

(19)



(11)

EP 2 526 801 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

28.11.2012 Bulletin 2012/48

(51) Int Cl.:

A42B 3/22 (2006.01)

(21) Application number: **11425142.4**

(22) Date of filing: **26.05.2011**

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

Designated Extension States:

BA ME

(72) Inventor: **Monti, Valter**

22030 Orsenigo (Prov. of Como) (IT)

(74) Representative: **Modiano, Micaela Nadia et al**

Modiano & Partners (IT)

Via Meravigli, 16

20123 Milano (IT)

(71) Applicant: **Suomy S.p.A.**

22044 Inverigo (CO) (IT)

(54) **Safety helmet, particularly for motorcycle and/or motor racing, with improved device for moving the sun visor**

(57) Safety helmet (1), particularly for motorcycle and/or motor racing, with improved device for moving the sun visor, comprising an outer cap (2) and an inner padding (3) internally associated with the outer cap (2) and wearable over the head of a user.

More precisely, between the outer cap (2) and the

inner padding (3) there is at least one interspace (4) that is provided at least at the front with an opening (5) and accommodates a sun visor (6) that can be extracted from the interspace (4) through the opening (5).

The peculiarity of the invention consists in that the sun visor (6) is associated with the inner padding (3) so that it can rotate.

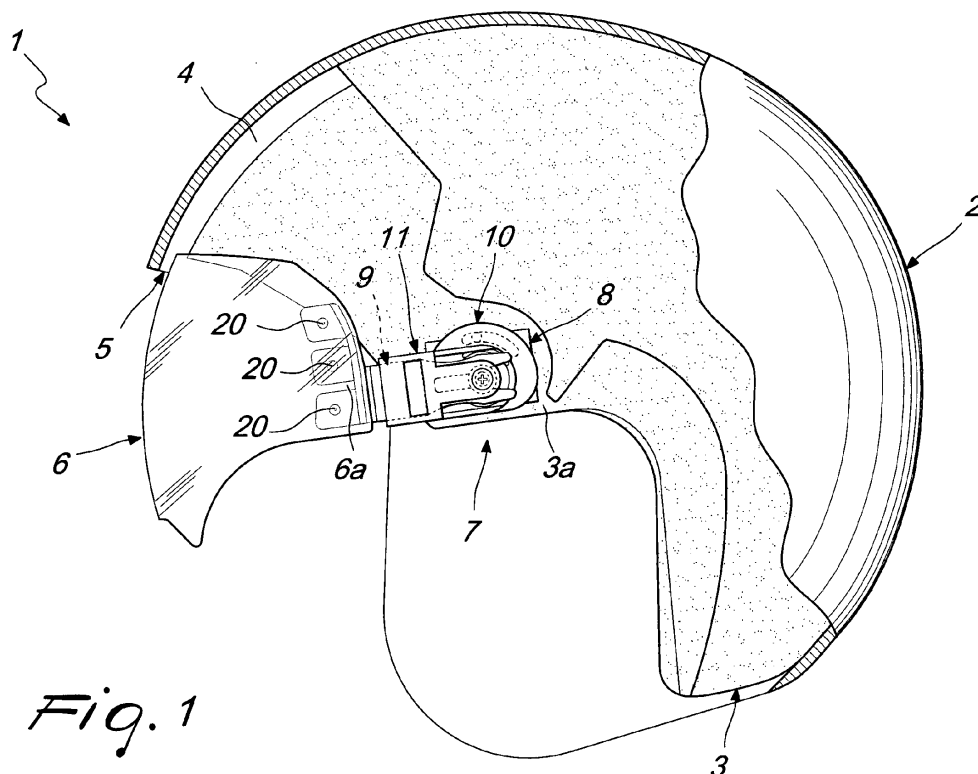


Fig. 1

EP 2 526 801 A1

Description

[0001] The present invention relates to a safety helmet, particularly for motorcycle and/or motor racing, with improved device for moving the sun visor.

[0002] Currently, in the field of safety devices and more specifically in the field of sports equipment for sports that can be practiced outdoors, such as for example motorcycle racing, motor racing and the like, safety helmets are known that are provided with a sun visor which is integrated in the safety helmet proper and can be removably arranged in front of the eyes of the user of the safety helmet according to necessity.

[0003] More exactly, the sun visor has the general purpose of protecting the user's eyes and part of the user's face, respectively, from the sun rays and from atmospheric agents or from other factors that can cause harm or simply be a nuisance to the user of the safety helmet.

