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(54) **PROTECTIVE HELMET**

(57) The present disclosure relates to a helmet comprising a cap (10) and a visor (20) configured to be removably coupled to the cap (10) in at least one coupling region (11) of the cap (10) about an axis of rotation (X). The helmet (100) further comprises a covering device (30) which comprises a constraining or coupling portion (31) and a head portion (32) and is configured to be coupled in the coupling region (11) in a removable manner to the cap (10) by means of the constraining or coupling portion (31) and which is configured to assume a first constraining or coupling position and a second constraining or coupling position. Furthermore, in the first constraining or coupling position, the head portion (32) is constrained in a first spatial relationship with respect to the cap (10) and in the second position the head portion (32) is constrained in a second spatial relationship with respect to the cap (10). In particular, in the second spatial relationship the head portion is closer to the cap (10) along the axis of rotation (X) than in the first spatial relationship. Furthermore, the covering device (30) is configured to pass from the first constraining or coupling position into the second constraining or coupling position, or vice versa, or to be uncoupled from or coupled in a removable manner to the cap (10), by means of a rototranslational movement. In particular, the head portion (32) of the covering device (30) is configured so that it can be deformed in an elastic manner, so as to allow a translation of the constraining or coupling portion (31) during the rototranslational movement.

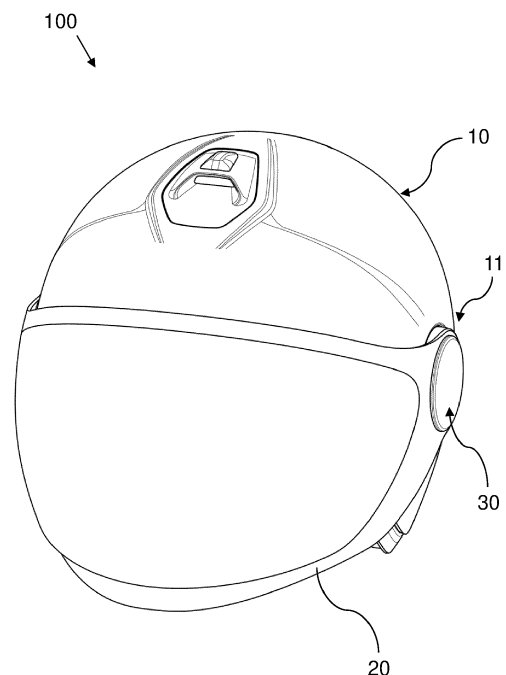


FIG. 1

Description

[0001] The present disclosure relates in general to a protective helmet including a cap and a visor.

[0002] The visor is associated in a removable manner with the cap in a fastening or more generally engaging region and is configured to rotate with respect to the cap about an axis of rotation passing through said fastening region. The fastening region is to be understood as meaning a removable coupling region for the visor, also configured to allow rotation of the visor.

[0003] The helmet also comprises a covering device configured to be coupled to the cap in the visor fastening region. The covering device has the function of covering and protecting a mechanism for rotation of the visor in the fastening region.

[0004] In particular, it is known to use a covering component in order to cover and/or conceal and protect from external agents the mechanism for rotation and coupling the visor in the fastening region. However, if the visor is uncoupled from the helmet, the covering component is unable to perform efficiently its function of covering the mechanism.

[0005] The present disclosure is based on the recognition by the inventors of the present patent application that, in the known helmets, the covering devices which are commonly used have a limited functionality.

[0006] One technical problem underlying the present disclosure consists in providing a helmet in which the covering device has a structure which is able to provide the helmet with a greater functionality, and/or to achieve further advantages, as well as providing a method for coupling the covering device to the cap.

[0007] This is achieved by providing a helmet as defined in the respective independent claim 1.

[0008] Secondary characteristic features of the aforementioned helmet are defined in the corresponding dependent claims.

[0009] The aforementioned technical problem is also solved by a method according to the respective independent claim and the following dependent claims.

[0010] The helmet according to the present disclosure comprises a cap, a visor configured to be removably coupled to the cap in at least one coupling region of the cap about an axis of rotation, and a covering device. In other words, a condition where the visor is coupled with the cap corresponds to a possibility for the visor to rotate about the axis of rotation positioned in the coupling region.

[0011] The covering device comprises in turn a constraining or coupling portion and a head portion and is configured to be coupled to the cap in a removable manner in the coupling region by means of the constraining or coupling portion.

[0012] Furthermore, the covering device is configured to assume a first constraining or coupling position and at least one second constraining or coupling position.

[0013] In particular, in the first constraining or coupling

position, the head portion is constrained in a first spatial relationship with respect to the cap, while in the second constraining position, or coupling position, the head portion is constrained in a second spatial relationship with respect to the cap, where in the second spatial relationship the head portion is closer to the cap along the axis of rotation than in the first spatial relationship.

[0014] In other words, a first constraining or coupling position of the covering device corresponds to a first spatial relationship of the head portion with respect to the cap and a second constraining or coupling position of the covering device corresponds to a second spatial relationship of the head portion with respect to the cap. Furthermore, in the second spatial relationship, the head portion is positioned in greater proximity to the cap, namely closer to the cap, than in the first spatial relationship along a direction corresponding to the axis of rotation. In other words, in the second spatial relationship, the head portion is translated axially towards the cap and at the same time is constrained to the cap in said second spatial relationship by means of the constraining portion.

[0015] Furthermore, the covering device is configured to pass from the first constraining or coupling position into the second constraining or coupling position, or vice versa, or to be uncoupled from or coupled in a removable manner to the cap, by means of a rototranslational movement. In other words, the covering device may perform a translation along the axis of rotation and subsequently, or simultaneously, or beforehand, may perform a rotation about the axis of rotation so as to pass from the first constraining or coupling position to the second constraining or coupling position, or vice versa, or be uncoupled from or coupled in a removable manner to the cap.

[0016] In particular, the head portion of the covering device is configured so that it can be deformed in an elastic manner, i.e. within an elastic range, so as to allow the aforementioned translation of the constraining or coupling portion of the covering device along the axis of rotation during the rototranslational movement. In particular, owing to the elastic deformation, in order to obtain both the constrained spatial relationships, the head portion may be elastically deformed so as to overcome a respective hump present inside the cap and be rotated beyond the hump into a respective seat corresponding to the first spatial relationship, for example the first seat, and a respective seat corresponding to the second spatial relationship, for example the second seat. An elastic return movement after rotation causes a slight translation of the constraining portion in the opposite direction and the presence of the respective hump prevents the constraining portion from coming out of the seat.

[0017] It is pointed out that the direction of elastic deformation is a direction towards the inside of the cap of the helmet, and the direction of elastic return movement is an opposite direction towards the outside. The elastic return movement occurs when the deformation action ceases.

[0018] The term "elastic deformation" is understood as

meaning a momentary change in the shape of the head portion by means of flattening, this being obtained owing to the material of the head portion, for example, which causes a displacement of the constraining portion in the direction of the axis of rotation, or in a direction parallel to the axis of rotation.

[0019] In other words, the elastic deformation of the head portion corresponds preferably to temporary flattening of said head portion towards said cap with a linear displacement of the constraining portion or coupling portion.

[0020] This elastic deformation allows a displacement also by only a few millimetres which helps overcome said hump or similar element present in the cap and create the constraint with the constraining portion and which normally is very small in size.

[0021] The term "cap" is understood as meaning the set of components which form the structure of the helmet intended to receive the head of a user. The visor is a screen-like component which is intended to cover a front opening of the cap and may be removed from the cap. The covering device is in fact a component which has a preferably mushroom-like form, with the constraining portion which corresponds to the mushroom stem and is intended to be inserted inside the cap in order to create the constraint, and with the head portion corresponding to the mushroom head and intended to come into contact with the cap in order to cover any rotation mechanism in the coupling region.

[0022] Preferably, the first constraining or coupling region of the covering device corresponds to a condition where the visor is coupled with the cap, while the second constraining or coupling position of the covering device corresponds to a condition where the visor is uncoupled from the cap.

[0023] Consequently, when the visor is removed, the covering device may be displaced or translated axially towards the cap, and may therefore compensate for the missing thickness of the visor, without leaving empty spaces. In this condition, the covering device may close any openings when the visor is absent.

[0024] Preferably, moreover, the first constraining or coupling position of the covering device corresponds to a condition where the head portion is in contact with the visor. In other words, in the first constraining or coupling position, the head portion is preferably in contact with the visor, for example by means of an at least partial contact between the visor and an inner side or cap side of the head portion directed towards the cap.

[0025] In this way it is possible for a user to position the covering device between either one of the first constraining or coupling position and the second constraining or coupling position during use. Consequently, the covering device may cover in an efficient and complete manner the mechanisms present in the coupling region, for example both if the visor is coupled to the cap and if the visor is uncoupled from the cap.

[0026] Basically, the present disclosure provides a hel-

met in which the covering device is configured to assume at least one first or second constraining or coupling position, so that the head portion of the covering device may be kept adjacent to or in contact with the visor or the cap, respectively.

[0027] In one embodiment, the constraining or coupling portion of the covering device is configured to be coupled to a first seat and to a second seat of the cap. In particular, a condition where the constraining or coupling portion is coupled with the first seat corresponds to the first constraining or coupling position of the covering device, and a condition where the constraining or coupling portion is coupled with the second seat corresponds to the second constraining or coupling position of the covering device.

[0028] In one embodiment, the first seat is in a position which is angularly offset around the axis of rotation and linearly translated along a direction parallel to the axis of rotation with respect to the second seat. In particular, the covering device in the second constraining or coupling position is angularly offset around the axis of rotation and linearly translated with respect to the first constraining or coupling position.

