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3,471,866

SAFETY HELMET SUSPENSION

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FIG. 1

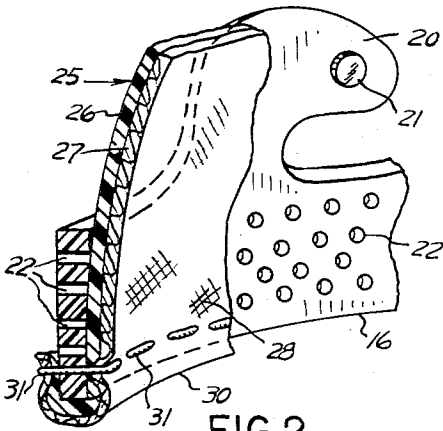
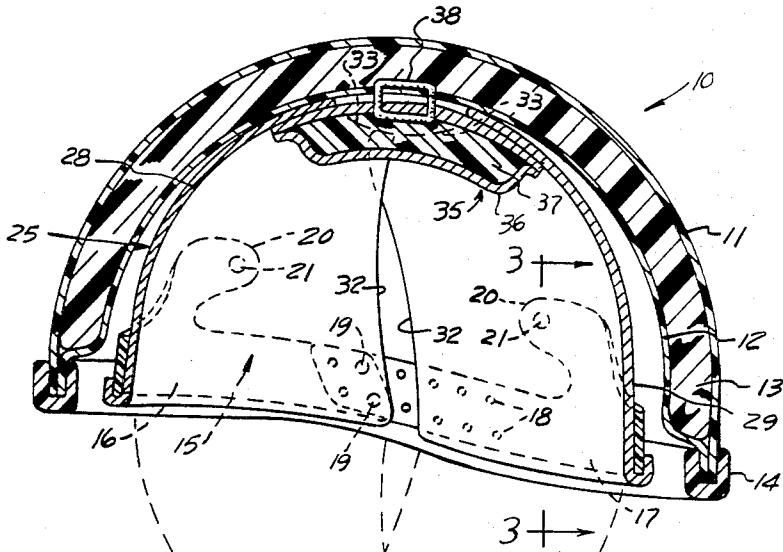


FIG. 2

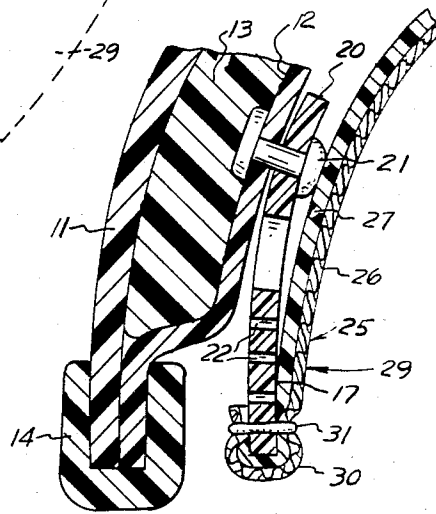


FIG. 3

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SAFETY HELMET SUSPENSION

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3 Claims

ABSTRACT OF THE DISCLOSURE

A suspension formed of a thin, smooth, perforated plastic strip headband arranged within but spaced from the inner wall of a safety helmet shell and secured thereto by tabs located above the headband, with a thick, soft, stretchable, air pervious cloth liner secured to the lower edge of the headband and extending upwardly towards the crown of the shell to cover the interior surfaces of the headband and tabs, and with the upper edge of the cloth covered and clamped against the shell by a resilient crown pad arranged within and secured to the crown of the shell.

BACKGROUND OF INVENTION

This invention relates to an improvement in the type of safety helmet head suspension illustrated, for example, in U.S. Patent No. 3,137,859 to Zbikowski, granted June 23, 1964. Such type suspension is formed of a headband made of thin, smooth plastic material strips secured within the helmet shell by upper tabs so that the headband is moveable, to some degree, relative to the shell and generally spaced therefrom a short distance.

