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(54) **Crash-helmet, in particular for motorcyclists.**

(57) This crash-helmet, in particular for motorcyclists, comprises a shell (2) which is open at the front and below and is provided with a substantially rigid retention element (3) which extends in a front region of the lower opening (4) of the helmet (1). The longitudinal ends (3a, 3b) of the retention element (3) extend upward and are oscillably associated with two opposite lateral regions of the shell (2). The retention element is controllably movable from a closed position, in which it downwardly delimits the front opening (5) of the helmet so as to downwardly embrace the user's chin, to an open position, in which it is moved forward and upward with respect to the closed position to allow the helmet to be put on and removed.

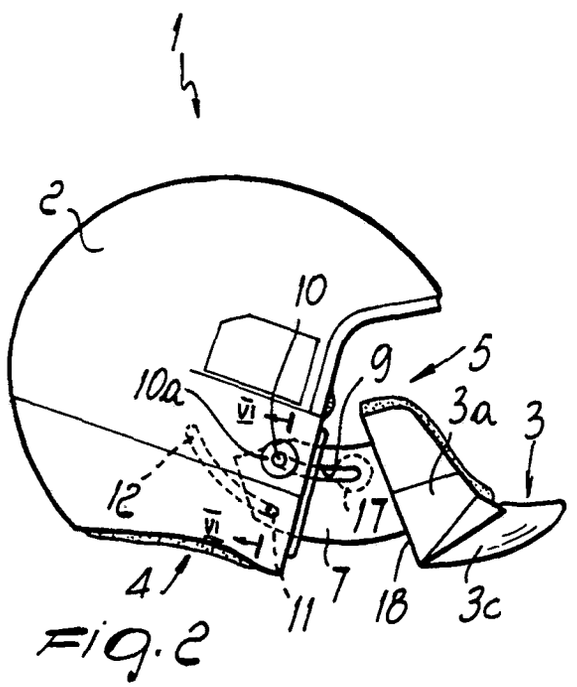

Fig. 2

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CRASH-HELMET, IN PARTICULAR FOR MOTORCYCLISTS

The present invention relates to a crash-helmet in particular for motorcyclists.

As is known, "jet"-type crash-helmets are constituted by a substantially dome-shaped shell made of rigid material, such as for example polycarbonate or glass fibers, which is open at the front and below. An adequately shaped layer of shock-proof material, usually foamed polystyrene, is arranged inside the casing or shell. A layer of soft padding is furthermore applied on the inner side of the layer of shock-proof material and allows the inside of the helmet to adapt to the user's head.

"Jet"-type helmets are usually secured to the head of the user by means of a strap which extends transversely to the lower opening and is tensioned or fastened after the helmet has been put on so as to downwardly embrace the user's chin.

This kind of helmet has some disadvantages, mainly related to the use of the strap to secure the helmet to the user's head.

Very often the strap is in fact not fastened or tensioned adequately, making the securing of the helmet unstable, with the possibility of an easy loss thereof due to accidental causes, in particular in case of falls, impacts, etc.

The strap is furthermore often uncomfortable when the helmet must be worn for a long time.

The strap is also used as a helmet securing element for a wide range of helmets of the closed type, i.e. with a chin-rest which extends on the front opening of the helmet, practically with the same disadvantages observed in "jet"-type helmets, though accidental removal of the helmet is made more difficult by the presence of the chin-rest.

In some kinds of closed helmets, the strap is replaced by a lower extension of the chin-rest which limits the helmet lower opening to a passage for the neck. In this kind of helmet, the chin-rest is movable with respect to the shell of the helmet so that it can be moved forward to allow the user's head to pass through the lower opening when the helmet must be put on or removed.

Though it solves the problems related to the use of the strap, the adoption of a lower extension of the chin-rest has the disadvantage of completely closing the front lower side of the helmet, creating aeration problems and problems of claustrophobia in individuals with such pre-disposition.

The aim of the present invention is to solve the above described problems by providing a crash-helmet, which can be safely secured to the head of the user.

Within the scope of this aim, an object of the invention is to provide a helmet which always ensures an adequate aeration of the front lower region, in particular for helmets of the closed type.

Another object of the invention is to provide a helmet which forces the user to secure it correctly when it is to be used.

Not least object of the invention is to provide a helmet which is easy to put on and to remove.

