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(54) **Device for hooking the visor to a motorcyclist helmet cap**

(57) A device for removably hooking visor (2) to a cap (4) of the type provided, in correspondence of each side end of porthole (22) of the helmet, with a guide-body (5) for the rotation of the visor that engages according to an axis into a hole (23) of the visor. The device also comprises a cursor (7) slidingly associated to the

guide-body and provided with means (8) for holding the visor. Cursor (7) translates between an engagement position of the holding means with the visor and a disengagement position. The device is also provided with elastic means (25) to push the holding means to an engagement position with the visor.

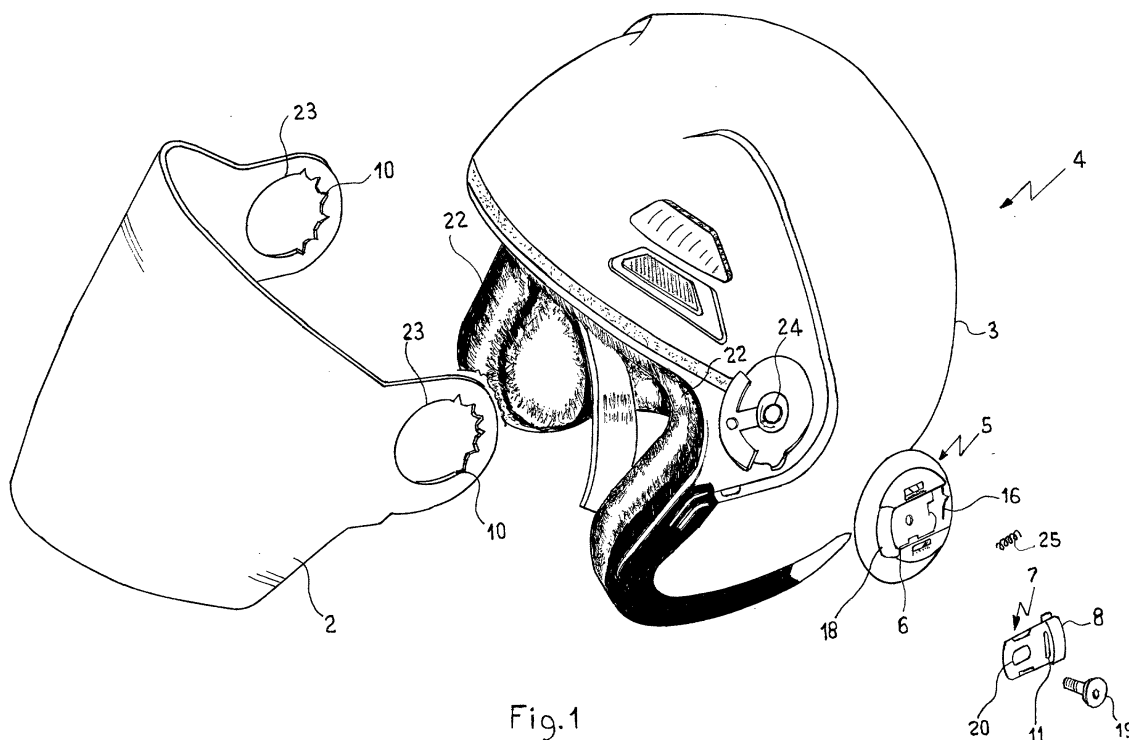


Fig.1

Description

[0001] The present invention relates to a device for hooking the visor to the cap of a helmet, and in particular to a device for hooking the visor to the cap of a helmet which allows at the same time to adjust the angular position of the visor with respect to the porthole - or window - of the cap.

[0002] Usually, the devices for hooking the visor to the cap of a helmet comprise pins that engage in special eyelets obtained in correspondence of the side ends of the visor and that fasten, for instance by screwing, in holes or seats obtained on the cap at the sides of the porthole. Such devices are intended for ensuring the attachment of the visor to the cap, allowing at the same time the rotation of the visor with respect to the porthole. However, these devices, for simplicity reasons, do not provide any adjustment of the angular position of the visor, which causes the positioning of the visor by the user to be only approximate.

[0003] On the contrary, devices are known for the adjustment of the visor with respect to the cap, or devices that allow to lock the visor in different pre-defined positions when the visor is caused to rotate to intercept or free the porthole. These devices do not provide usually the possibility of disconnecting the visor from the cap, unless by using suitable tools.

