ABSTRACT OF THE DISCLOSURE

A protective cover for the inner end of a rigid connector which extends through and secures together multiple thicknesses of sheet material such as employed in a football helmet, or other body covering device. The protective cover comprises a unitary member of elastomeric material which is of generally flattened tubular configuration so as to provide a cross-sectional area that is substantially parallel to the connector shank; and, in accordance with the invention, the protective cover is arranged to frictionally engage and position the anchor for accurate reception of the shank. In other words, the cover and anchor are adapted for pre-assembly as a unit for subsequent application to the connector. To facilitate the permanent association of the connector shank with the anchor, the inner flat wall of the tubular cover is formed with an opening in it, the opening being open to the atmosphere, with the opening through its outer side wall or base to permit the insertion of an appropriate tool, such as a riveting or peening tool or a wrench socket, to form or position an enlargement on the inner end of the connector shank. The last-mentioned opening may be proportional relative to the tool to function as a guide or pilot for facilitating the application of the tool to the connector parts.

In accordance with a further feature of the invention, the tubular cover is provided with relatively oppositely-directed, outwardly-diverging, resiliently-flexible wings which may function to extend over and beyond the edges of the straps or webs which extend beneath it. Where the webs or straps beneath such a cover include but a single thickness or ply of material, the free outer ends of the said wings are adapted for engagement with the inner surface of the rigid shank to thrust the cover resiliently away from the shell and thereby to contribute to the spring-like cushioning action of the cover.

In the preferred embodiment of the invention illustrated in the accompanying drawings:

FIGURE 1 represents a front perspective view of an athletic helmet, such as a football helmet, which utilizes the protective cover of the invention in association with the connectors or fasteners for its interior supporting straps and cushioning means;

FIGURE 2 is a greatly-enlarged fragmentary elevation of one of the covers of the invention, together with adjacent portions of the helmet shell and supporting straps;

FIGURE 3 is a sectional view on line 3—3 of FIGURE 2; and

FIGURE 4 is an exploded perspective view of the structure shown in FIGURES 2 and 3.

It will be appreciated that the structure shown in the accompanying drawing constitutes a preferred embodiment of the invention and, therefore, that the drawings and the following detailed description thereof respectfully show and describe the invention and its various details with a substantial degree of exactness. However, it will be appreciated that various of the details thus illustrated and described may be modified, and in certain instances omitted, all as will be obvious to those skilled in the art, without departing from the invention as defined in the appended claim.

Referring now to FIGURE 1 of the drawing, the helmet outer shell H is of conventional structure, being formed in the usual manner of a comparatively-rigid, preferably plastic material. This helmet shell is provided on its interior with a cushioning means such as a supporting network of straps, including the neck strap 11 and further conventionally-arranged suspension straps 12. All of such straps are secured or anchored to the inner wall of the helmet shell at suitable intervals by rivets R which exemplify the preferred form of connectors.

In the structure shown in FIGURES 2, 3 and 4 of the drawings, the neck strap 11 is comprised of a double thickness of woven fabric of a flexible and somewhat resilient nature, generally paralleling and adjacent the lower edge of the helmet shell in position to engage the back of the wearer's neck, adjacent the base of the skull, to function as a cushion. The shank 15 of the rivet R thus extends into the helmet through the opening 15b and extends through openings 15d and 15c, respectively, in the strap; and, in the strap plies or thicknesses 11a and 11b. The enlarged head 16 of the rivet shank against the outer surface of the helmet shell H, while the inwardly-directed end of the shank 15 extends through an opening 17 in the outer flat wall of...
the tubular cover C, thence through a rigid anchor 18, here shown in the form of a metal washer, which is contained within the interior of the tubular member C between the relatively-opposed and spaced flat side walls thereof. The inwardly-directed flat wall 20 of the cover C is provided with an opening 21 therethrough which is in registry with the opening 17 in its outer flat side wall or base 22. Thus, a riveting or peening tool inserted through the opening 21 will be aligned thereby with the inner end of the rivet shank 15 in order to achieve the peening or riveting operation which results in the formation of the enlarged head 23 on the inner end of the rivet. Formation of the rivet head 23 is thus permanently and securely achieved by the washer 18 against removal from the shank 15, while also strongly and permanently securing the cover C and strap 11 to the helmet shell H.

The cover C in the preferred embodiment is preferably molded as an integral unit from a suitable elastomeric material, such as a suitable polyethylene plastic or a natural or artificial rubber. The natural resiliency of the material employed is such as to enable the inner flat wall 20 of the cover to flex resiliently and yieldably in the manner of a cushion while nevertheless shielding the wearer from contact with the adjacent inner end 23 of the rivet and also with the metal anchor or washer 18.

In order to facilitate the assembly of the several interconnected parts, the relatively-opposed sheet-like rectangular inner and outer walls 20 and 22, respectively, of the flexible member C, are in generally parallel and spaced relation being interconnected at their opposite sides by the integral connecting wall portions 24 and 25. Thus, in its preferred form, the cover is of generally rectangular shape in cross section. Each of the flat walls 20 and 22 of the cover is preferably formed on its inner surface with projections, such as the relatively-parallel ribs 26 and 27 respectively, the free inner ends of which are disposed in planes which are spaced apart by a distance somewhat less than the thickness. It will be appreciated that the washer 18 will be flat prior to its curved or dish-like deformation by the riveting operation. Insertion of the washer 18 into operative position between the walls 20 and 22 will tend to force the said walls resiliently apart with the result that the gripping projections 26 and 27 will be maintained in yielding frictional engagement with the washer and will thus act to maintain the latter accurately positioned with its opening 17 in registry with the relatively-aligned openings 17 and 21 through the cover C. Obviously, accurate positioning of the washer may readily be secured in various known ways, as for instance by a drift punch inserted through the openings 21 and 17 of the opening 18a of the washer.