The material out of which said headbands are made has two inherent disadvantages, namely, when the weather is cold, the material tends to become cold during the time the helmet is not worn so that it is uncomfortable to put on and, when the weather is warm, the material, being imperforate, does not breathe or circulate air so that the headband tends to become hot and relatively sweaty upon the wearer's head. In addition, the mechanical fasteners used for securing the headband to the shell and the headband parts to each other will, in certain relatively poor fits upon the wearer's head, press against the wearer's head and become uncomfortable over a period of time.

Various types of paddings and coverings have been used in the past to cover such fasteners and to pad or line the interior of these headbands, but these have been only partially successful in alleviating the problem of uncomfortable pressures and uncomfortable coldness or warmth in response to weather changes.

Hence, this invention is concerned with alleviating the foregoing problems while at the same time permitting the continued use of the type of suspension described above.

SUMMARY OF INVENTION

An object of this invention is to provide a cloth-like liner as part of the suspension to cover the plastic strip headband and the interior of the helmet shell, but maintaining a spacing from the interior of the helmet shell and being air pervious for circulation of air, with the cloth being clamped within the helmet shell by means of a crown pad and with the cloth being of a thick and soft, warm feeling character so that the headband may be multiply perforated for passing air without attendant uncomfortable pressures or leaving of marks upon the wearer's head.

Summarizing, this invention contemplates utilizing a thin, plastic strip headband which is multiply perforated and which has secured to its lower edge a thick, stretchable, breathable cloth which covers the inside of the headband, including the fasteners thereof and lines the interior of the helmet, while being spaced therefrom and is secured in place frictionally, without positive securement, merely by the pressure of a typical crown pad.

These and other objects and advantages of this invention will become apparent upon reading the following description, of which the attached drawings form a part.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a cross-sectional elevational view of a safety helmet incorporating the improved suspension herein.

FIG. 2 is an enlarged, fragmentary, perspective view of a forward portion of the suspension, and

FIG. 3 is an enlarged, cross-sectional view of a fragment of the helmet, taken in the direction of arrows 3—3 of FIG. 1.

DETAILED DESCRIPTION

FIG. 1 illustrates a safety helmet 10 comprising a hard, outer shell 11, which may be formed of a fibrous glass reinforced resin, a thinner and semi-flexible inner shell 12, between which is located an energy-absorbing line 13 of a suitable foam plastic material. The lower edges of the two shells are clamped and held together by means of a suitable edge bead 14 which may be adhesively secured thereto.

Arranged within the helmet is a headband 15 formed of a forward part 16 and a rear part 17 whose opposite ends are overlapped and adjustably fastened together by means of snap fastener holes 18 formed in the rear part and stud halves of snap fasteners 19 secured to the forward part for adjustably interlocking the studs into various of the holes for sizing the band.

The upper edges of the headband parts are provided with curved tabs 20 which are secured by rivets 21 or the like mechanical fasteners to the inner shell 12.

The foregoing structure is similar to that shown in the above mentioned Zbikowski Patent No. 3,137,859.

The headband is formed of a thin sheet plastic material which is smooth and somewhat flexible, such as sheet polyethylene of about .040 inch thickness which is stiff but still relatively resiliently bendable or springy. Other suitable plastics may also be used.

All or a substantial portion of the sheet may be multiply perforated with small perforations 22, something not previously practical where the headband would press directly against the wearer's head since marks and uncomfortable pressure would result upon the wearer's head.

The invention herein contemplates arranging within the helmet shell a cloth inner liner 25 formed of a thick, soft, air pervious cloth material, which will cushion the head, protect the interior of the shell against dirt or grease and at the same time permit the free flow of air between the cloth liner and the shell and between the headband and the shell.

One type of cloth found to be particularly suitable for this function is a laminate made of woven or loose knit nylon jersey cloth 26 which is two-way stretchable and an open pore, soft, resilient foam plastic sheet 27, such as foamed polyurethane, the two layers being bonded together. This type of cloth is characterized by being air pervious and being stretchable to conform to the contours of the wearer's head and to maintain, normally, its spacing from the interior surface of the helmet.

The cloth liner is made in two sections, namely, a forward section or part 28 and a rear section or part 29, with the lower edge 30 of each being secured respectively to the

forward part 16 and rear part 17 of the headband 15 by means of stitches 31, as illustrated in FIGS. 2 and 3.

