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(54) **Protective shield for a helmet**

(57) The present disclosure relates to an assembly comprising a protective shield (12) for a helmet, such as a full visor, a partial visor or a chin guard and a pivot (16) adapted to pivot the protective shield (12) on a shell (17) of the helmet (15). The assembly comprises a locking device (24). The locking action is a removable locking action and the locking device (24) is operated so as to lock the protective shield (12) to the pivot and release a connection between the protective shield (12) and the pivot (16).

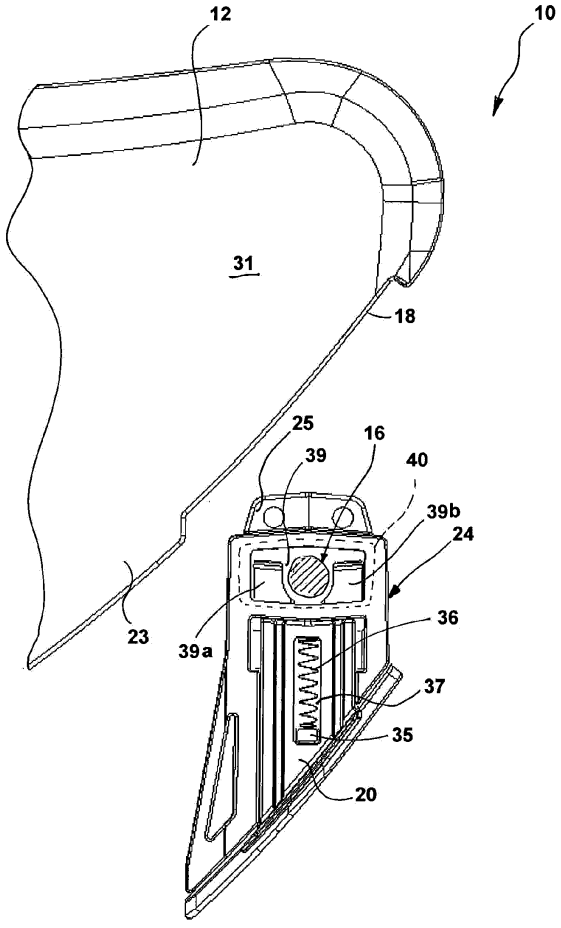

FIG. 3

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Description

[0001] The present disclosure relates in general to the sector of protective helmets and, more particularly, to an assembly comprising a protective shield for a helmet, such as a full visor, partial visor or a chin guard, and a pivot pivotably mounted on a shell of the helmet. The present disclosure also relates to a helmet including such an assembly and to method for connecting a protective shield to a shell of the helmet.

[0002] In the aforementioned sector it is known that there exists the need to remove or replace the protective shield even several times during the same day, for example in the case of a visor, when the light conditions and/or atmospheric conditions change, so that a more suitable visor may be used.

[0003] In particular, in order to facilitate replacement of the visor by a user, it is preferable for a user to remove the visor without using tools, such as spanners and screwdrivers.

[0004] In this connection, in a protective helmet, pivoting mechanisms which allow rapid replacement of the visor have been developed. In these devices a pivot element associated with the visor is engaged with a matching housing formed in the shell or in a pivoting base fixed to the shell. A fastening element is arranged in the shell and allows the pivot to be locked inside the respective housing.

[0005] The present disclosure is based on the realization, on the part of the inventor of the present patent application, that the aforementioned pivoting mechanisms are such that the pivot must be made as one piece with the visor, and therefore the visor and the pivot must be made of the same material, and that this need to use the same material is not always advantageous.

[0006] In fact, the materials used to make the visor are transparent and chosen from among those which have superior optical properties and it is not always possible to choose the materials from among those which guarantee suitable mechanical properties, such as metals, the latter not being used since, by nature, they are not transparent.

[0007] It therefore arises that, owing to the not always adequate mechanical properties of the materials, breakages of the visor pivot occur during replacement or when the new visor is fastened to the shell.

[0008] The inventor of the present patent application has also realized that, in an attempt to compensate for the lack of suitable mechanical properties, efforts have often been directed towards increasing the dimensions of the pivot and respective seat, thereby increasing the weight of the helmet to the detriment of the aesthetic appearance of the helmet.

[0009] Moreover, it has also been found that the increase in the dimensions of the pivot may not be sufficient to prevent the possibility of breakages due to replacement of the visor not performed properly by the user or prevent the possibility of breakages following repeated replacement of the visor over time.

[0010] A technical problem forming the basis of the present disclosure is that of providing an assembly for a protective helmet, having a structure which is able to overcome the drawbacks of the prior art and/or able to achieve further advantages and/or characteristics.

[0011] This is obtained by providing an assembly as defined in the independent claim 1, a helmet as defined in claim 15, and a method as defined in the independent claim 16. Secondary characteristic features of the subject of the present disclosure are defined in the corresponding dependent claims.

[0012] As a result of the assembly according to the present disclosure, the pivot may be detached from the protective shield, while remaining attached to the shell of the helmet so that, when the protective shield is replaced or removed, the protective shield may be replaced or removed from the remaining helmet portion without removal of the pivot.

[0013] Basically, a user may decide to operate the locking device and release a connection between protective shield and pivot, so that the protective shield may be detached from the pivot. Similarly, in order to connect the protective shield to the remaining helmet portion, a user may operate the locking device so as to fix again the protective shield to the pivot.

[0014] In one embodiment, the pivot is partially received inside a housing of the protective shield and may be operated by from a side edge of the protective shield.