This aim, these objects and others which will become apparent hereinafter are achieved by a crash-helmet, in particular for motorcyclists, as defined in the appended claims.

The characteristics and advantages of the invention will become apparent from the detailed description of two preferred but not exclusive embodiments of the helmet according to the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figures 1 to 7 illustrate the helmet according to the invention in the first embodiment, with reference to a "jet"-type helmet, and more particularly:

figure 1 is a lateral elevation view of the helmet with the retention element in closure position;

figure 2 is a lateral elevation view of the helmet with the retention element in open position;

figure 3 is a bottom plan view of the helmet;

figure 4 is a perspective view of the helmet while it is being worn;

figure 5 is an enlarged sectional view of figure 1, taken along the axis V-V and illustrating a detail of the helmet;

figure 6 is an enlarged sectional view of figure 2, taken along the axis VI-VI;

figure 7 is a perspective view of a detail of the retention element;

figures 8 to 11 illustrate the helmet according to the invention in the second embodiment with reference to a closed-type helmet, and more particularly:

figure 8 is a lateral elevation view of the helmet with the retention element in closed position;

figure 9 is a lateral elevation view of the helmet with the retention element in open position;

figure 10 is a bottom plan view of the helmet; and

figure 11 is a perspective view of the helmet while it is being worn.

With reference to the above figures, the crash-helmet according to the invention, generally indicated by the reference numerals 1 and 1a in the two embodiments, comprises a substantially dome-shaped shell 2 which is open at the front and below.

The shell 2 is obtained in a known manner and is made of rigid material, for example polycarbonate or glass fibers, and a layer of shock-proof material, for example foamed polystyrene, is provided inside it, together with a layer of padding.

According to the invention, a substantially rigid retention element 3 extends in a front region of the lower opening 4 and its longitudinal ends 3a and 3b extend upward and are oscillably associated with two opposite lateral regions of the shell 2.

The retention element 3 is controllably movable from a closed position, in which it downwardly delimits the front opening 5 of the helmet and downwardly embraces the chin of the user, to an open position, in which it is moved forward and upward with respect to the closed position to allow the user to easily put the helmet on or remove it.

More particularly, the longitudinal ends 3a, 3b of the retention element 3 are slidably associated with the shell 2 through guiding means 6 in the shape of an arc of a circle.

Said guiding means comprise, for each of the ends 3a and 3b, a tab 7 which has the shape of an arc of a circle and engages a correspondingly shaped seat 8 defined by an interspace provided on the inner side of the shell 2 starting from the respective lateral edge of the front opening 5.

A first slot 9 is defined on the tab 7 and has the shape of an arc of a circle; a first pin 10 engages therein and is associated with the shell 2; the tab 7 is provided with a second pin 11 which is inserted in a second slot 12 which is also in the shape of an arc of a circle and is defined on the bottom of the seat 8 inside which the tab slides.

The length of the two slots 9 and 12, which are mutually concentric, determines the extent of the possible oscillation of the retention element 3.

Snap locking means 13 for locking the retention element 3 at least in its closed position are advantageously provided.

Said snap locking means comprise a radial expansion 14 of the first pin 10, which is provided with a head 10a which can be accessed from the outer side of the helmet and can be controllably moved along its axis toward the inside of the helmet in contrast with elastic return means comprising a helical spring 15 which is arranged around the pin 10 and is located in an adapted accommodation 16 defined on the bottom of the seat 8.

At the end of the first slot 9 which is proximate to the first pin 10 when the retention element 3 is in closed position there is a recess 17 which is defined on the inner side of the tab 7 and is shaped correspondingly to the radial expansion 14 so as to couple therewith by the action of the spring 15 when the retention element is in closed position.

Advantageously, the ends 3a and 3b of the retention element 3 define abutments 18 which are directed toward the lateral edges of the front opening 5 and rest against them when the retention element 3 is in closed position, so as to provide excellent resistance to the backward movement of the retention element 3 in case of frontal impact.

The retention element 3 is provided, in its intermediate portion 3c located in a downward region of the helmet, with an anatomically shaped flattened configuration with a concavity 19 on the side directed toward the rear part of the helmet, so as to be comfortable for the user.

Said retention element 3 can be provided monolithically by molding rigid synthetic material coated, at least on the side directed toward the user, with soft material, such as for example foamed polyurethane or other padding materials.

