United States Patent [19]

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[11] **3,787,894**

[45] **Jan. 29, 1974**

[54] **EASILY ADJUSTABLE PROTECTIVE HEAD GEAR**

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[22] Filed: **Oct. 12, 1972**

[21] Appl. No.: **297,047**

[52] **U.S. Cl.** ..... **2/3 A**

[51] **Int. Cl.** **A42b 3/00**

[58] **Field of Search** 2/3, 6, 8, 10, 181, 183, 185

[56] **References Cited**

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[57] **ABSTRACT**

A protective helmet is dislosed in the form of a batting helmet comprising a shell formed of tough impact resistant plastic material with a flexible metal headband positioned in the shell interior with the ends of the band being connected to a threaded rod operable by rotation of a knurled knob positioned on the interior of a protrusion of the shell but externally accessible for manual rotation while the device is in place on the head of a wearer to accommodate the head size of the wearer; a band of foam rubber extends about the inner surface of the metal band and a crown cushion of foam rubber is positioned in the top of the shell; in a second embodiment, the knurled adjusting knob is positioned in a metal protrusion affixed to the exterior of the plastic shell as opposed to a unitary protrusion and shell construction of the first embodiment.

2 Claims, 4 Drawing Figures

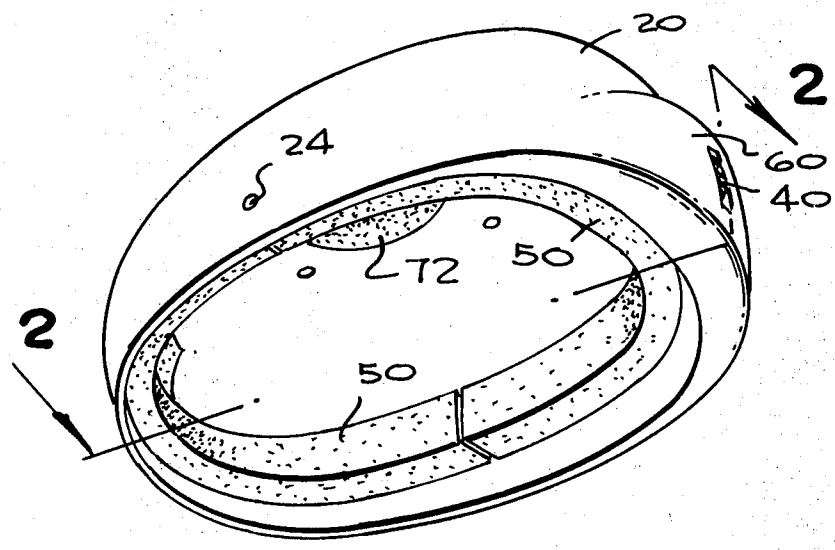


Fig-3

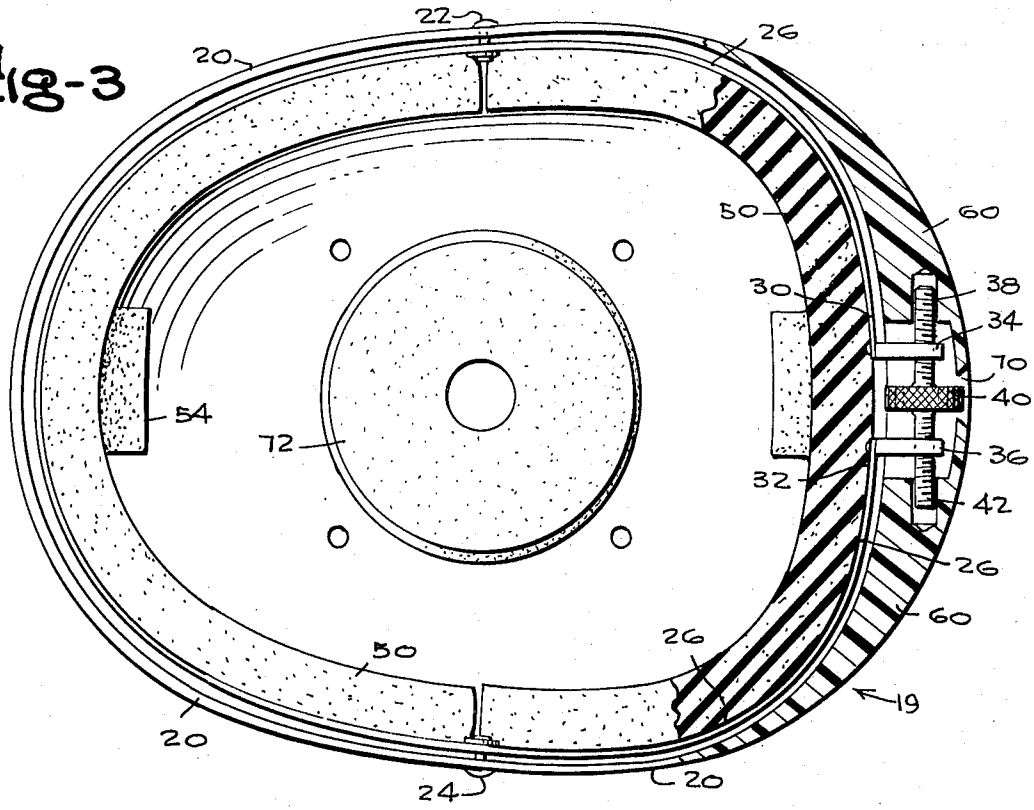
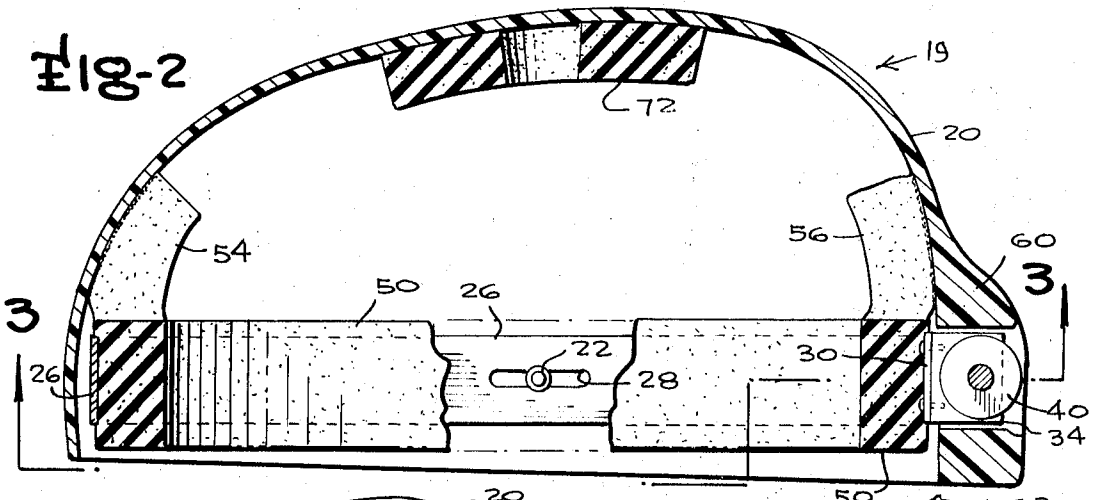


Fig-2



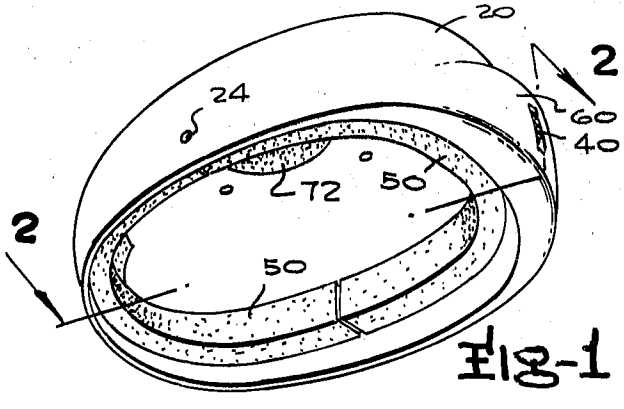


Fig-1

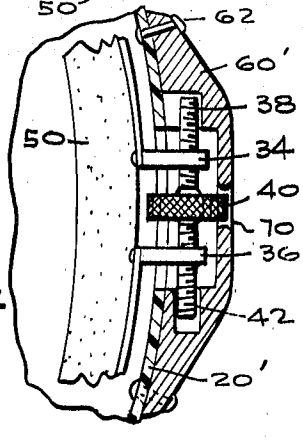


Fig-4

EASILY ADJUSTABLE PROTECTIVE HEAD GEAR

This invention is in the field of protective wearing apparel and is particularly directed to the field of protective helmets such as helmets of the type worn by participants in sporting or other events in which head protection is desirable.

Even more specifically, the subject invention is directed to a new and improved easy to use protective helmet that is quickly adjustable while on the head of the wearer without any loss or impairment of the protective efficiency of the helmet.