[0004] The sun visor is usually accommodated inside the safety helmet in an interspace that is formed for this purpose between the outer cap or shell and the expanded polystyrene that constitutes part of the padding of the safety helmet.

[0005] The sun visor is usually provided with hinges which are fixed to the outer cap and are such as to allow the rotation of the sun visor with respect to a rotation axis passing substantially through the user's temples from an extracted position from the above mentioned interspace to a retracted position in the interspace.

[0006] More specifically, this hingeing is implemented both on the right side and on the left side of the helmet, by means of coupling the outer cap to two side-plates which are associated so that they can rotate with the sun visor.

[0007] Such conventional helmets are not devoid of drawbacks, among which is the fact that the side-plates described above and, more generally, the mechanisms responsible for the movement of the sun visors, by being fixed to the outer cap by means of the perforation thereof, lead to the introduction of discontinuities in the structure of the outer cap, with consequent reduction of the mechanical strength thereof.

[0008] In order to reduce to the minimum the variations in rigidity of the outer cap owing to the presence of the holes made to affix the sun visor, a conventional technique is to provide fixing devices that require small holes so as to reduce to the minimum the removal of strong material from the outer cap.

[0009] This solution, which can be suitable for maintaining a structural rigidity that is substantially equal to the structural rigidity of a cap without fixing holes, can considerably alter the dynamic behavior of the cap proper in the event of impact.

[0010] In fact, construction science teaches that the presence of a small hole in a strong structure leads to a local concentration of forces that is greater the smaller the hole.

[0011] More precisely, this phenomenon is commonly

known as the "notch effect" and it favors the formation of cracks which over time, for example because of continual deformations during the donning and taking off of the helmet and/or because of the vibrations to which the safety helmet is subjected during its normal use, lead to the breaking of the cap of the safety helmet.

[0012] Since the helmet is a safety device, such reductions of the mechanical strength in general and of the fatigue strength represent a drawback that cannot be ignored and/or accepted.

[0013] Another drawback of conventional helmets consists in that the sun visor can undergo geometric alterations because of the deformations imposed on the outer cap, for example, during the steps of donning the safety helmet.

[0014] In fact, since the outer cap is usually made with relatively reduced thicknesses, it can undergo deformations and alterations that lead to a widening of the two lateral ends, with consequent variation of the upper portion where the sun visor is applied.

[0015] More precisely, since it is anchored to the outer cap, obviously the sun visor undergoes the same deformations as the outer cap with consequent variations in curvature, which lead the sun visor not to follow the contour of the outer cap correctly.

[0016] A further drawback with conventional helmets, which is linked to the deformability of the sun visor just described, consists in that such deformations and alterations of the sun visor can lead to possible rubbing of the sun visor both against the expanded polystyrene and against the inner part of the outer cap, during the steps of extracting and retracting the sun visor in the interspace formed between the expanded polystyrene and the outer cap.

[0017] It should be emphasized that the above mentioned drawbacks associated with inner sun visors can also be found in outer visors.

[0018] In fact, the latter are also typically anchored to the outer cap by means of hinges that require the perforation of the outer cap in order to allow the fitting thereof.

[0019] The aim of the present invention is to provide a safety helmet, particularly for motorcycle and/or motor racing, with improved device for moving the sun visor, that makes it possible to move the sun visor simply, quickly and effectively without in any way weakening the structural strength of the outer cap of the safety helmet on which the sun visor is used.

[0020] Within this aim, an object of the present invention is to provide a safety helmet that allows the sun visor to be lowered and/or raised without it rubbing against the expanded polystyrene or against the inner part of the cap, because of any deformations thereof during the usual operations of donning and taking off the helmet.

[0021] Another object of the present invention is to provide a safety helmet that offers the widest guarantees of reliability and safety during normal use thereof.

[0022] Another object of the present invention is to provide a safety helmet that can be made at low cost when

compared with the necessary costs of making conventional helmets.

[0023] This aim and these and other objects, which will become better apparent hereinafter, are achieved by a safety helmet, particularly for motorcycle and/or motor racing, with improved device for moving the sun visor, comprising an outer cap and an inner padding internally associated with said outer cap and wearable over the head of a user, between said outer cap and said inner padding there being defined at least one interspace that is provided at least at the front with an opening and accommodates a sun visor which can be extracted from said interspace through said opening, characterized in that said sun visor is associated with said inner padding so that it can rotate.