[0029] Preferably, the head portion of the covering device is shaped as a dome or with a profile in the form of a circumference arc or ellipse arc, and the constraining or coupling portion may be associated with the head portion along the inner side of the latter and in the vicinity of a vertex or apex of the form of the head portion. Consequently, the elastic deformation of the head portion causes a momentary flattening of the dome, or the arc profile, or even a transition from a convex profile into a profile which is momentarily slightly concave with a consequent linear displacement, or translation, of the constraining portion which may therefore be uncoupled.

[0030] Even more preferably, the constraining or coupling portion extends mainly, during use, along the axis of rotation X and is associated in a manner perpendicular to the head portion, for example in a manner perpendicular to the base of the form of the head portion.

[0031] In one embodiment, the helmet comprises a pair of first seats and a pair of second seats, each positioned on the cap symmetrically with respect to the axis of rotation.

[0032] Furthermore, in one embodiment, the helmet comprises a first covering device and a second covering device which can be respectively coupled in a removable manner to the cap in a first and a second coupling region, and the visor can be coupled in a removable manner to the cap in the first and in the second coupling region.

[0033] In other words, the helmet comprises two coupling regions, which are preferably positioned symmetrically on the cap with respect to the user's head, for example along the temple portions of the helmet, and the helmet comprises two covering devices configured to be removably coupled to the cap in the first and second regions, respectively, for coupling the visor to the helmet.

[0034] A further subject of the present disclosure is a

method for managing a helmet comprising a cap and a visor, the visor being able to be coupled in a removable manner with the cap in a constraining or coupling region of the cap. The method comprises:

- providing a covering device able to cover the constraining or coupling region;
- subsequently coupling in a removable manner the covering device with the cap by means of a constraining or coupling portion of the covering device in a first constraining or coupling position, in which a head portion of the covering device is constrained in a first spatial relationship with respect to the cap. The method also comprises coupling the covering device in a second constraining spatial relationship to the cap, wherein in said second spatial relationship the head portion of the covering device is closer to the cap than in the first spatial relationship along a direction corresponding to the axis of rotation. In other words, in the second spatial relationship the head portion is closer to the cap along the axis of rotation than in the first spatial relationship.

[0035] More particularly, the removable coupling of the covering device with the cap by means of a constraining or coupling portion of the covering device in a first constraining or coupling position occurs by means of an elastic deformation of a head portion of the covering device so that a constraining or coupling portion of the covering device is positioned in the first constraining or coupling position.

[0036] Similarly, the coupling of the covering device in a second constraining spatial relationship to the cap occurs by means of an elastic deformation of the head portion of the covering device such that the constraining or coupling portion of the covering device is positioned in the second constraining or coupling position.

[0037] According to a preferred embodiment, the method may further comprise:

- uncoupling the covering device from the cap;
- coupling in a removable manner the visor with the cap in a constraining or coupling region of the cap around an axis of rotation;
- coupling again in a removable manner the covering device with the cap by means of the constraining or coupling portion in the first constraining or coupling position, in which the head portion of the covering device is constrained in the first spatial relationship with respect to the cap, further away from the cap along the axis of rotation than in the second spatial relationship. More particularly, coupling again in a removable manner of the covering device with the cap by means of the constraining or coupling portion in the first constraining or coupling position is performed by means of an elastic deformation of a head portion of the covering device so that the constraining or coupling portion is positioned in said first con-

straining or coupling position.

[0038] Preferably, the head portion in the first spatial relationship is adjacent to or in contact with the visor, in the vicinity of the constraining or coupling region of the cap, when the visor is coupled to the cap.

[0039] In one embodiment, when the covering device is in the first constraining or coupling position, the constraining or coupling portion is coupled with a first seat of the cap. Furthermore, when the covering device is in the second constraining or coupling position, the constraining or coupling portion is coupled with a second seat of the cap.

[0040] In particular, the first seat is in a position which is angularly offset around the axis of rotation and linearly translated along a direction parallel to the axis of rotation with respect to the second seat.

[0041] Preferably, the covering device is configured to perform a rototranslational movement during the step of uncoupling from or coupling in a removable manner with the cap, in such a way that the constraining or coupling portion translates along the axis of rotation and rotates about the same axis of rotation so as to be uncoupled from or coupled in a removable manner with the first seat or with the second seat of the cap.

[0042] According to one embodiment, the head portion of the covering device is configured so that it can be deformed in an elastic manner so as to cause translation of the constraining or coupling portion along the axis of rotation during the step of uncoupling or coupling in a removable manner of the covering device from/with the cap. This translation allows the constraining portion to overcome a respective hump which is located in the cap and to then perform a rotation about the axis of rotation.

[0043] Further advantages, characteristic features and modes of use of the helmet and the method according to the present disclosure will become clear from the following detailed description of some preferred embodiments, provided by way of a non-limiting example.

[0044] It is in any case clear that each embodiment forming the subject of 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.

[0045] Reference will be made to the figures of the attached drawings in which:

- Figure 1 shows a perspective view a helmet according to an embodiment of the present disclosure;
- Figures 2A and 2B show a detailed view, from the front, of the helmet according to Figure 1, in which the covering device is respectively in the first constraining or coupling position and in the second constraining or coupling position;
- Figure 3 shows an exploded view of the helmet according to Figure 1;
- Figure 4 shows a view from below of the helmet according to Figure 3;

- Figure 5A shows a detailed view from the inside of the cap of a helmet according to the present disclosure, in which the covering device is in the first position;
- Figure 5B shows a detailed view from the inside of the cap of a helmet according to the present disclosure, in which the covering device is uncoupled from the cap and is not shown;
- Figure 6 shows a cross-sectional view of a helmet according to the present disclosure;
- Figures 7A and 7B show a detail of a cross-sectional view of a helmet according to the present disclosure, in which the covering device is respectively in the first constraining or coupling position and in the second constraining or coupling position;
- Figure 7C shows a cross-sectional view of Figures 7A and 7B in which the head portion of the covering device is in an elastically deformed condition;
- Figure 8 shows a front view of a helmet according to the present disclosure.

[0046] With reference to the attached figures, the reference number 100 denotes a helmet according to the present disclosure. The helmet 100 comprises a cap 10 and a visor 20 configured to be coupled in a removable manner to the cap 10 in at least one coupling region 11 of the cap 10, about an axis of rotation X. In other words, the visor 20 may rotate about the axis of rotation X when it is coupled in a removable manner to the cap 10. The coupling may be performed on the cap 10 about the axis of rotation X.

[0047] Moreover, the helmet further comprises a covering device 30 comprising a constraining or coupling portion 31 and a head portion 32. The covering device 30 is configured to be coupled in a removable manner in the coupling region 11 to the cap 10, by means of the constraining or coupling portion 31, and to assume a first constraining or coupling position and a second constraining or coupling position.

[0048] The covering device 30 has a substantially mushroom-like form and comprises a stem which corresponds to the constraining portion 31 and a head which corresponds to the head portion 32.

[0049] In particular, in the first constraining or coupling position, the head portion 32 is constrained in a first spatial relationship with respect to the cap 10 and in the second constraining or coupling position the head portion 32 is constrained in a second spatial relationship with respect to the cap 10. Furthermore, in the second spatial relationship the head portion 32 is closer to the cap 10 along the axis of rotation X than in the first spatial relationship.

[0050] In other words, along the direction corresponding to the axis of rotation X, in the second spatial relationship the head portion 32 is positioned closer to the cap 10 than in the first spatial relationship. In this way, preferably, in the first spatial relationship, the head portion 32 is spaced from the cap, while in the second spatial

relationship the head portion 32 is in contact with the cap. Both the relationships are constraining relationships where the covering device is constrained to the cap.

[0051] Furthermore, the covering device is configured to pass from the first constraining or coupling position into the second constraining or coupling position, or vice versa, or to be uncoupled from or coupled in a removable manner to the cap 10, by means of a rototranslational movement. In other words, the covering device 30 is configured to perform a rototranslational movement in order to pass from the first constraining or coupling position into the second constraining or coupling position, or to be uncoupled from or coupled in a removable manner to the cap 10.

[0052] In particular, the rototranslational movement may be performed preferably about the axis of rotation X and along the axis of rotation X or along a direction parallel to the axis of rotation X.

[0053] For example, in order to pass from the constraining or coupling position into the second constraining or coupling position, or vice versa, the covering device 30 may perform a translation along the axis of rotation X, preferably so as to be positioned at the height of a coupling zone, and may perform a rotation about the axis X in such a way that the constraining or coupling portion 31 may engage with another coupling zone.

[0054] Alternatively, the covering device 30 may perform a plurality of rototranslational movements so as to pass from the first constraining or coupling position into the second constraining or coupling position, or vice versa, or so as to be uncoupled from or coupled in a removable manner to the cap 10.

[0055] Furthermore, the head portion 32 of the covering device 30 is configured so that it can be deformed in an elastic manner, so as to allow a translation of the constraining or coupling portion 31 along the axis of rotation X during the rototranslational movement. In other words, the head portion 32 is configured to be deformed within the elastic range of the material from which it is made, so that it can be deformed in a reversible manner, as shown in the attached Figure 7C.

[0056] In fact, in an elastic deformation condition, namely in which the head portion 32 is pressed with form deformation towards the inside of the cap, and consequently under the deforming action, the constraining or coupling portion 31 advances towards the cap in the direction parallel to the axis of rotation X and may overcome the constraint which is created in the first position and, after rotation, be detached from the cap. Similarly, under the deforming action, the constraining or coupling portion 31 advances towards the cap in the direction parallel to the axis of rotation X and may overcome the constraint which is created in the second position, and, after rotation, be detached from the cap.

