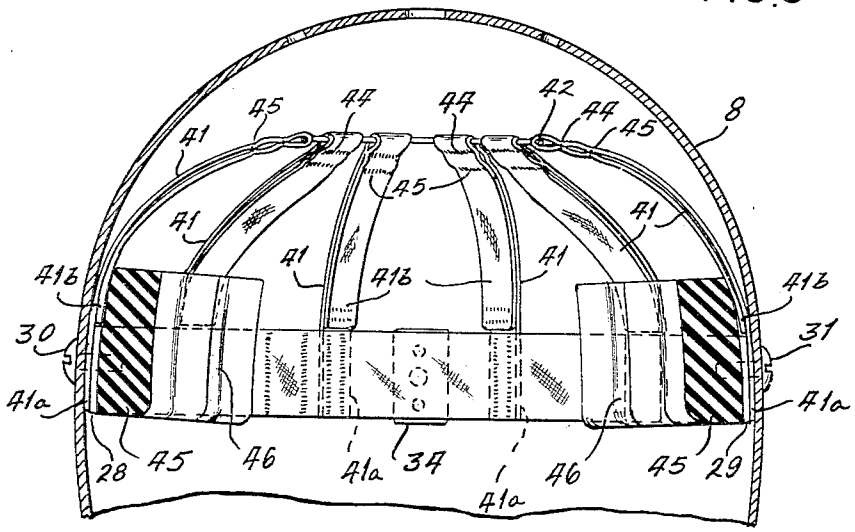


FIG. 3

INVENTOR:
JOHN H. RAWLINGS

BY Gravely, Lieder & Woodruff
ATTORNEYS.