[0024] Further characteristics and advantages of the present invention will become better apparent from the description of a preferred, but not exclusive, embodiment of a safety helmet, particularly for motorcycle and/or motor racing, with improved device for moving the sun visor, according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a side elevation view of an embodiment of a safety helmet, particularly for motorcycle and/or motor racing, with improved device for moving the sun visor, according to the invention, in which the outer cap is partially sectional;

Figure 2 is an enlarged-scale detail of the safety helmet shown in Figure 1;

Figures 3, 4 and 5 are side elevation views of the components that form the hingeing between the sun visor and the inner padding of the safety helmet shown in Figure 1.

[0025] With reference to the figures, the safety helmet, particularly for motorcycle and/or motor racing, with improved device for moving the sun visor, generally designated with the reference numeral 1, comprises an outer cap 2, generally made of a rigid and strong material, and an inner padding 3 associated internally with the outer cap 2 and wearable over the head of a user.

[0026] Conveniently, the inner padding 3 is made at least partially of a deformable material like expanded polystyrene, for absorbing the energy developed as a result of the impact of the safety helmet 1 against another body.

[0027] More precisely, the inner padding 3 can be defined by a first layer made of expanded polystyrene and by a second layer, not shown, which forms the inner or comfort lining of the safety helmet 1.

[0028] Moreover, in the specific embodiment proposed, the safety helmet 1 is a safety helmet for use in motorcycle racing and, in particular, is a safety helmet of the open-face type. However, what is described below can also be applied to other types of helmets like full-face helmets or modular/flip-up helmets and/or helmets that are designed to be used in other fields than motorcycle and motor racing, while still remaining within the

inventive concept of the present invention.

[0029] As can be seen from Figures 1 and 2, formed between the outer cap 2 and the inner padding 3 is at least one interspace 4 that is provided at least at the front with an opening 5 and accommodates a sun visor 6 that can be extracted from the interspace 4 through the opening 5, by means of command elements that are known per se to the person skilled in the art and therefore not described in detail.

[0030] According to the invention, the sun visor 6, which as shown in Figure 1 has an ergonomically contoured shape adapted to cover all the region of the user's eyes, is associated directly so that it can rotate with the inner padding 3 by way of hinged means 7 associated with the end portions 6a of the sun visor 6 and laterally associated with the inner padding 3 with respect to the opening 5 for moving the sun visor 6 from an extracted position from the interspace 4, in which the sun visor 6 can be arranged in front of the user's face so as to protect his/her eyes and at least part of his/her face from solar radiation, from the action of atmospheric agents or the like, to a retracted position in the interspace 4 and vice versa.

[0031] Advantageously, the hinged means 7 comprise two side-plates 8 associated with the inner padding 3 at its lateral regions 3a and comprise two elements 9 for supporting the sun visor 6 which are integrally associated with the end portions 6a of the sun visor 6.

[0032] Conveniently, each supporting element 9 is associated so that it can rotate with the respective side-plate 8 by means of a hinge forming part of the hinged means 7 and provided by a first hinge element 10 associated integrally with the side-plate 8 and a second hinge element 11 associated so that it can rotate with the first hinge element 10 and associated integrally with the respective supporting element 9.

[0033] More specifically, each supporting element 9 is substantially L-shaped with the foot 9a of the L fixable to one of the end portions 6a of the sun visor 6 by means of three fixing points 20 and with the stem 9b of the L inserted in a guide 12 formed by the respective second hinge element 11.

[0034] As shown in the figures, the stems 9b of each supporting element 9 end substantially in a fork and comprise a central portion 13 that is radially widened in order to accommodate a hinge pivot 14 which is integral with the respective first hinge element 10 and provided, in the proposed embodiment, by a screw.

[0035] To complete the description of the stems 9b of the supporting elements 9, which terminate substantially in a fork, it should be emphasized that they are made of an elastically yielding material for their snap-acting locking with the hinge pivot 14 as a consequence of the insertion of the supporting elements 9 in the guides 12.

[0036] Guided movement of the sun visor 6 with respect to the side-plate 8 is made possible thanks to the presence of a slider element 17 which is integral in rotation with the second hinge element 11 and accommodat-

ed so that it can slide in a curvilinear slot 18 defined on the first hinge element 10.

[0037] More precisely, the ends of the curvilinear slot 18 define the stroke limit points of the slider element 17 and thus of the sun visor 6.

[0038] The side-plates 8 are advantageously integrally fixed to the inner padding 3 by means of fastening elements 15 which are provided with portions that are undercut and embedded in the inner padding 3.