[0057] Preferably, the first constraining or coupling position of the covering device 30 corresponds to a condition where the visor 20 is coupled with the cap 10 and the second position corresponds to a condition where

the visor 20 is uncoupled or detached from the cap 100. In other words, the covering device 30 is preferably configured to assume the first constraining or coupling position if the visor 20 is coupled, while still in a removable manner, with the cap 10, namely when the visor 20 is mounted, albeit removably, on the cap 10, and is preferably configured to assume the second constraining or coupling position if the visor 20 is uncoupled from the cap 10, namely when the visor 20 is detached, or absent, from the cap 10.

[0058] The thickness of the visor which is arranged between the head portion 32 of the covering device 30 and the cap corresponds preferably substantially to the difference in position in the direction parallel to the axis X between the first constraining position and the second constraining position.

[0059] As a result, when the visor is removed, the covering device may assume the second spatial relationship and be moved towards the cap, also coming into contact with the cap with the head portion, so as to close any possible opening.

[0060] Preferably, as mentioned above, the first constraining or coupling position of the covering device 30 corresponds to a condition where the head portion 32 is in contact with the visor 20. In particular, in the condition where it makes contact with the visor 20, the head portion 32 is situated preferably adjacent to or in contact with, or bearing against, the visor 20 in the vicinity of the coupling region 11.

[0061] In other words, the head portion 32 has preferably an inner side or cap side, directed towards the head of a user of the helmet 100, and an outer side, directed in the opposite direction to the inner side, namely towards the outside of the helmet 100 and, in the condition where it is in contact with the visor 20, the inner side or cap side of the head portion 32 is at least partially adjacent to, or in contact with, the visor 20.

[0062] It is possible to obtain an improved protection of the rotation mechanism by using in fact the same covering device, and without additional parts.

[0063] Preferably, the constraining or coupling portion 31 of the covering device 30 is configured to be coupled in a removable manner with a first seat 12a and to be coupled with a second seat 12b of the cap 10. In particular, a condition where the constraining or coupling portion 31 is coupled with the first seat 12a corresponds to the first constraining or coupling position of the covering device 30, and a condition where the constraining or coupling portion 31 is coupled with the second seat 12b corresponds to the second constraining or coupling position of the covering device 30.

[0064] Preferably, the coupling between the constraining or coupling portion 31 and the first seat 12a and the second seat 12b may be performed by means of a mechanical coupling system, for example a form-fitting joint. In particular, the constraining or coupling portion 31 may be hook-shaped or L-shaped and may be configured to engage inside the first seat 12a and the second seat 12b,

for example so as to engage a terminal region of the constraining or coupling portion 31. In other words, the first seat 12a and the second seat 12b preferably have a concave receiving space configured to receive at least partially the constraining or coupling portion 31. For example, the first seat 12a and the second seat 12b may be shaped in the form of a U or any other type of concave profile.

[0065] The first seat 12a and the second seat 12b are arranged at different heights or different levels in the cap along the axis X precisely in order to obtain the two constraining or coupling positions of the coupling device 30. The seats may be formed both in the cap directly or in elements or components which are stably fixed to the cap.

[0066] Preferably, the first seat 12a is in a position angularly offset around the axis of rotation X and linearly translated along a direction parallel to the axis of rotation X with respect to the second seat 12b, such that the covering device 30 in the second constraining or coupling position is angularly offset around the axis of rotation X and linearly translated with respect to the first constraining or coupling position.

[0067] In other words, the first seat 12a is situated preferably at a different angle around the axis of rotation X and at a different height along a direction parallel to the axis of rotation X with respect to the second seat 12b.

[0068] Preferably, the second seat 12b of the cap is located along the axis of rotation X more towards the user's head, namely more towards the inside of the helmet 100, than the first seat 12a, in such a way that in the second spatial relationship the head portion 32 is closer to the cap 10 along the axis of rotation X than in the first spatial relationship.

[0069] Consequently, for example, in order to pass from the first constraining or coupling position into the second constraining or coupling position (after removing the visor 20 or repositioning the visor 20, respectively), or vice versa, the covering device 30 may perform a translation along the axis of rotation X, preferably so as to be positioned at the height of the second seat 12b or the first seat 12a, and may perform a rotation about the axis X in such a way that the constraining or coupling portion 31 may engage inside the second seat 12b or the first seat 12a. The transition from the first constraining position into the second constraining position takes place after removing the visor.

[0070] According to one aspect of the present disclosure, the head portion 32 of the covering device 30 is shaped as a dome or with a profile in the form of a circumference arc or ellipse arc. In this way, when the head portion 32 is elastically deformed, the dome or the arc profile is momentarily flattened in a substantially flat configuration, or if necessary passing from a convex configuration into a concave configuration, with linear translation or displacement of the constraining portion 31 along the axis of rotation X or along an axis parallel to the axis of rotation X. Alternatively, the head portion 32 may be

shaped with a polygonal profile. The form of the head portion 32 is any case such as to favour the elastic deformation so as to allow the translation of the constraining or coupling portion 31 along the axis of rotation X.

[0071] For example, the constraining or coupling portion 31 may be associated with the head portion 32 in the vicinity of an apex or a vertex of the dome shape or a circumference or ellipse arc profile, preferably along the inner side or cap side of the head portion. In this way, an elastically deformed condition of the head portion 32, for example at the apex or vertex, corresponds to a translation of the constraining or coupling portion 31 along the axis of rotation X.

[0072] The seats for constraining with the constraining or coupling portion 31 may be formed using techniques available to the person skilled in the art, for example by means of suitable elements having a hump and groove profile, wherein the groove corresponds to the respective retaining seat and, when the constraining or coupling portion is inserted inside the cap, there occurs firstly, by means of the aforementioned elastic deformation, a translation in order to overcome axially the hump, namely parallel to the axis of rotation X, and then, following rotation, engagement inside the groove with an elastic return movement in order to stabilize the coupling. Groove and respective hump are therefore at least adjacent and angularly offset about the axis X in order to allow the aforementioned coupling and stable positioning of the constraining portion by means of the aforementioned rotation, following translation.

[0073] It should be pointed out that the elastic deformation of the head portion allows a substantially linear displacement of the coupling or constraining portion 11 and overcoming of the hump or other engaging system, and then the rotation of the covering device which may therefore be removed from the cap.

[0074] Basically the curved form or dome shape of the head portion is used in order to displace even by just a few millimetres the constraining portion.

[0075] It is understood that other mechanical solutions may be provided in order to obtain said mechanical coupling.

[0076] For example, the first seat 12a is a one of a pair of first seats and the second seat 12b is one of a pair of second seats. Furthermore, the pair of first seats is positioned on the cap 10 in a symmetrical manner with respect to the axis of rotation X and the pair of second seats is positioned on the cap 10 symmetrically with respect to the axis of rotation X.

[0077] In other words, preferably the cap 10 comprises a pair of first seats and a pair of second seats, where each pair is preferably positioned symmetrically around the axis of rotation X.

[0078] For example, a pair of first seats is positioned at 180° around the axis of rotation X with respect to the other pair of first seats, and a pair of second seats is positioned at 180° around the axis of rotation X with respect to the other pair of second seats.

[0079] Preferably, the constraining or coupling portion 31 of the covering device is suitably shaped so as to be able to engage simultaneously both the seats of the pair of first seats or both the seats of the pair of second seats, for example by means of double hook or double L shape, or the constraining portion has a fork shape with two prongs suitably each suitably hook-shaped.

[0080] By suitably deforming the head portion of the covering device, the translation of the constraining portion is obtained so that the hook overcomes axially a hump present close or adjacent to the respective seat and then, following a rotation about the axis of rotation X, by means of an elastic return movement of the head portion 32, which results in a translation towards the outside of the cap, engagement of the hook inside the groove is obtained. In order to obtain the release, the reverse procedure with is performed translation towards the inside of the cap and rotation of the covering device in order to overcome the hump.

[0081] It is to be understood that, in order to allow insertion towards the cap and locking inside the respective seats, the visor has suitable through-seats 35 and preferably it is envisaged that the visor assumes a predefined angular position around the axis X in order to allow the passage of the constraining and coupling portion 31 along the direction parallel to the axis X.

[0082] For the sake of simpler illustration, in the present disclosure hitherto a single covering device 30 has been described. Preferably, the coupling region 11 of the cap 10 is a first coupling region 11a and the cap 10 comprises a second coupling region 11b. In particular, the visor 20 is preferably configured to be coupled in a removable manner to the cap 10 in the first coupling region 11a and the second coupling region 11b. Moreover, the covering device 30 is preferably a first covering device 30a and the helmet 100 comprises a second covering device 30b. In particular, the first covering device 30a is configured to be coupled in a removable manner to the cap 10 in the first coupling region 11a and the second coupling device 30b is configured to be coupled in a removable manner to the cap 10 in the second coupling region 11b.

[0083] Preferably, the first coupling region 11a and the second coupling region 11b are arranged on opposite sides in the so-called temple regions of the user's head, namely on the sides of the helmet 100 which protect the temple zones of the user's head. The axis X extends preferably between one temple region and the other one, in particular between the first coupling region 11a and the second coupling region 11b and is preferably the same for both the covering devices 30a, 30b.

