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(54) Protection device of a military helmet for absorbtion impacts (shocks).

(57) Protection Device for a military helmet for absorption impacts for the inside of that helmet, consisting of a cap of elastic foamed material formed of various horizontal and vertical straps (1, 6). The vertical straps (1) are of different height and extend themselves in the form of trapeze until the upper part (4) of the helmet, leaving between themselves spaces (2, 5) which form air chambers between the skull of the user and the inner overhead part of the helmet; the whole device is fixed at the inner superior part of the helmet by adhesive elements. The two horizontal straps (6) are separated by spaces (7), which serve to increase the ventilation of the skull of the user and for incorporation of communication elements. The cap to be inserted is a homogeneous piece having the exact form of the inside of the helmet.

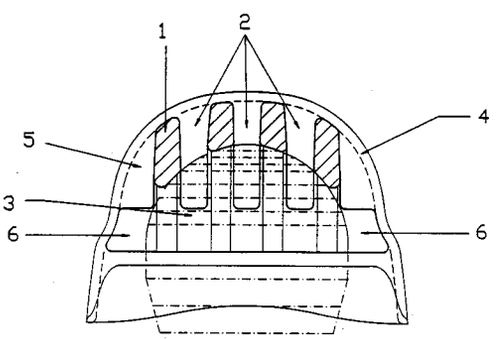

FIG 2

EP 0 664 967 A1

BACKGROUND OF THE INVENTION

The invention refers to a new protection device for military helmets for absorption impacts and forming a cap of elastic foamed material fixed at the inside of the spherical dome of the helmet by adequate adhesive elements.

Shock absorbing devices are known multiple in the form of textile belts or strips on the inside of helmets for military protection, which are fixed at various points to the upper part of the helmet. The purpose of those devices is to keep a distance between the head of the user and the inner part of the helmet, in order to avoid that a transmission of the energy produced by impacts may cause damage to the user.

A contact of the head or skull of the user with the upper inner part of the helmet occurs after the textile belts have been considerably extended, after having absorbed part of the energy of an impact. Further with all devices having belts which are fixed at the sides of the helmet, exists the possibility of the direct transmission of the impacts coming from the side to the skull of the user. Those devices are definitely not capable of producing an adequate absorption of the energy produced by any impact (detonation, machine-gun, etc.) on the helmet and transfered to the skull of the user.

There are also known other devices arranged on the inside of helmets, protecting against accidents at work and other accidents. However, they do not sufficiently satisfy the requirements for military helmets. Those devices consist of plastic belts, in which are incorporated plugs or buttons at the outside part of the belts in the direction to the inner wall of the helmet for the absorption of the blows. In those devices essentially the belts are extended radially from an annular belt and can be fixed to the upper part of the helmet, keeping the helmet portable. Another protective device consisting of a horizontal carrying belt in the form of a ring, with straps, radiating from a central piece, by which the device is fastened to the upper part of the helmet is known by EP-0 423 379. The straps are equipped with buttons, which can be directly fastened to the upper part of the helmet.

SUMMARY OF THE INVENTION

The object of the invention is to provide a shock absorbing cap, formed by elastic foamed material, in such a way that it garanties sufficient ventilation for the user, as well as an omnidirectional absorption of the impacts, and at the same time, reduces considerably the total weight of the helmet.

The aforementioned object is accomplished by various shock-absorbing straps separated between each other by spaces forming air chambers which straps integrally set about of two horizontal straps having air chambers forming an omnidirectional effecting shock absorbing body.

By their configuration and arrangement the absorbing straps form spaces, serving for the ventilation of the skull of the user of the helmet. These spaces give further an important advantage; on the one hand, they act as air chambers between the skull of the user and the inside of the upper part of the helmet, and on the other hand they form an absorbing air cushion, which increases the absorbing properties of the device.

The protective device is sufficiently stable, due to the fact that it is attached to the upper part of the helmet at various points, whereby adhesive elements are used, and by its own configuration, since its surface fits exactly into the interior surface of the upper part of the helmet.

The protective device, formed by various straps of elastic foamed material, represents a homogeneous piece, with absorbing qualities, due to the configuration of the straps, forming air chambers between the skull of the user and the upper part of the helmet and extending in the form of trapeze until the upper part of the helmet.