[0015] Moreover, in one embodiment, the removable locking device is received inside a recess formed in the protective shield. With this embodiment it is possible to obtain a protective shield in which the locking device is incorporated in the thickness of the protective shield so that, once the pivot has been removed, there are few or no projections protruding from the protective shield. With this embodiment it is possible to obtain an assembly in which, when protective shield is fixed to the shell of the helmet, there are no projections on the protective shield which are exposed to stresses and might be prone to breakage.

[0016] In one embodiment, the removable locking device includes a locking element which can be manually operated by a user and which is able to assume at least two positions, namely a first engagement position, in which the locking element interacts with the pivot to provide an engagement, and a second position, in which the locking element is in a relationship such as to allow removal of the protective shield from the pivot. Basically, a user may remove the protective shield by simply operating the locking element between the first position and second position, and vice versa. For example, in the second position, the locking element is in a spaced relationship with respect to the pivot so as to avoid interaction with the pivot and free the latter from any constraint with the protective shield.

[0017] In some embodiments, the locking element is a translatable slider, for example adapted to be moved be-

tween the first position and the second position by means of translation.

[0018] In particular, in some embodiments, said locking element is a slide member.

[0019] The pivot may be easily detached from the protective shield by a user by operating a slide member, namely a slider or sliding shoe, which is, for example, slidably housed in a seat, which may be a guide seat associated with the protective shield.

[0020] In some embodiments, the locking element is a lever or arm, for example which may be moved between the first position and the second position by means of rotation.

[0021] In all the embodiments mentioned above, said locking element, namely the lever or slide member, may be displaced by a user between a first position in which the locking element retains, for example by means of interference, a head portion of the pivot and a second position, for example retracted position, in which the locking element is spaced from the head portion of the pivot and allows the head portion of the pivot to be released from the protective shield.

[0022] In some embodiments, the seat where said locking element is arranged may coincide partially with a pivot housing. This solution has the advantage of providing a very compact system for locking the pivot in the protective shield of the helmet.

[0023] The second position of the slide member may be a position in which the locking element (the slide body or the lever or the arm or a similar locking element) is partially extracted from the seat, without being entirely removed. In other words, removal of the protective shield from the pivot may be performed by means of partial displacement of the locking element with respect to the protective shield. This solution has the advantage that the locking element remains attached to the protective shield during the pivot separation operations.

[0024] In some embodiments, the locking element is operated with respect to the seat by means of operation of a gripping portion of the locking element, which, when the locking element is in the respective seat, projects from an edge of the protective shield. In other words, the locking element and the respective seat are arranged so that the locking element projects, or protrudes albeit slightly, from an edge of the protective shield and may therefore be easily accessed and operated by a user for displacement between one position and the other position.

[0025] In some embodiments, the housing for the head portion of the pivot has an inlet mouth facing on one side of the protective shield, so that the pivot projects from this side, substantially perpendicular thereto and may be connected to a respective portion of the protective shield of the helmet, using known methods. The seat for the locking element instead has an inlet mouth open on the edge of the protective shield situated between the two sides of the protective shield, so as to be easily accessible on one side by a user. Basically, the seat for the locking element and the housing for the pivot have respective inlet mouths which are spaced and have axes substantially perpendicular to each other.

[0026] As a result of this configuration the removal system according to the present disclosure may be used without interfering with the operation or connection of the pivot to the shell portion.

[0027] In one embodiment, in order to control the position of the locking element and facilitate the movement between the first position and the second position, it is envisaged using a spring which is deformed when the locking element is in the second position spaced from the head portion of the pivot. In this way, when the locking element is released from the second position, the locking element may reposition itself in the first position owing to the action of said spring.

[0028] Basically the spring acts as an actuator for repositioning the locking element in the first position and for keeping the locking element in the first position.

[0029] Further advantages, characteristic features and the modes of use of the assembly and the helmet according to the present disclosure will become clear from the following detailed description of a number of preferred embodiments, provided by way of a non-limiting example.

[0030] It is clear, however, that each embodiment of the subject according to the present disclosure may have one or more of the advantages listed above; in any case it is not required that each embodiment should have simultaneously all the advantages listed. Reference shall be made to the figures in the accompanying drawings in which:

- Figure 1 shows a view of a helmet including an assembly according to an embodiment of the present disclosure;
- Figure 2 shows a view of the helmet according to Fig. 1 from which a visor of the helmet has been removed;
- Figure 3 shows a partial exploded view of an assembly according to an embodiment of the present disclosure;
- Figure 4 shows an exploded view of an assembly according to an embodiment of the present disclosure;
- Figure 5 shows a view of an assembly according to an embodiment of the present disclosure in an operating condition;
- Figure 6 shows a partial exploded view of an assembly according to an embodiment of the present disclosure;
- Figure 7 shows a head portion of a pivot element of an assembly according to an embodiment of the present disclosure;
- Figure 8 shows an axonometric view of a pivot element of an assembly according to an embodiment of the present disclosure;

- Figure 9 shows a partially sectioned side view of an assembly according to a further embodiment of the present disclosure, associated with a helmet.

[0031] With reference to the accompanying figures, the reference number 10 denotes an assembly including a protective shield, such as a visor 12 for a protective helmet 15 and a connection pivot 16 according to some embodiments of the present disclosure. The connection pivot 16 is adapted to connect the visor 12 to a shell 17 of the helmet 15.