[0084] The present disclosure also relates to a method for managing a helmet 100 comprising a cap 10 and a visor 20. The visor is configured to be coupled in a removable manner with the cap 10 in a coupling region 11 of the cap 10. The method comprises:

- providing a covering device 30 able to cover the con-

straining region 11;

- then coupling in a removable manner the covering device 30 with the cap 10 by means of a constraining or coupling portion 31 of the covering device 30 in a first constraining or coupling position, in which a head portion 32 of the covering device 30 is constrained in a first spatial relationship with respect to the cap 10, and coupling in a removable manner the covering device 30 with the cap 10 by means of a constraining or coupling portion 31 of the covering device 30 in a second constraining or coupling position, in which the head portion 32 of the covering device 30 is constrained in a second spatial relationship closer to the cap 10 than in the first spatial relationship. The removable coupling of the covering device 30 with the cap 10 by means of the constraining or coupling portion 31 of the covering device 30 in a first constraining or coupling position occurs by means of elastic deformation of the head portion 32 of the covering device 10 such that the constraining or coupling portion 31 is positioned in the first spatial relationship with respect to the cap 10. Similarly, the removable coupling of the covering device 30 with the cap 10 by means of the constraining or coupling portion 31 of the covering device 30 in a second constraining or coupling position occurs by means of elastic deformation of the head portion 32 of the covering device 10 such that the constraining or coupling portion 31 is positioned in the second spatial relationship with respect to the cap 10.

[0085] Namely, the elastic deformation of the head portion 32, or deformation within the elastic range of the material from which the head portion 32 is made, allows the constraining or coupling portion 31 of the covering device 30 to be positioned in the first constraining or coupling position or in the second constraining or coupling position, according to the needs of the user of the helmet 100, as shown in the attached Figure 7A.

[0086] According to a preferred embodiment, the method may further comprise:

- uncoupling the covering device 30 from the cap 10;
- coupling in a removable manner the visor 20 with the cap 10 in the coupling region 11 of the cap 10 around an axis of rotation X. In other words, the visor 20 may rotate around the axis of rotation X when it is coupled in a removable manner to the cap 10 and the coupling may be performed on the cap 10 along the axis of rotation X.

[0087] The method then comprises:

- coupling again in a removable manner the covering device 30 with the cap 10 by means of the constraining or coupling portion 31 in the first constraining or coupling position, in which the head portion 32 of the covering device 30 is constrained in the first spatial

relationship with respect to the cap.

[0088] In particular, in the first spatial relationship the head portion 32 is further away from the cap 10 along the axis of rotation X) than in the second spatial relationship.

[0089] The coupling again in a removable manner of the covering device 30 with the cap 10 by means of the constraining or coupling portion 31 in the first constraining or coupling position is performed by means of an elastic deformation of the head portion 32 so that the constraining or coupling portion 31 is positioned in said first constraining or coupling position.

[0090] Preferably, the head portion 32 in the second spatial relationship is adjacent to or in contact with the cap 10, in the vicinity of the coupling region 11 of the cap 10.

[0091] Preferably, moreover, in the first spatial relationship the head portion 32 is configured to be adjacent to or in contact with the visor 20 when the latter is coupled to the cap 10.

[0092] In other words, according to the present method, when the visor 20 is uncoupled from the cap 10 it is possible to couple the covering device 30 to the cap 10 in the first or second constraining or coupling position, in which the head portion is in the first and second spatial relationship, respectively, with respect to the cap. Moreover, when the visor 20 is coupled to the cap 10, the covering device 30 may be coupled to the cap 10 in the first position, in which the head portion is in the second spatial relationship and is preferably adjacent to or in contact with the visor 20.

[0093] In other words, when the visor 20 is uncoupled from the cap 10, the covering device 30 may be coupled in the first or second position, in such a way as to be respectively spaced from or in contact with the cap 10. Furthermore, when the visor 20 is coupled with the cap 10, the covering device 30 may be coupled in the first position, in such a way as to be respectively adjacent to or in contact with the visor 20.

[0094] According to one embodiment, when the covering device 30 is in the first constraining or coupling position, the constraining or coupling portion 31 is coupled with a first seat 12a of the cap 10. Furthermore, when the covering device 30 is in the second constraining or coupling position, the constraining or coupling portion 31 is coupled with a second seat 12b of the cap 10.

[0095] For example, the constraining or coupling portion is hook-shaped or L-shaped, while the first seat 12a and the second seat 12b are U-shaped or shaped with a hollow or concave profile. Preferably, a terminal region of the constraining or coupling portion 31 is configured to be coupled in a removable manner with the first seat 12a or with the second seat 12b.

[0096] In particular, the first seat 12a is in a position which is angularly offset around the axis of rotation X and linearly translated along a direction parallel to the axis of rotation X with respect to the second seat 12b.

[0097] For example, in order to be coupled with the first seat 12a or with the second seat 12b, the constraining or coupling portion is translated along the axis of rotation X, for example by means of elastic deformation and subsequently, or beforehand, or simultaneously, it is rotated about the axis X so that the terminal region of the constraining or coupling portion 21 may be coupled in a removable manner with the first seat 12a or with the second seat 12b. The coupling may be made stable, for example by providing a hump or other locating element which prevents the constraining portion from coming out of its seat.

[0098] Preferably, the covering device 30 is configured to perform a rototranslational movement during the step of uncoupling from or coupling in a removable manner with the cap 10, in such a way that the constraining or coupling portion 31 translates along the axis of rotation X and rotates about the same axis of rotation X so as to be uncoupled or coupled in a removable manner from/with the first seat 12a or from/with the second seat 12b of the cap 10.

[0099] According to one embodiment, as mentioned above, the head portion 32 of the covering device 30 is configured so that it can be deformed in an elastic manner in order to cause translation of the constraining or coupling portion 31 along the axis of rotation X during the step of uncoupling or coupling in a removable manner of the covering device 30 from/with the cap 10.

[0100] The helmet according to the present invention has been described hitherto with reference to preferred embodiments thereof. It is to be understood that other embodiments may exist, all of these falling within the scope of protection of the claims which are attached below.

Claims

1. Helmet (100) comprising:

- a cap (10);
 - a visor (20) configured to be coupled in a removable manner to said cap (10) in at least one coupling region (11) of said cap (10) about an axis of rotation (X);
- wherein said helmet (100) further comprises a covering device (30) able to cover said coupling region (11) and comprising a constraining or coupling portion (31) and a head portion (32); and
- wherein said covering device (30) is configured to be coupled in said coupling region (11) in a removable manner to said cap (10) by means of said constraining or coupling portion (31) and to assume at least a first constraining or coupling position and a second constraining or coupling position; and
- wherein in said first constraining position said

head portion (32) is constrained in a first spatial relationship with respect to said cap (10) and wherein in said second constraining position said head portion (32) is constrained in a second spatial relationship with respect to said cap (10); and

wherein in said second spatial relationship said head portion is closer to said cap (10) along said axis of rotation (X) than in said first spatial relationship; and

wherein said covering device (30) is configured to be uncoupled from or coupled in a removable manner to said cap (10) by means of a rototranslational movement; and wherein said head portion (32) of said covering device (30) is configured so that it can be deformed in an elastic manner to allow a translation of said constraining or coupling portion (31) during said rototranslational movement.

2. Helmet (100) according to the preceding claim, wherein said first position corresponds to a condition where said visor (20) is coupled with said cap (10) and said second position corresponds to a condition where said visor (20) is uncoupled from said cap (10), in which the visor is removed or absent.
3. Helmet (100) according to the preceding claim, wherein said first position of said covering device (30) corresponds to a condition where said head portion (32) is in contact with said visor (20).
4. Helmet (100) according to any one of the preceding claims, wherein said constraining or coupling portion (31) of said covering device (30) is configured to be coupled to a first seat (12a) and to a second seat (12b) of said cap (10), wherein a condition where said constraining or coupling portion (31) is coupled with said first seat (12a) corresponds to the first position of said covering device (30), and wherein a condition where said constraining or coupling portion (31) is coupled with said second seat (12b) corresponds to the second position of said covering device (30).
5. Helmet (100) according to the preceding claim, wherein said first seat (12a) is in a position angularly offset around the axis of rotation (X) and linearly translated along a direction parallel to the axis of rotation (X) with respect to the second seat (12b), such that said covering device (30) in said second constraining or coupling position is angularly offset around the axis of rotation (X) and linearly translated with respect to the first constraining or coupling position.
6. Helmet (100) according to claim 4 or 5, wherein said first seat (12a) and/or second seat (12b) comprises

a groove and the cap comprises at least one hump adjacent to the respective groove, and wherein an elastic deformation of the head portion (32) corresponds to a translation of the constraining or coupling portion (31) so as to axially overcome said hump and subsequently, after a rotation around said axis of rotation (X), an elastic return movement of the head portion (32) corresponds to engagement of the coupling portion inside the groove.

7. Helmet (100) according to any one of the preceding claims, wherein said head portion (32) of said covering device (30) is shaped as a dome or has a profile in the form of a circumference arc or ellipse arc.

8. Helmet (100) according to any one of the preceding claims, wherein said first seat (12a) is one of a pair of first seats and said second seat (12b) is one of a pair of second seats, and wherein said pair of first seats is positioned on said cap (10) symmetrically with respect to said axis of rotation (X), and wherein said pair of second seats is positioned on said cap (10) symmetrically with respect to said axis of rotation (X).

9. Helmet (100) according to any one of the preceding claims, wherein said coupling region (11) of said cap (10) is a first coupling region (11a), and said cap (10) comprises a second coupling region (11b), and wherein said visor (20) is configured to be coupled in a removable manner to said cap (10) in said first coupling region (11a) and said second coupling region (11b); and wherein said covering device (30) is a first covering device (30a) and the helmet (100) comprises a second covering device (30b), wherein said first covering device (30a) is configured to be coupled in a removable manner to said cap (10) in said first coupling region (11a) and said second covering device (30b) is configured to be coupled in a removable manner to said cap (10) in said second coupling region (11b).