[0039] More specifically, the fastening elements 15 comprise arches 16 which are integral with the side-plates 8, and the inner padding 3 is made by means of a process of co-molding together with the side-plates 8 so as to render them non-separable, either on purpose or by accident, from the inner padding 3.

[0040] The safety helmet 1 can further be provided, in a manner that is known per se, with a plurality of further elements such as, for example, air intakes, helmet fastening devices, high or low frequency radio communication devices which are not described since they are outside the scope of the inventive concept.

[0041] What has been described so far for moving the sun visor 6, with suitable technical contrivances that can be easily identified by the person skilled in the art, can be used for the outer visor as well, if provided.

[0042] Operation of the safety helmet 1, particularly for motorcycle and/or motor racing, with improved device for moving the sun visor, is clear and evident from the foregoing description.

[0043] In practice it has been found that the safety helmet, particularly for motorcycle and/or motor racing, with improved device for moving the sun visor, according to the present invention, fully achieves the intended aim and objects in that anchoring the mechanism responsible for moving the sun visor to the inner padding by means of a process of co-molding thereof, the inner padding being made of a rigid material which is not subjected to any deformations during the normal use of the safety helmet, brings the consequence that the rotation of the sun visor proper is not influenced by any deformations of the outer cap.

[0044] In fact, since as previously mentioned the expanded polystyrene, with which the inner padding is made, is more rigid than the outer cap, the anchoring points of the sun visor are in turn fixed points that are capable of ensuring the same angle of rotation on the left and right sides of the helmet.

[0045] Another advantage of the safety helmet according to the present invention, deriving from the use of an anchoring system like that described, consists in the absence of perforations in the outer cap for affixing the sun visor.

[0046] In fact, as mentioned previously in the initial preamble, any perforations in the outer cap represent discontinuities of the mechanical structure thereof.

[0047] A further advantage of the safety helmet according to the present invention consists in that it has implementation costs that are substantially lower than

those of the known art since, by implementing the described process of co-molding, all the operations to perforate and work on the outer cap for fixing the sun visor are avoided.

5 [0048] The safety helmet, particularly for motorcycle and/or motor racing, with improved device for moving the sun visor, thus conceived, is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

10 [0049] Moreover, all the details may be substituted by other, technically equivalent elements.

[0050] In practice the materials employed, provided they are compatible with the specific use, and the contingent dimensions and shapes, may be any according to requirements and to the state of the art.

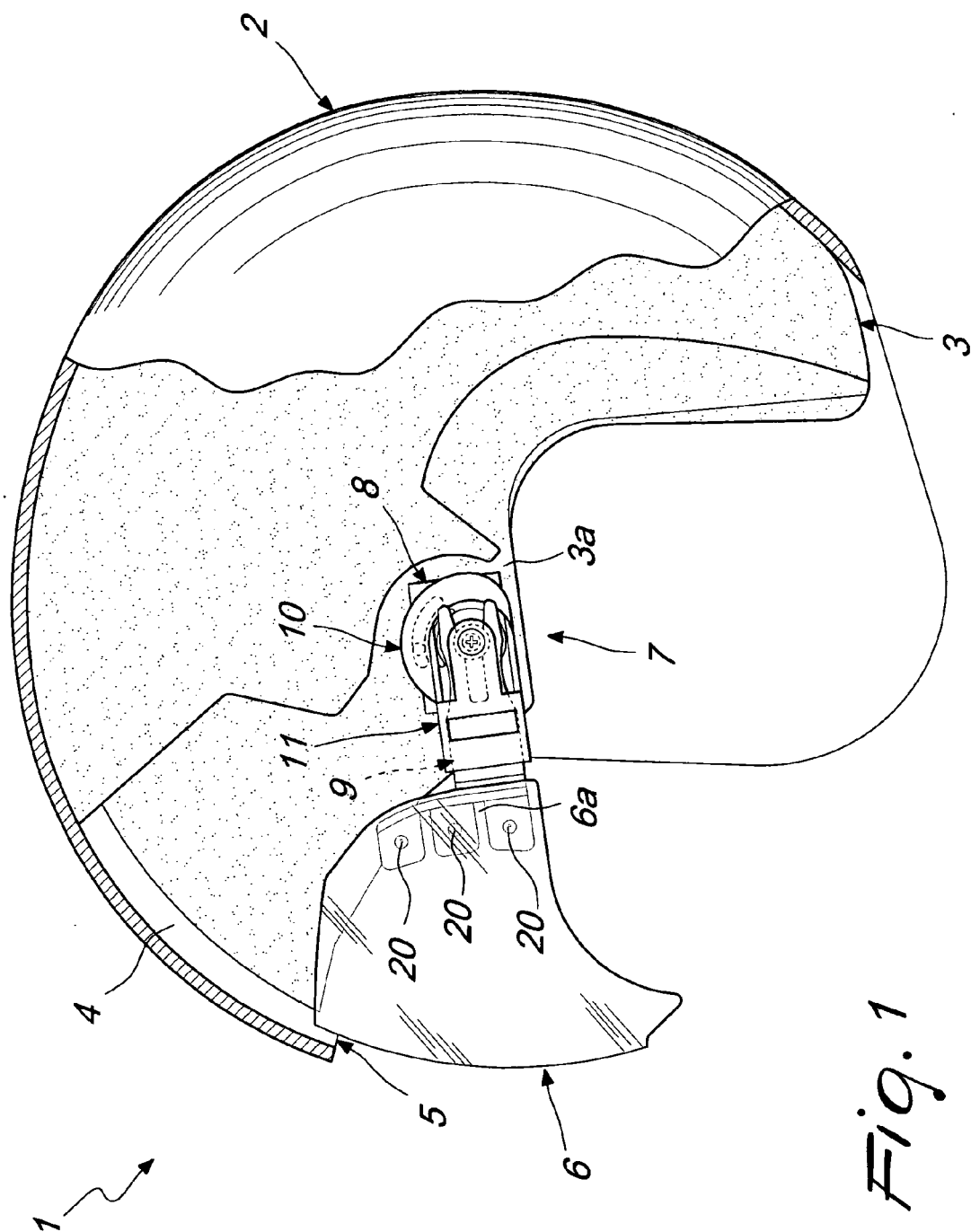
15 [0051] Where the technical features mentioned in any claim are followed by reference numerals and/or signs, those reference numerals and/or signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference numerals and/or signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference numerals and/or signs