A layer 20 of padding material can be provided on the inwardly directed side of the ends 3a and 3b, so that said ends perform an effective action for protecting the lateral regions of the user's face which is particularly advantageous in the first embodiment, i.e. in "jet" type helmets.

With reference to figures 8 to 11, in the second embodiment the longitudinal ends 3a and 3b of the retention element 3 are joined by a bridge-like element 21 which extends in front of the helmet 1a and defines a chin-rest of a closed helmet. An aeration passage 22 is conveniently defined between the chin-rest 21 and the intermediate portion 3c of the retention element 3.

In the second embodiment, the same reference numerals used for the first embodiment have been kept for the other elements which constitute the helmet.

In this second embodiment, the chin-rest 21 and the retention element 3 may be provided monolithically.

The use of the helmet according to the invention is as follows.

With the retention element 3 in closed position, in order to put the helmet on the pins 10 are pressed toward the inside of the helmet so as to disengage the radial expansions 14 from the recesses 17. By acting on the retention element 3, said element is thus caused to move forward and upward so as to allow the user to put the helmet on easily.

With the helmet on, the retention element 3 is returned to its closed position by acting thereon in the opposite direction. When the end closed position is reached, the retention element 3 is locked by the spring 15, which causes the radial expansions 14 to engage the recesses 17.

In practice it has been observed that the helmet according to the invention fully achieves the intended aim, since the retention element ensures

an excellent securing of the helmet to the user's head, avoiding the disadvantages of strap securing in known helmets.

Another advantage which derives from the adoption of the retention element according to the invention in jet-type helmets is that the lateral and lower parts of the user's face are better protected.

The helmet thus conceived is susceptible to numerous modifications and variations, all of which are within the scope of the inventive concept; all the details may furthermore be replaced with technically equivalent elements.

In practice, the materials employed, as well as the dimensions, may be any according to the requirements and to the state of the art.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. A crash-helmet, in particular for motorcyclists, comprising a shell (2) which is frontally and downwardly open, characterized in that it comprises a substantially rigid retention element (3) which extends in a front region of the helmet lower opening (4), the longitudinal ends (3a, 3b) of said retention element extending upward and being oscillably associated with two opposite lateral regions of said shell (2), said retention element (3) being controllably movable from a closed position, in which it downwardly delimits the front opening (5) of the helmet (1, 1a) in a position suitable to downwardly embrace the user's chin, to an open position, in which it is moved forward and upward with respect to said closed position, to allow the helmet to be put on or taken off.

2. A crash-helmet, according to claim 1, characterized in that said longitudinal ends (3a, 3b) of said retention element (3) are slidably associated with said shell (2) through guiding means (6) in the shape of an arc of a circle.

3. A crash-helmet, according to claims 1 and 2, characterized in that said guiding means (6) comprise, for each end (3a, 3b) of said retention element (3), a tab (7) which is in the shape of an arc of a circle and is slidably associated with a correspondingly shaped sliding seat (8) defined on the inner side of said shell (2) from the lateral edge of said front opening (5).

4. A crash-helmet, according to any of the preceding claims, characterized in that said guiding means (6) comprise a first slot (9) formed in said tab and has the shape of an arc of a circle, a first pin (10) engaging in said first slot (9), said first pin being associated with said shell (1).

5. A crash-helmet, according to any of the preceding claims, characterized by snap locking means (13) for locking said retention element (3) at least in said closed position.

6. A crash-helmet, according to any of the preceding claims, characterized in that said snap locking means (13) comprise a radial expansion (14) of said first pin (10) which can engage a recess (17) defined along said first slot (9) proximate to an end thereof, said first pin (10) being accessible from the outer side of said shell (2) and being axially controllably movable in contrast to elastic return means (15) for disengaging said expansion (14) from said recess (17) when said retention element is in said closed position.

7. A crash-helmet, according to any of the preceding claims, characterized in that said guiding means (6) comprise a second slot (12) in the shape of an arc of a circle which is defined on the bottom of said sliding seat (8), said second slot being concentric to said first slot (9) and engaging a second pin (11) rigidly associated with said tab (7).

8. A crash-helmet, according to any of the preceding claims, characterized in that said longitudinal ends (3a, 3b) of said retention element (3) have abutments (18) which rest against the lateral edges of said front opening (5) when said retention element is in said closed position.