Dec. 30, 1969 J. H. RAWLINGS 3,486,169

HELMET COMBINATION SUSPENSION

Filed Jan. 26, 1968 2 Sheets-Sheet 2

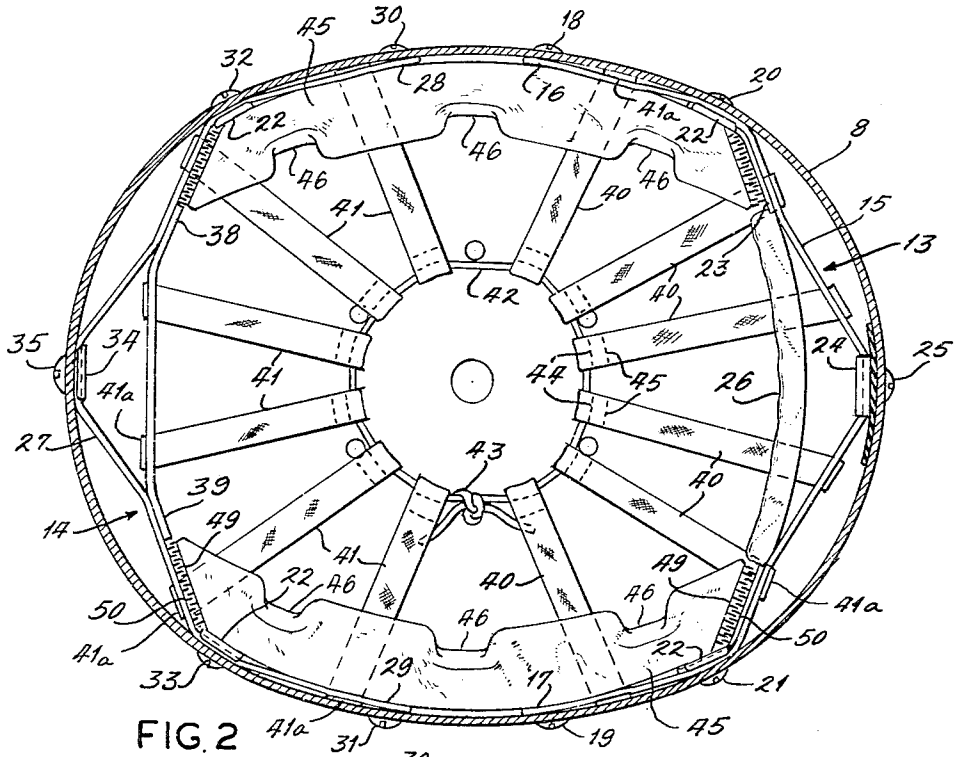


FIG. 2

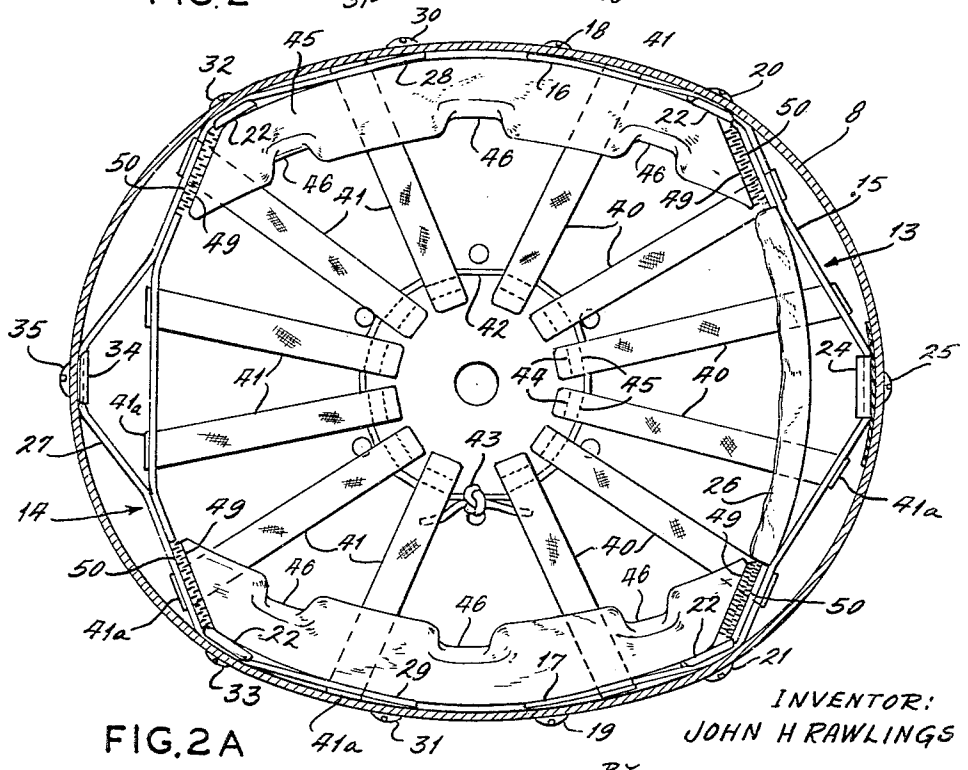


FIG. 2A

INVENTOR:
JOHN H RAWLINGS

BY Gravely, Lieder & Woodruff
ATTORNEYS.

United States Patent Office 3,486,169
Patented Dec. 30, 1969

3,486,169

HELMET COMBINATION SUSPENSION

John H. Rawlings, Dallas, Tex., assignor to Automatic Sprinkler Corporation of America, St. Louis, Mo., a corporation of Ohio

Filed Jan. 26, 1968, Ser. No. 700,937
Int. Cl. A42b 1/08, 3/00
U.S. Cl. 2—3 8 Claims

ABSTRACT OF THE DISCLOSURE

A helmet assembly in which the head suspension system is arranged to be adjustable to accommodate various head shapes, and in which shock and sound control padding is mounted for removability to allow using different sizes and shapes of padding to achieve comfort and protection.

This invention relates to protective helmets and is especially directed to improvements in helmets of the general type used by football players.

There are a number of problems which have persisted for some time in the construction of helmets, especially helmets of the type used by football players. One of the more important of these problems is the arrangement of suspension means by which the helmet shell is mounted on the head of the player. Practically no attention has been given to the fact that head shapes vary from player to player and there is practically no suspension assembly that will properly position the helmet shell for maximum protection on everyone. Another important problem is the poor location and mounting arrangement for padding so that there will be achieved more than adequate shock absorbing means between the helmet shell and the player's head, and the lack of means to control the propagation of sound within the helmet shell.

One of the main objects of this invention is to provide a suspension system and sound control padding so as to overcome the above mentioned problems.

It is also an important object of this invention to provide helmet suspension means that can be selectively adjusted to accommodate practically all head shapes and still maintain the helmet in a comfortable position.