[0004] Some of such devices are provided with mechanisms that, once screwed on the cap, keep, by interposition of parts, the end of the visor, in order to lock it removably in the position desired by the user. Such mechanisms, generally made up by leverages, are very complex and require both hands for their activation. Therefore, the activation of the device is particularly tiresome, as, in order to lift or to lower the visor, the user must keep the motor-cycle in balance using only his legs.

[0005] To solve this problem, devices have been proposed for adjusting the rotation of the visor using one only hand.

[0006] In particular, according to the known art, these devices, fastened to the cap near the side ends of the porthole, are provided with a cylindrical body whereon the visor is rotatably assembled and a threaded pin which, by engaging in a hole obtained on the helmet cap, allows to keep the visor onto the cap according to an axis. The cylindrical body houses a pawl elastically pushed to engage into a concavity of a rack obtained in the visor. The concavities, or seats, identify different angular positions in whose correspondence the visor may be located during its rotation about the threaded pin. An example of such devices is described in the British Patent Application GB 2,024,000 (Nolan S.p.A.).

[0007] The connection of the visor to the helmet is therefore disjoined from the rotation adjusting device and may be realized, as mentioned above, with threaded pins that require the help of special tools for their assembly and disassembly.

[0008] Object of the present invention is to solve the drawbacks of the known art through a device for hooking the visor to a helmet cap allowing at the same time an easy adjustment of the angular position of the visor with respect to the porthole.

[0009] Another object of the present invention is to provide a device for hooking the visor to the cap, said device being extremely simple and highly reliable, and such as to allow the rotation of the visor and the locking thereof in the desired position with one only hand.

[0010] Another object of the present invention is to provide a device that does not require special tools to fix or to remove the visor to or from the cap, but that, on the contrary, allows to perform such operations in any condition and with the hands only, while ensuring an extreme use safety.

[0011] These and still other objects are achieved by the present invention that relates to a device for removably hooking the visor to a helmet cap, of the type provided, in correspondence of each side end of the cap porthole, a guide-body for the rotation of the visor that can be engaged according to an axis in a hole of said visor, characterized in that it comprises a cursor slidably associated to said guide-body and provided with means preventing the visor from the translation in the direction of said axis, said cursor being translatable between a position of engagement of said means holding said visor and a disengagement position, said device also comprising elastic means for pushing said cursor to said position of engagement with the visor.

[0012] Thanks to this solution, the translation of the cursor suffices per se to release the visor from the cap, and therefore no tools are needed to perform such operation.

[0013] According to a preferred embodiment of the present invention, the cursor comprises a tooth elastically pushed to engage in a seat belonging to one or more seats obtained on the visor. Said one or more seats respectively define one or more stable angular positions for the visor during the rotation movement of the latter about the axis engaging with the guide-body.

[0014] The presence of the sliding cursor of both the aforesaid means for the axial holding, constituted, for instance, by a fork that holds the axial shifting of the visor, and the tooth that engages with seats obtained on the visor, provides the device according to the invention with the capacity of efficiently preventing the axial translation of said visor, coupled with the effect of the holding projection present on the guide-body, adjusting at the same time the angular position of the visor during the rotation.

[0015] The extreme simplicity of the device made up by only a few components that can be assembled in a short time, ensures also a great utilization facility and safety as well as a high reliability.

[0016] According to a preferred embodiment of the present invention, the above position of disengagement of the holding means coincides with an end of stroke

position of the cursor, in such a manner that no accidental unhooking of the visor can take place.

[0017] Advantageously, the elastic means suitable to push the cursor to the engagement position of the means for holding the visor comprise a helical spring interposed between the cursor and the circular body.

[0018] According to a second preferred embodiment of the present invention, the aforesaid tooth is obtained integrally with the cursor, and the elastic means that push the cursor to an engagement position with the visor also push the tooth to one or more seats obtained in the visor.