9. A crash-helmet, according to any of the preceding claims, characterized in that said retention element (3) has, on its portion arranged below said shell (2), an anatomically shaped flattened portion with a concavity (19) on its side directed toward the rear side of the helmet (1, 1a).

10. A crash-helmet, according to any of the preceding claims, characterized in that said retention element (3) has a core of rigid material coated with padding material at least on its side which is intended to be directed toward the user.

11. A crash-helmet, according to any of the preceding claims, characterized in that a layer (20) of padding material is provided on the inner side of said longitudinal ends (3a, 3b) of said retention element (3).

12. A crash-helmet, according to any of the preceding claims, characterized in that said longitudinal ends (3a, 3b) of said retention element (3) are joined by a bridge-like element (21) which extends in front of said helmet (1a) and defines a chin-rest, an aeration passage (22) being defined between said chin-rest and said retention element.

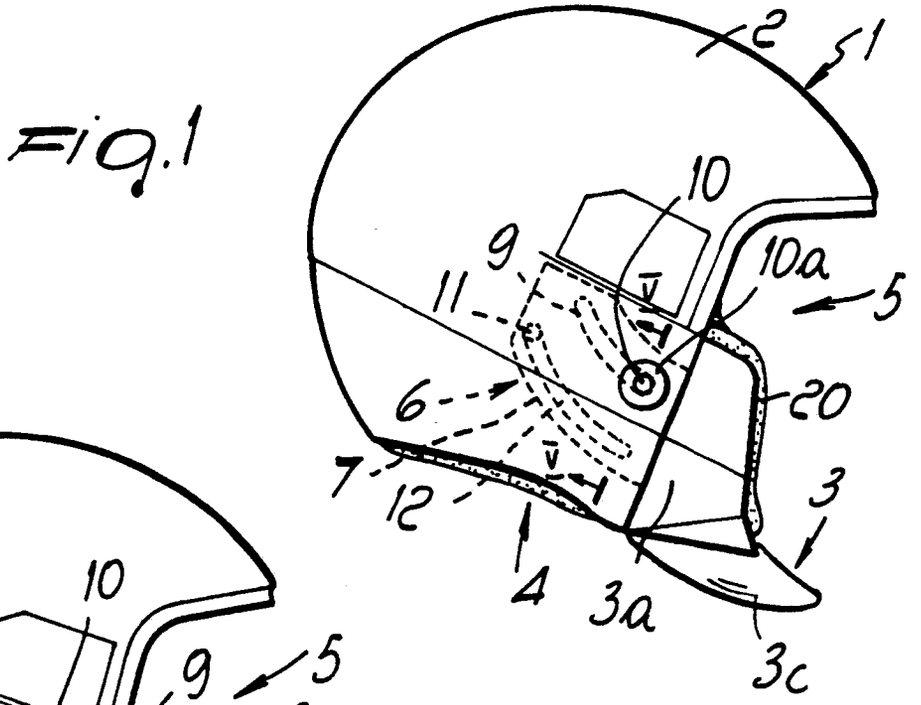