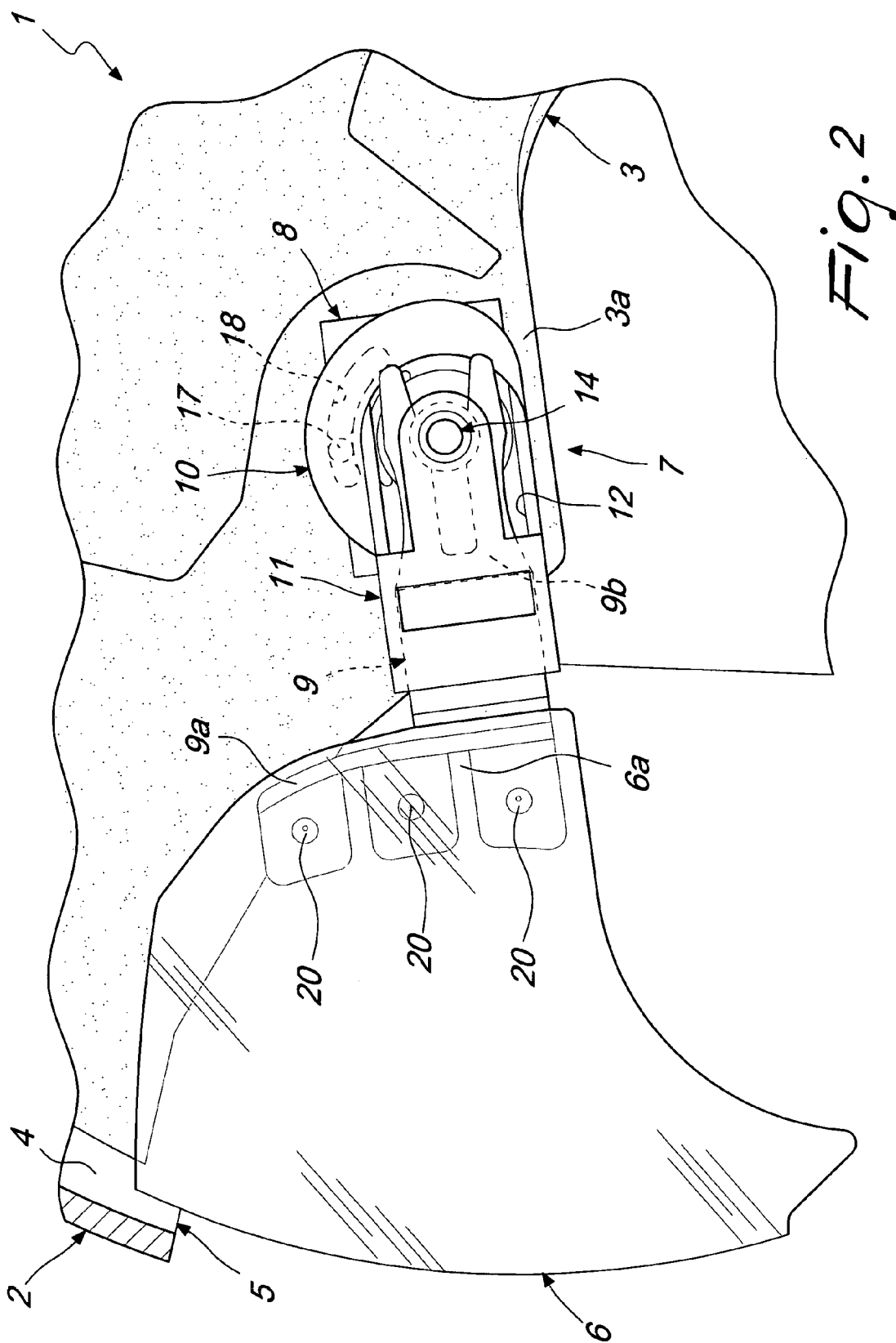
25

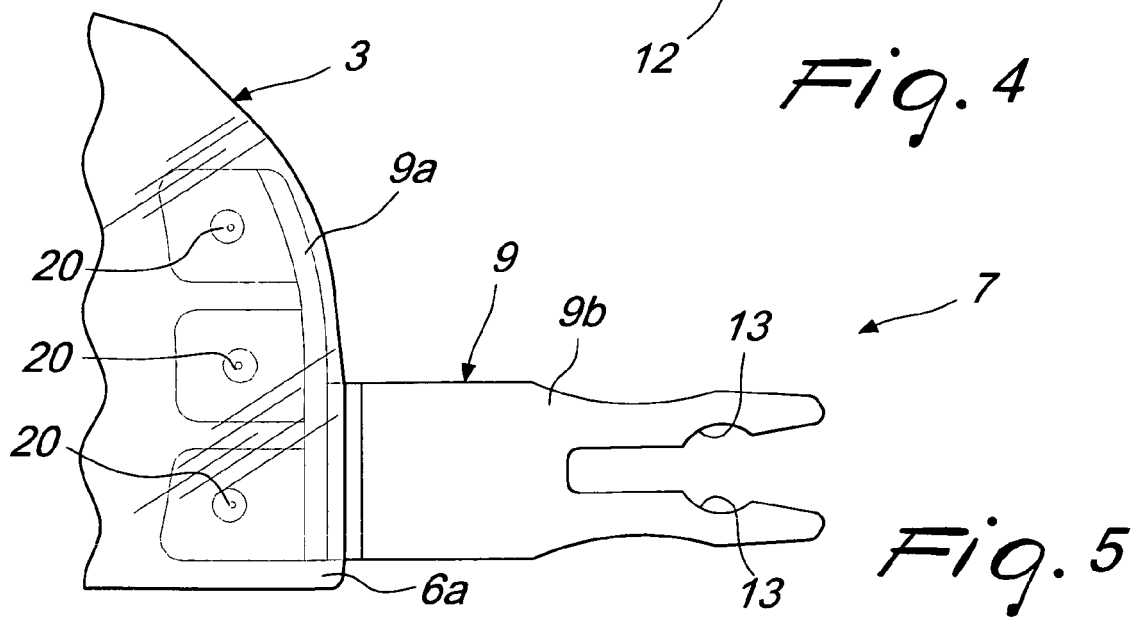