[0032] In particular, the pivot 16 includes a head portion 40 and a stem 41 and is reversibly connected to the visor 12 so as to allow, if necessary, the visor 12 to be detached from the pivot 16. In particular, the assembly 10 includes a locking device 24, in which the locking action is a removable locking action. The locking device 24 can be operated by a user so as to connect/disconnect the pivot 16 from the visor 12, for example in order to remove the visor 12 or allow it to be replaced.

[0033] The visor is made of transparent material, so as to allow a user to view the locking device 24 when the locking device 24 is mounted on the helmet 15.

[0034] In particular, with reference to Figures 3, 4, 5 and 6, the removable locking device 24 comprises a locking element, such as a slide member 20 slidably housed inside a seat, which in the example is a guide seat 22 arranged in the visor 12.

[0035] In the example of embodiment shown, the visor 12 also includes a housing 30 adapted to receive the head portion 40 of the pivot 16. As can be seen from the example of embodiment, the housing 30 of said head portion 40 of the pivot 16 coincides with a portion of said guide seat 22. In fact, the housing 30 of said head portion 40 is the end part, namely the bottom zone, of the guide seat 22.

[0036] The slide member 20 is slidable inside the guide seat 22 so as to assume at least two positions, i.e. a first position in which the slide member 20 is inside the guide seat 22 occupying at least partially the housing 30 so as to retain said head portion 40 of the pivot 16, and a second position, set back with respect to the housing 30, such that the slide member 20 is separated or spaced from said head portion 40 of the pivot 16 and allows removal of said head portion 40 of the pivot 16.

[0037] In the example of embodiment shown, the visor 12 includes an outer side 21, facing the outside of the helmet 15, and an inner side 23. The locking device 24 comprising the slide member 20 and the guide seat 22 is fixed onto the outer side 23.

[0038] In particular, in the embodiment shown, the locking device 24 can be handled as though it were a single body, and detached from the visor 12.

[0039] In particular, the locking device 24 comprises a base piece 25, which is shaped so as to define a recess 26, and an intermediate insert 27 which is internally hollow and received inside the recess 26 and fixed to the base piece 25.

[0040] Even more particularly, the locking device is a block which may be detached, where required, from the protective shield 12.

[0041] In an embodiment such as that shown, the locking device 24, including the base piece 25, is received inside a hollow seat 31 of the visor 12 so that the entire removable locking device 24 is confined within the thickness of the visor and is therefore located flush with the inner side 23 of the visor. Basically, the removable locking device unit 24 does not project from the inner side 23 of the visor 12.

[0042] Consequently, in this embodiment, the intermediate insert 27 inserted inside the recess 26 is flush with the inner side 23 of the visor 12, namely the thickness in the region where the pivot 16 is pivotably mounted is substantially the same as the thickness of the visor 12 in the other regions.

[0043] The intermediate insert 27 has a pocket-like form and includes internally the guide seat 22 and comprises a bottom wall 28, a cover 29 and side walls or edges 28a, 28b. The guide seat 22 is in fact a slot formed between the bottom wall 28, the side walls 28a, 28b and the cover 29 of the intermediate insert 27. Sliding guides may be provided inside the intermediate insert 27 in order to favour sliding of the slide member 20.

[0044] It can be seen that the connection unit 24 is arranged such that the guide seat 22 has its inlet mouth facing a side edge 18 of the visor 12. This arrangement on an edge 18 of the visor 12 facilitates use for a user so as to allow lateral insertion of the slide member 22 inside the guide seat 20. In fact, the slide member 20 is arranged so that it can be accessed on one side from an edge 18 of the visor 12.

[0045] As can be seen from the figures, the cover 29 extends, in the direction of sliding of the slide member 20, by an amount less than the corresponding extension of the bottom wall 28, namely the cover 29 does not close completely the bottom wall 28 and defines with respect thereto a window or opening 33 on the inner side 23 of the visor 12.

[0046] This opening 33 together with the bottom wall 28 and the side walls 28a, 28b of the intermediate insert 27 define the housing 30 for the head portion 40 of the pivot 16. It can be seen that, on the basis of the configuration described above, the inlet mouth of the guide seat 22 has an axis which is perpendicular to the inlet mouth of the housing 30.

[0047] The head 40 of the pivot 16 has a substantially quadrangular, in particular rectangular, form and the housing 30 has a corresponding form; in particular, the housing 30 matches the pivot 16. Owing to the form of the head 40 and the housing 30, the pivot 16 and the visor 12, when they are connected together, are rotationally integral, namely they rotate together about a pivoting axis defined by the pivot 16.

[0048] It is also pointed out that the slide member 20 comprises an insertion portion 32, extending longitudinally in the sliding direction inside the guide seat 22, and

a gripping portion 34 projecting laterally from the insertion portion 32. The gripping portion 34, when the slide member 20 is inserted inside the guide seat 22, comes into contact with the side edge 18 of the visor 12 and acts as an end-of-travel stop for the slide member 20. Furthermore the gripping portion 34 projects from the side edge 18 of the visor 12 so as to allow easy gripping by a user.

[0049] With reference to Figure 3, it can be seen that the slide member 20 is kept inserted inside the guide seat 22 and is connected to the guide seat 22 by means of a spring 36 arranged between the slide member 20 and the guide seat 22. In particular, the spring 36 is arranged so as to be compressed when the slide member 20 is retracted from the guide seat 22, so as move it away from the pivot 16.

[0050] Even more particularly, a spiral spring 36 is present in the guide seat 22 and is fixed to a shoulder 35 which projects internally from the cover 29.

[0051] The spring 36 is also housed inside a central incision 37 formed in the insertion portion 32 of the slide member 20.