[0019] Further characteristics and advantages of the present invention will be clearer thanks to the following description, made by way of non limiting illustration, with reference to the schematic drawings attached, wherein:

- Figure 1 is an exploded view of a hooking device according to a preferred embodiment of the present invention;
- Figure 2a, 2b are schematic views of a helmet provided with the device according to the present invention, with a hooked respectively unhooked visor;
- Figure 3 is a perspective view of the cursor according to a particular aspect of the present invention; and
- Figure 4 is a perspective view of a guide-body wherein the cursor of Figure 3 can be slidingly associated.

[0020] Figures 1-4 show a preferred embodiment of the device according to the present invention, to removably hook to cap 3 visor 2 of interception of a porthole, or window, 22 of a helmet 4, i.e. a device that allows to connect or disconnect visor 2 to or from cap 3, allowing at the same time the rotation of said visor 2 with respect to porthole 22. The device according to the present invention comprises, for each portion of cap 3 located near the side ends of porthole 22, a guide-body 5 tied to cap 3 whereon visor 2 rotatably engages according to an axis by means of a hole 23. The guide-body 5 allows the rotation of visor 2 about an axis substantially orthogonal with respect to the walls of cap 3 and prevents any movement transversal to said rotation axis of said visor 2.

[0021] To the guide-body 5, provided with a contrast protrusion 18, there is also slidingly associated a cursor 7 provided with holding means 8 of visor 2 in the direction of the above axis and translatable between a position wherein the holding means 8 engage with visor 2 to prevent it from sliding along the rotation axis, and a position wherein means 8 are disengaged from visor 2. In the following, reference will be made to the rotation axis of visor 2, defined by the coupling between hole 23 and the guide-body 5, by the term "axial", while by the expression "axial holding means of the visor" there will be intended to indicate the above defined holding means 8.

[0022] Besides, the device according to the present

invention comprises also elastic means 25 intended for pushing cursor 7, and therefore the axial holding means 8, in engagement with visor 2.

[0023] More particularly, helmet 4 has, on the sides of cap 3, near each side end of porthole 22, a circular-plan cylindrical guide unit that by engaging in the circular hole 23 of visor 2, acts as a pin to allow the rotation of visor 2 on porthole 5, allowing thereby the opening and closing of visor 2 on porthole 22. The circular guide-body comprises, in a transversal position with respect to the rotation axis, a groove 6 wherein cursor 7, provided with axial holding means 8, is slidingly inserted and can translate between an engagement position of the holding means 8 with visor 2, shown on Figure 2a, and a disengagement position, shown on Figure 2b. Besides, the circular guide unit 5 has, as mentioned above, in a position diametrically opposed with respect to the axial holding means 8, a contrast protrusion 18. The holding means, coupled with contrast protrusion 18 allow, when cursor 7 is in engagement position, to hook visor 2 to helmet cap 3, preventing it from sliding along the rotation axis, moving away from said cap 3.

[0024] Within groove 6 of guide-body 5, there is also present a cylindrical helical spring 25 that constitutes the elastic means suitable to push cursor 7 to the aforesaid engagement position. As will be described later on, spring 25 is located between a pin 26 of the guide-body 5 and an abutment 27 of cursor 7.

[0025] In the particular realization of the device shown in the figures, the stroke of cursor 7, defined by groove 6, and the overall size of the holding means 8 allow to disconnect visor 2 from the guide-body 5 only when cursor 7 reaches an end-of-stroke position (disengagement position) opposed to the aforesaid engagement position of means 8 with visor 2. In this manner, it is possible to disconnect visor 2 from cap 3 only in the position of cursor 7 shown in Figure 2b, so that any accidental unhooking of visor 2 from cap 3 is prevented.

[0026] Cursor 7 has, as a translation activating means, a protrusion 11 which, moved by hand by user, allows the shifting of said cursor towards the disengagement position of holding means 8 of visor 2, overcoming the action of spring 25.

[0027] The means of axial holding 8 of visor 2 according to the present invention, may be constituted by a protrusion of cursor 7 that extends, in a substantially orthogonal way with respect to the rotation axis, above cap 3, for a length and at a distance from cap 3 such as to allow the housing of the surface of visor 2 adjoining hole 23 between the protrusion (i.e. the holding means 8) and cap 3.