10. Helmet (100) according to any one of the preceding claims, wherein said elastic deformation of the head portion (32) corresponds to a temporary flattening of said head portion towards said cap (10) and a translation of said constraining portion (11).

11. Helmet (100) according to any one of the preceding claims in combination with claim 7, wherein said elastic deformation of the head portion (32) causes a momentary flattening of the dome, or of the arc profile, or a momentary transition of the dome from a convex profile to a concave profile.

12. Method of managing a helmet (100) comprising a cap (10) and a visor (20), which can be coupled in a removable manner with said cap (10) in a coupling

region (11) of the cap (10), wherein said method comprises the steps of:

- providing a covering device (30) able to cover said coupling region (11);
- subsequently coupling in a removable manner the covering device (30) with said cap (10) by means of a constraining or coupling portion (31) in a first constraining or coupling position, in which a head portion (32) of said covering device (30) is constrained in a first spatial relationship with respect to said cap (10); and wherein the method further comprises the step of coupling in a removable manner the covering device (30) with the cap (10) by means of the constraining or coupling portion (31) in a second constraining or coupling position, wherein in said second position the head portion (32) of the covering device (30) is constrained in a second spatial relationship closer to the cap (10) than in the first spatial relationship; wherein, when said covering device (30) is in said first position, said constraining or coupling portion (31) is coupled with a first seat (12a) of said cap (10), and wherein, when said covering device (30) is in said second position, said constraining or coupling portion (31) is coupled with a second seat (12b) of said cap (10); wherein said first seat (12a) is in an angularly offset position around the axis of rotation (X) and linearly translated along a direction parallel to the axis of rotation (X) with respect to the second seat (12b); and wherein said covering device (30) is configured to perform a rototranslational movement during the step of uncoupling from or coupling in a removable manner with said cap (10), in such a way that said constraining or coupling portion (31) translates along said axis of rotation (X) and rotates about said axis of rotation (X) so as to be uncoupled from or coupled in a removable manner with said first seat (12a) or said second seat (12b) of said cap (10), respectively; and wherein said head portion (32) of the covering device (30) is configured so that it can be deformed in an elastic manner so as to cause the constraining or coupling portion (31) to translate along said rotation axis of rotation (X) during the step of uncoupling or coupling in a removable manner of said covering device (30) from/with said cap (10).

13. Method according to the preceding claim, wherein said method further comprises:

- uncoupling said covering device (30) from said cap (10);
- coupling in a removable manner said visor (20)

with said cap (10) in the coupling region (11) of the cap (10) around an axis of rotation (X);

- coupling again in a removable manner said covering device (30) with said cap (10) by means of said constraining or coupling portion (31) in the first constraining or coupling position, in which said head portion (32) of the covering device (30) is constrained in the first spatial relationship with respect to said cap (10), and

wherein in said first spatial relationship said head portion (32) is further away from said cap (10) along said axis of rotation (X) than in said second spatial relationship.

14. Method according to claim 12, wherein said head portion (32) in said second spatial relationship is adjacent to or in contact with said cap (10), in said coupling region (11) of the cap (10).

15. Method according to the preceding claim, wherein said first seat (12a) and/or second seat (12b) comprises a groove and the cap (10) comprises at least one hump adjacent to the respective groove, and wherein by elastically deforming the head portion (32) the constraining or coupling portion (31) is translated so as to axially overcome said hump and subsequently, following rotation around said axis of rotation (X), the constraining or coupling portion (31) is engaged inside the groove with the simultaneous elastic return movement of the head portion (32).

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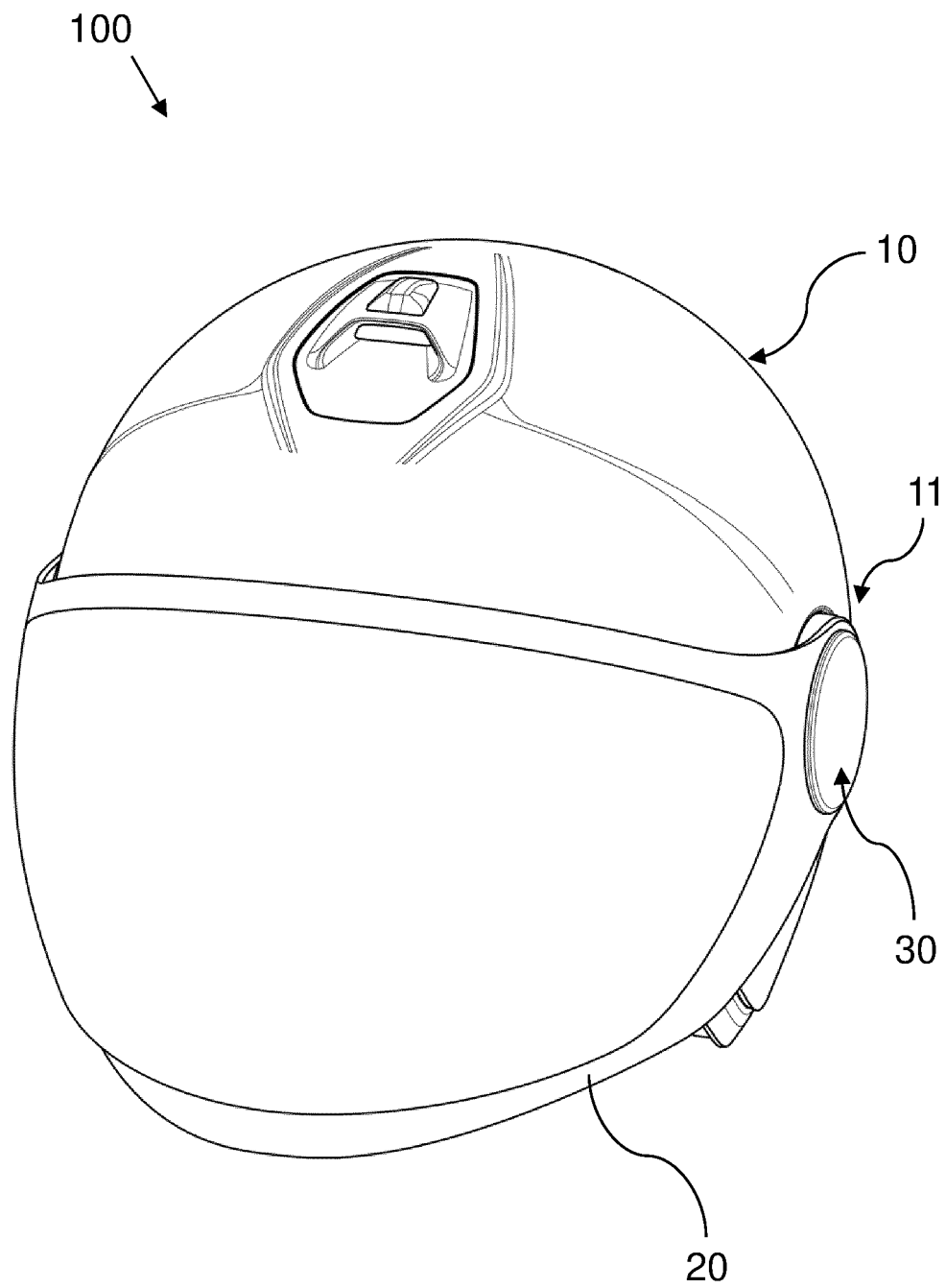