As shown in FIG. 1, the vertically or upwardly extending edges 32 of the two cloth parts are spaced or gapped apart at their lower parts and substantially near the crown of the helmet to thus permit free circulation of air as well as to permit ease of adjustment of the headband for sizing. The upper edges 33 of the cloth terminate near the crown of the helmet shell.

Secured within the helmet is a crown pad 35 formed of a flexible envelope 36 which may be made of plastic sheet, and stuffed with a foam plastic, resilient material 37, with the pad secured to the inner shell centrally by a suitable fastener, such as by means of a tie cord 38 passing through aligned holes formed in the pad and the inner shell. An example of this type of pad is disclosed in the patent to Webb, U.S. Patent No. 3,365,725, granted Jan. 30, 1968.

The crown pad is arranged to overlap and cover the upper edges 33 of the cloth parts 28 and 29 and because of its resiliency, the pad will frictionally hold or clamp the edge portions of the cloth against the helmet shell thereby loosely securing it in place for relative movement and stretching when applied to the wearer's head.

For adjusting the headband size or for merely airing out or cleaning the interior of the helmet shell, the cloth edges 32 may be grasped and the cloth pulled downwardly, as shown in the dotted line position in FIG. 1. Once the necessary adjustments or cleaning steps have been taken, the cloth may be folded back inwardly of the helmet where it will conform to its predetermined shape due to its natural stretchability and at that point the user may tuck the edges of the cloth under the crown pad to thereby neatly clamp these edges in position in the way which maintains the spacing between the cloth and the interior of the helmet shell.

The cloth, being relatively thick and resilient, insulates the wearer's head against the coldness of the headband during cold weather conditions and feels warm and comfortable to the touch. On the other hand, during warm weather conditions, the breathability of the cloth makes the helmet much more comfortable and less sweaty at the headband.

This invention may be further developed within the scope of the following claims. Accordingly, it is desired that the foregoing description be read as being merely illustrative of an operative embodiment of this invention, and not in a strictly limited sense.

Having fully described an operative embodiment of this invention, I now claim:

1. In a safety helmet formed of a shell having a crown portion and a lower open edge portion, and a headband, for encircling the wearer's head, arranged within the shell near its edge portion, the improvement comprising:

said headband being formed of a strip of thin, flat, smooth plastic material having upwardly extending tabs formed on its upper edge, said tabs being secured to the shell and the headband being normally spaced a short distance inwardly of the shell inner surface; an inner cloth liner formed of a thick, soft, stretchable, air pervious cloth-like material having a lower edge secured to the lower edge of the headband and extending upwardly to the crown of the shell and covering the headband and tabs and normally spaced inwardly of the shell inner surface;

a thick, resilient crown pad arranged within the shell and centrally secured to the crown portion of the shell;

the upper edge of the cloth being arranged between the pad and the shell and the pad completely overlapping said upper edge and frictionally clamping it against the shell.

2. A construction as defined in claim 1 and said cloth being formed of a laminate of a soft, stretchable relatively loose woven jersey-type material and a layer of open pore, foam plastic material, with the foam plastic material facing towards the inner surface of the shell;

said cloth being air pervious and said headband having multiple perforations formed therethrough for free circulation of air through the cloth, headband and the space between the shell and the cloth and headband.

3. A construction as defined in claim 1, and said headband being formed of two interconnected parts, namely, a forward part and a rear part whose ends are releasably interconnected for size adjustment;

said cloth liner being formed of two parts, namely a forward part and a rear part secured to the respective headband parts, with the two cloth parts being spaced apart a short distance between their lower edges to a point near the helmet crown portion, but overlapping at the crown portion of the shell.

References Cited

UNITED STATES PATENTS

2,339,080	1/1944	Karabin	2-3
2,739,309	3/1956	Frieder et al.	2-3
3,015,103	1/1962	Zbikowski	2-3
3,365,725	1/1968	Webb	2-3
3,366,971	2/1968	Scherz	2-3

JAMES R. BOLER, Primary Examiner

U.S. Cl. X.R.