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54 **Crash-helmet for cyclists and for non-motor sports in general.**

57 Crash helmet for cyclists and for non-motor sports in general, comprising a first protection cap of expanded polystyrene and a second reinforcement cap of transparent rigid plastic material, such as polycarbonate, whose surface is provided with a metallized layer capable of lending different colours according to the depth of the layer and the type of metal used, giving in this way a special aesthetic quality to the helmet, while keeping unchanged the protection characteristics of said helmet.

EP 0 630 589 A1

Object of this invention is a crash-helmet for cyclists and non-motor sports in general, comprising a first cap of expanded polystyrene and a second cap of rigid plastic material such as polycarbonate, fitted on said first polystyrene cap and provided, on its surface, with a metallized layer suitable to lend special aesthetic qualities, while keeping unchanged the protection characteristics of said helmet.

As known, the main function of crash-helmets for cyclists and for sportspeople who practice sports involving danger of damages due to falls, accidental hittings and the like, is to develop an effective protection activity of the user head, and in particular of the skull; such helmets, which usually are cap-shaped, are also provided with holes or slits to let the ventilation air enter and circulate, as well as with fasteninig means, such as thongs or chin-straps, opportunely fixed to the cap.

A helmet of the above mentioned type is described in the Patent Application EP 93105996.8 in the name of the same Applicant, and is constituted by the association between a first protection cap of expanded polystyrene or the like, and a second reinforcement cap of rigid plastic material such as polycarbonate, whose shape and size allow it to fit on to the polystyrene cap and to offer a high mechanical resistance to shocks as well as a remarkable lightness, so granting to the helmet high mechanical resistance to shocks besides good characteristics of easy handiness and lightness.

The polycarbonate utilized to manufacture the external helmet cap according to the necessary requirements of shock resistance, is transparent; the transparency of this material stresses any imperfections that might be present on the first cap of expanded polystyrene, and does not permit to mask the fastening elements of the chin-straps nor the grooves, slits and the like, that are indispensable for a correct ventilation of the helmet.

All this leads to a poorly satisfactory global aesthetic effect, inasmuch said protection helmets, while having to satisfy in the first place the safety requirements of the user, are also used by a various and not necessarily specialistic public and should therefore satisfy the requirements of a pleasant presentation and be characterized by a good aesthetic quality.

Object of this invention is therefore the realization of a crash-helmet for cyclists and sports-activity in general, constituted by a first protection cap of expanded polystyrene, and by a second reinforcement cap of transparent polycarbonate, which, while having a high mechanical shock resistance and good lightness characteristics, has also a particular aesthetic quality, keeping at the same time unchanged the protection characteristics of said helmet.

Another object of this invention is the realization of a helmet for cyclists, constituted by a first protection cap of expanded polystyrene and a second reinforcement cap of transparent polycarbonate whose surface layer is such as to permit to realize colours of variable intensity and shade.

Still another object of this invention is the realization of a helmet for cyclists such as to permit to highlight inscriptions, decorations and the like either placed on the external surface of polystyrene or on the internal surface of the second polycarbonate cap.

Still another object of this invention is the realization of a surface covering such as to allow to obtain colours stable with time and resistant to wheathering.

These and still other objects and relevant advantages, which shall be made clearer by the following description, are obtained by a crash-helmet for cyclists and sportspeople in general, constituted by a first protection cap of expanded polystyrene or the like and a second reinforcement cap of polycarbonate, whose shape and size permit its fitting on said first protection cap, which polycarbonate cap, according to this invention, is provided with a metallized layer, suitable to lend particular aesthetic qualities, while keeping inalterated the characteristics of shock resistance ensured to said helmet by said second cap.

More in detail, said metallized layer, obtained according to known techniques by electroplating and vaporization of metal ions, permits, when realized on the surface of said cap of transparent polycarbonate, to obtain colours of a "metallic" type of various intensities and shades, according to the thickness of the deposited layer and in particular of the layer of silicium monoxide, lending in this way the helmet remarkable aesthetic qualities. Such metallization, being carried out on a transparent surface such as that of the polycarbonate external cap, permits to obtain also changing colours, with a high degree of light reflection, lending in this way the helmet a special aesthetic quality that could not be obtained if the metallization should be carried out on opaque surfaces. Besides, such metallized layer permits to mask any possible imperfection present on the underlying polystyrene cap, and to hide from sight the fastening elements of the chin-straps and other non aesthetic elements present on said first polystyrene cap.