Numerous items of protective headwear have been designed in the past for use by participants in athletic events. Such devices are exemplified by batting helmets worn by baseball players and the well-known football helmets worn by participants in that sport. The non-uniformity of the human head size has required that athletic teams such as baseball teams either maintain a large stock of various sizes of batting helmets or to employ helmets having size adjustment capability. Unfortunately, both alternatives are susceptible to inherent drawbacks; for example, the maintenance of a supply of various sizes of helmets is an expensive proposition for obvious reasons. The drawbacks of employing a large number of different sizes of helmets for a particular team have resulted in the use of a number of various helmet designs in which the helmet size is adjustable. Unfortunately, prior known adjustable helmets have also suffered from a number of deficiencies. For example, the prior known adjustable designs have frequently been difficult to adjust and have usually required a time-consuming removal of the helmet from the wearer's head in order to effect such adjustment by a trial and error process. In other words, the user adjusts the helmet, then tries it on and readjusts, tries it on again, etc., until a desirable fit is achieved. This operation is time consuming and is particularly undesirable in athletic contests in which there may be a limited amount of time available for effecting such adjustment. It is, therefore, highly desirable that any helmet employed in athletic events be adjustable while on the head of the user in order to quickly and efficiently obtain a rapid and accurate adjustment of helmet size.

While there are a number of protective headwear devices which can be adjusted while on the head of the wearer, such devices universally employ external means protruding from the helmet in a manner which would be capable of inflicting injury to persons other than the wearer and which, due to their external exposed position, are frequently susceptible to structural damage when struck by a bat, ball or similar item.

Therefore, it is the primary object of this invention to provide a new and improved article of protective headwear that is adjustable in size while on the head of the wearer, economical to produce, reliable and trouble-free and does not impose any hazards on the user or others in the vicinity of the user.

Obtainment of the objects of this invention is enabled by the preferred embodiment through the provision of a protective shell formed of plastic and dimensioned to be received over the head of a wearer. A headband is provided on the interior of the shell in the form of a flexible metal band in the form of a loop connected to the sides of the shell by means of a rivet extending from the shell through a slot on each side of the band. Consequently, a relatively loose movement of the band with respect to the helmet is permitted. The metal band is provided with forwardly extending adjustment tabs adjacent each end with the ends of the band being positioned in spaced relatively close facing relationship with respect to each other in the front or forward portion of the helmet with the adjustment tabs extending forwardly of the forward edge of the band. The adjustment tabs are respectively received on threaded rod members extending from each side of a knurled adjustment knob positioned on the interior of the helmet in a forwardly extending protrusion.

An access opening is provided forwardly of the knurled adjustment knob so that the knob can be rotated by the wearer while the helmet is being worn. Cushioning means in the form of a strip of foam rubber is provided on the inner surface of the headband with supporting tabs of foam rubber extending upwardly for adhesive engagement with the interior of the helmet shell for providing additional support for the headband. Additionally, a crown cushion of foam rubber is mounted in the top central portion of the shell. In a second embodiment, the knurled adjusting knob is mounted in a separate metal enclosure provided forwardly of the plastic shell and affixed to the plastic shell by rivets or other retaining means. Helmets of the last-mentioned type would normally be constructed from old helmets and would be for the purpose of making such helmets adjustable while on the head of the wearer. In both embodiments, the knurled adjusting knob is positioned on the interior of the helmet body per se and it is therefore not susceptible to external damage nor is it capable of causing damage or injury to other persons or items which might happen to engage the helmet in a forceful manner.

A better understanding of the manner in which the objects of this invention are achieved will be enabled when the following detailed description is read in conjunction with the appended drawings in which:

FIG. 1 is a perspective view looking upward from below the first embodiment of the invention;

FIG. 2 is a sectional view taken along lines 2—2 of FIG. 1;

FIG. 3 is a sectional view taken along lines 3—3 of FIG. 2; and

FIG. 4 is a sectional view of the adjusting means as employed in a second embodiment.

The preferred embodiment of the invention illustrated in FIGS. 1–3 comprises a protective shell **19** having a main portion **20** formed of tough impact resistant plastic material. Rivets **22** and **24** are mounted on opposite sides of the shell and extend inwardly for providing relatively loose support for a headband **26** formed of a strip of flexible steel or the like and having plural guide surfaces defined by the peripheries of slots **28** formed in headband **26** and through which the rivets extend for providing side support for the band. The slots (only one of which is illustrated in the drawings) are dimensioned so that the headband can slide with relative ease with respect to the supporting rivets **22, 24.**

Headband **26** has first and second ends **30, 32** positioned adjacent the front of the helmet in facing relationship as shown in FIG. **3.** First and second metal tabs **34, 36** are respectively affixed to the first and second ends **30, 32** and extend forwardly as shown in FIG. **3.** Metal tab **34** is threadably received on a threaded shaft portion **38** extending from one side of a knurled adjust-

ing knob **40** mounted within the confines of the interior of the shell. Similarly, the second tab **36** extends forwardly and is threadably received on a threaded shaft portion **42** coaxial with the first threaded shaft portion **38** and also extending from the knurled adjusting knob **40** in an obvious manner. The threads on shaft portions **38** and **42** are in opposite directions so that rotation of knob **40** serves to move the tabs **34, 36** and the attached ends **30, 32** of the headband either toward each other or away from each other to effect an adjustment of the headband size.

