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(54) PROTECTIVE HELMET

(57) The present disclosure relates to a helmet (100) for protecting the head of a user, wherein the helmet (100) comprises a cap (101) and an internal cavity (102) having an access zone (121) and intended to accommodate the head of a user. The cap (101) has a front portion (115) defining a front opening and a rear portion (116), and the helmet (100) comprises a chin strap device (10) comprising at least one belt structure (11).

The belt structure (11) is fixed between side portions (117) of the cap (101), or right side portion and left side portion, each comprised between the front portion (115) and the rear portion (116), and the belt structure (11) extends at least between the side portions (117) and the zone (121) for access to the internal cavity (102). A zone of the side portion (117) comprised between the belt structure (11) and the front opening is a front side zone (117a) of the cap, and a zone of the side portion (117) comprised between the belt structure (11) and the rear portion (116) is a rear side zone (117b) of the cap.

Furthermore, the helmet comprises at least one tie element (12a, 12b) which extends along the front side zone (117a), and a first part of the at least one tie element (12a, 12b) is connected to the front side zone (117a) of the cap (101) and a second part of the at least one tie element (12a, 12b) is connected to the belt structure (11).

Furthermore, the at least one tie element (12a, 12b) is a first tie element (12a, 12b) and the helmet comprises at least one second tie element (13a, 13b) which extends along the rear side zone (117b). In particular, a first part of the at least one second tie element (13a, 13b) is connected to the rear side zone (117b) of the cap (101) and a second part of the at least one second tie element (13a, 13b) is connected to the belt structure (11).

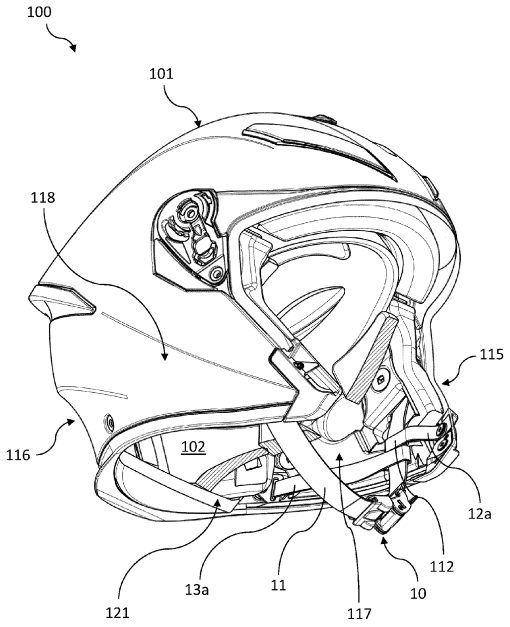

FIG. 1

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Description

[0001] The present disclosure relates in general to the technical sector of protective helmets. More particularly, the present disclosure relates to a protective helmet comprising a cap and a chin strap device, fixed to the cap, and at least one tie element.

[0002] In the sector relating to protective helmets it is known to use a chin strap device, formed for example by a belt fixed to the cap in two side regions of the helmet and configured to be closed underneath the jaw of a user wearing the helmet. The chain strap device according to the prior art is able to prevent accidental removal of the helmet due to a movement of the cap away from the user's head since the chin strap device is able to engage with the user's jaw and prevent movement of the cap.

[0003] This solution, while being advantageous from many points of view, has a number of drawbacks and in particular has not proved to be sufficient to prevent rotation of the helmet.

[0004] In other words, the helmets according to the prior art do not solve the technical problem of improving the performance of the helmet as regards preventing rotation of the cap with respect to the user's head, in particular a rotation tending to expose at least partially a frontal zone of the head. This problem may negatively affect the level of protection offered by the helmet since the cap is unable to protect effectively the whole of the user's head in the event of rotation.

[0005] The starting point of the present disclosure is therefore the technical problem of providing a helmet, which is able to satisfy all the aforementioned requirements with regard to the prior art and overcome the aforementioned drawback and/or achieve further advantages.

[0006] This is obtained by means of a helmet as defined in the respective independent claim. Secondary characteristic features are claimed in the dependent claims.

[0007] In particular, the present disclosure relates to a helmet configured to protect the head of a user and comprising a cap and an internal cavity positioned or defined inside the cap and intended to accommodate the head of a user. In other words, the cap defines an internal cavity intended to accommodate the user's head. Furthermore, the internal cavity has an access zone, configured to allow access of the user's head inside the internal cavity. The cavity also has a front portion, defining a front opening, and a rear portion, opposite to the front portion.

[0008] The helmet also comprises a chin strap device comprising in turn at least one belt structure which is fixed at least to respective side portions of the cap, each comprised between the front portion and the rear portion.

[0009] The expression "cap" is understood, in the context of the present disclosure, as meaning the assembly forming the rigid structure for protecting and accommodating the user's head.

[0010] "Side portions" is understood as meaning the flanks or sides of the cap, when viewing the cap from a front zone.

[0011] In particular, the belt structure extends transversely with respect to the cap between the two side portions of the cap and the zone for access to the internal cavity. Furthermore, a zone of the side portion comprised between the belt structure and the front opening is a front side zone of the cap, and a zone of the side portion comprised between the belt structure and the rear portion is a rear side zone of the cap.

[0012] Consequently, when viewing from the front the cap as worn by a user, the access zone is located underneath the cap, and the chin strap device extends underneath the cap between the two flanks of the latter. For the sake of easier illustration it is to be understood that any spatial reference, such as "above", "below", "front", "rear", "frontal", "right", "left" and similar indications in the context of the present disclosure are to be understood as being of a non-limiting nature, but as referring to when the helmet is in use and therefore in relation to the head of the user wearing the helmet.