[0028] In the preferred embodiment, shown in detail in Figures 3 and 4, the holding means are constituted by a fork-shaped appendix 12 of cursor 7, whose upper arm prevents, by contrast of parts, visor 2 from sliding axially when cursor 7 is in its engagement position (Figure 2a). The external surface 15 of the upper arm 13 of fork 12 is, according to a particular aspect of the present

invention, inclined towards the rear side of the cap, in order to allow an easy disengagement of hole 23 of guide-body 5, when cursor 7 has reached the end-of-stroke position, shown in Figure 2b.

[0029] The lower arm 14 of fork 12 engages in an aperture 16 (Fig. 4) obtained in the guide-body 5, in such a way that the size of said opening 16 defines the stroke width for cursor 7. Aperture 16, opposite to the engagement position with visor 2, houses pin 26 that supports an end of the cylindrical helical spring 25.

[0030] According to a particularly advantageous aspect of the present invention, cursor 7, as is better shown in Figure 3, has also a tooth 9 elastically pushed in engagement with one of seats 10 obtained on visor 2. Seats 10, that belong to a rack (or toothing) preferably realized along the internal profile of hole 23, define a plurality of stable angular positions for said visor 2, allowing the adjustment of its rotation, by serial locations, by user. In fact, as stressed by Figure 1, tooth 9, during the rotation of visor 2 about the engagement axis with the guide-body, alternately engages in seat 10 of the rack obtained along the internal profile of hole 23, so as to shift within prefixed positions of the rotation for said visor 2.

[0031] In the embodiment shown, tooth 9 is integrally realized with cursor 5 and protrudes from the latter, transversally to the rotation axis of visor 2, so as to engage one of seats 10 of hole 23, when cursor 7 is in its engagement position with visor 2 (Figure 2a). As a consequence, the cylindrical helical spring 26, by pushing cursor 7 and the holding means 8 to engage with a portion of visor 2, pushes also tooth 9 into one of seats 10.

[0032] In particular, tooth 9 is located between the arms of fork 12 (see Figure 3), in such a way that the engagement of fork 12 with the surface of visor 2 adjoining hole 23 involves as a consequence the engagement of tooth 9 with one of seats 10.

[0033] Alternatively, in order to allow particular configurations of visor 2, but increasing the complexity of the device, it is possible to realize a tooth 9, translation-tied to guide-body 5 disjointedly from cursor 7 and provided with own elastic pushing means.

[0034] Tooth 9 and seats 10 of the rack obtained along the internal perimeter of hole 23 have a complementary tapered saw tooth profile, that facilitates the rotation and the adjustment of the angular position of visor 2. When the user of helmet 4 lifts visor 2 or lower it, causing its rotation about guide-body 5 whereon it is engaged, the tapered profile of seats 10 helps the coming out of tooth 9 from said seats and causes the partial translation of cursor 7 towards its disengagement portion from visor 2, without the latter being ever reached, overcoming only partly the pushing exercised by spring 25.

[0035] More specifically, the rotation of visor 2 by user, about the axis defined by guide-body 5, involves, thanks to the complementary tapered profiles of seats 10 and tooth 9, the partial translation of cursor 7 and the holding means 8 towards the aforesaid disengagement position

of cursor 7, which however is never reached, overcoming only partly the pushing exercised by spring 25. When, continuing the rotation of visor 2, pin 9 is substantially in correspondence of another of seats 10 of hole 23, spring 25 pushes tooth 9 into such subsequent seat, determining the reaching of a prefixed angular stable position of visor 2 with respect to porthole 22.

[0036] The number of seats 10 obtained on the internal profile of hole 23 depends on the number of angular positions wherein it is expected, in the design step, that visor 2 will be stably located during its opening and closing movement. Obviously, the profile of eyelet 23 might be provided with one only seat 10, for instance in correspondence of the maximum opening position of visor 2.

[0037] In order to fasten still more effectively visor 2 to cap 3, the guide-body 5 is provided with a protrusion 18 which, superposed to visor 2 when the latter is tied to guide-body 5, contrasts any shift along the rotation axis of said visor 2, abutting on a position opposed to fork 12 of cursor 7 and in particular, in the case of a circular-plan guide-body 5, it extends in a position diametrically opposite with respect to the engagement position of cursor 7 with visor 2.

[0038] According to a further aspect of the present invention, guide-body 5 may be provided with recesses 29, or holes, wherein tangs or other structural coupling elements belonging to removable accessories of the helmet, such as a front or aerodynamic appendices or a sun shading flange may be housed.