Cushioning is provided on the interior of shell **20** by means of a headband cushion means **50** engaging the interior of the headband **26** and extending about the internal periphery thereof. A rear tab **54** of cushioned foam rubber material extends unitarily up from the headband cushion as shown in FIG. **2** and is adhesively secured to the inner surface of the shell **20.** A forward tab **56** extends upwardly unitarily from the cushion **50** and is adhesively secured to the forwardmost portion of the inner surface of the shell main portion **20** so that the cushions **54** and **56** serve to provide additional support for the headband due to the fact that they frictionally engage the inner surface of the headband. In addition, the cushion member **50** can be adhesively secured to the headband if desired. Additional cushioning is provided by a crown cushion **72** positioned centrally on the interior of the main portion **20** as best shown in FIGS. **2** and **3.**

Knurled adjusting knob **40** in conjunction with threaded shaft portions **38, 42** and tabs **34, 36,** serves to adjust the headband to vary the size thereof. It is to be noted that the knurled adjusting knob **40** is mounted in a forwardly extending protrusion **60** of the shell main portion **20** which completely encloses the headband adjusting means. However, an access opening **70** permits the wearer of the helmet to manually engage knob **40** to rotate same while the helmet is on the wearer's head.

Attention is now invited to FIG. **4** which illustrates a second embodiment of the invention in which the adjusting means for the headband is positioned in a separate metal enclosure **60'** connected to a shell main portion **20'** of high impact plastic or the like by means of rivets **62** as shown. In all other respects, the FIG. **4** embodiment is identical to the first embodiment illustrated in FIGS. **1–3.** It is to be understood that the embodiment of FIG. **4** is of particular use in providing an adjustable helmet through the modification of an older style helmet shell.

It should be understood that the subject invention is not limited to a batting helmet and is capable of employment in a wide variety of helmets such as industrial headwear, football helmets, pilot's helmets, etc. Moreover, the subject invention is not limited to the exact construction shown and the spirit and scope of the invention is to be limited solely in light of the appended claims.

I claim:

1. An article of protective headwear comprising a protective shell means formed of tough impact resistant plastic material dimensioned to fit over the human head including a forwardly extending protrusion housing unitarily formed as a part of said shell, an inwardly extending surface in said protrusion housing defining a forwardly facing aperture in the forwardmost portion of said protrusion housing, a crown cushion pad formed of soft cushioning material positioned in the uppermost portion of the interior of said shell, a flexible headband formed of an elongated length of thin strip material extending in a loop about the periphery of the interior of said protective shell and having first and second end portions positioned in adjacent spaced relationship adjacent said forwardly extending protrusion housing, means connecting said headband to said shell member including rivet means extending inwardly through said shell means on each side of said shell means with each rivet means having inner portions on the interior of said shell slidably engaged with a guide surface in said headband with sufficient clearance being provided between said rivet means and the respective guide surfaces in said headband for enabling limited movement of said headband with respect to said rivet means, a headband cushion of soft foam material engaging the interior surfaces of said headband for engagement with the head of a wearer, cushion tab members extending unitarily upward from said headband cushion, adhesive means securing the upper ends of said cushion tab members to the interior surface of said protective shell means, a manually operable rotary knob positioned in said forwardly extending protrusion housing with a forward edge of said knob adjacent said aperture in said forwardly extending protrusion housing, threaded rod means extending horizontally in a coaxial manner from each side of said rotary knob means, means in said forward protrusion housing supporting said threaded rod means so that the axis of said threaded rod means extends horizontally in side-to-side orientation with respect to said shell, a connector tab connected to each of said end portions of said headband and extending forwardly from said end portions of said headband into said forwardly extending protrusion housing, threaded apertures provided in the portions of said connector tab members in said protrusion housing, wherein said rod means extending from each side of said rotary knob is threadably received in said threaded apertures in each of said connector tab members whereby rotation of said rotary knob moves said connector tabs toward or away from each other in accordance with the direction in which said knob is rotated to effect adjustment of the size of said headband so that the headband size can be adjusted by rotation of said rotary knob by the finger of a wearer of said article of protective headwear extending through said aperture in said forwardly extending protrusion portion for rotating said knob to effect adjustment of the headband size while the article of protective headwear is in position on the wearer's head.

2. The invention of claim **1** wherein said headband is formed of metal.

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