[0013] The helmet also comprises at least one first tie element which extends along the front side zone and a second tie element which extends along the rear side zone. In particular, a first part or end of the first tie element is connected to the front side zone of the cap, and a second part of end of the first tie element is connected to the belt structure of the chin strap device. Similarly, a first part or end of the second tie element is connected to the rear side zone and a second part or end of the second tie element is connected to the belt structure of the chin strap device.

[0014] The expression "tie element" is understood as meaning an element which is intended to be tensioned between the belt structure and the portion of the cap to which it is fixed should rotation of the cap occur.

[0015] Preferably, the cap comprises a pair of first tie elements, where each of the two first tie elements extends along a respective front side zone, namely along a front, right-hand, side zone and along a front, left-hand, side zone. Preferably, the cap comprises a pair of second tie elements, where each of the two second tie elements extends along a respective rear side zone, namely along a rear, right-hand, side zone and along a rear, left-hand, side zone.

[0016] The present disclosure also relates to use of a helmet and a method for protecting the head of a user by means of a helmet according to the respective independent claims.

[0017] Basically, according to the present disclosure, it is possible to provide a helmet which comprises at least one first tie element connected, on one side, to the chin strap device and, on the other side, to the cap, in a zone comprised between the chin strap device and the front opening of the cap, so that the at least one tie element may be tensioned so as to oppose rotation of the cap with respect to the user's head.

[0018] Therefore, the helmet according to the present

disclosure is able to solve the problem of rotation of the cap towards the rear zone, also called roll-off, namely the rotation of the cap tending to expose at least partially a frontal zone of the user's head.

[0019] The helmet also comprises a second tie element which is configured to be tensioned in the event of rotation of the cap so as to oppose or prevent rotation of the cap with respect to the user's head, in particular rotation tending to expose during use an occipital zone of the user's head.

[0020] Further advantages, characteristic features and modes of use forming the subject of the present disclosure will become clear from the following detailed description of embodiments thereof, provided by way of a non-limiting example.

[0021] 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.

[0022] Reference will be made to the figures of the attached drawings in which:

- Figure 1 shows a view of a helmet according to an embodiment of the present disclosure;
- Figure 2 shows a cross-sectional view of the helmet according to Figure 1, in which the tie elements are not tensioned;
- Figure 3 shows a cross-sectional view of the helmet according to Figure 1, in which the tie elements are tensioned;
- Figure 4 shows an exploded view of the helmet according to Figure 1;
- Figure 5 shows a view of a helmet according to an embodiment of the present disclosure when worn by a user;
- Figure 6 shows a detailed view of the helmet according to Figure 5.

[0023] With reference to the attached figures, the reference number 100 denotes overall a protective helmet according to an embodiment of the present invention.

[0024] In the description below, reference is made to a helmet in the condition when worn by a user. Therefore, for the purposes of simpler illustration, as mentioned above, it is agreed in the context of the present disclosure that any spatial reference, such as "inner", "outer", "right", "left", "above", "below" is to be understood as being in relation to the head of a user when wearing the helmet. Consequently, for example, an inner side of the helmet is a side of the helmet directed towards the head of the user, and an outer side of the helmet is a side of the helmet directed towards an outer zone opposite to the user's head; or a zone above the helmet is to be understood as being a zone which, when the helmet is worn, is situated above the user's head, a zone below the helmet is a zone which is situated below the helmet when it is worn, and so on.

[0025] The helmet 100 is configured to protect the head of a user and comprises a cap 101 and an internal cavity 102, positioned inside said cap 101 and intended to accommodate the head of a user. Furthermore, the internal cavity 102 has an access zone 121, configured to allow access of the user's head inside the internal cavity 102.

[0026] The cap 101 has a front portion 115 defining a front opening preferably connected to the access zone 121, namely in such a way that the front opening and the access zone 121 form preferably a single opening in the cap 101. The cap also has a rear portion 116, opposite to the front portion 115.

[0027] The helmet 100 also comprises a chin strap device 10 comprising in turn at least one belt structure 11, which is fixed between two side portions 117, 118, namely between a right side portion and a left side portion, of the cap 101. In particular, each side portion of the two side portions 117, 118 is comprised between the front portion 115 and the rear portion 116 and the belt structure 11 extends at least between the side portions 117 and the zone 121 for access to the internal cavity 102.

[0028] In particular, preferably the belt structure is fixed on an inner side of the cap, namely along an inner surface of the cap facing the internal cavity.

[0029] Namely, the belt structure 11 extends between a fixing point on a side portion 117 and a fixing point on the other side portion 118 of the cap 101, crossing a lower region of the helmet 100 where the access zone 121 is located. Even more preferably, in connection with the fixing point, the belt structure 11 is fixed to the side portion 117 of the cap 101 in the vicinity of at least one temple zone of the head of a user wearing the helmet 100.

[0030] Furthermore, a zone of a side portion 117 comprised between the belt structure 11 and the front opening is a front side zone 117a of the cap 101 and a zone of the side portion 117 comprised between the belt structure 11 and the rear portion 116 is a rear side zone 117b of the cap 101. In other words, the belt structure 11 divides the side portion 117 into a front side portion 117a, positioned towards the front opening, and a rear side zone 117b, positioned towards the rear portion 116.

[0031] The helmet also comprises at least one tie element 12a, 12b which extends along the front side zone 117a. In particular, a first part or end of the at least one tie element 12a, 12b is connected to the front side zone 117a of the cap, and a second part or end, preferably opposite to the first end, is connected to the belt structure 11.

[0032] Furthermore, the at least one tie element 12a, 12b is a first tie element 12a, 12b and the helmet comprises at least one second tie element 13a, 13b which extends along the rear side zone 117b. In particular, a first part of the at least one second tie element 13a, 13b

is connected to the rear side zone 117b of the cap 101 and a second part of the at least one second tie element 13a, 13b is connected to the belt structure 11.