Still another important object of the present invention is to provide a protective helmet with detachable side pads so that protection and control of sound within the helmet is achieved.

It is a further object of the present invention to provide improved suspension means for mounting the protective helmet on the head of a football player and to assemble the suspension means in at least two independent parts and to interconnect the parts for cooperation.

One preferred embodiment of the present invention includes a unitary helmet shell provided with a crown portion, the usual ear covers and cheek extensions, and removably mounted front and rear suspension assemblies, each of which is provided with a plurality of suspension straps. The preferred embodiment also includes means for adjustably interconnecting the suspension straps so as selectively to lengthen or shorten the straps in a manner to accommodate a variety of head shapes. The preferred embodiment, furthermore, includes detachable side pads which extend over the temples and above the ears in a manner to absorb shock from side blows and also to control cross travel of sound within the helmet shell.

In view of the statement of the foregoing objects and a brief description of the preferred embodiment of the

present invention, reference will now be made to the several views in the drawings, wherein:

FIG. 1 is a side elevational view of the presently improved helmet emboding the various features to be presently described;

FIG. 2 is a greatly enlarged sectional view of the helmet shown in FIG. 1, the view being taken along the line 2—2;

FIG. 2A is a view similar to FIG. 2 to show one alternate arrangement for the suspension harness; but other arrangements are, of course, possible;

FIG. 3 is a transverse sectional view of the presently improved helmet taken at least 3—3 in FIG. 1;

FIG. 4 is a greatly enlarged fragmentary view of a typical arrangement of the suspension means; and

FIG. 5 is a greatly enlarged view of a side pad showing the herein preferred means for adjustably and movably mounting the pad in protective position.

Reference will now be made to the several views in the drawing where it can be seen that the helmet comprises a one piece molded shell **8** made of any suitable material, such as laminated fiber glass, and conformed so as to provide a crown portion, a front edge **9** which fits well down over the forehead of the wearer and a rear edge **10** which extends down over the neck of the wearer to protect the cervical region. The helmet **8** is also provided with the usual ear and cheek extensions **11**, and each of these extensions is provided with a sound admitting opening **12**.

Turning now to FIGS. 2 and 3, it can be seen that the shell **8** is provided on the interior with a pair of suspension harnesses, a suspension harness **13** being adapted to conform to the front of the wearer's head and the suspension harness **14** being adapted to accommodate the rear portion of the wearer's head. The front suspension harness includes a main strap **15** which extends from one end portion **16** to an opposite end portion **17**. The end portions **16** and **17** respectively are connected by removable threaded elements **18** and **19** to the shell **8** in a manner that will be presently described. In addition the main strap **15** is also secured at opposite sides of the front portion by threaded elements **20** and **21** which pass through openings in the helmet shell **8** and engage clamp plates **22** which are of identical configuration and will be presently described. The portion of the main strap **15** between the clamp plates **22** is secured in position by another clamp plate **24** removably held in position by a threaded element **25** passing through the front wall of the shell **8**. The suspension strap **15** cooperates with a chordal strap **23** directed across the forehead portion so that a forehead pad **26** may be mounted thereon to prevent contact of the rough material of the strap with the forehead of the player.

The rear suspension harness includes the main strap **27** secured by its ends **28** and **29** by threaded means **30** and **31** which pass through the shell **8**, and between its ends **28** and **29** the strap **27** is also removably connected to the shell by clamp plates **22** held by threaded elements **32** and **33**, and still further by a rear clamp plate **34** having its threaded attachment element **35** mounted in the shell. The head of the wearer is prevented from engaging the interior rear portion of the shell **8** by the chordal strap **37** which has its ends **38** and **39** secured to the main strap **27** spaced from the clamp plates **22**.

