Dec. 6, 1966 G. E. MORGAN 3,289,212

SIZER MEANS FOR HELMETS

Filed Dec. 7, 1964

FIG. 1

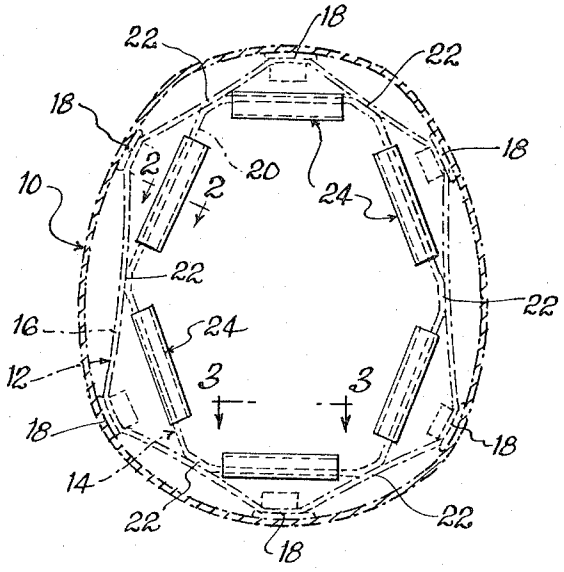
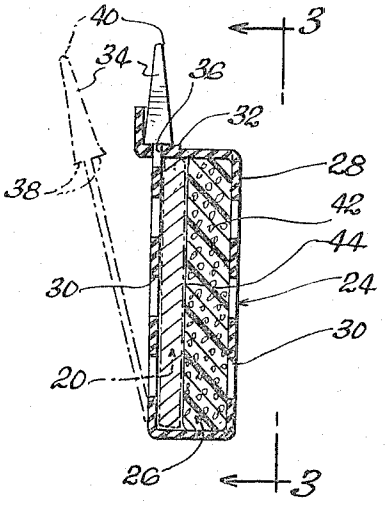


FIG. 2



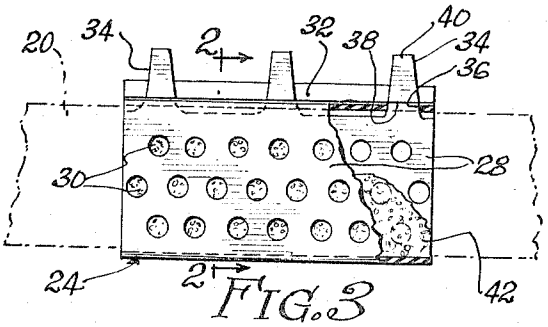


FIG. 3

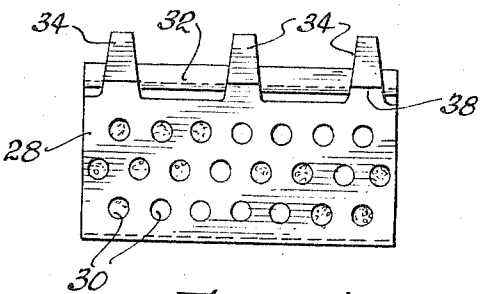


FIG. 4

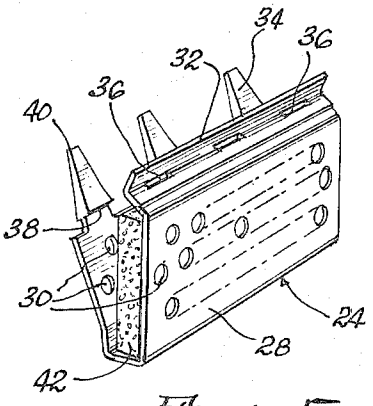


FIG. 5

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SIZER MEANS FOR HELMETS

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This invention relates to an element adapted to be included in helmets of the type worn for protective purposes. In particular, the invention relates to a sizer suitable for insertion within a helmet to thereby change the size of the helmet.

The use of protective helmets in playing football and in various other activities to ward off the detrimental effects of blows is extremely common. Such helmets usually comprise an outer shell of plastic or other relatively firm material with a cradle on the inside of the helmet for contact with the head. This cradle, which may comprise a plurality of straps or other materials, is spaced from the helmet shell with a view toward avoiding direct contact between the shell and the head. A highly suitable arrangement of straps for use as the head cradle is disclosed in United States Patent No. 2,250,275.