[0033] It is to be understood that, in the context of the present disclosure the term "tie element" refers to a preferably ribbon or band or strip like element or an element with any similar form. In particular, a tie element is preferably configured to be tensioned between two points for fixing or connection to other elements of the helmet, for example the belt structure, so as to oppose or prevent rotation of the cap with respect to the head of the user, for example a rotation tending to expose at least partially a frontal zone of the head and/or an occipital zone.

[0034] In other words, during use the belt structure 11 is fixed to the cap 101 in the vicinity of a temple zone of the user's head and is configured to engage with or be coupled with the user's head in a jaw zone so as to keep the user's head inside the internal cavity 102 and therefore prevent removal of the helmet 100. Moreover, during use, the at least one tie element 12a, 12b is associated with the cap 101 in the vicinity of a cheekbone zone of the user and is connected to or fastened or wound around the belt structure 11, so as to be able to engage with it or be coupled to it in order to oppose rotation of the cap 101 with respect to the user's head, in particular a rotation tending to expose during use a frontal zone of the head. The second tie element 13a, 13b operates in a similar manner and opposes rotation of the cap tending to expose during use an occipital zone of the head.

[0035] Preferably, the side portion is a first side portion 117, or right side portion, and moreover the front side zone is a first front side zone 117a and the rear side zone is a first rear side zone 117b.

[0036] In particular, preferably the helmet comprises a second side portion 118, or left side portion, comprised between the front portion 115 and the rear portion 116 and opposite to the first side portion 117. Basically, owing to the geometry of the parts described above, the belt structure 11 extends between the first side portion 117 and the second side portion 118. For example, the first side portion 117 may be right side portion of the cap and the second side portion 118 may be a left side portion of the cap, or vice versa.

[0037] Furthermore, preferably a zone of the second side portion 118 comprised between the belt structure 11 and the front opening is a second front side zone 118a of the cap 101 and a zone of the second side portion 118 comprised between the belt structure 11 and the rear portion 116 is a second rear side zone 118b of the cap 101.

[0038] In particular, moreover preferably the at least one tie element 12a, 12b, namely the first tie element 12a, 12b, is one of a pair of tie elements 12a, 12b, wherein a first tie element of the pair of tie elements 12a, 12b extends along the first front side zone 117a of the cap 101 and the other tie element of the pair of tie elements 12a, 12b extends along the second front side zone 118 of the cap 101.

[0039] Namely, preferably each tie element 12a, 12b of the pair of tie elements 12a, 12b is connected to the respective front side zone, for example right or left side zone, and is furthermore connected to the belt structure in the respective side portion of the cap 101.

[0040] In other words, preferably each of the pair of tie elements 12a, 12b is associated with the cap 101 in the vicinity of the respective cheekbone zone of the user's head, for example in a right or left zone of the cap.

[0041] Preferably, the at least one second tie element 13a, 13b is configured to be tensioned in the event of rotation of the cap 101 so as to oppose or prevent rotation of the cap 101 with respect to the user's head, in particular a rotation tending to expose during use an occipital zone of the user's head.

[0042] Preferably, the pair of tie elements 12a, 12b is a pair of first tie elements 12a, 12b and the at least one second tie element 13a, 13b is one of a pair of second tie elements 13a, 13b. In particular, a first tie element of the pair of second tie elements 13a, 13b extends along the first rear side zone 117b of the cap 101 and the other tie element of the pair of tie elements 13a, 13b extends along the second rear side zone 118b of the cap 101. For example, the first rear side zone 117b is one of a rear, right, side zone and a rear, left, side zone of the cap, while the second rear side zone 118b is the other one of a rear, right, side zone and a rear, left, side zone of the cap. In particular, preferably each of the pair of second tie elements is connected to the respective rear side zone and each one is furthermore connected to the belt structure in the respective side portion of the cap, for example the right or left side portion.

[0043] Preferably, the belt structure 11 comprises a first belt portion 11a and a second belt portion 11b and comprises furthermore a mutual connection mechanism 11c. In particular, the first belt portion 11a is fixed onto the first side portion 117 of the cap 101 and the second belt portion 11b is fixed onto the second side portion 118 of the cap 101. Even more particularly, the mutual connection mechanism 11c is configured to connect in a removable manner a free end of the first belt portion 11a with a free end of the second belt portion 11b.

[0044] In other words, preferably when the mutual connection mechanism 11c connects together the first belt portion 11a and the second belt portion 11b, the belt structure 11 forms a continuous structure which extends from the first side portion 117 of the cap 101 to the second side portion 118 of the cap 101. Furthermore, the mutual connection mechanism 11c may separate the first belt portion 11a and the second belt portion 11b, for example so as to allow removal of the helmet from the user's head.

[0045] The mutual connection device 11c may also be configured to allow lengthening or shortening of the belt structure 11, for example so as to allow more efficient adaptation of the belt structure 11 to the user's head.

[0046] Preferably, the second part of the at least one tie element 12a, 12b, namely that connected to the belt structure 11, has a ring or a loop and the belt structure

11 is inserted so as to pass through and/or slide in the ring or loop.

[0047] Moreover, preferably each of the pair of first tie elements 12a, 12b is connected to the belt structure 11 by means of a ring or a loop, inside which the belt structure 11 is inserted so as to pass through it and/or slide therein. Even more preferably, the first belt portion 11a is inserted so as to pass through and/or slide in a ring or loop of one of the pair of first tie elements 12a, 12b, while the second belt portion 11b is inserted so as to pass through and/or slide in a ring or loop of the other one of the pair of first tie elements 12a, 12b.