As can be seen in FIGS. 2 and 3, and in some minor detail in FIG. 4, the front suspension harness is provided with a plurality of suspension elements **40** and the rear suspension harness is provided with a plurality of suspension elements **41**. The respective elements **40** and **41** have their outer ends secured to the suspension harness **13** and **14** respectively while the inner ends are directed toward a central crown area and are joined by a cord

42 which is laced through the inner end loops of the elements 40 and 41 and secured with a tie 43. The respective elements 40 and 41 are stitched or tacked at 44 and 45 (FIG. 3) so that each thereof will be provided with a space through which the cord 42 may be strung either at the end (as shown) or at one or two places inwardly of the end. For example, (FIG. 2A) the cord 42 may be looped through the front elements 40 between the stitching 44 and 45 so as to shorten elements 40 and accommodate the forehead suspension harness to a head shape where the forehead is backwardly sloped. On the other hand, if the player's forehead is very prominent and the rear portion of the head is sloped, the cord 42 may be placed in the elements 41 either between the stitching 44 and 45 or inwardly of the stitching 45 so that the suspension system will accommodate that particular head shape. In like manner the cord 42 may be inserted through element openings in certain of the harness elements 40 and 41 on either side to take care of head shapes that are not symmetrical from side to side.

Turning now to FIG. 4 it can be seen that a typical suspension harness end portion includes for the rear suspension harness 14 the main strap 27 provided with one end 28 having a grommet eye 28*a* positioned therein in order to receive the threaded element 30 which will be inserted through the body of the shell 8 and through the opening in the grommet eye 28*a* for threading connection with a socket element (later to be described in connection with FIG. 5). Inwardly of the end 28 the main strap 27 provides an anchorage for the outer ends 41*a* and 41*b* of one of the loop elements 41. Proceeding still further away from the end 28, the main strap 27 is securely anchored to the shell 8 by a clamp plate 22 which has a threaded opening 22*a* therein to receive the threaded element 32 which passes through the shell 8. The clamp plate 22 is provided with suitable longitudinal beads for purpose of stiffening the same. To the left of the clamp plate 22 as seen in FIG. 4 the main strap 27 supports the ends 41*a* and 41*b* of another suspension loop 41 and also supports a piece of Velcro material. The view of FIG. 4 is typical of the arrangement of end portions of the front and rear suspension harnesses. The Velcro material is set forth in United States Patent No. 2,717,437 issued Sept. 13, 1955 to De Mestral. The Velcro material is available from John Boyle and Company, Incorporated of New York City.

Turning now to FIG. 5, and with reference to FIGS. 2, 3 and 4, it can be seen that a typical side pad 45 includes a body of shock absorbing foam material shaped with a plurality of indentations 46 in order to allow the body to shape itself to the temple portion of the wearer's head. The outer side of the pad 45 is provided with a pair of threaded sockets 47, each socket 47 being attached to a mounting patch 48. The patches 48 are then adhesively or otherwise secured to the surface of the pad 45. The opposite bevelled end portions of the pad 45 carries a cooperating section of VELCRO material 49 such that when the pad 45 is mounted so that, for example, the threaded elements 18 and 30 enter the sockets 47, the Velcro portion 49 on the opposite ends of the pad 45 will engage the cooperating Velcro elements 50 (see FIG. 4) and maintain the end portions of the pad in position. It is, of course, appreciated that each pad 45 may be adjustably mounted by joining the Velcro pads 49 and 50 in any desired position prior to moving the central portion of the pad up or down to match sockets 47 with 18 and 30 and/or 19 and 31. Alternatively the ends can be adjusted after the threaded elements engage sockets 47.

Having now described the structural features of the presently improved helmet suspension and padding, it should be easily appreciated that the suspension harness assembly can be adjusted and shaped to accommodate substantially any head shape or configuration so that the helmet may be individually tailored to the needs and comfort of the wearer. It can also be appreciated, in view of the disclosure in FIGS. 2 and 3 that the side pads 45 are so located that the wearer's ears are outside of the sound chamber within the helmet shell 8. In other words, the pads 45 prevent sound revibration within the helmet shell 8 and thereby prevent stadium roar from bothering the hearing ability of the wearer. This is an important feature which has not heretofore been fully realized by manufacturers of helmets. The side pads 45 may be quite easily removed and replaced with various thicker or thinner pads depending on the comfort of the wearer, and the application of the Velcro material to the ends of the pads 45 permits some degree of up or down adjustment of the pad ends to suit the comfort of the wearer.