According to a further object of the invention the absorbing straps integrally set up from two horizontal straps arranged adjacent to the front and the back part of the spherical dome of the helmet and form a homogeneous piece. The horizontal straps produce also an absorbing effect on the lower part of the profile of the cap. These two horizontal straps are interrupted and do not form a ring in the inside of the cap, thus leaving there some spaces where communication elements like radio or telephone transmitting elements, to be connected to the ears of the user, can be incorporated in the cap.

The device according to the invention has in an enumerating and not in a limitating way the following advantages: Great capacity of absorbing energy of an impact per volume unity; Little weight which reduces the total weight of the helmet in comparison with other protecting devices; Usable in A.B.Q. Thermic insulator, to be used in cold and heat; Acoustic insulator; Moisture resistant; Hygienic, easily changeable; Low manufacturing costs and easy manufacturing; Comfortable and ergonomic for the skull of the user and substitution of various pieces by one.

BRIEF DESCRIPTION OF THE FIGURES:

Figure 1 is a Top view of the device according to the invention shown inside of the spherical dome of a helmet.

Figure 2 is a Front view of the helmet ac-

cording to Figure 1 and

Figure 3 is a cross section of the device.

A protective device, as represented in the Figures 1 and 2, showing the inside of a military helmet, into which the protective device has been inserted, comprises as it can be seen in the Figure 2, various vertical shock absorbing straps 1 having spaces between them, whereby air chambers are formed for increasing the capacity of absorption of impacts. The absorbing straps 1 are of different heights and integrally set up of horizontal straps 6. These straps follow the form of the inner overhead spherical dome 4 of the helmet and leaving spaces 2 and 5 between each other, which form the aforementioned air chambers serving for ventilation between the skull 3 of the user and the inner wall 4 of the helmet.

The straps 1 and the two horizontal straps 6 forming an integrally body which fits exactly into the upper inner part of the helmet, see Figures 1 to 3. The horizontal straps 6 are cut in a way as not to form a complete ring inside the spherical dome of the helmet thus leaving space 7 on each side, in order to increase the ventilation and for incorporation of communication elements like radio or telephone equipment to the ears of the user of the helmet.

These spaces are between the sides of the upper straps 1 and the horizontal straps 6 and being adjacent the front and the back of the spherical dome 4 of the helmet and continue until the upper straps 1.

The shock absorbing straps 2 are of different height and extending trapezoidally from the spherical dome 4 of the helmet for obtaining a progressive increase of shock-absorption.

Claims

1. Protection Device for a military helmet for absorption impacts forming a cap of elastic foamed material fixed at the inside of the spherical dome (4) of the helmet by adhesive material, **characterized** by various shock-absorbing straps (1) separated between each other by spaces (2) forming air chambers which straps (1) integrally set about of two horizontal straps (6) having air chambers (5) forming an omnidirectional effecting shock absorbing body.

2. Protection Device according claim 1, **characterized** in that the shock absorbing straps (2) are of different height and extending trapezoidally from the spherical dome (4) of the helmet for obtaining a progressive increase of shock-absorption.

3. Protection Device according claims 1 and 2, **characterized** by interior spaces (7) between the sides of the upper straps (1) and the horizontal straps (6) being adjacent the front and the back of the spherical dome (4) of the helmet and continue until the upper straps (1) for transversal ventilation of the head of the helmet user and for incorporation of communication elements.

4. Protection Device according claims 1 to 3, **characterized** that the surface of the cap fits exactly into the interior surface of the upper inner part of the helmet and that the horizontal straps (6) form an interrupted ring.