[0048] In other words, preferably, the at least one tie element 12a, 12b is configured to slide with respect to the belt structure 11. For example, the belt structure 11 is slidably inserted in a ring portion or loop portion 112 of the at least one tie element 12a, 12b.

[0049] Preferably, the second part of the at least one second tie element 13a, 13b, namely that connected to the belt structure 11, has a ring or a loop and the belt structure 11 is inserted so as to pass through and/or slide in the ring or loop.

[0050] Moreover, preferably each of the pair of second tie elements 13a, 13b is connected to the belt structure 11 by means of a ring or a loop, inside which the belt structure 11 is inserted so as to pass through it and/or slide therein. Even more preferably, the first belt portion 11a is inserted so as to pass through and/or slide in a ring or loop of one of the pair of second tie elements 13a, 13b, while the second belt portion 11b is inserted so as to pass through and/or slide in a ring or loop of the other one of the pair of second tie elements 13a, 13b.

[0051] According to one aspect of the present disclosure, preferably the first part of the at least one tie element 12a, 12b is connected to the front side zone 117b of the cap 101 in a front fixing zone 127a, and the first part of the at least one second tie element 13a, 13b is connected to the rear side zone 117b of the cap 101 in a rear fixing zone 127b. In particular, preferably the front fixing zone 127a is closer to the belt structure 11 than the rear fixing zone 127b. In other words the belt structure 11 is arranged between the front fixing zone 127a and the rear fixing zone 127b and is closer to the front fixing zone 127a than the rear fixing zone 127b.

[0052] Preferably, the at least one first tie element 12a, 12b has a smaller length than the at least one second tie element 13a, 13b. In particular, "length" is understood as meaning the direction which extends along the side portion of the cap between the respective zone for fixing the tie element and the belt structure. Namely, the at least one first tie element 12a, 12b has a smaller length between the front fixing zone 127a and the belt structure 11 than the length of the at least one second tie element 13a, 13b between the rear fixing zone 127b and the belt structure 11.

[0053] Preferably, the protective helmet according to the present disclosure is a helmet without chin guard protection or a helmet comprising a removable chin guard, or a helmet comprising a chin guard which can be opened. For example, the helmet may be a jet or demi-jet helmet or a modular helmet, or a full-face helmet with a chin guard which can be opened.

[0054] The present disclosure also relates to use of a helmet 100 according to one of the embodiments described for protecting the head of a user.

[0055] The present disclosure relates furthermore to a method for protecting the head of a user by means of a helmet 100 comprising a cap 101, namely in order to avoid or prevent rotation of the cap 101 with respect to the head, i.e. to avoid or prevent a roll-off action. In particular, the cap comprises a front portion 115 defining a front opening and a rear portion 116. The helmet further comprises an internal cavity 102 having an access zone 121 and intended to accommodate the head of a user. In particular, the method involves:

- providing a belt structure 11, fixed on a first side portion 117 of the cap 101, comprised between the front portion 115 and the rear portion 116, and furthermore fixed on a second side portion 118 comprised between the front portion 115 and the rear portion 116 and opposite to the first side portion 117. In particular, preferably the belt structure 11 is configured to engage with or surround during use at least one portion of the head of a user, for example a jaw zone of the head, in the access zone 121 of the internal cavity 102.

[0056] The method furthermore involves:

- providing at least one first tie element 12a, 12b which extends along a first front side zone 117a of the cap 101, positioned on the first side portion 117 and comprised between the front portion 115 and the belt structure 11. Furthermore, a first part of the at least one tie element 12a, 12b is connected to the cap 101 in the first front side zone 117a, and a second part of the at least one tie element 12a, 12b is connected to the belt structure 11.

[0057] The method furthermore involves providing at least one second tie element 13a, 13b which extends along a rear side zone 117b of the cap 101, positioned on the first side portion 117 and comprised between the rear portion 116 and the belt structure 11, and wherein a first part of said at least one second tie element 13a, 13b is connected to the rear side zone 117b of the cap 101 and a second part of said at least one second tie element 13a, 13b is connected to the belt structure 11.

[0058] According to the protection method, moreover, when the cap 101 rotates in a rotational movement, the belt structure 11 and the at least one first tie element 12a, 12b and the at least one second tie element 13a, 13b are under tension. In other words the at least one first tie element may be tensioned so as to oppose the rotational movement with respect to the user's head tending to ex-

pose at least partially, during use, a frontal zone of the user's head, namely oppose or prevent the so-called roll-off movement. Similarly, the at least one second tie element may be tensioned so as to oppose the rotational movement with respect to the user's head tending to expose at least partially, during use, an occipital zone of the user's head.

[0059] Preferably, the at least one first tie element 12a, 12b is one of a pair of tie elements 12a, 12b and the other tie element of the pair of tie elements 12a, 12b extends along a second front side zone 118a of the cap 101, positioned on the second side portion 118 and comprised between the front portion 115 and the belt structure 11. Furthermore, preferably a first part of the other tie element of the pair of first tie elements 12a, 12b is connected to the cap 101 in the second front side zone 118a, and a second part of the other tie element of the pair of first tie elements 12a, 12b is connected to the belt structure 11. Furthermore, when the cap 101 rotates in a rotational movement, the belt structure 11 and the pair of first tie elements 12a, 12b are under tension. Namely, the belt structure 11 and the pair of first tie elements 12a, 12b are tensioned so as to oppose the rotational movement with respect to the user's head tending to expose at least partially, during use, a frontal zone of the user's head, namely oppose or prevent the so-called roll-off movement.

[0060] Preferably, moreover, in addition to the pair of first tie elements 12a, 12b, the helmet 100 further comprises a pair of second tie elements 13a, 13b. In particular, said second tie element is one tie element of the pair of second tie elements 13a, 13b which extends along a first rear side zone 117b of the cap 101, positioned on the first side portion 117 and comprised between the rear portion 116 and the belt structure 111, and the other tie element of the pair of second tie elements 13a, 13b extends along a second rear side zone 118b of the cap 101, positioned on the second side portion 118 and comprised between the rear portion 116 and the belt structure 11.