[0039] The great structural simplicity of the device illustrated above involves a like assembly simplicity.

[0040] In fact, for the assembly, a cursor 7 is first translatablely tied in groove 6, so that the lower arm 14 of fork 12 inserts into opening 26. Possibly, groove 6 may be so shaped as to allow the snap-insertion of cursor 7, by means, for instance, of elastically strainable portions, and to prevent cursor 7 from shifting axially.

[0041] Afterwards, the cylindrical helical spring 25 is located between pin 26 and the abutment surface 27 of cursor 7.

[0042] Then, for each side end of helmet 4, guide-body 5 (see Fig. 1) is coupled to a corresponding cavity shaped in cap 3 and fastened thereto by means of a partly threaded element 19 (screw or bolt) that engages in a seat also threaded, integral with cap 3. Element 19 may be a pin provided with a T-shaped head that inserts into an eyelet 20 of cursor 7, allowing its transversal sliding, and into a through-hole 28 of unit 5. Said pin 19, that does not involve visor 2, needs not being removed to allow visor 2 to be disconnected from cap 3.

[0043] Lastly, eyelet 23 of the visor is inserted on the cylindrical guide-body 5, causing the latter to position frontally beyond contrast protrusion 18 realized thereon; afterwards, by acting by hand on protrusion 11 of cursor 7, the front part of hole 23 of visor 2 inserts automatically on the cylindrical guide-body 5 and, once cursor 7 is released, it is held up by means 8, or the upper arm 13 of fork 12.

[0044] As may be appreciated by those skilled in the art, such assembly requires only a few simple operations, and is therefore extremely rapid. The guide-body 5, of circular shape, as shown in Figure 4, is realized disjointedly from the helmet cap, but obviously it might be realized integrally with cap 3, without falling outside the protection scope of the present invention.

[0045] Just in the same way, the partly threaded element 19 may be replaced by any other mechanism or element that, according to the known art, would allow to stably fasten unit 5 to cap 3.

Claims

1. A device for removably hooking visor (2) to a cap (3) of a helmet, of the type provided, in correspondence of each side end of porthole (22) of the helmet, a guide-body (5) for the rotation of visor (2) that engages, according to an axis, in a hole (23) of said visor (2), **characterized in that** it comprises a cursor (7) slidably associated to said guide-body and provided with means (8) for holding said visor in the direction of said axis, said cursor being translatable between a position of engagement of said holding means (8) with said visor (2) and a disengagement position of said holding means (8) with said visor, the device comprising also elastic means (25) to push said cursor (7) to said engagement position with visor (2).
2. The device according to claim 1, **characterized in that** said cursor comprises a tooth (9) elastically pushed to engage into one of one or more seats (10) obtained on visor (2), said one or more seats (10) defining one or more stable angular positions for said visor (2).
3. The device according to claim 2, **characterized in that** said one or more seats (10) are obtained along the internal perimeter of said hole (23) of visor (2).
4. The device according to any of the preceding claims, **characterized in that** said disengagement position of said holding means (8) coincides with an end of stroke position of said cursor (7).
5. The device according to any of the preceding claims, **characterized in that** said cursor (7) comprises means (11) for its translation activation.
6. The device according to any of the preceding claims, **characterized in that** said elastic means comprise a helical spring (25) interposed between cursor (7) and guide-body (5).
7. The device according to any of the preceding claims 2-6, **characterized in that** said tooth (9) is obtained

integrally with said cursor (7) and said elastic means (25) that push cursor (7) to an engagement position with visor (2), also push said tooth (9) in one of the said one or more seats (10) obtained in visor (2).