FIG. 1

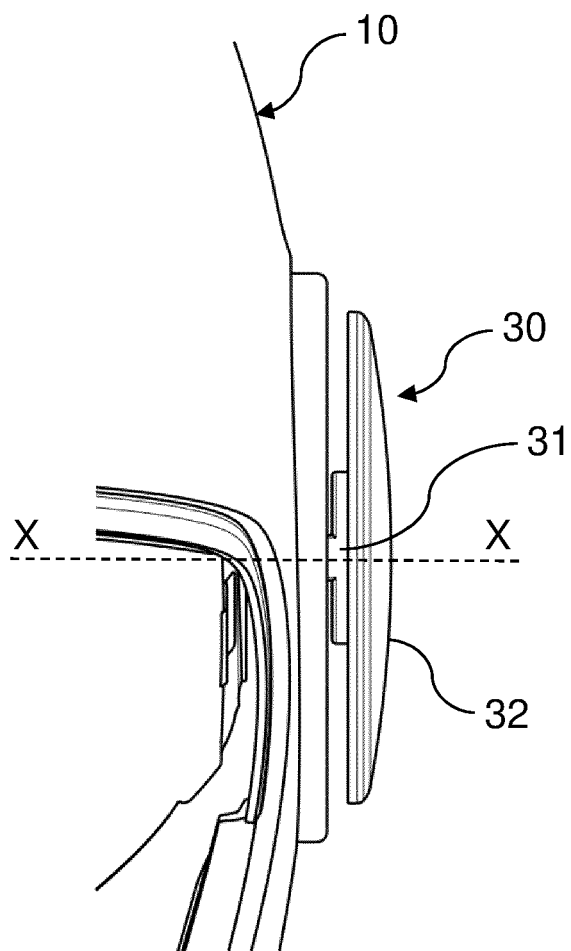


FIG. 2A

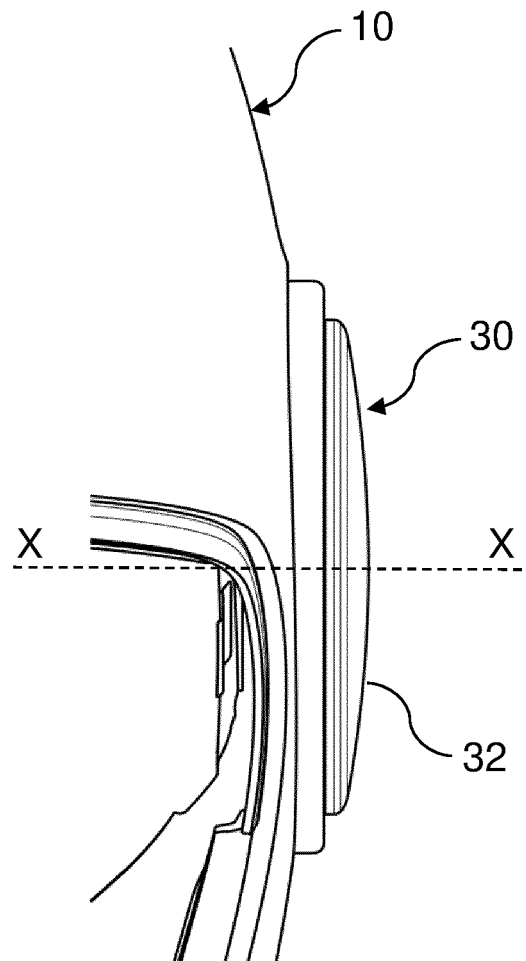


FIG. 2B

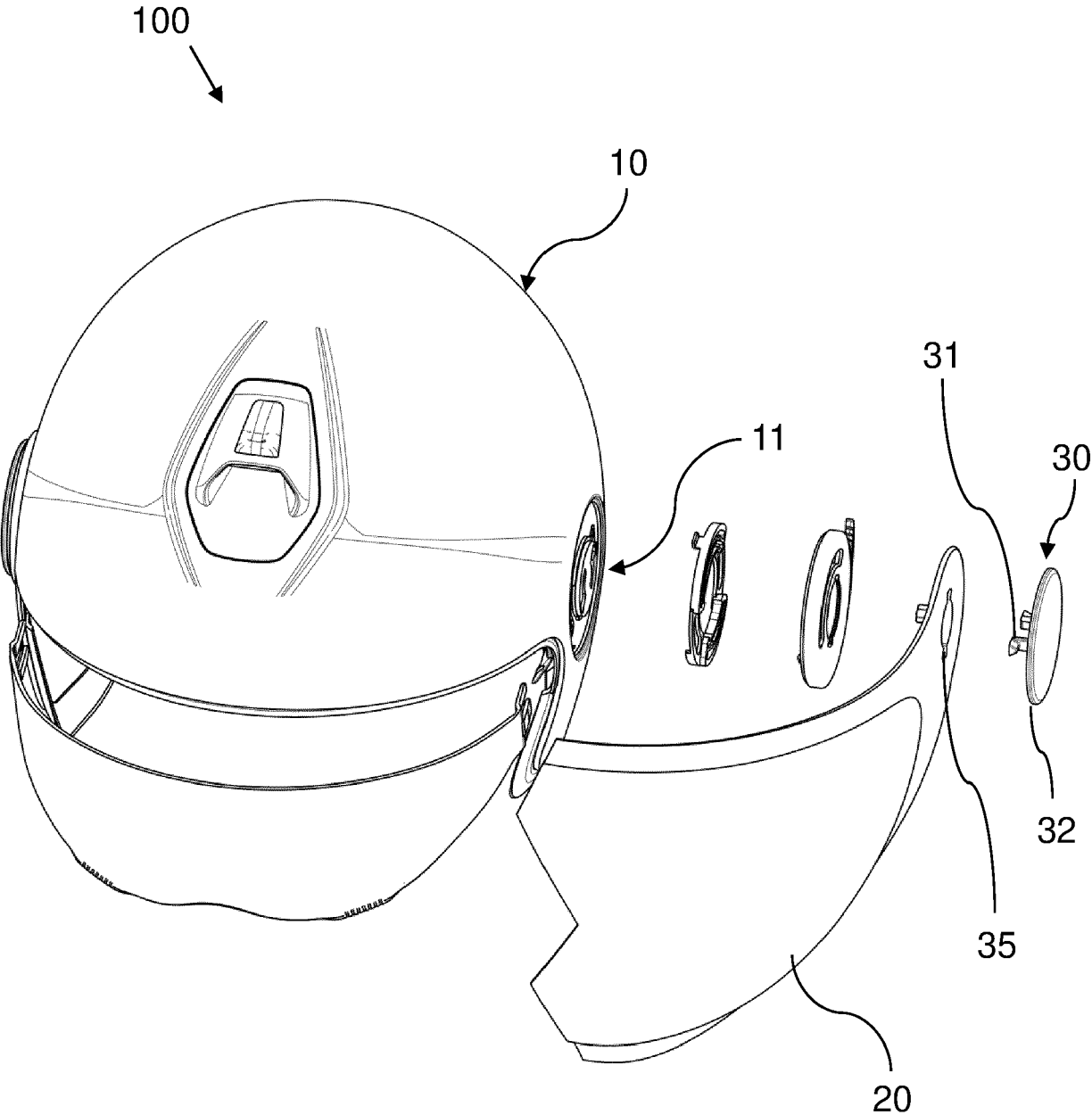


FIG. 3

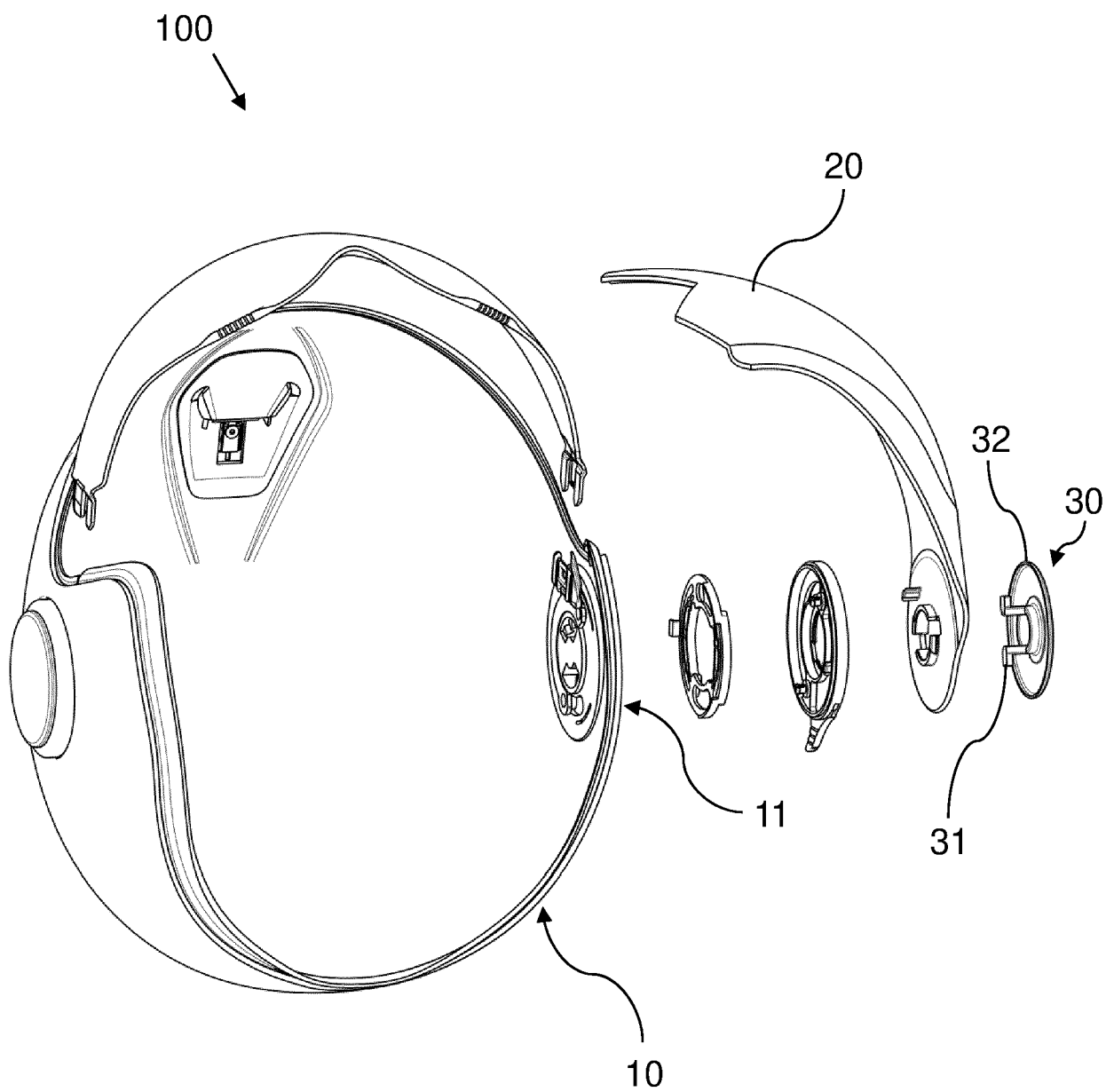


FIG. 4

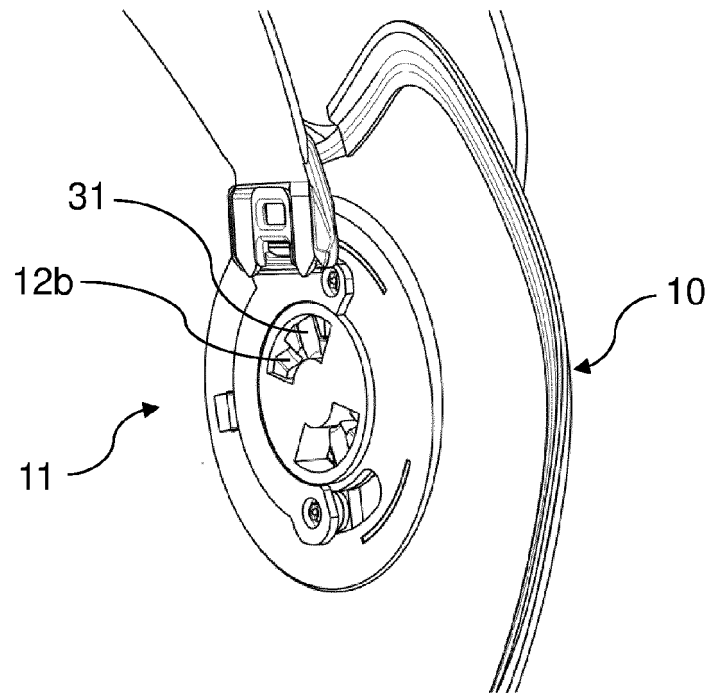


FIG. 5A

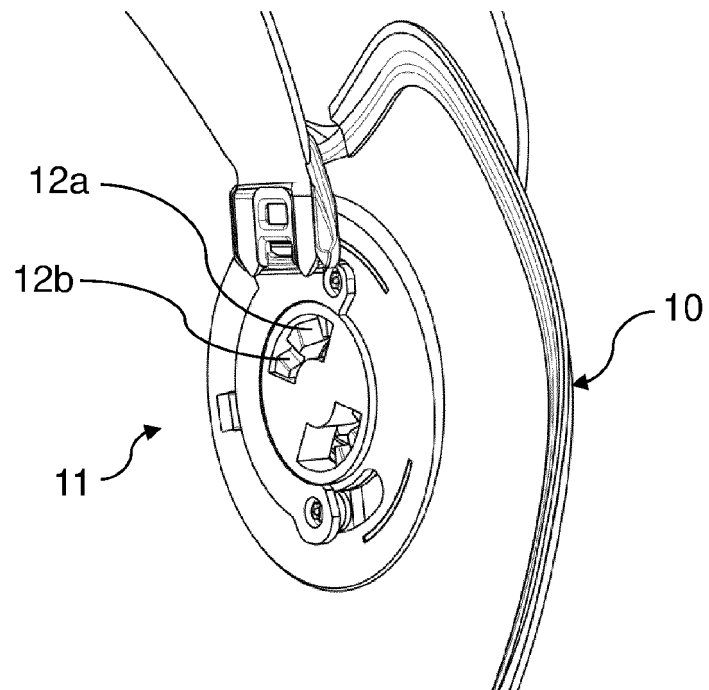


FIG. 5B

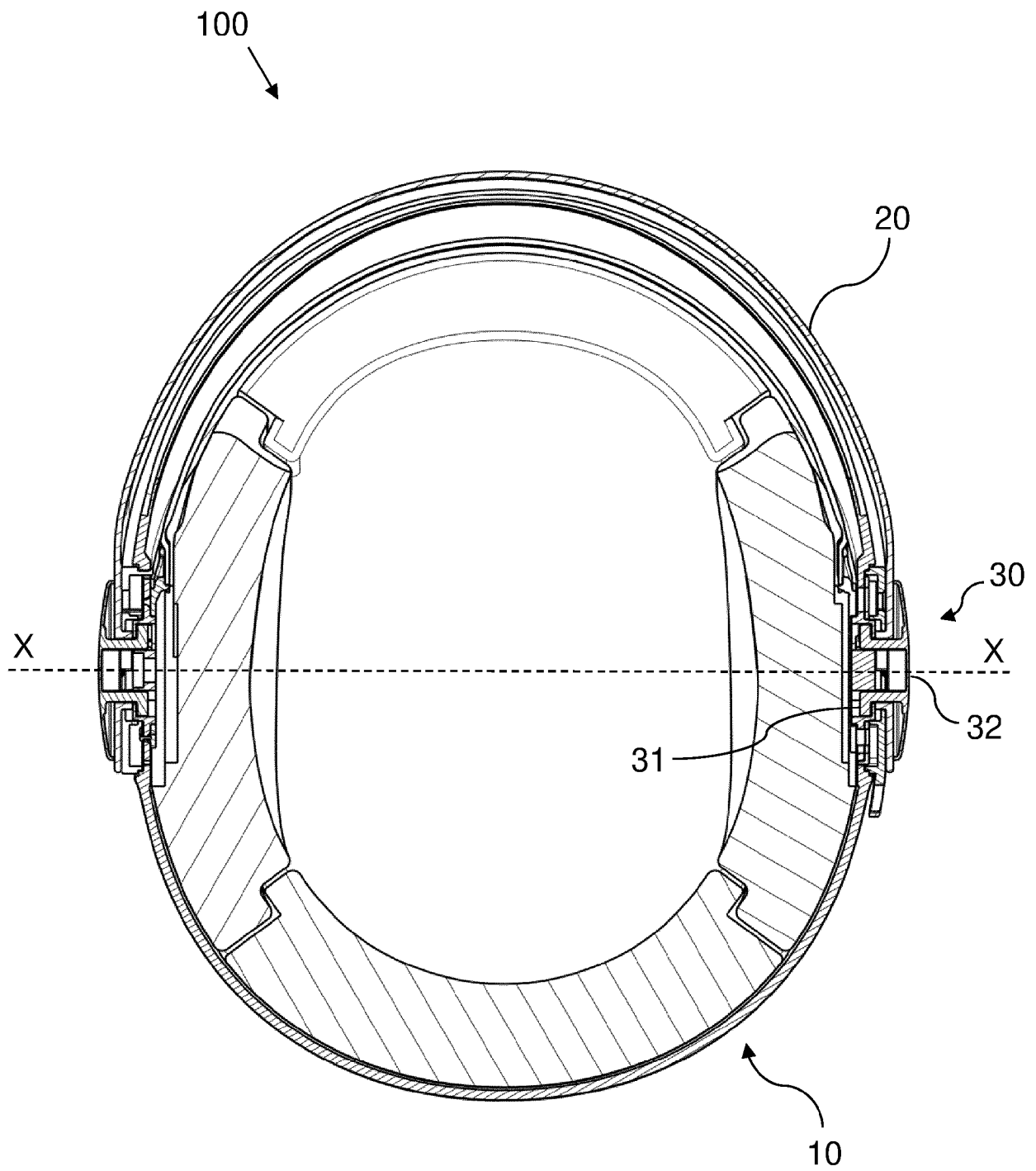


FIG. 6

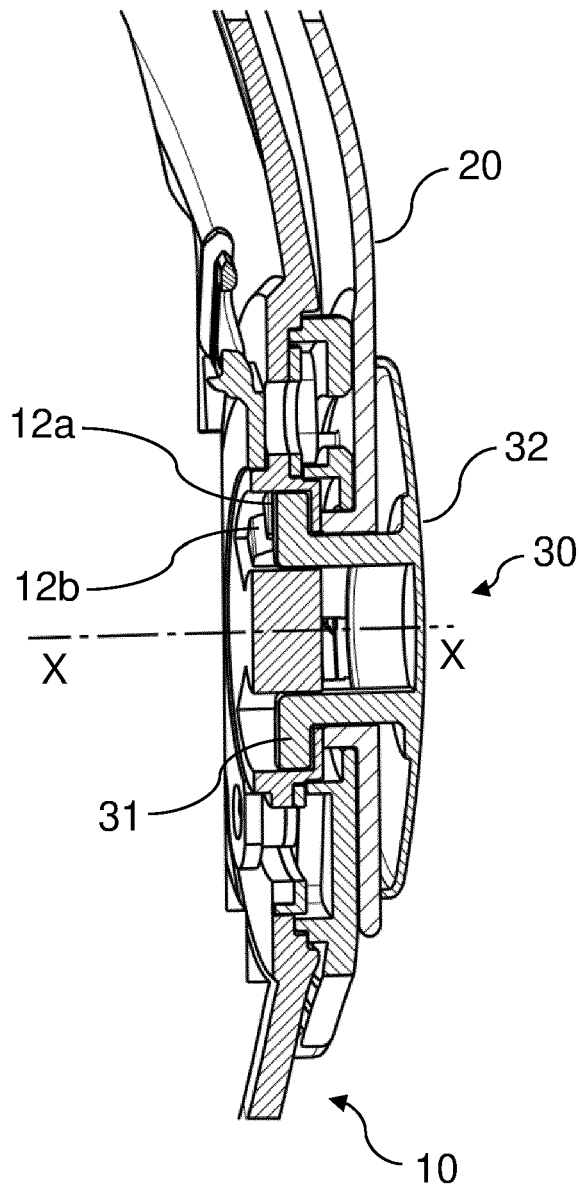


FIG. 7A

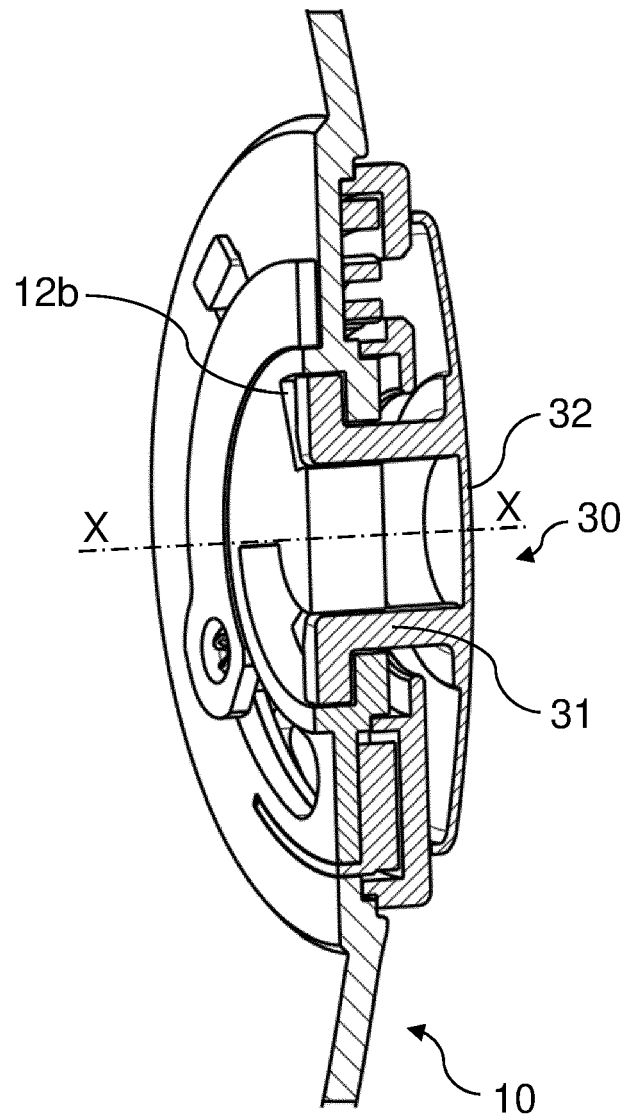


FIG. 7B

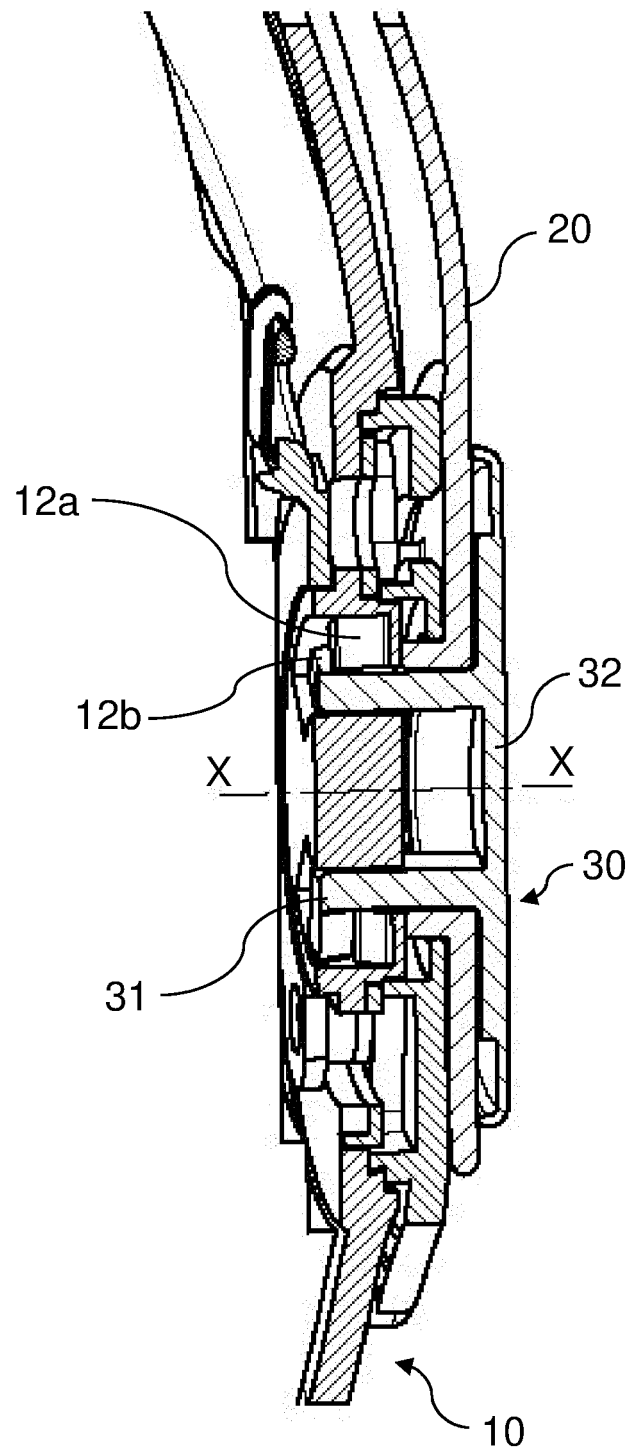


FIG. 7C

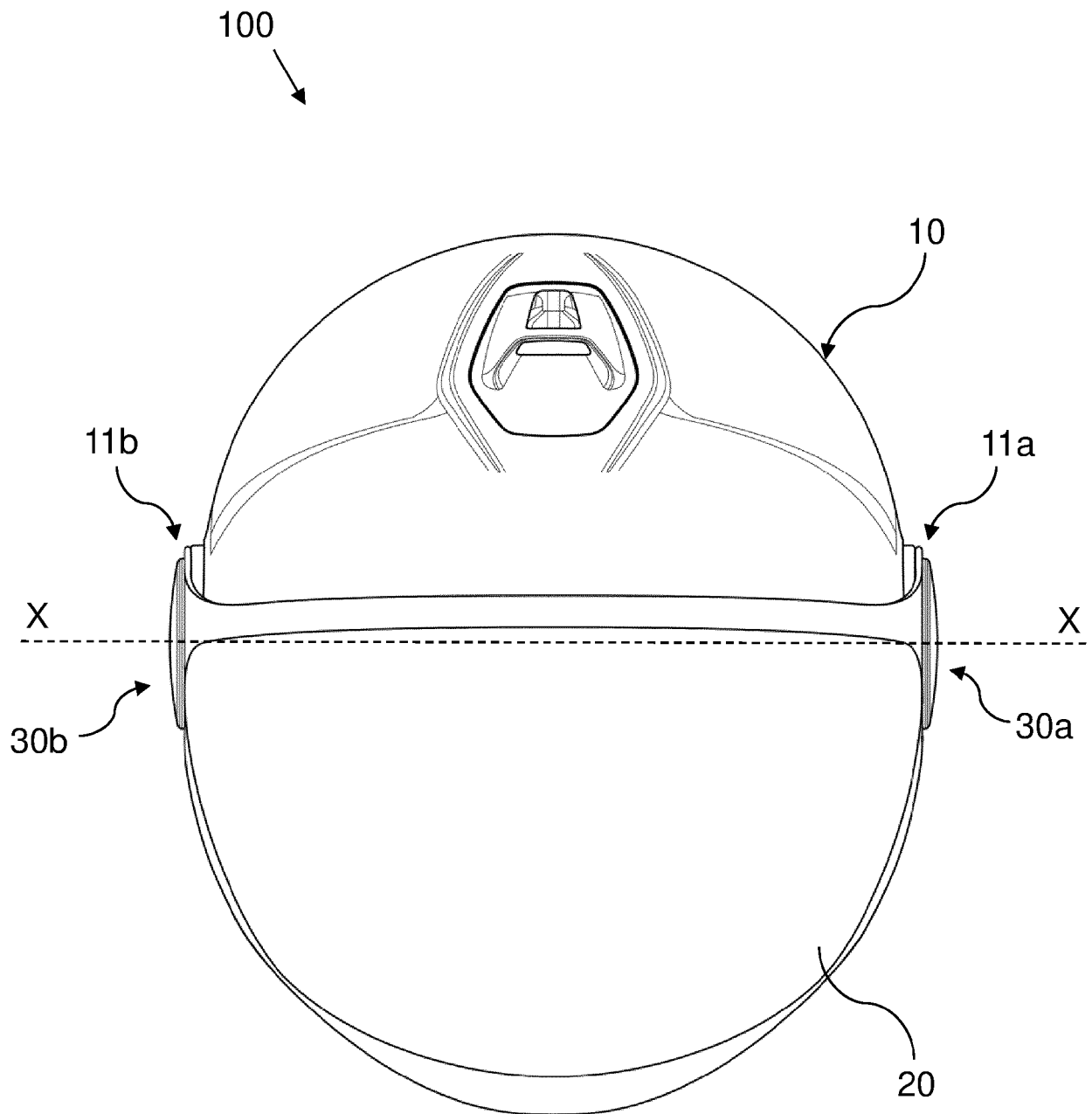


FIG. 8



EUROPEAN SEARCH REPORT

Application Number

EP 23 17 2604

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2007/112989 A1 (MAT GLOBAL SOLUTIONS S L [ES]; TACCIOLI EMILIANO [IT] ET AL.) 11 October 2007 (2007-10-11) * page 4, line 22 - page 5, line 7; figures 1-4 * * page 6, line 19 - page 7, line 19 * -----	1-15	INV. A42B3/22
A	US 2012/284905 A1 (KIM TAE YOUNG [KR]) 15 November 2012 (2012-11-15) * paragraphs [0055] - [0057]; figure 2 * -----	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			A42B
The present search report has been drawn up for all claims			

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EPO FORM 1503 03.82 (P04C01)

Place of search	Date of completion of the search	Examiner
The Hague	29 September 2023	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		

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

EP 23 17 2604

5 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
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29-09-2023

10	Patent document cited in search report	Publication date	Patent family member(s)	Publication date
	WO 2007112989 A1	11-10-2007	NONE	
15	US 2012284905 A1	15-11-2012	EP 2522238 A2 US 2012284905 A1	14-11-2012 15-11-2012
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