FIG.1

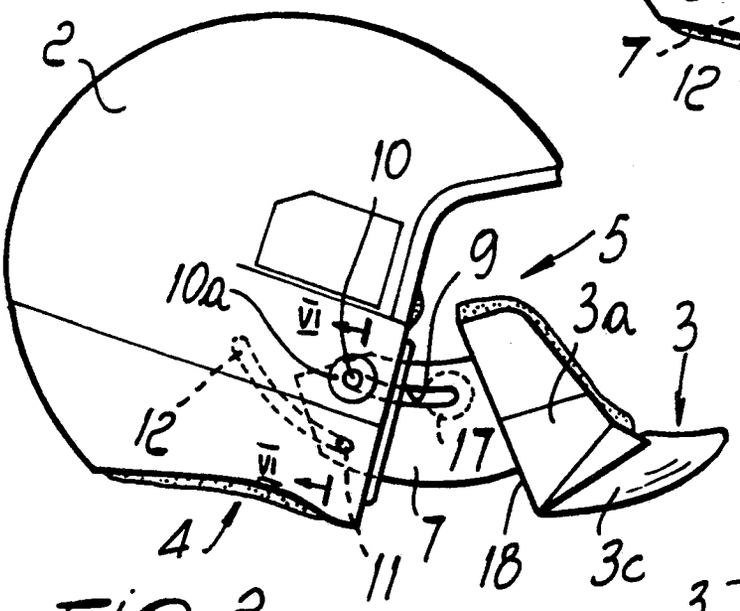

FIG.2

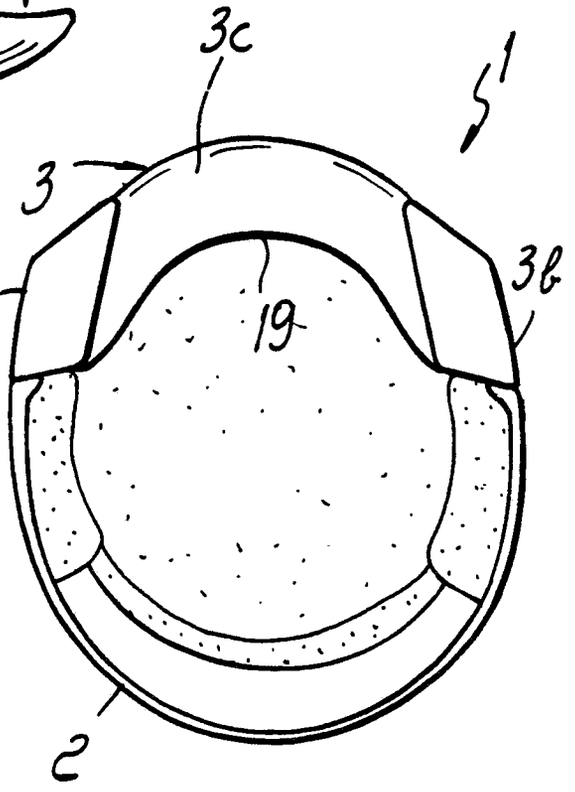

FIG.3

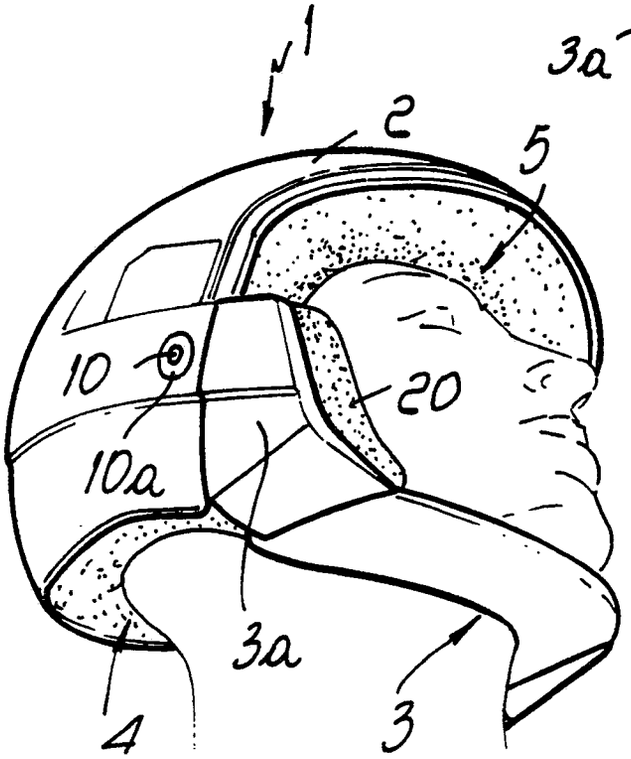

FIG.4

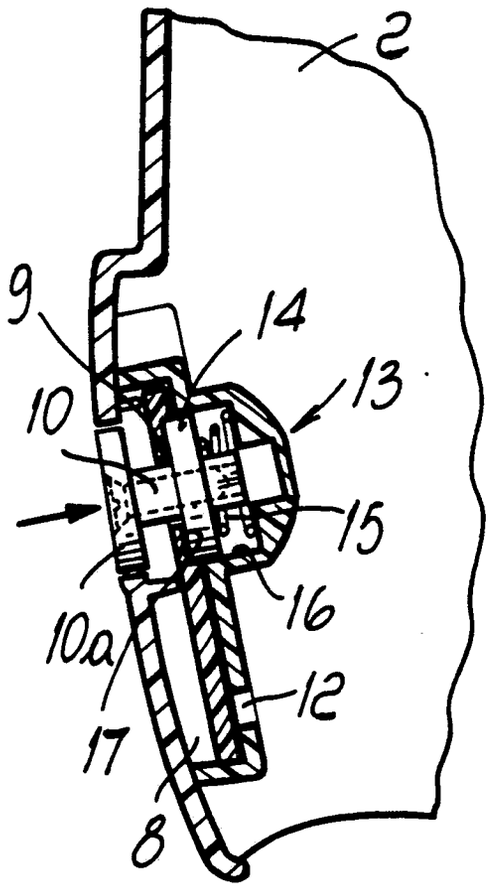

Fig. 5

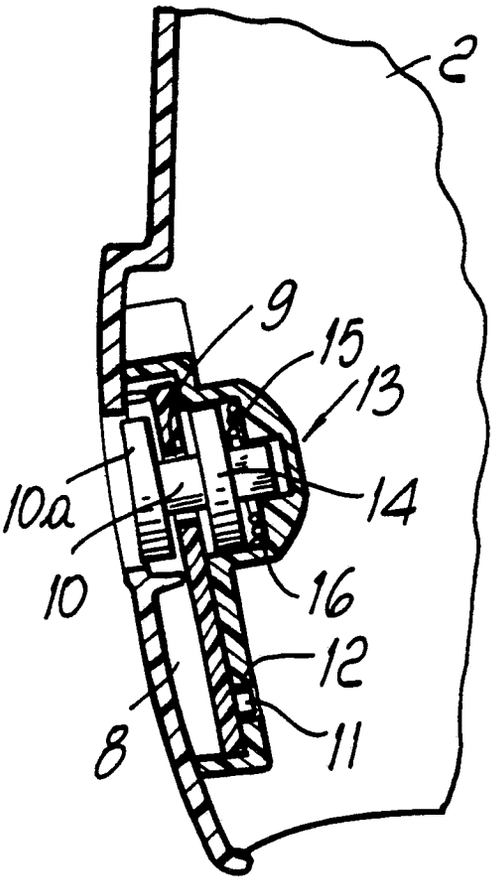

Fig. 6

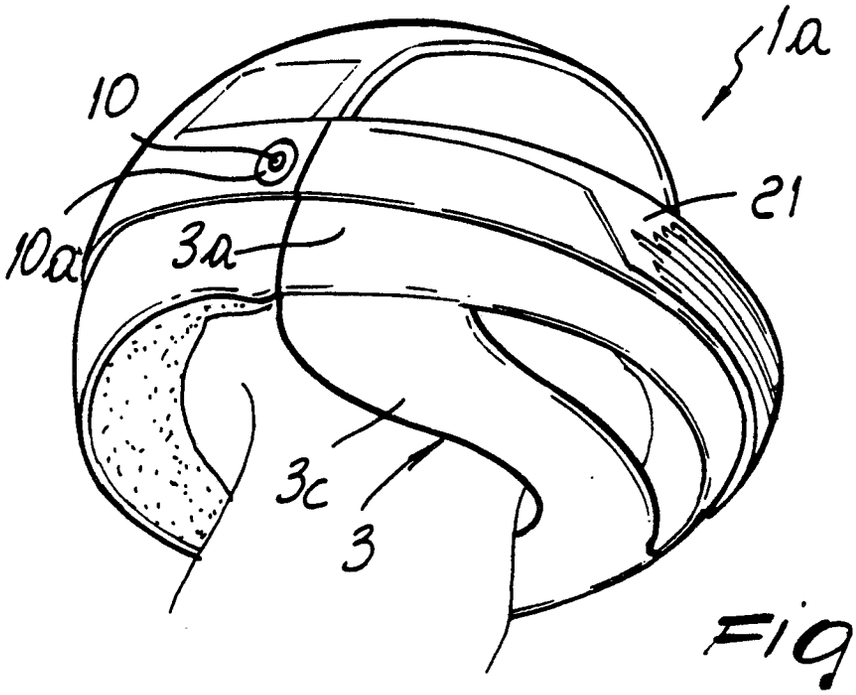

Fig. 11

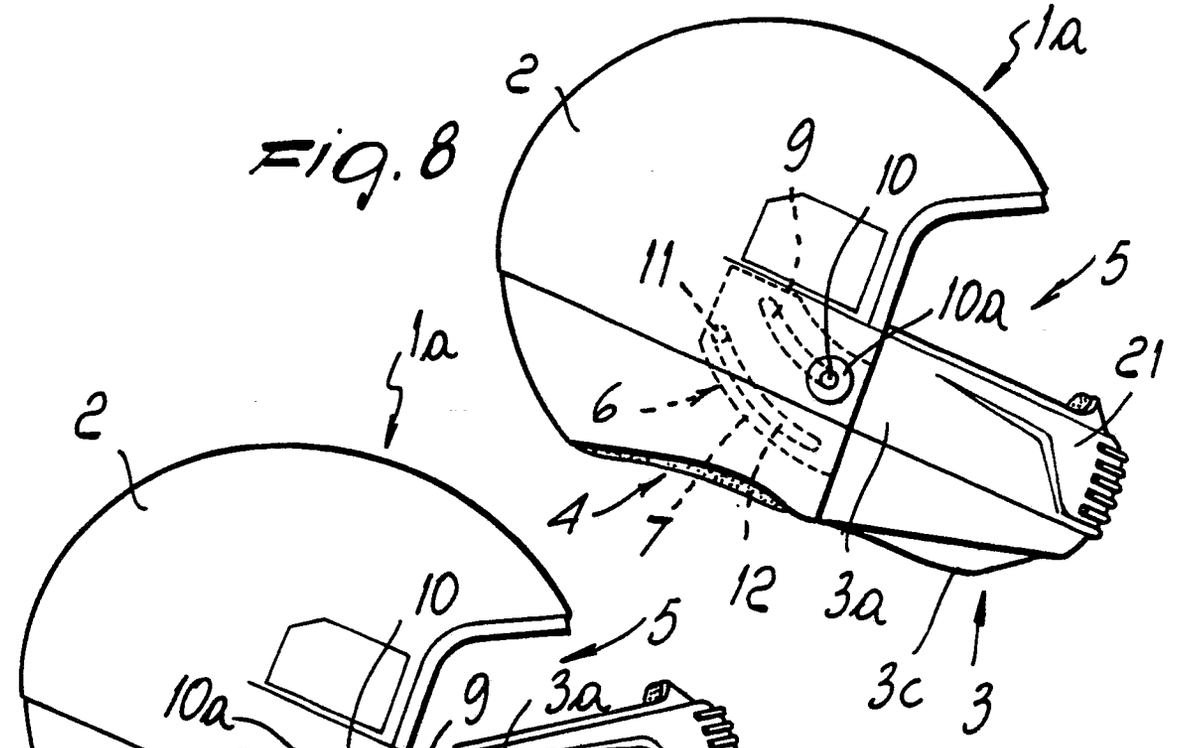

Fig. 8

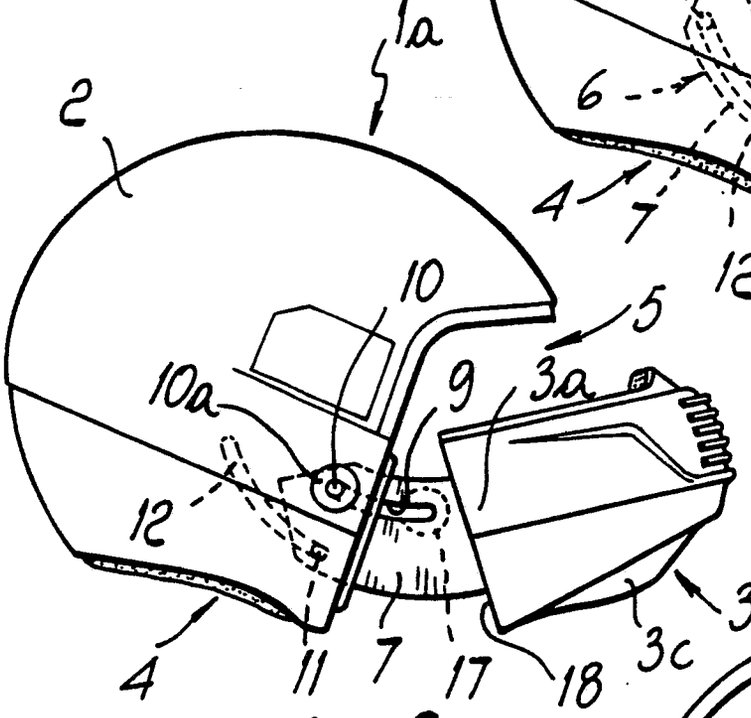

Fig. 9

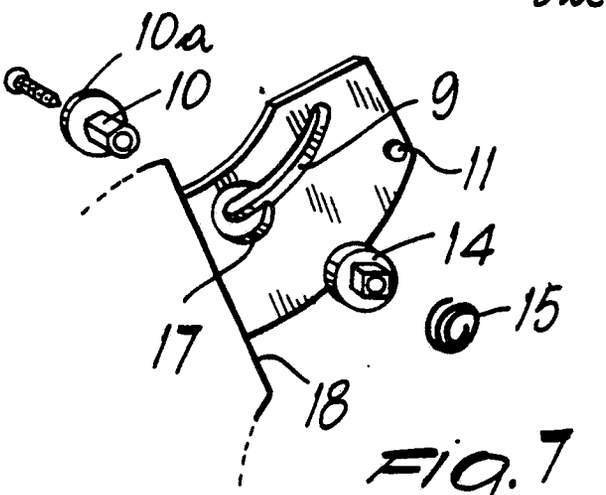

Fig. 7

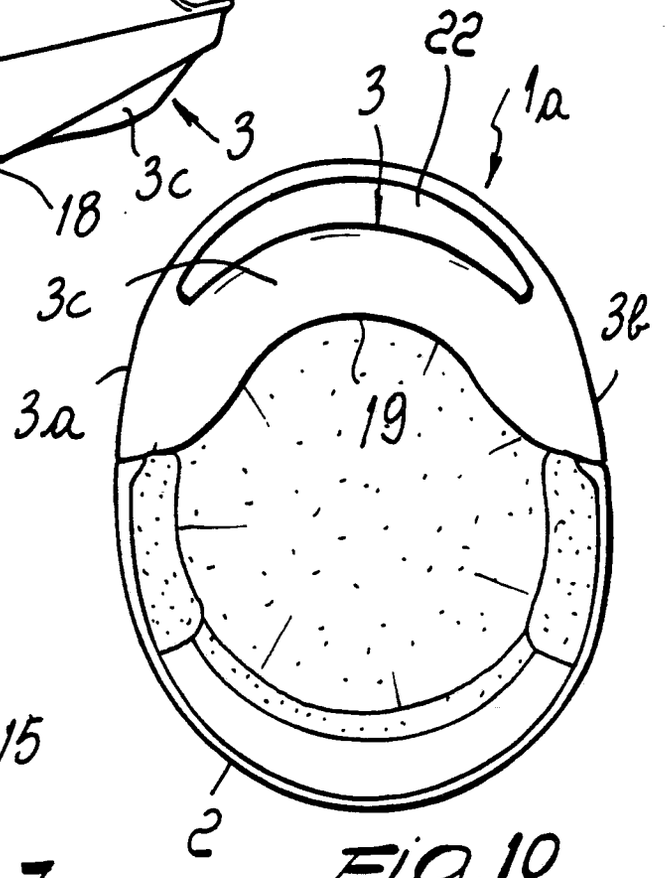

Fig. 10

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EUROPEAN SEARCH REPORT