[0052] Owing to the configuration of the parts described here, when the slide member 20 is retracted away from the pivot housing 30, the spring 36 is compressed against the shoulder 35, so as to limit the travel of the slide member 20.

[0053] With reference to Figure 3, it can also be seen that, in order to retain the head portion 40 of the pivot 16, the slide member 20 comprises at the free end of the insertion portion 32 a substantially round central cavity 39 which defines two arms 39a, 39b. The stem 41 of the pivot 16 is received inside the central cavity 39.

[0054] The two arms 39a, 39b and the resilient force of the spring 36 are calibrated such that the slide member 20 may be retracted to free the housing 30 and allow removal of the pivot 16, which is extracted through the opening 33.

[0055] Operation of the assembly according to the present disclosure is now described. Initially, the connection unit 24 is fixed to the inner side 23 of the visor 12 by means of screws or similar locking elements.

[0056] Then, the slide member 20 is pulled back from the housing 30, compressing the spring 30, until the two arms 39a, 39b free the housing 30. In this condition, the head portion 40 of the pivot 16 may be inserted inside the housing 30.

[0057] Then the slide member 20 is released and, owing to the action of the spring 36, it returns into the initial position and is repositioned inside the whole of the guide seat 22 until the arms 39a, 39b of the insertion portion 32 occupy the housing 30 on the sides of the stem 41 of the pivot 16, locking the head portion 40.

[0058] In order to remove the pivot 16, an equal and opposite action is performed, by retracting the slide member 22 from the housing 30 and removing the head portion 40 of the pivot.

[0059] The assembly according to the present disclosure has been described hitherto with reference to preferred embodiments thereof.

[0060] It is understood that other embodiments relating to the same inventive idea may exist, all of these falling within the scope of protection of the claims which are provided hereinbelow.

[0061] In particular, with reference to Figure 9, this shows a further embodiment in which the removable locking device 110 comprises a locking element in the form of an arm or lever 120 which is pivotably mounted on the inner side 23 of the visor 12 and received inside a respective seat. In said seat, the arm 120 is rotatable between a first engagement position and a second position which allows disengagement of the arm 120 and the pivot 16.

[0062] In this embodiment also, the head 40 of the pivot 16 is received inside a housing 30 which coincides with the seat of the arm 120. Moreover, the arm 120 has a C-shaped or hook-shaped end 139 which is intended to engage with the stem 41 of the pivot 16 so as to ensure connection.

[0063] In order to maintain stable engagement/locking together of the arm 120 and the pivot 16, the removable locking device comprises a spring 136 which in the example is a torsion spring. The spring 136 is positioned so as to be coaxial with a zone where the arm 120 is pivotably mounted on the visor 12 and comprises a first section connected to the visor 12 and a second section connected to the arm 120.

[0064] The spring 136 is able to be deformed when the arm 120 is rotated into the second position, freeing the pivot 16. In this way, when the arm 120 is released by the user, the spring 136 returns into its original condition and brings the arm 120 back into the first engagement position.

[0065] In this embodiment also, the arm 120 and the respective seat, together with the spring 136, are housed inside a cavity of the visor 12 so as to be incorporated in the thickness of the visor 12 and reduce any projections from the inner side of the visor 12.

[0066] Furthermore, in this embodiment also, the arm 120 has a gripping portion 134 which projects from an edge 18 of the visor 12 so as to be accessible by a user.

Claims

1. Assembly (10) comprising a protective shield (12) for a helmet and a pivot (16) adapted to pivot the protective shield (12) with respect to a shell (17) of the helmet (15), wherein the pivot (16) is adapted to be detached from the protective shield (12), and wherein the assembly (10) comprises a locking device (24), said locking action being a removable locking action, and wherein said locking device (24) is adapted to be actuated to lock the protective shield (12) to the pivot (16) and to release a connection between the protective shield (12) and the pivot (16).

2. Assembly according to claim 1, wherein said locking device (24) includes a locking element (20, 120) housed in a seat (22), wherein the locking element (20, 120) is adapted to assume at least a first engagement position, in which the locking element (20, 120) interacts with the pivot (16) to provide an engagement, and a second position, in which the locking element (20, 120) is in a spaced relationship with respect to the pivot (16) such as to allow separation of the protective shield (12) from the pivot (16).

3. Assembly according to claim 2, wherein the locking element (20, 120) can be operated by a user.

4. Assembly according to claim 2 or 3, wherein the locking element (20, 120) is connected to the protective shield (12) both in the first position and in the second position.

5. Assembly according to claim 2, 3 or 4, wherein the locking element (20) is a slide member adapted to be moved between the first position and second position by means of translation.

6. Assembly according to claim 2, 3 or 4, wherein the locking element (120) is an arm adapted to be moved between the first position and second position by means of rotation.

7. Assembly according to any one of claims 2 to 6, wherein the protective shield (12) comprises a seat (22) for accommodating the locking element (20, 120) and a housing (30) for receiving a head portion (40) of the pivot (16), and wherein said housing (30) is included in, or coincides with, a part of said seat (22) and said locking element (20, 120) is adapted to assume in said seat (22) said first position in which said locking element (20) is arranged partly inside said housing (30) and retains said head portion (40) of the pivot (16) and a second position in which said locking element (20) is spaced from said housing (30) and frees said head portion (40) of the pivot (16).

8. Assembly (10) according to claim 7, wherein the housing (30) for said head portion (40) of the pivot (16) coincides with an end part of the seat (22).