[0061] Furthermore, preferably a first part of said one tie element of the pair of second tie elements 13a, 13b is connected to the cap 101 in the first rear side zone 117b, and a second part of said tie element of said pair of second tie elements 13a, 13b is connected to the belt structure 11, and wherein a first part of the other tie element of the pair of second tie elements 13a, 13b is connected to the cap 101 in the second rear side zone 118b, and a second part of the other tie element of the pair of second tie elements 13a, 13b is connected to the belt structure 11. In particular, preferably, according to the method, when the cap 101 rotates in a first rotational movement towards the rear portion, the belt structure 11 and the pair of first tie elements 12a, 12b are under tension and/or, when the cap 101 rotates in a second rotational movement towards the front part, the belt structure 11 and the pair of second tie elements 13a, 13b are under tension.

[0062] In other words, preferably the belt structure 11 and the pair of first tie elements 12a, 12b are under tension when the cap rotates in a first rotational movement tending to expose a frontal zone of the head of a user, while the belt structure 11 and the pair of second tie elements 13a, 13b are under tension when the cap rotates in a second rotational movement tending to expose an occipital zone of the head of a user.

[0063] Preferably, the second part of the at least one first tie element 12a, 12b, connected to the belt structure 11, has a ring or a loop and, according to the method, the belt structure 11 slides in the ring or loop of the at least one first tie element 12a, 12b.

[0064] Preferably, each of the pair of first tie elements 12a, 12b has a ring or loop 112 in the region where it is connected to the belt structure 11, and the latter slides inside the ring or loop.

[0065] Preferably, the second part of one of the pair of second tie elements 13a, 13b, which is connected to the belt structure 11, has a ring portion or loop portion 112 and the second pair of the other one of the pair of second tie elements 13a, 13b connected to the belt structure 11 has likewise a ring portion or loop portion. Furthermore, preferably, according to the method, the belt structure 11 slides in the ring or loop of one of the pair of second tie elements 13a, 13b and of the other one of the pair of second tie elements 13a, 13b.

[0066] Namely, each of the pair of first tie elements 12a, 12b and each of the pair of second tie elements 13a, 13b is preferably connected to the belt structure 11 by means of a ring or loop, inside which the belt structure 11 slides.

[0067] The subject-matter of the present disclosure has been described hitherto with reference to its embodiments. It is to be 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 below.

Claims

1. Helmet (100) for protecting the head of a user, wherein said helmet (100) comprises a cap (101) and an internal cavity (102) having an access zone (121) and intended to accommodate the head of a user,

   wherein said cap (101) has a front portion (115) defining a front opening and a rear portion (116),
   wherein said helmet (100) comprises a chin strap device (10) comprising at least one belt structure (11),
   wherein the belt structure (11) is fixed between side portions (117), or right side portion and left side portion, of the cap (101) each comprised between the front portion (115) and the rear portion (116) and wherein said belt structure (11) extends at least between said side portions

(117) and said zone (121) for access to the internal cavity (102),
and wherein a zone of a side portion (117) of said side portions comprised between the belt structure (11) and said front opening is a front side zone (117a) of the cap and a zone of said side portion (117) comprised between the belt structure (11) and said rear portion (116) is a rear side zone (117b) of the cap,
and wherein the helmet comprises at least one tie element (12a, 12b) extending along said front side zone (117a), and wherein a first part of said at least one tie element (12a, 12b) is connected to the front side zone (117a) of the cap (101) and a second part of said at least one tie element (12a, 12b) is connected to the belt structure (11), and
wherein said at least one tie element (12a, 12b) is a first tie element (12a, 12b) and the helmet comprises at least one second tie element (13a, 13b) which extends along said rear side zone (117b), and wherein a first part of said at least one second tie element (13a, 13b) is connected to the rear side zone (117b) of the cap (101) and a second part of said at least a second tie element (13a, 13b) is connected to the belt structure (11).

2. Helmet (100) according to the preceding claim, wherein said side portion is a first side portion (117), or right side portion, and said front side zone (117a) is a first front side zone (117a) and said rear side zone (117b) is a first rear side zone (117b)

and wherein the helmet comprises a second side portion (118) or left side portion comprised between the front portion (115) and the rear portion (116) and opposite to the first side portion (117), and wherein said belt structure (11) extends between said first side portion (117) and said second side portion (118),
and wherein a zone of said second side portion (118) comprised between the belt structure (11) and said front opening is a second front side zone (118a) of the cap (101), and a zone of said second side portion (118) comprised between the belt structure (11) and the rear portion (116) is a second rear side zone (118b) of the cap (101),
and wherein said first tie element (12a, 12b) is one of a pair of tie elements (12a, 12b), wherein one of said pair of tie elements (12a, 12b) extends along said first front side zone (117a) of the cap (101) and the other one of said pair of tie elements (12a, 12b) extends along said second front side zone (118a) of the cap (101).

3. Helmet (100) according to the preceding claim, wherein said pair of tie elements (12a, 12b) is a pair of first tie elements (12a, 12b), and wherein said at least one second tie element (13a, 13b) is one of a pair of second tie elements (13a, 13b), wherein one of said pair of second tie elements (13a, 13b) extends along said first rear side zone (117b) of the cap (101) and the other one of said pair of tie elements (13a, 13b) extends along said second rear side zone (118b) of the cap (101).