It is desirable also to provide the cover pad C with laterally outwardly-projecting wings 28 and 29 adapted to extend across and cover any rough edges of the strap 11 in a manner to shield the wearer from irritating contact with the straps. Where a plurality of thicknesses of the strap are employed as at 11a and 11f, these thicknesses themselves will normally lend some cushioning effect. In fact, the primary function of the double thickness of straps 11 in the present instance is to provide a cushion between the rear edge portion of the rigid plastic helmet shell and the back of the wearer's neck at the base of the skull. However, in instances where the cover pad C is applied over simply a single thickness of strap or web having a substantially lesser degree of resiliency, the wings 28 and 29 are adapted to serve the further function of enhancing the resilient compressibility or cushioning effect of the cover. To this end, the wings 28 and 29 in the preferred embodiment are disposed in such a manner to function as extensions of the flattened outer side wall 22 of the cushion to which they are integrally attached. In addition, their free ends project in relatively outwardly-diverging planes such that their free edges are adapted for engagement with the outer surface of the helmet shell H on opposite sides of the strap and resiliently thrust against same.

Thus, from the foregoing description, it is believed to be readily apparent that covers such as indicated at C in the preferred embodiment herein when operatively applied to the interior of a football or other athletic helmet, or in fact to any comparatively stiff protective shell or guard intended for wear on the body, limbs, or head of a user, will function reliably and efficiently to protect the user from injury or discomfort caused by engagement with the inwardly-projecting end of the rivet 15 and its associated anchor or washer 18. It is to be particularly noted that, where the washer 18 has its central portion inwardly depressed by the pressure incident to peening over of the inner end 23 of the rivet, the resulting bore-like or con-cave shape of the washer 18 results in its peripheral edges projecting somewhat inwardly. Notwithstanding this, such peripheral edges are completely covered by the inner flattened side 20 of the cover. Moreover, the resiliency of this inner side 20 is enhanced by the inwardly-projecting ribs 26 which serve a cushioning function in addition to the positioning or gripping function earlier described.

As has been heretofore brought forth, the cover C has been conceived especially with the purpose of facilitating its assembly with the other portions of the helmet structure. Thus, in assembling the cover C with its associated components, after the rivet R has been inserted into position through the holes 15a, 15b, 18a, 18b and the helmet shell H and the straps 11a and 11b, respectively, the cover C and washer 18 may be then applied in preassembled condition over the inner end of the washer. With this in mind, it will be apparent that the washer 18 will first have been inserted into position in the cover C between the flat walls 20 and 22, from either end of the opening 18a defined by the tubular cover. As shown in FIGURE 4, the washer 18 is positioned for assembly or insertion into the cover in the direction indicated by the arrow A. The inner extremities of the sets of projections 26 and 27 are respectively disposed in parallel planes which will normally be spaced apart a distance somewhat less than the thickness of the washer 18, so that insertion of the washer forces them apart. They thereafter maintain a resilient clamping action on the washer which is thus gripped and frictionally retained in the cover. Obviously, after the washer is once inserted with its opening 18a in registry with the openings 17 and 21 of the cover, the openings 17, 18a and 21 may be brought accurately into alignment by use in obvious manner of a drift punch or the like. Following this, the pre-assembled washer and cover are ready for use and may be applied over the free inner end of the rivet shank 15. With the parts thus assembled, a suitable riveling or peening tool is inserted through the opening 21 which preferably is so proportioned with respect to the peening tool to as freely receive and guide the latter accurately into operative engagement with the rivet.

It will be readily apparent that the foregoing describes but one embodiment of the invention and one specific mode of assembly of the various parts. In addition to varying and omitting certain specific structural details of the cover and/or its associated washer, the mode of assembly above described may be changed or departed therefrom in obvious manner, while nevertheless remaining within the scope of the present invention.

Having thus described my invention, I claim:

1. A protective cover for the inner end of a rigid connector extending through and securing together inner and outer thicknesses of sheet material in a protective body covering device, said cover comprising a unitary member of elastomeric material of generally flattened tubular configuration of continuous cross-section having relatively spaced parallel inner and outer walls, a rigid washer positioned between said inner and outer walls, said walls being formed with generally circular openings therethrough respectively, for permitting access to said inner end by a tool and for accurately locating said tool for operative engagement
with the said inner end of the connector, said tubular cover being of generally rectangular shape in cross-section and the inner and outer walls of said tubular cover being each provided on its inner surface with a series of projections having their inner extremities in parallel planes normally spaced apart a distance less than the thickness of the washer to be yieldably urged apart by the said washer, said washer being resiliently gripped and retained in said cover by and between the said projections of the inner and outer walls, and having a central opening aligned with the registering openings through the respective walls.

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