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Marietta et al.

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[54] **CROWN CUSHION MEMBER**

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

[51] **Int. Cl.** **A42b 1/08**

[58] **Field of Search** ..... 2/3 R, 6, 171

[56] **References Cited**

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[57] **ABSTRACT**

A helmet includes a removable crown member providing both protective cushioning and enhancing the custom sizing of the helmet. A unitary assembly includes an outer cover enveloping a plurality of concentrically disposed and independently vertically displaceable cushion elements each of which comprises a multi-layered component.

11 Claims, 3 Drawing Figures

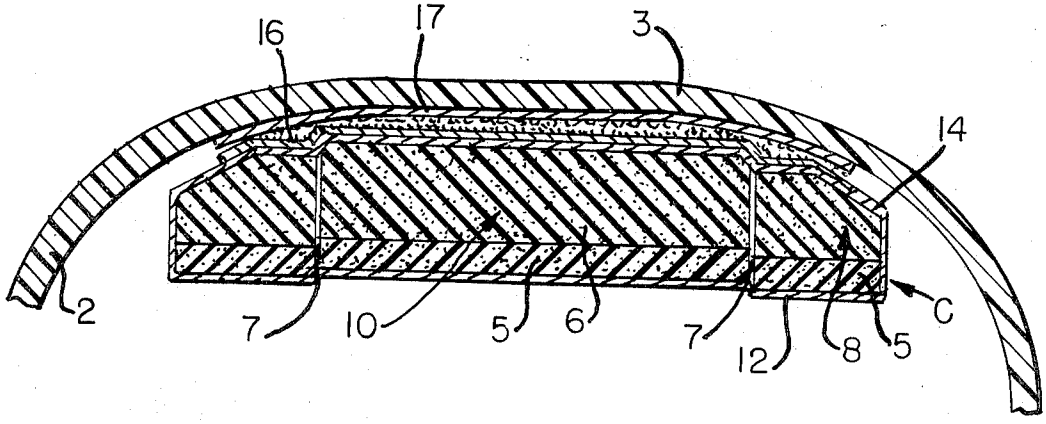


FIG. 1.

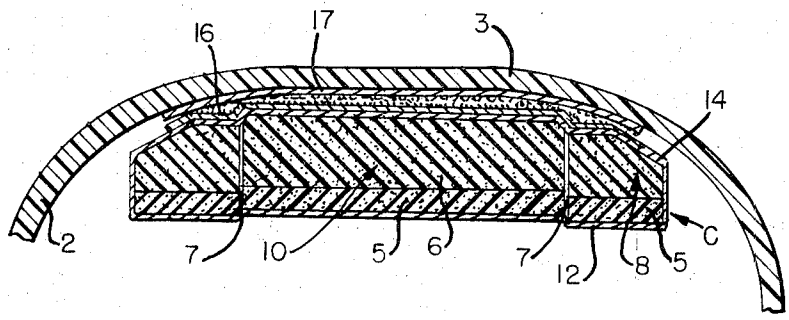


FIG. 2.

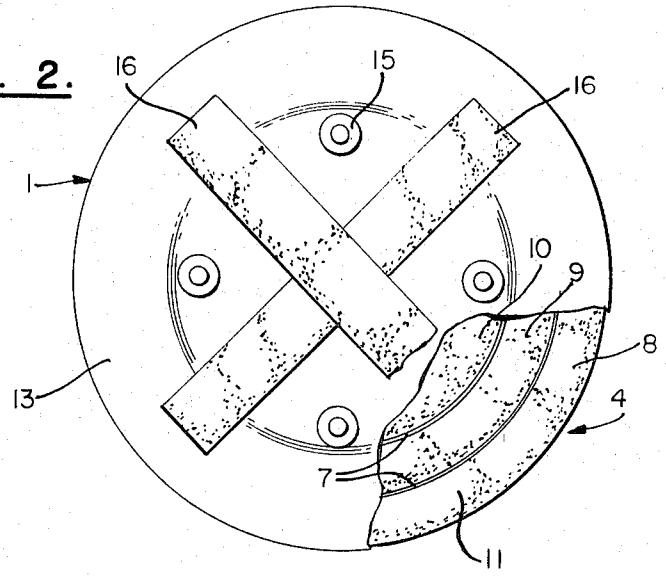
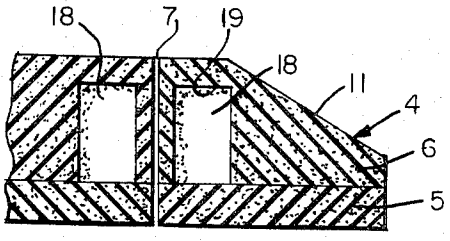


FIG. 3.



CROWN CUSHION MEMBER

This invention relates generally to protective headgear and more particularly to an improved cushion element for use in a helmet to protect the area of the crown of the wearer's head.