What is claimed is:

1. A helmet comprising: a shell having a crown portion formed with a front forehead protecting edge, a rear neck protecting edge and side ear covering extensions; head engaging front and rear suspension means in said shell adapted to space the shell from the forehead and neck of the wearer, said front and rear suspension means extending generally chordally of said shell and having end portions anchored to said shell above said side ear covering extensions; and shock cushions mounted in said shell above said ear covering extensions, said cushions extending forwardly and rearwardly to engage respectively said front and rear suspension means adjacent said end portions anchored to said shell.

2. A helmet comprising: a shell having a crown portion formed with a front forehead protecting edge, a rear neck protecting edge and side ear covering extensions; head engaging front and rear suspension means in said shell adapted to space the shell from the head of the wearer, said front and rear suspension means being independently mounted in said shell; head engaging suspension elements connected to each of said suspension means extend inwardly and upwardly toward the central area of said crown portion; tie means interconnects the inner end portions of said suspension elements to support the shell crown portion spaced from the head of the wearer; and shock cushions mounted in said shell above said ear covering extensions, said cushions extending forwardly and rearwardly to engage respectively said front and rear suspension means.

3. The helmet set forth in claim 2 wherein said elements have a plurality of openings in the inner end portions, and said tie means is selectively engageable in predetermined ones of said openings to shape said suspension elements to the head of the wearer.

4. A helmet comprising: a shell having a crown portion formed with a front forehead cover, a rear neck cover and side ear covering extensions; a front suspension harness having opposite ends and a medial portion connected to said shell; a rear suspension harness having opposite ends and a medial portion connected to said shell, said front and rear harnesses being independent of each other; shock cushions mounted in said shell above said side ear covering extensions and having end portions engaged with said opposite end portions of said front and rear suspension harnesses, said cushions extending in contact along the sides of the wearers head above the ears to cut-off sound echoes within said shell; head engaging elements connected to said front and rear suspension harnesses and extending upwardly in said shell to ends thereof which coverge at a central region within said crown portion; and means connecting said ends of said elements in collective adjacency at the central region to retain said shell normally spaced from the head of the wearer.

5. The helmet set forth in claim 4 wherein said front suspension harness includes a chordal band engageable with the forehead of the wearer, said rear suspension harness includes a chordal band engageable with the

back of the head of the wearer, and said cushion end portions are detachably connected to said chordal bands.

6. A helmet comprising: a shell having a crown portion formed with a front forehead cover, a rear neck cover and side ear covering extensions; a front suspension harness connected to said shell; a rear suspension harness connected to said shell; head engaging elements connected to said front and rear suspension harnesses and extending upwardly in said shell to ends thereof which converge at a central region within said crown portion; and means connecting said ends of said elements in collective adjacency at the central region to retain said shell normally spaced from the head of the wearer; said head engaging elements have means at the inner converging ends to selectively be engaged by said connecting means to permit adjusting said elements collectively to the shape of the wearer's head.

7. A helmet comprising: a shell having a crown portion formed with a front forehead cover, a rear neck cover and side ear covering extensions; a front suspension harness connected to said shell; a rear suspension harness connected to said shell; head engaging elements connected to said front and rear suspension harnesses and extending upwardly in said shell to ends thereof which converge at a central region within said crown portion; and means connecting said ends of said elements in collective adjacency at the central region to retain said shell normally spaced from the head of the wearer; said head engaging

elements each have means adjacent the inner ends to selectively receive said connecting means and thereby change its effective length.

8. A helmet comprising: a shell having a crown portion formed with a front forehead cover, a rear neck cover and side ear covering extensions; a front suspension harness connected to said shell; a rear suspension harness connected to said shell; head engaging elements connected to said front and rear suspension harnesses and extending upwardly in said shell to ends thereof which converge at a central region within said crown portion; means connecting said ends of said elements in collective adjacency at the central region to retain said shell normally spaced from the head of the wearer; and shock cushions mounted in said shell above said ear cover extensions to engage the temple and sides of the wearer's head and shut off stadium roar within said shell crown.

References Cited

UNITED STATES PATENTS

2,417,616	3/1947	Ryniker	2—181.8
2,969,546	1/1961	Morgan	2—3
3,183,522	5/1965	Groot	2—6
3,289,212	12/1966	Morgan	2—3
3,292,180	12/1966	Marietta	2—3
3,344,433	10/1967	Stapenhill	2—3

JAMES R. BOLER, Primary Examiner