8. The device according to any of the preceding claims 2-7, **characterized in that** said tooth (9) and said one or more seats (10) ' have a complementary tapered saw-tooth profile.
9. The device according to any of the preceding claims, **characterized in that** said holding means comprise a fork (12) whose upper arm (13) superposes to part of visor (2) to lock it axially when cursor (7) is in said engagement position.
10. The device according to claim 9, **characterized in that** said tooth (9) is realized between arms (13, 14) of said fork (12).
11. The device according to claim 9 or 10, **characterized in that** the lower arm (14) of said fork (12) engages in an aperture (16) obtained in guide-body (5) suitable to define the end-of-stroke positions of said cursor (7).
12. The device according to any of the preceding claims, **characterized in that** said guide-body (5) comprises at least a contrast protrusion (18) to prevent visor (2) from shifting along said axis.
13. The device according to any of the preceding claims, **characterized in that** said guide-body (5) is realized disjointedly with respect to cap (3) of helmet (4).
14. The device according to claim 13, **characterized in that** said guide-body (5) comprises recesses (29) for coupling with helmet (4) removable accessories.
15. The device according to claim 13 or 14, wherein said guide-body (5) is fastened to cap (3) of helmet (4) by at least partly threaded fasteners (19).
16. The device according to claim 15, wherein said fastening means (19) of guide-body (5) to cap (3) of helmet (4) are T-head pins.