Numerous types of cushion members for use in a helmet to provide protection adjacent the various portion of the wearer's head have been previously used. The protective cushioning has been in the form of either a single unitary member surrounding the lateral periphery of the wearer's head or else comprises a plurality of separate cushion members providing lateral, frontal and posterior protective means for the head. A popular alternate type of construction employs a suspension system comprising a plurality of straps or webs arranged to isolate the wearer's head from the interior wall of the helmet shell. In this latter situation various types of cushion elements additionally have been provided to protect the crown of the wearer's head. An example of such a prior known device will be found in U.S. Pat. No. 3,292,180 dated Dec. 20, 1966. A feature lacking in many of the present crown cushion members is the adaptability of the member to fully conform to the configuration of the crown portion of the wearer's head. This shortcoming has been evident in instances wherein a crown member is either supported by the head straps in a suspension assembly as in the above mentioned patent or, when the crown cushion member is attached directly to the interior of the helmet shell.

By the present invention an improved crown cushion member is offered which may be used in a protective helmet employing either a suspension supporting system or one or more other cushion pads serving to support and protect the user's head. Conformity between the lower exposed face of the present cushion member and the crown of the wearer's head is achieved in a manner not heretofore possible such that when properly fitted the present arrangement provides a full and constant contact between the wearer's head crown and the body of the cushion member which is removably attached either directly to the interior of the helmet shell or to a suspension harness. It will be readily appreciated that the configuration of the crown of the human head varies indefinitely both as to angularity when viewed in longitudinal and lateral vertical cross sections as well as when viewed in top plan. With the instant multi-part cushion filling, which in turn comprises a multi-layer construction, a universal adaptability is achieved permitting a single crown cushion member to be used to provide a custom fit in the area of a wearer's head crown.

Accordingly, one of the primary objects of the present invention is to provide an improved crown cushion member for use in a protective helmet including a removable unitary element readily adaptable to conforming to the configuration of the wearer's head crown.

Another object of the present invention is to provide an improved crown cushion member comprising a unitary assembly including a multi-layered cushion filling.

Still another object of the present invention is to provide an improved crown cushion member comprising a unitary assembly including an outer cover containing a cushion filling forming a plurality of separate concentric sections.

A further object of the present invention is to provide an improved crown cushion member comprising an outer cover containing a multi-part and multi-layered cushion filling wherein one layer of said filling is provided with a plurality of enclosed vertically extending bores or cells.

With these and other objects in view which will more readily appear as the nature of the invention is better understood, the invention consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

A preferred and practical embodiment of the invention is shown in the accompanying drawing, in which:

FIG. **1** is a vertical sectional view through the crown cushion member of the present invention as typically installed within a helmet.

FIG. **2** is a top plan view of the crown cushion member of FIG. **1** with a portion of the cover removed for clarity.

FIG. **3** is a fragmentary vertical sectional view through a cushion filling of another embodiment of the present invention.

Similar reference characters designate corresponding parts throughout the several figures of the drawing.

Referring now to the drawing, the present invention will be seen to comprise a crown cushion member, generally designated **1**, adapted to be removably installed juxtaposed the top area of the inner wall **2** of a helmet shell **3**. It will be understood that the cushion member **1** may be employed to provide protection for a wearer's head crown in various types of helmets such as those used in contact sports, by aviators, and by various personnel working in industrial environments. Although the figures of the drawing disclose the subject cushion member **1** as installed directly against the inner wall **2** of the helmet shell **3**, it will be appreciated that this same invention may be utilized in combination with a web strap suspension supporting system (not shown) as preferred by some helmet users.

The cushion member as illustrated defines a circular configuration when viewed in plan but quite obviously could be formed in an elongated or oval configuration without departing from the spirit of the instant invention. In the sizing of any one helmet for use by a particular wearer the principal consideration is usually the size or adjustment of the suspension system, if such a system is used or on the other hand the size and location of cushion elements disposed in the frontal, posterior and lateral areas of the helmet shell **3** and although crown elements have been employed in the past primarily for their protective feature, this area of the helmet should also be considered when properly sizing a helmet to a specific user's wear. Thus the present cushion member **1** will be understood to provide not only the necessary valuable protection in the area of the wearer's head crown but also serves to enhance the custom fitting of a helmet.

The crown member **1** includes a cushion filling, generally designated **4**, comprising a multi-layered construction including a first layer **5** of a relatively soft rubber-like construction and which is affixed to a second layer **6** such as by adhesive. This second layer **6** comprises a high density relatively hard rubber-like substance which preferably is constructed of a closed cell substance and will be seen to define a vertical thickness substantially greater than that of the soft first layer **5**. The thus described cushion filling **4** is cut throughout its vertical extent to provide a plurality of angular cush-

ion elements each adjacent two of which provide the angular joint 7 therebetween.

In the embodiment of FIG. 2, the cushion filling 4 comprises an outer ring cushion element 8 surrounding an intermediate cushion element 9 which in turn surrounds a central cushion element 10 while the embodiment of FIG. 1 will be seen to include only the outer ring cushion element 8 and central cushion element 10. It will be appreciated that the exact number of separate elements comprising the cushion filling 4 is optional and may be determined pursuant to the desired overall dimensions of the crown cushion member and/or the peripheral configuration thereof.