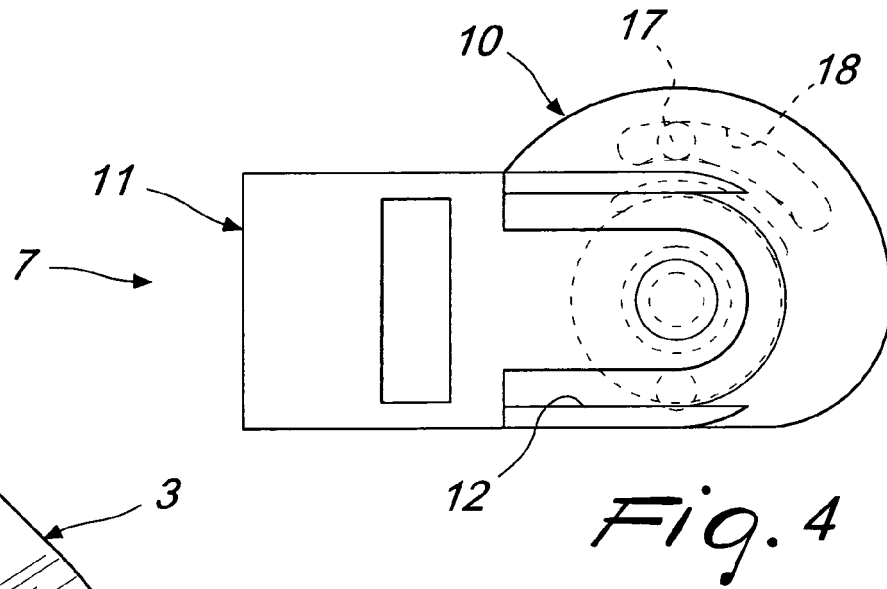
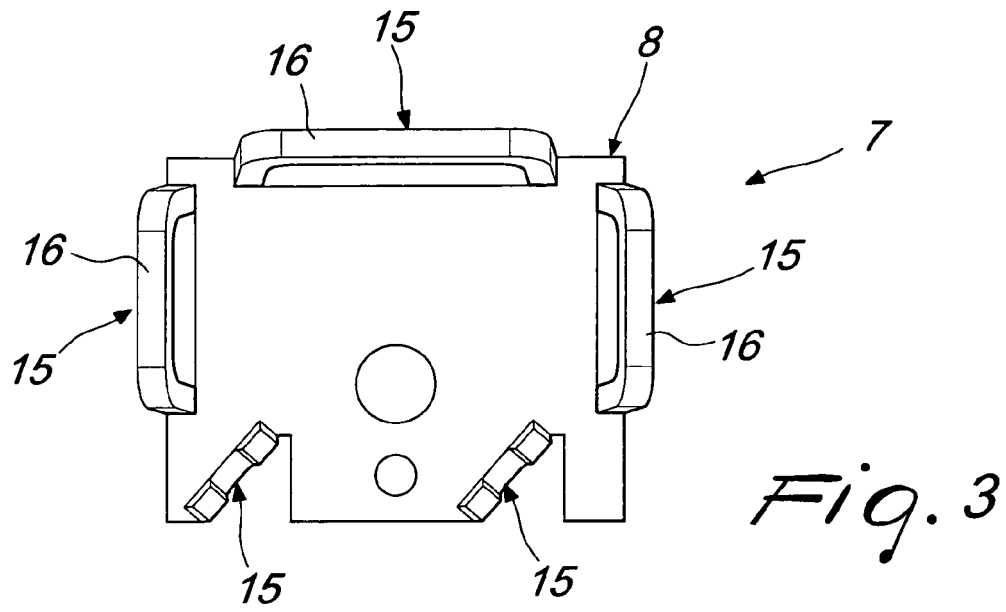
Claims