Application Number

EP 90 10 3196

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	EP-A-0134183 (J. GAMELIN) * page 3, line 5 - page 6, line 2 * * figures 1, 2 *	1, 5, 10, 11	A42B3/08 A42B3/28
A		2-4, 6-9, 12	
X	EP-A-0258552 (M. CIANFANELLI) * page 4, line 11 - page 8, line 2 * * page 8, line 9 - page 9, line 2 * * claims 1-8; figures *	1, 2, 4, 5, 8, 10 11	
A		3, 6, 7, 9, 12	
X	AT-B-387134 (E. THALER) * page 2, line 47 - page 3, line 19 * * claims 1-3; figures *	1-3, 5, 8	
A		4, 6, 7, 9-12	
X	EP-A-0097285 (M.P.A. MECCANICA PLASTICA AGORDINA S.P.A.) * page 3, line 5 - page 6, line 26 * * figures *	1, 8	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A		2-6, 12	A42B
A	FR-A-2546381 (C. MORIN) * page 3, line 10 - page 5, line 4 * * claims 1-4, 6; figure 1 *	1	
A	US-A-3478365 (T. J. VARGA) * column 2, lines 22 - 41 * * claim 2; figures *	1	
A	US-A-4042974 (C. R. MORGAN ET AL.)		
A	US-A-2881442 (T. J. SOWIE)		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	13 AUGUST 1990	BOURSEAU A.M.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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