To enhance the conformity between the upper portion of the cushion member 1 and the specific configuration of the shell inner wall 2 in any particular installation, the cushion filling 4 is constructed to provide an upper beveled surface 11 on the top portion of the second layer 6, which beveled surface 11 may extend across the entire upper portion of the outer ring 8 as in the embodiment of FIG. 2 or may extend across only a partial portion of the upper surface of the second layer 6 as shown in the outer ring cushion element 8 of FIG. 1.

Enveloping the cushion filling 4 is a cover, generally designated C, formed of any suitable soft and flexible material such as synthetic plastic or leather and which may comprise two components, namely a cover bottom 12 and cover top 13 suitably joined together as at the seam 14 which may be closed by any suitable means such as stitching or by adhesive. The exterior surfaces of the cushion filling 4 are preferably adhesively secured to the juxtaposed inner surfaces of the enveloping cover C to preclude significant shifting of the cover relative to its contents. In view of the inherent pliant nature of the cover substance it will be appreciated that the functioning of the crown cushion member components will not be impaired by this adhesive attachment between the cushion filling and cover so that during installation and use of the cushion member the various cushion elements 8, 9 and 10 comprising the cushion filling 4 may be independently shifted to various vertical planes such as shown in the illustration of FIG. 1.

The crown cushion member 1 may be attached within the helmet shell 3 by means of any suitable separable fastening arrangement and examples of two operable means are shown in FIG. 2 of the drawing wherein it will be seen that snap fastener components 15 are attached to the cover top 13 in a spaced apart manner and are adapted to cooperate with suitable mating components (not shown) adequately attached to the inner wall 2 of the helmet shell 3. Also shown in FIG. 2 of the drawing are a plurality of strips 16 of Velcro attaching components which may be suitably affixed to the cover top 13 such as by adhesive and are adpated to cooperate with the mating Velcro component strips 17 adequately affixed to the inner wall 2 of the shell 3 as shown in FIG. 1. Using any of the above described fastener components it will be seen that the crown cushion member 1 may be readily attached and removed from the helmet shell 3 for cleaning or replacement thereof. Thus it will follow that many means are provided to permit selective installation of crown cushion members having various overall thicknesses as well as lateral dimensions in order to provide for custom sizing. In the case of a wearer having a relatively high head crown it may be advisable to utilize the crown cushion member as shown in FIG. 2 which includes three separate elements 8, 9 and 10 thus permitting a more pronounced vertical displacement between the planes defined by the center portion of the cushion member and the outermost portions thereof. In view of the relatively higher density of the second cushion filling layer 6 it will be understood that this layer serves primarily as a shock absorbing protective layer and as such does not become readily deformed or compressed when the helmet is properly fitted and no external pressure is applied to the helmet shell 3. An ultimate sizing of the crown cushion member 1 to a particular wearer's head will therefore occur as the first or softer deformable layer 5 is compressed by the crown of the wearer's head.

The compressibility of the second layer 6 may be somewhat increased without sacrifice of significant shock protection by including the construction shown in FIG. 3 of the drawing which involves the formation of a plurality of vertically extending cylindrical bores or cells 18 through the second layer 6 such that the uppermost limit 19 of each bore is disposed just short of the topmost portion of the layer 6.

What is claimed is:

1. A crown cushion member for use in the shell of protective headgear, comprising, a cushion filling enveloped within an outer cover, means on said cover permitting of attachment of said member within said shell in an area overlying a wearer's head crown, said cushion filling including a plurality of individual annular cushion elements having substantially vertically disposed concentric joints therebetween, each said annular cushion element having a first soft layer juxtaposed the wearer's crown and a second relatively harder layer adjacent the shell interior surface whereby, upon fitting of said crown cushion member on a wearer's crown said joints between said annular cushion elements permit of independent vertical displacement of each said element within said cover.

2. A crown cushion member according to claim 1 wherein, said attaching means includes mating separable fastener components respectively mounted on said cover and upon the inner wall of said shell.

3. A crown cushion member according to claim 1 wherein, said cushion filling includes a plurality of laterally spaced-apart vertically extending hollow cells therein.

4. A crown cushion member according to claim 1 wherein, the upper surface of said cushion filling is beveled to provide a reduced cushion filling thickness adjacent the periphery thereof.

5. A crown cushion member according to claim 2 wherein, said fastener components are snaps.

6. A crown cushion member according to claim 2 wherein, said fastener components are Velcro strips.

7. A crown cushion member according to claim 1 wherein, said second layer is substantially greater in thickness than said first layer.

8. A crown cushion member according to claim 1 wherein, said second layer is at least three times as thick as said first layer.

9. A crown cushion member according to claim 1 wherein, the juxtaposed surfaces of said two layers are adhesively united.

10. A crown cushion member according to claim 1 wherein, said cushion elements are circular in plan configuration.

11. A crown cushion member according to claim 3 wherein, said hollow cells are disposed entirely within the confines of said second layer.

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