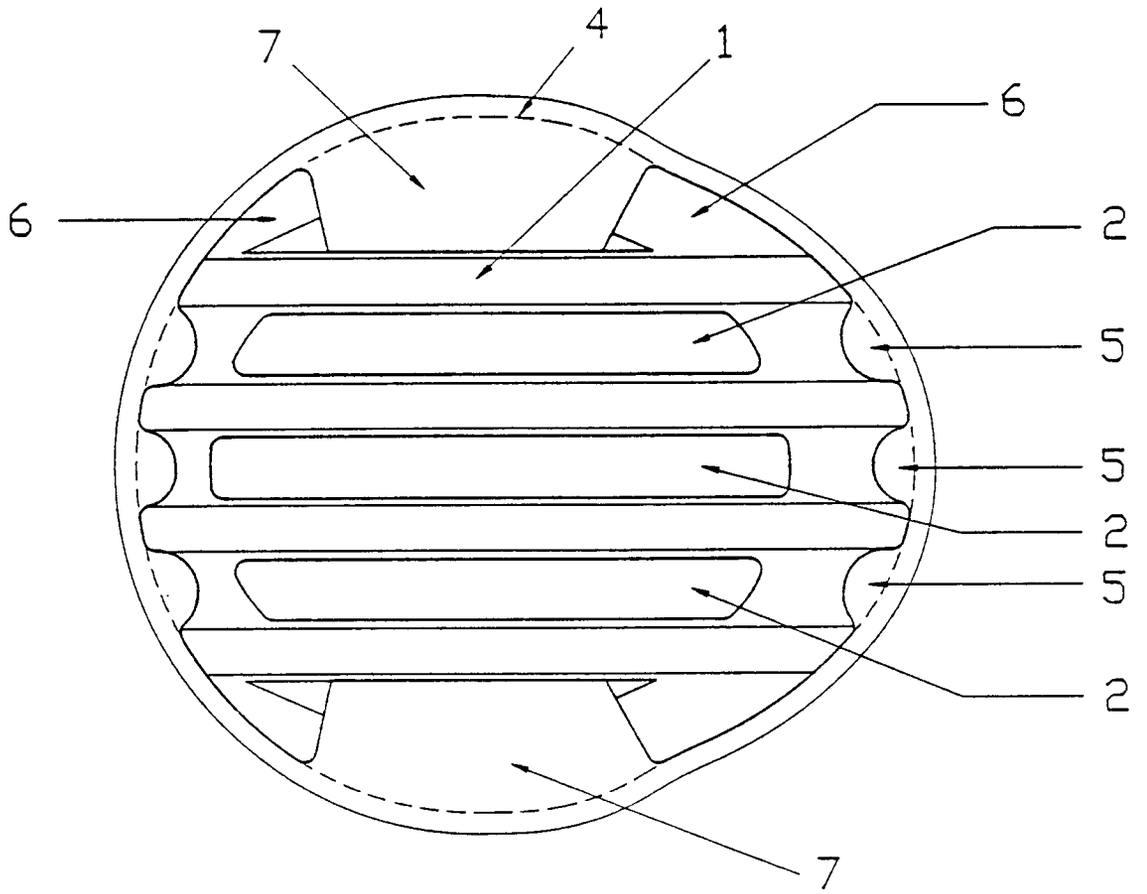

FIG 1

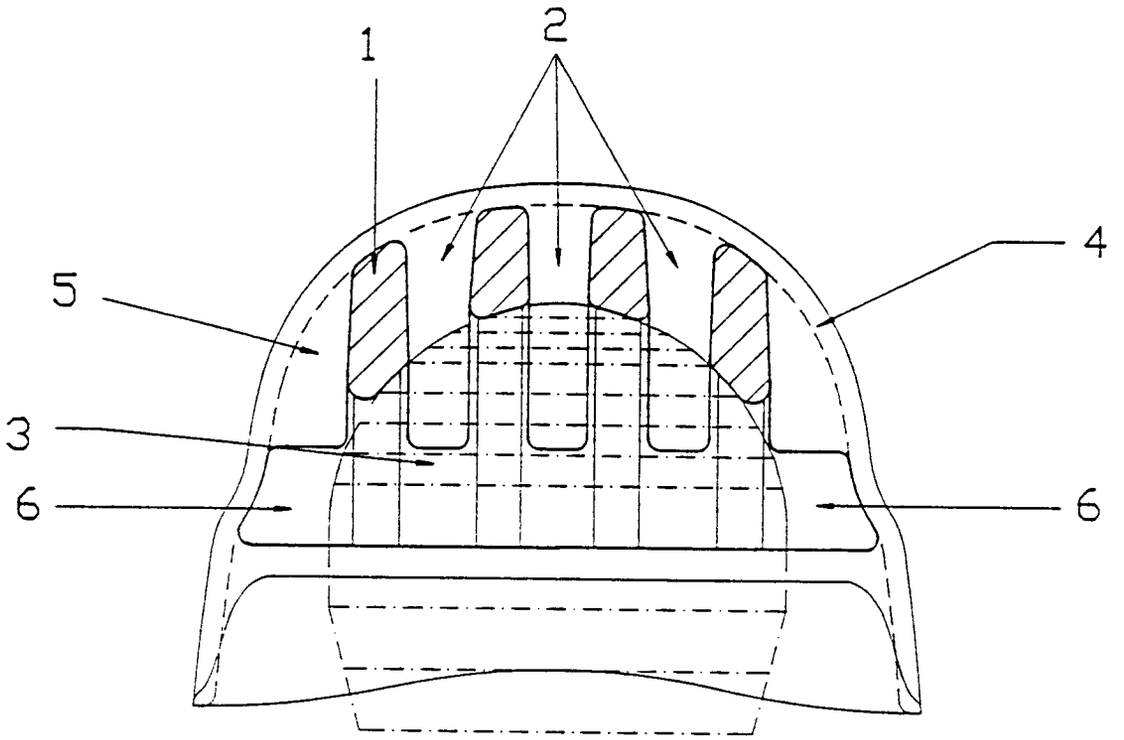

FIG 2

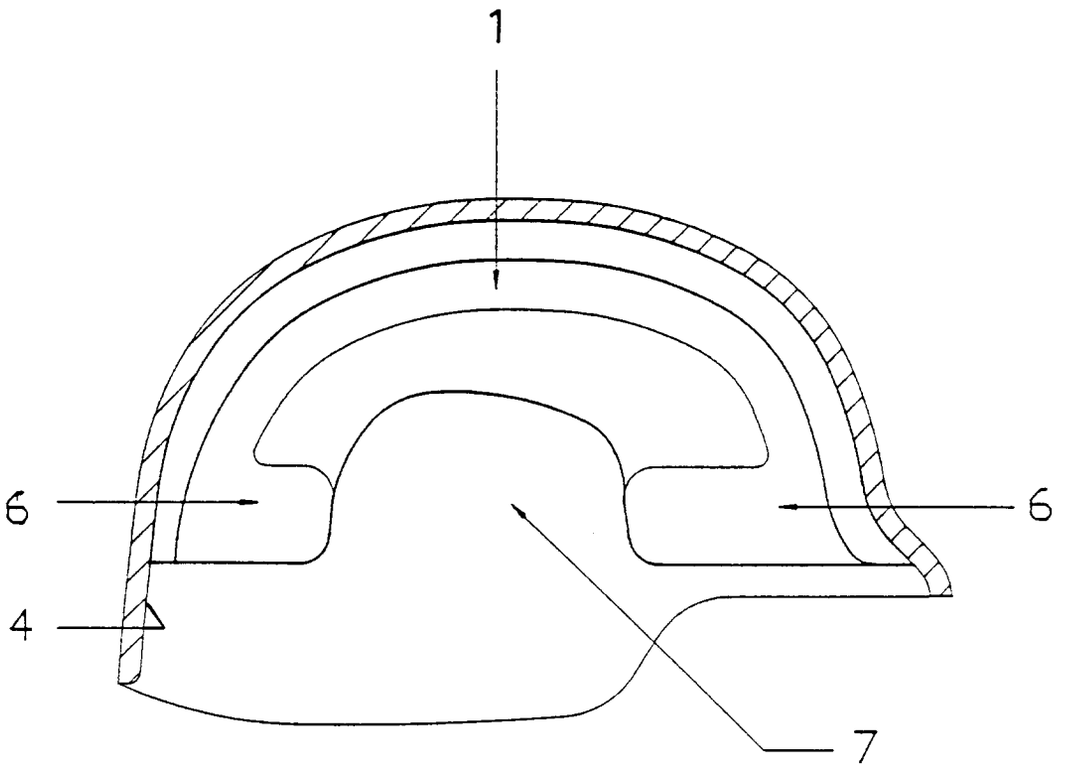

FIG 3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 11 9132

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	WO-A-91 05489 (ROSEBANK PLASTICS PTY. LTD.) * page 5, line 15 - page 7, line 13 * * page 7, line 31 - page 10, line 12 * * claims 1-3,12,14,15; figures 1-7 *	1	A42B3/12 A42B3/28
A		2-4	
X	US-A-3 186 004 (R. E. CARLINI) * column 2, line 15 - line 32 * * column 3, line 19 - line 40 * * figures *	1	
A		2-4	
X	US-A-4 172 495 (W. H. ZEBUHR ET AL.) * column 2, line 19 - line 34 * * column 3, line 17 - line 36 * * figures *	1	
A		2-4	
A	US-A-2 706 294 (D. L. SPRINKLE)		
A	US-A-2 785 404 (E. STROHM)		
A	US-A-2 625 683 (H. P. ROTH ET AL)		
A	US-A-2 763 005 (R. E. RICHTER)		
A	WO-A-86 03950 (G. BORETTI)		
A	US-A-4 766 614 (J. S. CANTWELL ET AL.)		
A	FR-A-2 553 266 (NOLAN S.P.A.)		

TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A42B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	15 May 1995	Bourseau, A-M

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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