4. Helmet (100) according to one of claims 2 or 3, wherein said belt structure (11) comprises a first belt portion (11a) and a second belt portion (11b) and a mutual connection mechanism (11c),

wherein said first belt portion (11a) is fixed on said first side portion (117) of the cap (101) and said second belt portion (11b) is fixed on said second side portion (118) of the cap (101),
and wherein said mutual connection mechanism (11c) is configured to connect in a removable manner a free end of said first belt portion (11a) with a free end of said second belt portion (11b).

5. Helmet (100) according to one of the preceding claims, wherein said second part of said at least one tie element (12a, 12b) connected to said belt structure (11) has a ring or a loop and wherein said belt structure (11) is inserted so as to pass through and/or slide in said ring or loop.

6. Helmet (100) according to one of the preceding claims, wherein said second part of said at least one second tie element (13a, 13b) connected to the belt structure (11) has a ring or a loop and wherein said belt structure (11) is inserted so as to pass through and/or slide in said ring or loop.

7. Helmet (100) according to one of the preceding claims, wherein said first part of said at least one tie element (12a, 12b) is connected to the front side zone (117b) of the cap (101) in a front fixing zone (127a),

and wherein said first part of said at least one second tie element (13a, 13b) is connected to the rear side zone (117b) of the cap (101) in a rear fixing zone (127b),
and wherein said front fixing zone (127a) is closer to said belt structure (11) than said rear fixing zone (127b).

8. Helmet (100) according to one of the preceding claims, wherein said at least one first tie element (12a, 12b) has a shorter length than said at least one second tie element (13a, 13b).

9. Helmet (100) according to any one of the preceding

claims, wherein said helmet (100) is a helmet without a chin guard or a helmet comprising a removable chin guard, or a helmet comprising a chin guard which can be opened.

10. Use of a helmet (100) according to any one of the preceding claims for the protection of the head of a user.

11. Method of protecting the head of a user by means of a helmet (100) comprising a cap (101), wherein said cap (101) comprises a front portion (115) defining a front opening and a rear portion (116), and wherein said helmet further comprises an internal cavity (102) having an access zone (121) and intended to accommodate the head of a user, wherein the method involves:

- providing a belt structure (11), fixed on a first side portion (117) of the cap (101), comprised between the front portion (115) and the rear portion (116), and on a second side portion (118), comprised between the front portion (115) and the rear portion (116) and opposite to the first side portion (117);
- providing at least one first tie element (12a, 12b) which extends along a first front side zone (117a) of the cap (101), positioned on the first side portion (117) and comprised between the front portion (115) and the belt structure (11), wherein a first part of the at least one tie element (12a, 12b) is connected to the cap (101), in said first front side zone (117a), and a second part of the at least one tie element (12a, 12b) is connected to the belt structure (11),
- providing at least one second tie element (13a, 13b) which extends along a rear side zone (117b) of the cap, positioned on the first side portion (117) and comprised between the rear portion (116) and the belt structure (11), and wherein a first part of said at least one second tie element (13a, 13b) is connected to the rear side zone (117b) of the cap (101) and a second part of said at least one second tie element (13a, 13b) is connected to the belt structure (11).

wherein, when the cap (101) rotates in a rotational movement, said belt structure (11) and the at least one first tie element (12a, 12b) and/or second tie element (13a, 13b) are under tension.

12. Method according to the preceding claim, wherein said at least one first tie element (12a, 12b) is one of a pair of first tie elements (12a, 12b), wherein the other one of said pair of first tie elements (12a, 12b) extends along a second front side zone (118a) of the cap (101), positioned on the second side portion (118) and comprised between the front portion (115) and the belt structure (11),

and wherein a first part of the other one of said pair of tie elements (12a, 12b) is connected to the cap (101) in said second front side zone (118a), and a second part of said other one of said pair of first tie elements (12a, 12b) is connected to the belt structure (11),
wherein, when the cap (101) rotates in a rotational movement, said belt structure (11) and said pair of first tie elements (12a, 12b) are under tension.

13. Method according to the preceding claim, wherein at least one second tie element (13a, 13b) is one of a pair of second tie elements (13a, 13b) and the other one of said pair of second tie elements (13a, 13b) extends along a second rear side zone (118b) of the cap (101), positioned on the second side portion (118) and comprised between the rear portion (116) and the belt structure (11),

wherein a first part of one of said pair of second tie elements (13a, 13b) is connected to the cap (101) in said first rear side zone (117b), and a second part of said one of said pair of second tie elements (13a, 13b) is connected to the belt structure (11), and wherein a first part of the other one of said pair of second tie elements (13a, 13b) is connected to the cap (101) in said second rear side zone (118b), and a second part of said other one of said pair of second tie elements (13a, 13b) is connected to the belt structure (11), wherein when the cap (101) rotates in a first rotational movement towards the rear portion, said belt structure (11) and said pair of first tie elements (12a, 12b) are under tension and/or when the cap (101) rotates in a second rotational movement towards the front portion, said pair of second tie elements (13a, 13b) are under tension.

14. Method according to the preceding claim, wherein said second part of said at least one tie element (12a, 12b) connected to said belt structure (11) has a ring or loop and wherein, according to the method, said belt structure (11) slides in said ring or loop.

15. Method according to claim 13 or claim 14, wherein said second part of said one of said pair of second tie elements (13a, 13b) connected to the belt structure (11) has a ring or a loop and said second part of said other one of said pair of second tie elements (13a, 13b) connected to the belt structure (11) has a ring or a loop, and
wherein, according to the method, said belt structure (11) slides in said ring or loop of said one of said pair of second tie elements (13a, 13b) and in said ring or

loop of said other one of said pair of second tie elements (13a, 13b).