9. Assembly (10) according to any one of the preceding claims 2 to 8, wherein the seat (22) has a inlet mouth facing an edge (18) of the protective shield (12) and said locking element (20, 120) is accessible from said edge (18) of the protective shield (12).

10. Assembly (10) according to any one of the preceding claims 2 to 9, comprising at least one spring (36), wherein said spring (36) is in a deformed condition when the locking element (20) is in the second position, and wherein said spring (36) is in a rest condition, when the locking element (20) is in the first position.

11. Assembly (10) according to any one of the preceding claims, wherein the protective shield (12) is transparent.

12. Assembly according to any one of the preceding claims, comprising a recess (31) formed in the protective shield (12), wherein the locking device (24) is received in said recess (31) so as to be incorporated in a thickness of the protective shield (12).

13. Assembly (10) according to any one of the preceding claims, wherein the locking device (24) is associated with the protective shield and is a member detachable from the protective shield (12).

14. Assembly (10) according to any one of the preceding claims, wherein the protective shield is a visor (12).

15. Helmet (15) including an assembly (10) according to any one of the preceding claims.

16. Method for connecting a protective shield (12) for a helmet to a pivot (16) adapted to pivot the safety shield (12) with respect to a shell (17) of the helmet (15), wherein the method comprises the steps of

- removably locking the pivot (16) to the protective shield (12), and
- disengaging the pivot (16) from the protective shield (12) for removal of the protective shield (12) from the shell (17) of the helmet (15).

17. Method according to claim 16, wherein in order to removably lock the pivot (16) to the protective shield (12) a locking element (20, 120) is moved manually between a first position in which said locking element (20, 120) retains the pivot (16) and a second position in which said locking element (20, 120) is in a spaced relationship with respect to the pivot and allows removal of the pivot (16) from the protective shield (12).