Such metallization, according to this invention, can be realized on the whole external surface of said polycarbonate cap, on the internal surface, or on both the internal and external surfaces of said cap, according to the type of colours and optical effect wished.

Always according to this invention, such metallization may be carried out either on the whole

surface of the polycarbonate cap or on some zones only of said cap; in the latter instance, it is possible to keep the transparence provided by the material in some zones of said cap, for instance by suitably protecting said zones during the metallization stage, so that diaphanies, adhesives and the like carrying inscriptions, patterns and various decorations can be applied either on the external surface of said first polystyrene cap or on the internal and/or external surface of said second polycarbonate cap, in such a manner that said diaphanies, adhesives and the like are perfectly visible.

Always according to this invention, a process for the realization of said metallization proved particularly advantageous, which provides for a first treatment of the polycarbonate reinforcement cap with an "antiscratch" agent of a known type and available on the market, and a following metallization treatment, according to known techniques, of said external cap.

Surprisingly, it has been noticed that the first "antiscratch" treatment of the polycarbonate cap permits to obtain a better adhesion of the metallized layer to said cap, making such layer particularly stable with time and resistant to wheathering.

Claims

1. Crash-helmet for cyclists and sportspeople in general, of the type constituted by a first protection cap of expanded polystyrene and a second reinforcement cap of polycarbonate, whose shape and size are such as to permit its fitting on said first protection cap, characterized in that said second polycarbonate cap is provided with a metallized layer suitable to lend particular aesthetic qualities, while keeping unchanged the characteristics of shock resistance ensured to said helmet by said second cap.
2. Crash-helmet for cyclists and sports-activities in general according to claim 1, characterized in that said second metallized layer is realized on a surface of transparent polycarbonate and permits to obtain colors even changing, of different intensity and shade according to the type of metal utilized and the thickness of said layer.
3. Crash-helmet for cyclists and sports-activity in general according to claim 1, characterized in that said metallized layer hides any possible imperfections that may be present on said first polystyrene protection cap, as well as the fastening elements of the chin-straps and other unaesthetic elements present on said first cap.
4. Crash-helmet for cyclists and sports-activities in general according to claim 1, characterized in that said metallized layer is realized on both the external and internal surfaces of said second polycarbonate cap.
5. Crash-helmet for cyclists and sports-activity in general according to claim 1, characterized in that said metallized layer is realized on the whole internal surface of said second polycarbonate cap.
6. Crash-helmet for cyclists and sports-activities in general according to claim 1, characterized in that said metallized layer is realized on the whole external surface of said second polycarbonate cap.
7. Crash-helmet for cyclists and sports-activities in general according to claim 1, characterized in that said metallized layer is realized in such a way as to keep the transparence in some zones of said cap, leaving in this way visible inscriptions, patterns and various decorations, applied either on the external surface of said first polystyrene cap or on the internal surface of said second polycarbonate cap.
8. Crash-helmet for cyclists and sports-activities in general according to claim 1, characterized in that said metallized layer is realized by means of a first treatment of said polycarbonate reinforcement cap with an "antiscratch" agent and a following metallization treatment, obtaining in this manner a metallized layer stable with time and resistant to wheathering.



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EUROPEAN SEARCH REPORT

Application Number
EP 93 10 9927

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.5)
X	US-A-4 993 082 (J. J. GENTES ET AL.) * the whole document * ---	1-8	A42B3/06 A42B3/00
A	US-A-4 599 752 (S. C. MITCHELL) * the whole document * ---	1-8	
A	US-A-2 293 308 (J. T. RIDDELL, SR., ET AL) ---		
A	DE-C-972 661 (D. HILDEBRANDT) ---		
A	US-A-4 100 625 (C. F. TUNG) ---		
A	FR-A-2 680 305 (M. D. C. BONNEROY) -----		
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			A42B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		14 December 1993	Bourseau, A-M
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X : particularly relevant if taken alone		T : theory or principle underlying the invention	
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