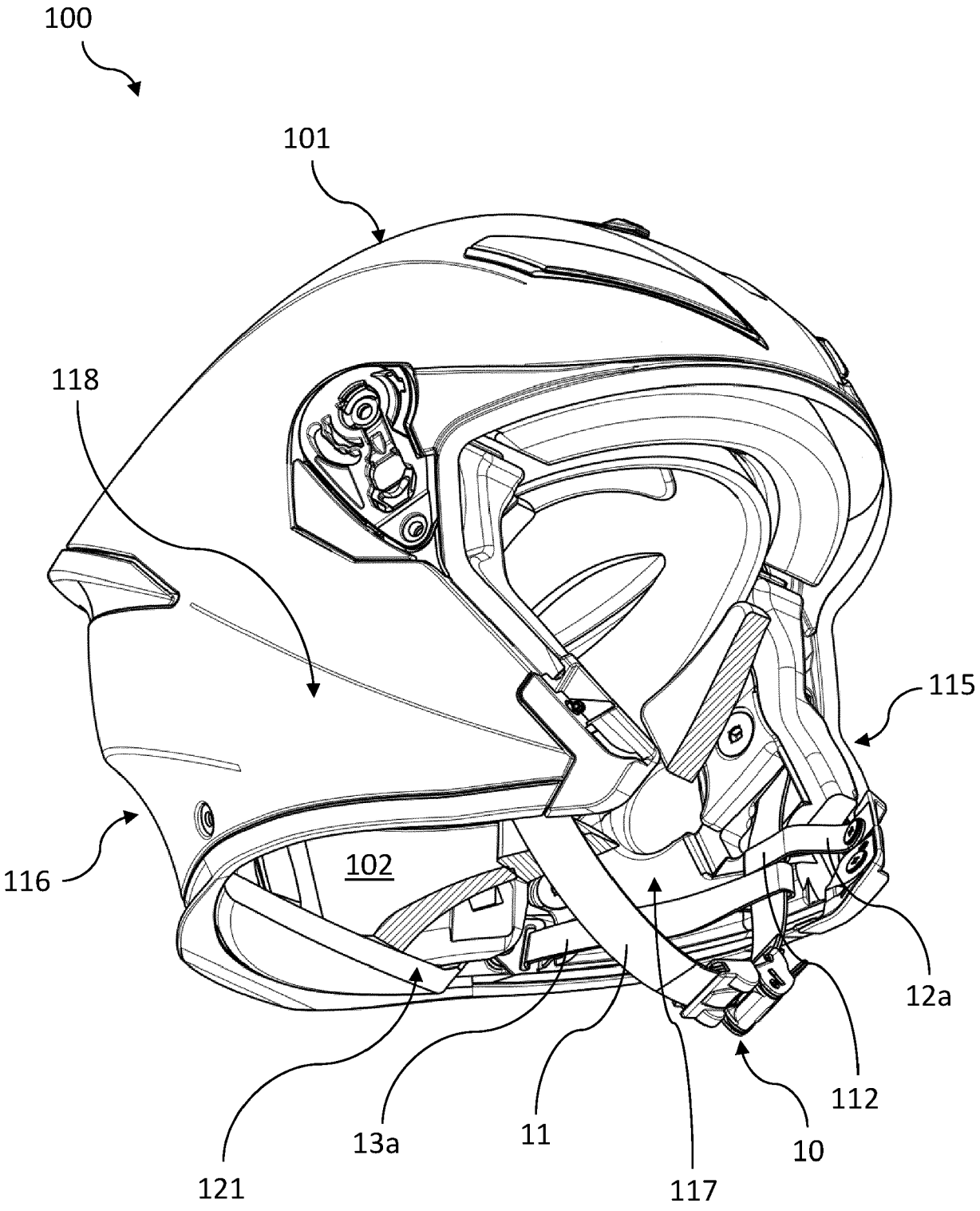

FIG. 1

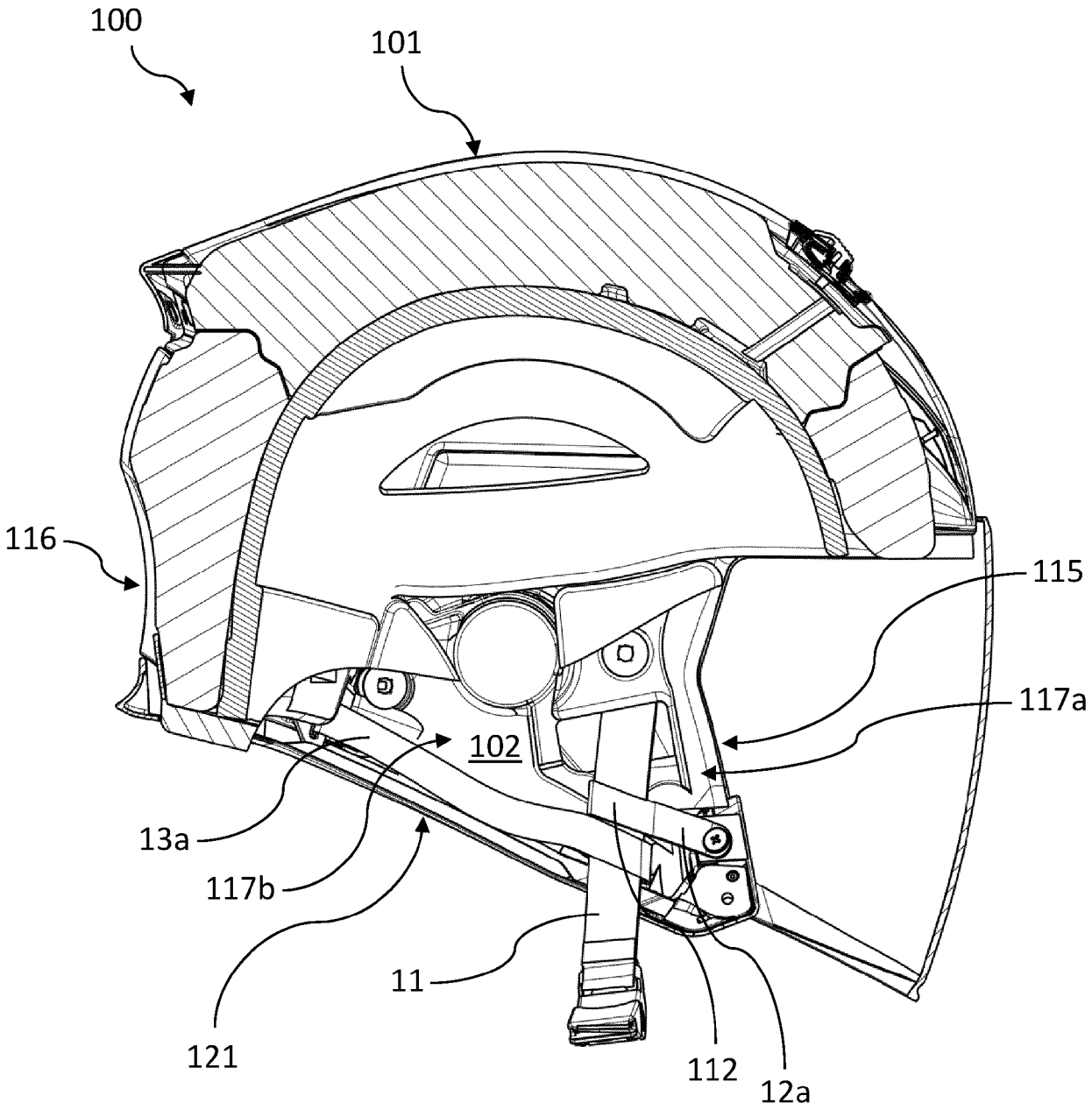