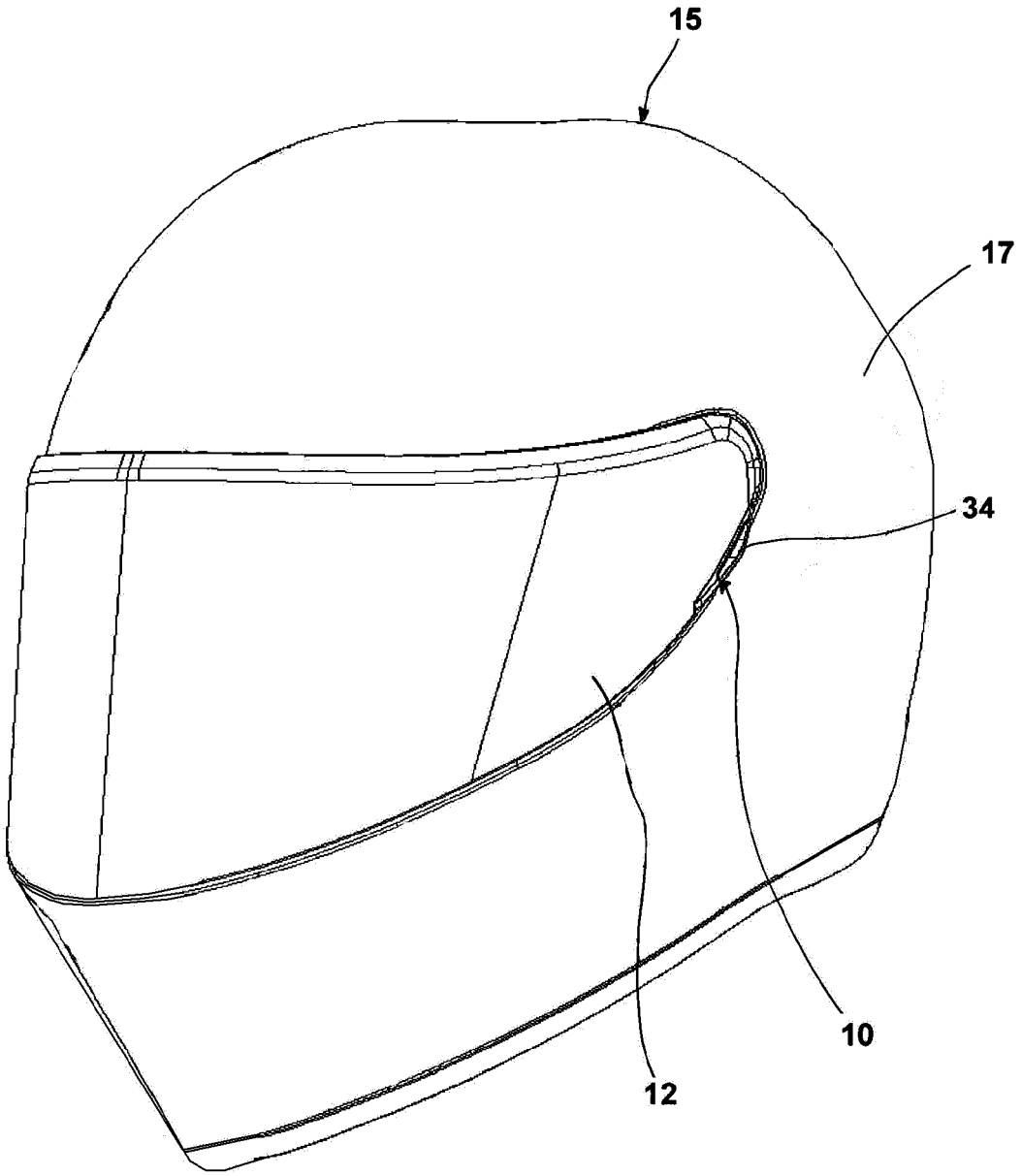

FIG. 1

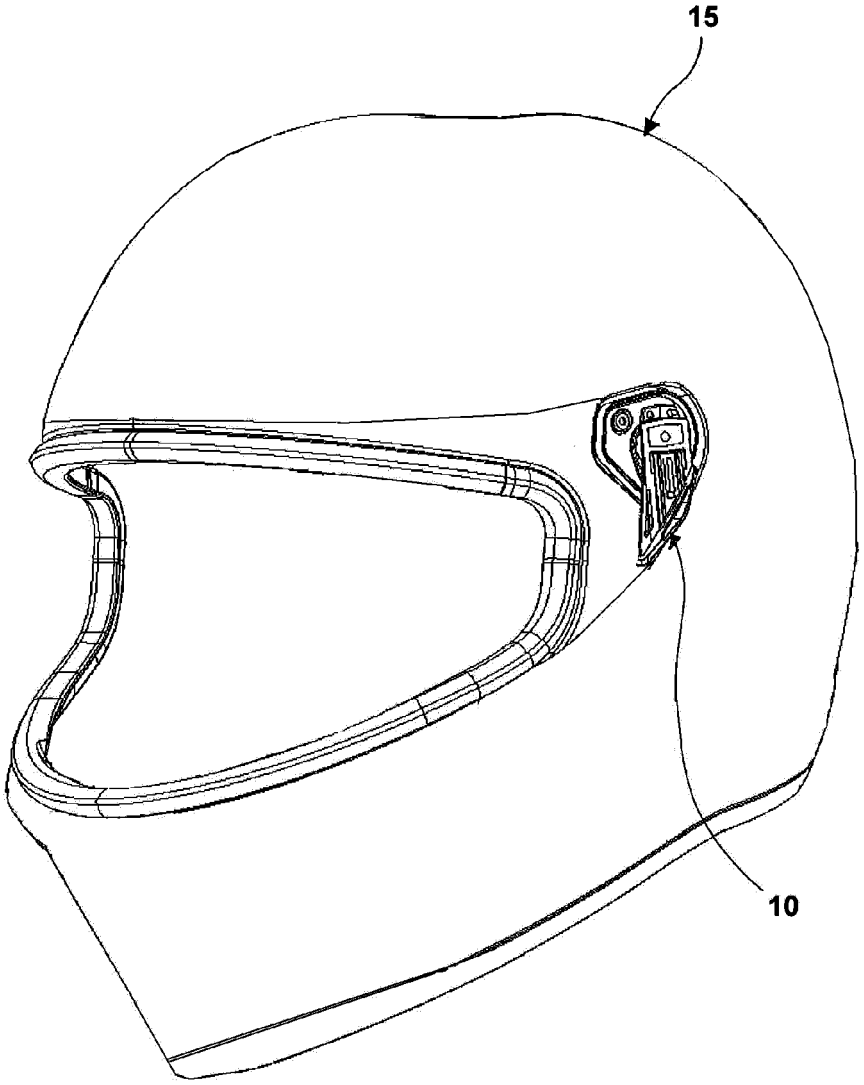

FIG. 2

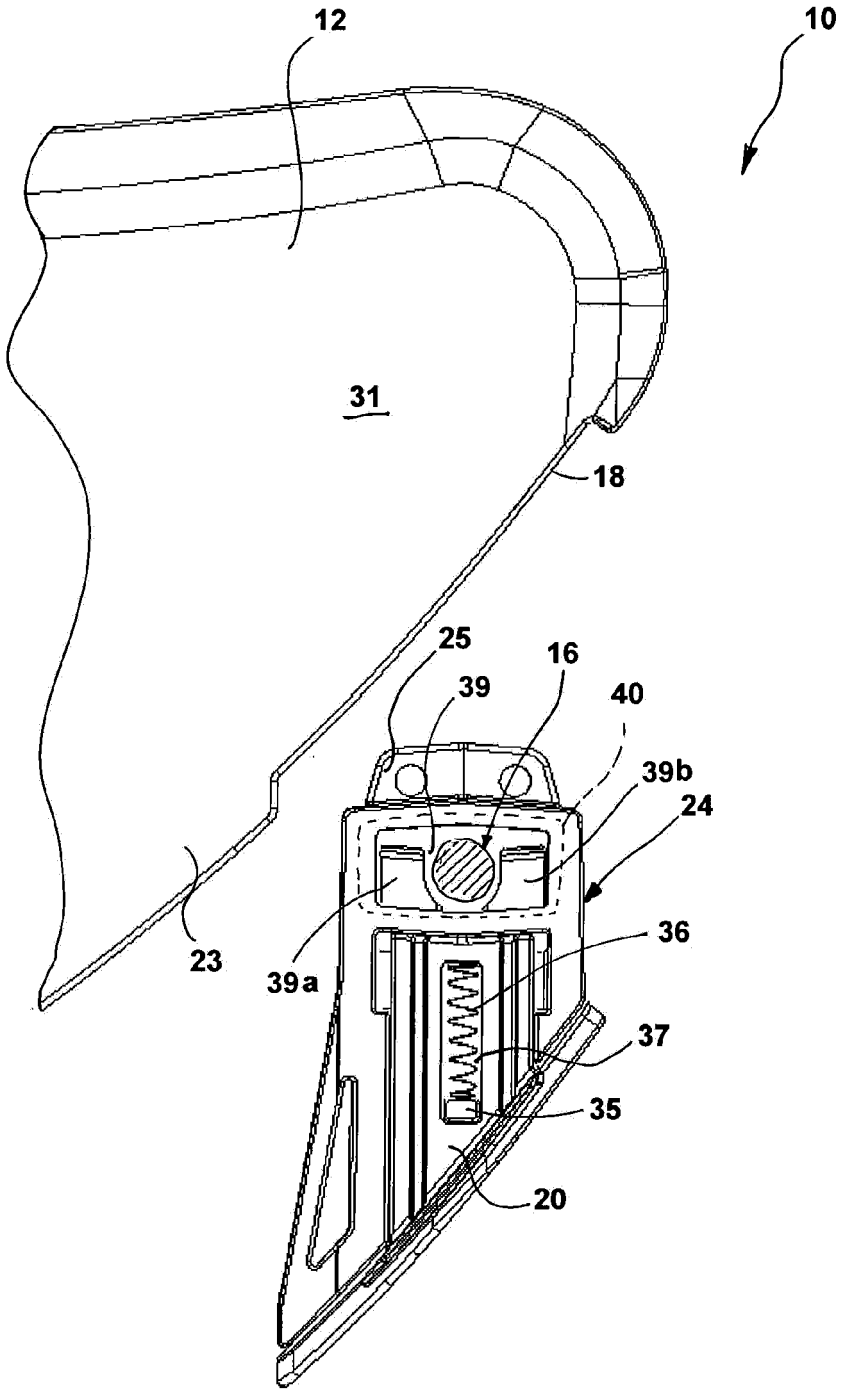

FIG. 3

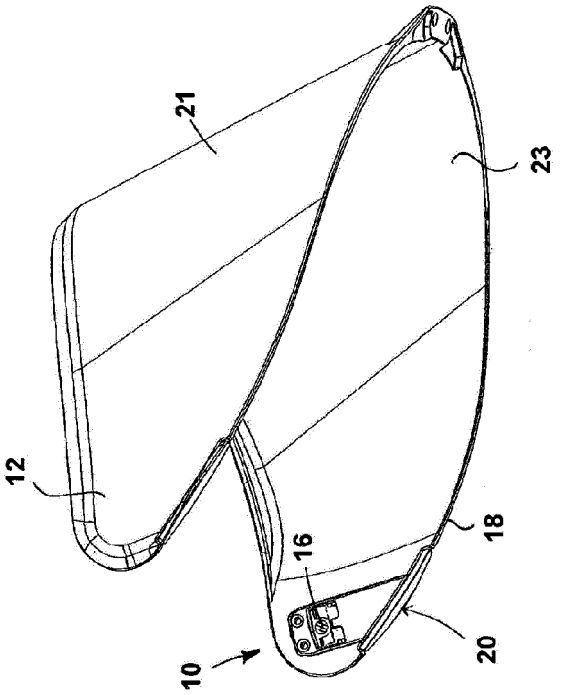

FIG. 5

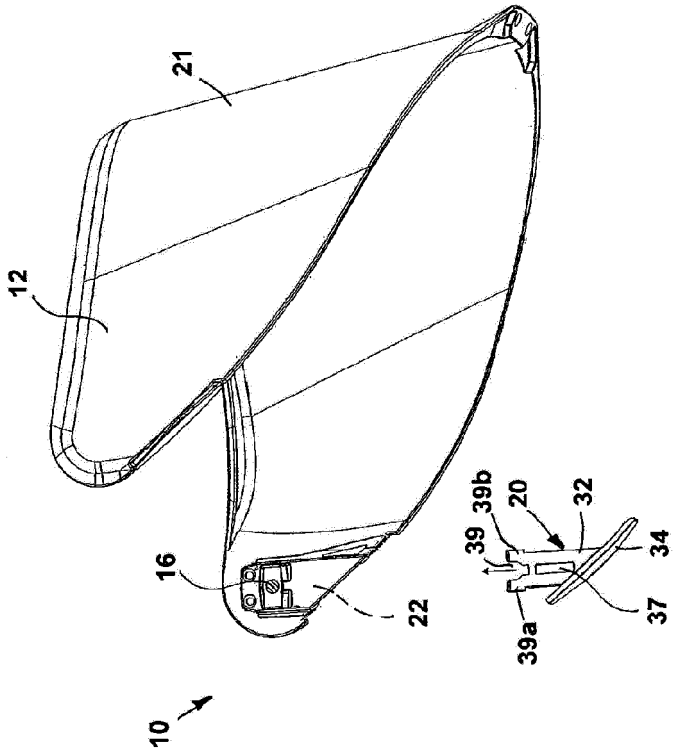

FIG. 4

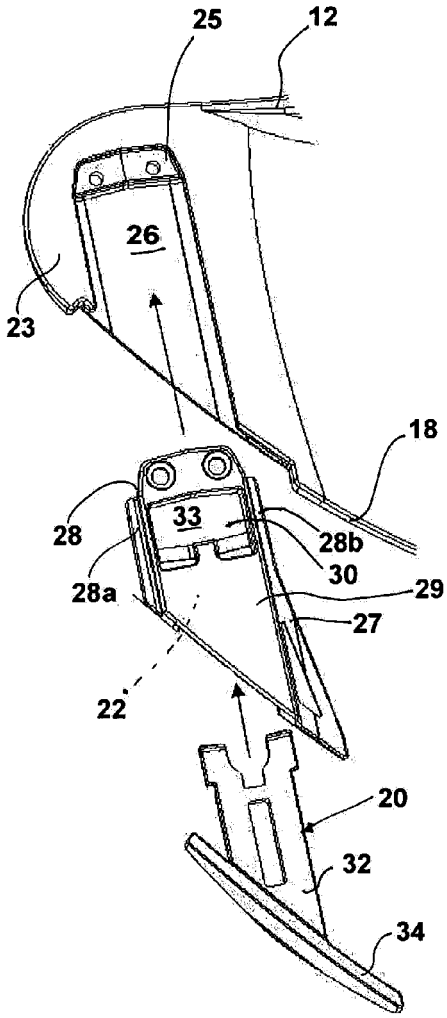

FIG. 6

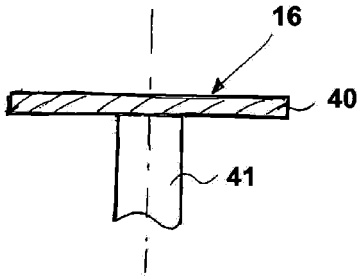

FIG. 7

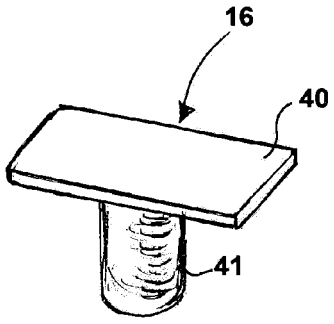

FIG. 8

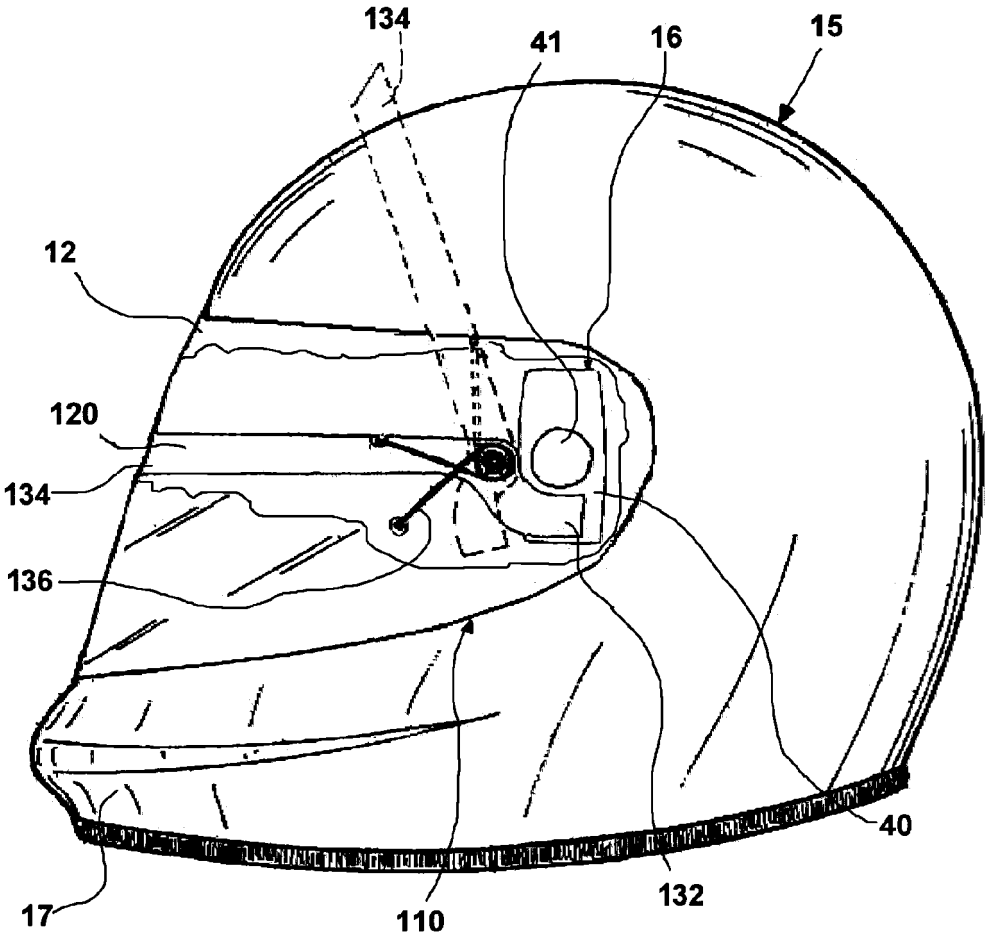

FIG. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 13 15 5803

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	EP 1 366 683 A1 (OPTICOS SRL [IT]) 3 December 2003 (2003-12-03) * paragraphs [0020] - [0027]; figures 1,2 *	1-5,11, 14-17	INV. A42B3/22
X	EP 1 591 030 A1 (GI VI S R L [IT]) 2 November 2005 (2005-11-02) * paragraphs [0007] - [0015]; figures 1-5 *	1-4,6, 11,14-17	
X	EP 1 397 969 A1 (OPTICOS SRL [IT]) 17 March 2004 (2004-03-17) * paragraphs [0029] - [0034], [0039] - [0043]; figures 1,4a *	1-5,7-17	
X	EP 0 685 177 A1 (BAYERISCHE MOTOREN WERKE AG [DE]) 6 December 1995 (1995-12-06) * column 3, line 32 - column 4, line 28; figure 2 *	1,15,16	
A	GB 2 300 346 A (BARRY NICHOLA [GB]) 6 November 1996 (1996-11-06) * pages 3,4; figure 2 *	1,15,16	TECHNICAL FIELDS SEARCHED (IPC) A42B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 May 2013	D'Souza, Jennifer

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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