1. A safety helmet (1), particularly for motorcycle and/or motor racing, with improved device for moving the sun visor, comprising an outer cap (2) and an inner padding (3) internally associated with said outer cap (2) and wearable over the head of a user, between said outer cap (2) and said inner padding (3) there being defined at least one interspace (4) that is provided at least at the front with an opening (5) and accommodates a sun visor (6) which can be extracted from said interspace (4) through said opening (5), **characterized in that** said sun visor (6) is associated with said inner padding (3) so that it can rotate.
2. The safety helmet (1), according to claim 1, **characterized in that** it comprises hinged means (7) associated with the end portions (6a) of said sun visor (6) and associated laterally with said inner padding (3) with respect to said opening (5) for the movement of said sun visor (6) from an extracted position from said interspace (4), in which it can be arranged in front of said user's face, to a retracted position in said interspace (4) and vice versa.
3. The safety helmet (1), according to claim 1 or 2, **characterized in that** said hinged means (7) comprise two side-plates (8) associated with said inner padding (3) at its lateral regions (3a) and comprise two elements (9) for supporting said sun visor (6) which are integrally associated with said end portions (6a) of said sun visor (6) and associated so that it can rotate with the respective one of said side-plates (8).

4. The safety helmet (1), according to claim 3, **characterized in that** each one of said side-plates (8) comprises fastening elements (15) that are provided with portions that are undercut and embedded in said inner padding (3), said inner padding (3) being made by means of a process of co-molding together with said side-plates (8). 5
5. The safety helmet (1), according to claim 4, **characterized in that** said fastening elements (15) comprise arches (16) that are integral with said side-plates (8). 10
6. The safety helmet (1), according to one or more of claims 3 to 5, **characterized in that** said hinged means (7) comprise for each one of said side-plates (8) a hinge made from a first hinge element (10) associated integrally with said side-plate (8) and a second hinge element (11) associated so that it can rotate with said first hinge element (10) and integrally associated with one of said supporting elements (9). 15
20
7. The safety helmet (1), according to claim 6, **characterized in that** it comprises for each one of said side-plates (8) a slider element (17) which is integral in rotation with said second hinge element (11) and accommodated so that it can slide in a curvilinear slot (18) defined on said first hinge element (10) for the guided movement of said sun visor (6) with respect to said side-plates (8). 25
30
8. The safety helmet (1), according to claim 7, **characterized in that** the ends of said curvilinear slots (18) define the stroke limit points of said slider elements (17). 35
9. The safety helmet (1), according to one or more of claims 6 to 8, **characterized in that** each one of said supporting elements (9) are substantially L-shaped with the foot (9a) of said L fixable to one of said end portions (6a) of said sun visor (6) and with the stem (9b) of said L inserted in a guide (12) defined by one of said second hinge elements (11). 40
10. The safety helmet (1), according to claim 8, **characterized in that** said stem (9b) of said supporting element (9) ends substantially in a fork and comprises a central portion (13) that is radially widened in order to accommodate a hinge pivot (14) which is integral with said first hinge element (10). 45
50
11. The safety helmet (1), according to claim 10, **characterized in that** each one of said stems (9b) of said supporting elements (9) which terminate substantially in a fork is made of an elastically yielding material for their snap-acting locking with said hinge pivot (14) as a consequence of the insertion of said supporting elements (9) in said guides (12). 55
12. The safety helmet (1), according to one or more of claims 1 to 11, **characterized in that** said inner padding (3) is made at least partly of expanded polystyrene.
13. The safety helmet (1), according to one or more of claims 1 to 12, **characterized in that** it is of the full-face type.
14. The safety helmet (1), according to one or more of claims 1 to 12, **characterized in that** it is of the modular or flip-up type.
15. The safety helmet (1), according to one or more of claims 1 to 12, **characterized in that** it is of the open-face type.









EUROPEAN SEARCH REPORT

Application Number
EP 11 42 5142

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2011/072548 A1 (HERSICK F JOSEPH [US] ET AL) 31 March 2011 (2011-03-31) * paragraphs [0033], [0056]; claim 1; figure 8a *	1-3	INV. A42B3/22
E	EP 2 340 732 A1 (LINK INNOVA ENGINEERING S C [ES]) 6 July 2011 (2011-07-06) * paragraphs [0020], [0024], [0025]; figures 1a,1b,2 *	1	
A	US 2001/054188 A1 (GUAY LOUIS [FR] ET AL) 27 December 2001 (2001-12-27) * paragraphs [0031], [0034], [0041]; figure 7 *	1	
A	DE 10 2004 004044 A1 (WACKER CONSTRUCTION EQUIPMENT [DE]) 27 October 2005 (2005-10-27) * paragraph [0046]; figure 2 *	1	
A	DE 20 2009 013339 U1 (KIN YONG LUNG IND CO LTD [TW]) 18 March 2010 (2010-03-18) * paragraph [0016]; figures 1,2 *	1	
A	EP 1 498 041 A1 (VOSS IRMGARD [DE]) 19 January 2005 (2005-01-19) * paragraphs [0021], [0022]; figures 2,8 *	1	TECHNICAL FIELDS SEARCHED (IPC) A42B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 1 November 2011	Examiner D'Souza, Jennifer
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 P : intermediate document		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 L : document cited for other reasons & : member of the same patent family, corresponding document	

 1
EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 42 5142

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-11-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2011072548 A1	31-03-2011	AT 511770 T	15-06-2011
		AU 2007295033 A1	20-03-2008
		EP 2061352 A2	27-05-2009
		WO 2008033189 A2	20-03-2008
EP 2340732 A1	06-07-2011	NONE	
US 2001054188 A1	27-12-2001	CA 2349764 A1	29-11-2001
		FR 2809286 A1	30-11-2001
DE 102004004044 A1	27-10-2005	NONE	
DE 202009013339 U1	18-03-2010	NONE	
EP 1498041 A1	19-01-2005	DE 20311047 U1	04-12-2003