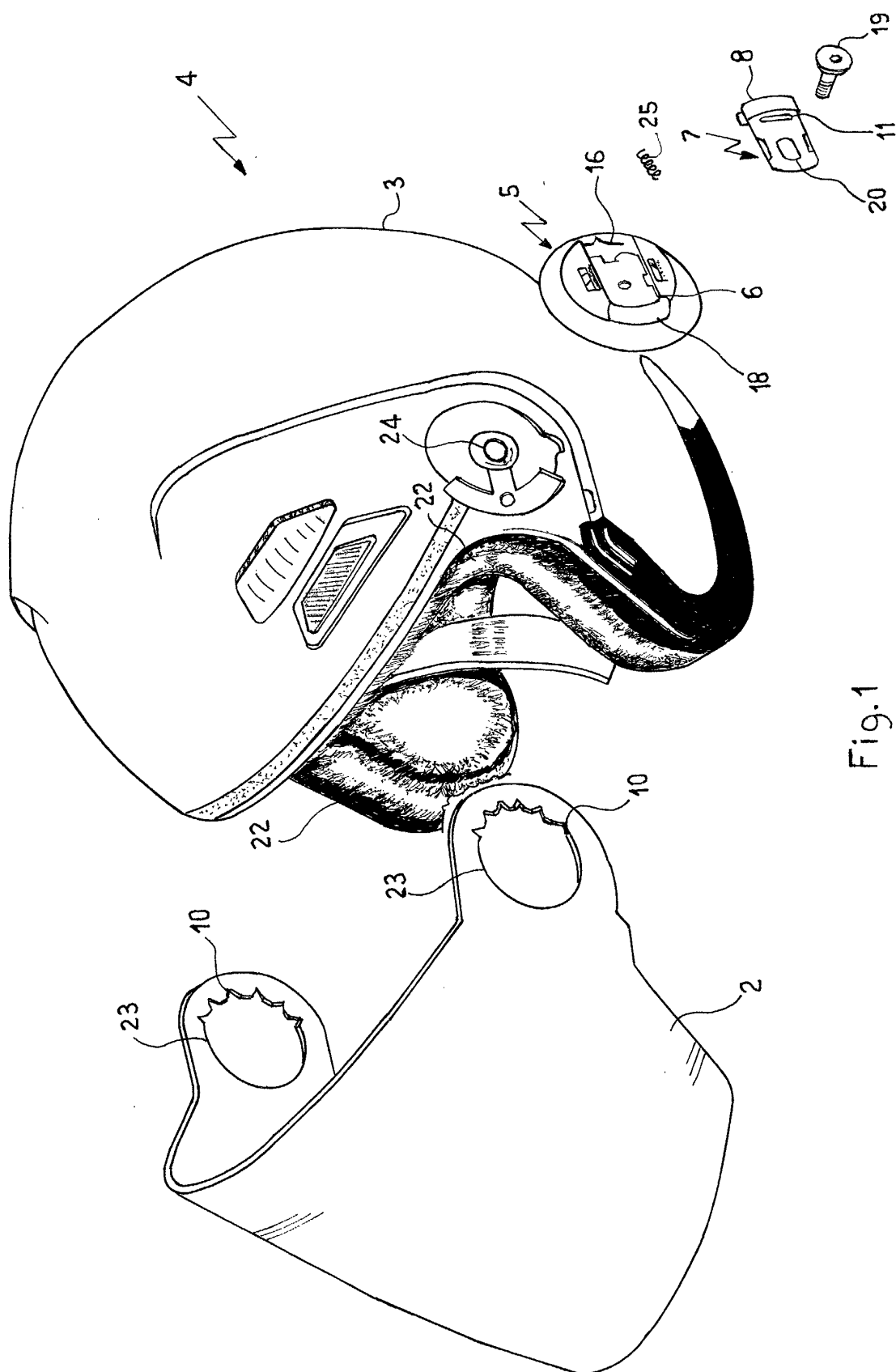


Fig. 1

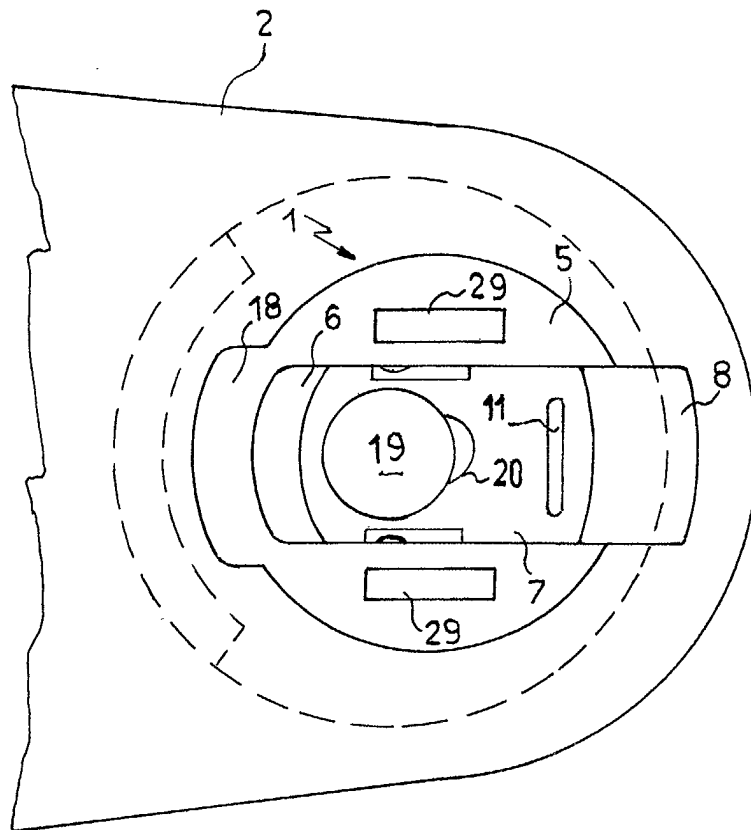


Fig. 2a

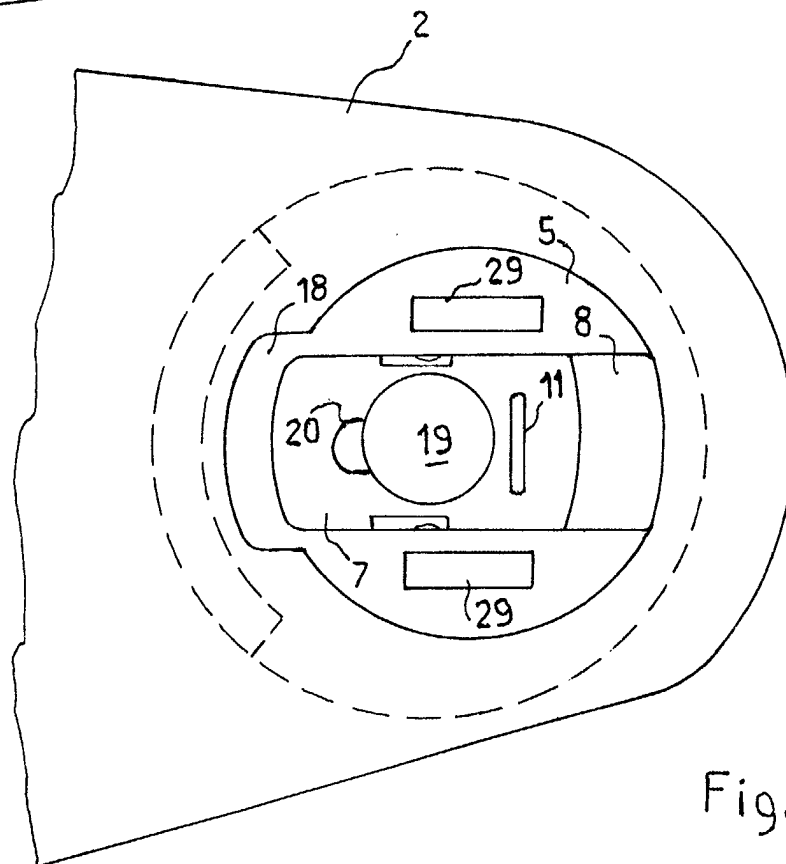


Fig. 2b

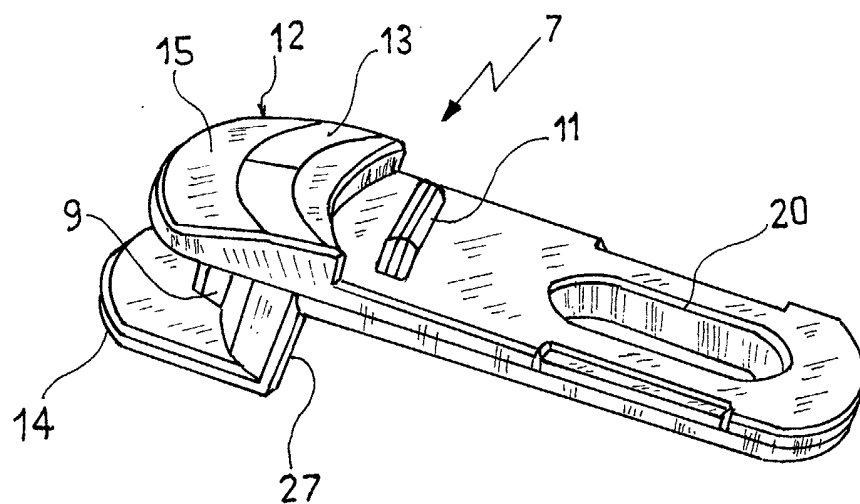


Fig.3

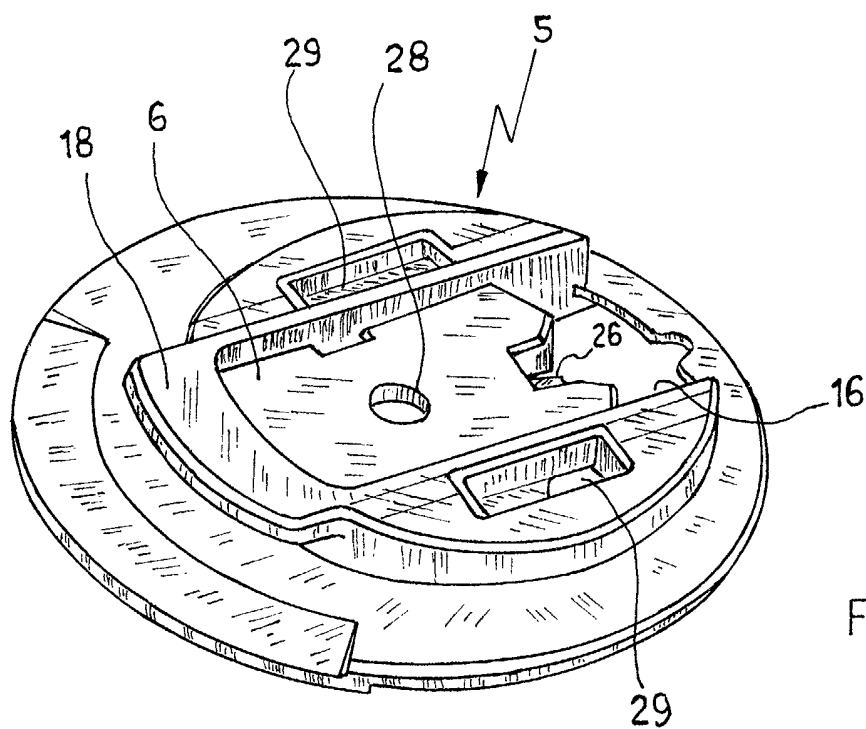


Fig.4



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EUROPEAN SEARCH REPORT

Application Number
EP 02 42 5335

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Place of search THE HAGUE		Date of completion of the search 13 December 2002	Examiner Bourseau, A-M
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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