It is highly desirable, particularly in contact sports such as football, to provide helmet constructions which acurately fit the head of the wearer. Thus, the head cradle should fit around the head on all sides so that there will be little freedom of movement of the head with respect to the cradle. Where a poor fit is provided, there is a much greater possibility of injury due to blows directed at the head.

Perfect fits for everyone engaged in contact sports would only be possible if each helmet and head cradle were custom made. This is completely unsatisfactory in virtually all cases due to the necessary increase in cost and lack of efficiency in producing such helmets. In the case of organizations employing helmets but having a relatively small budget, custom fitting would be impossible, and it is even difficult in many cases to keep an adequate inventory. Thus, even where a wide variety of helmet sizes is available, it is not always possible for institutions to keep up with changes in personnel to the extent that each individual needing a helmet would have available the best fit.

Attempts have been made to provide helmet designs which include means for adjusting the size of the helmet. In many cases, however, the adjusting means are inconvenient and there is a tendency to ignore this approach. Furthermore, the provision of adjusting characteristics particularly in the head band of conventional helmet designs can weaken the structure to a dangerous point. Accordingly, adjusting means which utilize buckles or the like on a head band are avoided in the best helmet designs.

It is an object of this invention to provide an improved means for adjusting the size of protective helmets such as those used in contact sports.

It is a further object of this invention to provide a sizer for helmets which can be very easily incorporated into conventional helmet constructions to thereby minimize any inconvenience in securing a size adjustment.

It is an additional object of this invention to provide a sizer for helmets which does not in any way weaken or otherwise detract from the protective characteristics of conventional helmets.

These and other objects of this invention will appear hereinafter and for purposes of illustration but not of limitation, specific embodiments of this invention are shown in the accompanying drawings in which:

FIGURE 1 is a cross-sectional view of a helmet illustrating portions of a head cradle and sizer elements associated therewith;

FIGURE 2 is an enlarged cross-sectional view of a sizer element taken about the line 2—2 of FIGURE 1;

FIGURE 3 is a front elevational view of a sizer element taken about the line 3—3 of FIGURE 2;

FIGURE 4 is a rear elevational view of the sizer element shown in the open position; and,

FIGURE 5 is a perspective view of the sizer element shown in the open position.

The improvement of this invention is adapted to be associated with a protective helmet construction of the type comprising a substantially rigid outer helmet shell. The helmet construction contemplated is of the type including a head cradle secured within the shell and defining an area for receiving the wearer's head and for holding the wearer's head in spaced-apart relationship with respect to the interior surface of the shell.

The head sizer of this invention includes resilient pad portions which are adapted to be located over inwardly facing surfaces defined by the head cradle. The sizer means are adapted to be located in virtually any position within the helmet shell. When located in place, the sizers are effective to decrease the size of the head receiving area defined by the cradle. As will be pointed out, the sizers are to be carefully placed in any area within the shell where proper fitting between the cradle and the wearer's head is not indicated.

In the accompanying drawings, there is illustrated a helmet shell **10** which includes straps **12** and **14** forming a head cradle within the helmet shell. The straps comprise an outer peripheral strap **16** which is secured to the shell **10** at a plurality of points designated **18**. In addition, the head cradle includes a head band **20** which is attached to the strap **16** at six points designated by the numeral **22**. It will be noted that this attachment of the head band is provided at a point intermediate the points **18**.

The head sizer of this invention is generally designated by the numeral **24**. As suggested by FIGURE 1, the head sizers can be located at several points within the helmet shell. It will be appreciated that the particular arrangement of sizers illustrated in this case is not in any way limiting insofar as the contribution of this invention is concerned. Obviously, in some cases, an individual may wish to employ only a single sizer while in other cases, several of the sizers may be considered suitable.

The sizer structure consists of an inner resilent pad portion **26** and an outer covering **28**. Both the front and back walls of the covering define holes **30** provided for ventilation purposes.

The free ends of the covering **28** each define extensions which permit securing of sizers within the helmet shell. As shown in FIGURE 3, one of these extensions comprises a portion **32** while the other extension includes a set of fastening fingers **34**. Openings **36** defined by the extension **32** are located to correspond with the position of the fingers **34**.

The fingers each comprise portions **38** forming outwardly extending shoulders. These portions taper upwardly to relatively narrow ends **40**. It will be appreciated that when the ends **40** are inserted into the openings **36** to their fullest extent, the shoulders **38** will serve to lock the respective ends of the covering. The covering is made of a strong but stretchable material so that the fingers **34** can be removed from the openings if a further change in size is desired.

The resilient pad **26** is located in attached relationship with respect to one portion of the covering **28**. This pad is preferably attached to the covering by means of an adhesive, and the pad serves as the major element for determining the thickness of the sizer. Obviously, pads

of various thicknesses could be inserted within the covering to provide greater selectivity in the use of the sizers.

It will be apparent that the sizers described can be easily associated with straps forming a head cradle within a helmet. In the arrangement shown in FIGURE 2, a sizer **24** is attached to the head band **20**. It will be appreciated, however, that other straps could also have sizers associated therewith and it will also be noted that sizers could be employed in combination with head cradles of other designs without departing from the inventive concepts described.

In the pad arrangement shown, the pad portion of the sizer is situated in overlying relationship with respect to the inner facing surface **44** of the band **20**. With this arrangement, one or more of the sizers will effect a decrease in the effective size of the area defining the head receiving portion of the helmet. Since the sizers are of a relatively soft resilient material, there will be no discomfort whatsoever when employing such an element. Furthermore, the sizers do not in any way change the structural characteristics of the cradle since they are merely attached to straps and do not weaken the straps with which they are associated.

It will be apparent that the head sizers described herein will provide many advantages in protective helmet constructions. The sizers decrease the likelihood of injury since they will provide a more accurate fit when the helmets available are not an exact size. The sizers are particularly suitable for use by institutions which, for monetary or other reasons, cannot carry a large inventory of helmets. The sizers are considered of particular importance due to the fact that head shapes vary considerably and in many cases, the best fit available will not be adequate without the use of a sizer of the type described.

It will be understood that various changes and modifications may be made in the construction described which provide the characteristics of this invention without departing from the spirit thereof particularly as defined in the following claims.

That which is claimed is:

1. In a protective helmet construction comprising a substantially rigid outer helmet shell and including a head cradle within the shell defining an area for receiving the wearer's head and for holding the head in spaced-apart relationship with respect to the interior surface of the shell, said head cradle being formed at least in part by means of straps which are substantially permanently attached to said shell, the improvement comprising head sizer means, means removably securing said sizer means to said cradle straps, said sizer means comprising individual assemblies secured as a plurality of separate locations on said straps, each of said sizer means including a resilient pad portion adapted to be located over

the inwardly facing surfaces of said cradle whereby the pad portion is effective to decrease the size of the head receiving area defined by the cradle, and a flexible covering disposed around said resilient pad, and wherein said covering comprises a back portion extending around one of said straps and securing said sizer means to said strap.

2. A construction in accordance with claim **1** including outwardly extending fingers defined by said covering, and openings defined by said covering, a portion of said covering being wrapped around one of said straps and said fingers received in said openings securing the sizer means on said strap.

3. A construction in accordance with claim **2** wherein said covering defines a plurality of ventilating holes.

4. A construction in accordance with claim **1** wherein the straps forming said head cradle include a peripheral head band portion comprising a permanent part of the head cradle, said head band portion being free of direct attachment with said rigid shell, and wherein said sizer means are removably secured to the peripheral head band portion.

5. A construction in accordance with claim **4** including a flexible covering disposed around said resilient pad, said covering comprising front and back portions with said resilient pad being attached to one of said portions, the other of said portions being free of attachment with said pad, said head band being disposed between said other portion and said pad, the ends of said covering being secured together holding said sizer in place.

6. In a construction in accordance with claim **5** wherein said covering is a single piece of material folded around said pad with the free ends thereof including extending portions, one of said extending portions comprising fingers and the other of said extending portions defining openings for receiving said fingers, said fingers and openings comprising the means holding the sizer in place on the head band.

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