FIG. 2

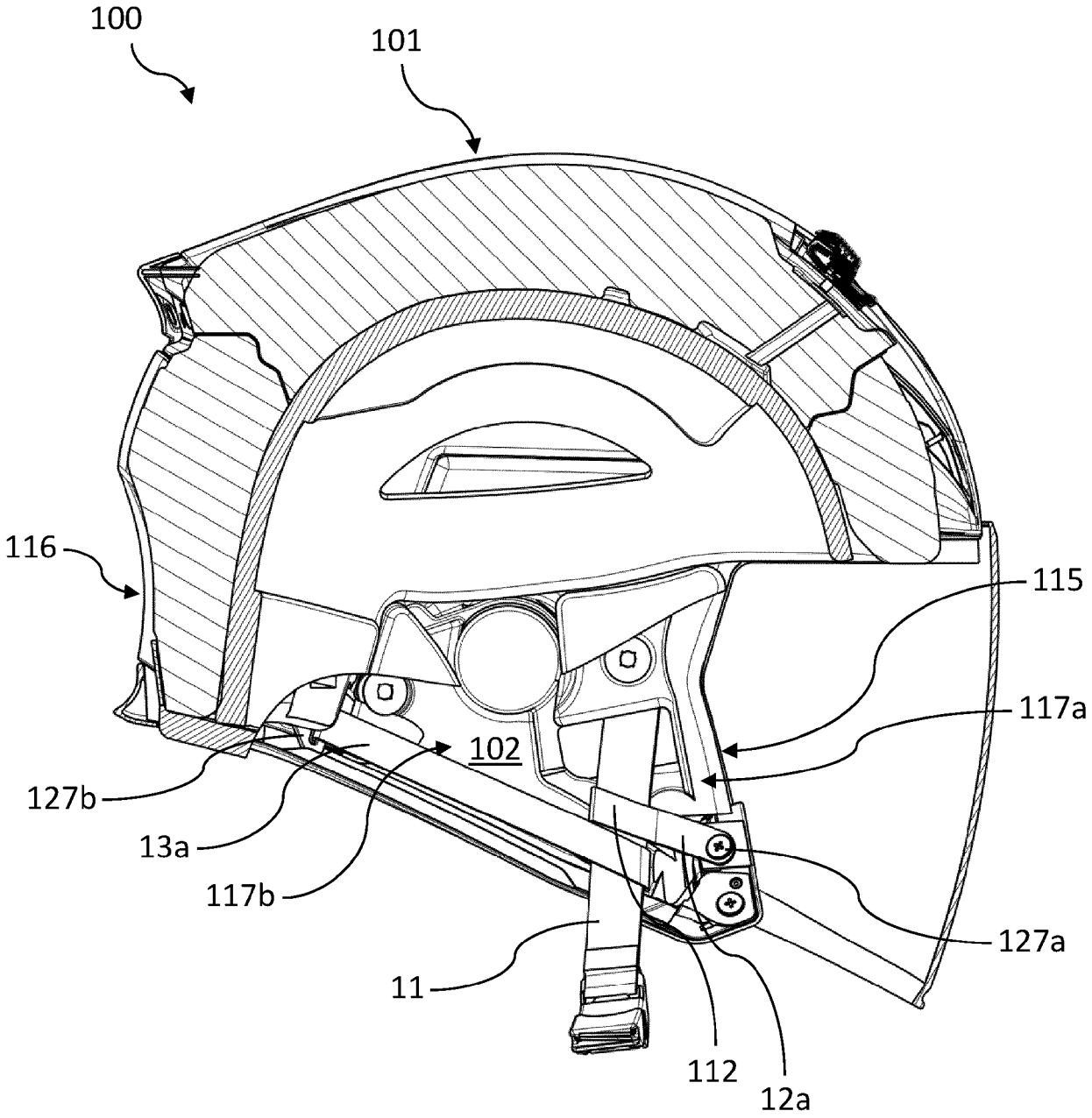

FIG. 3

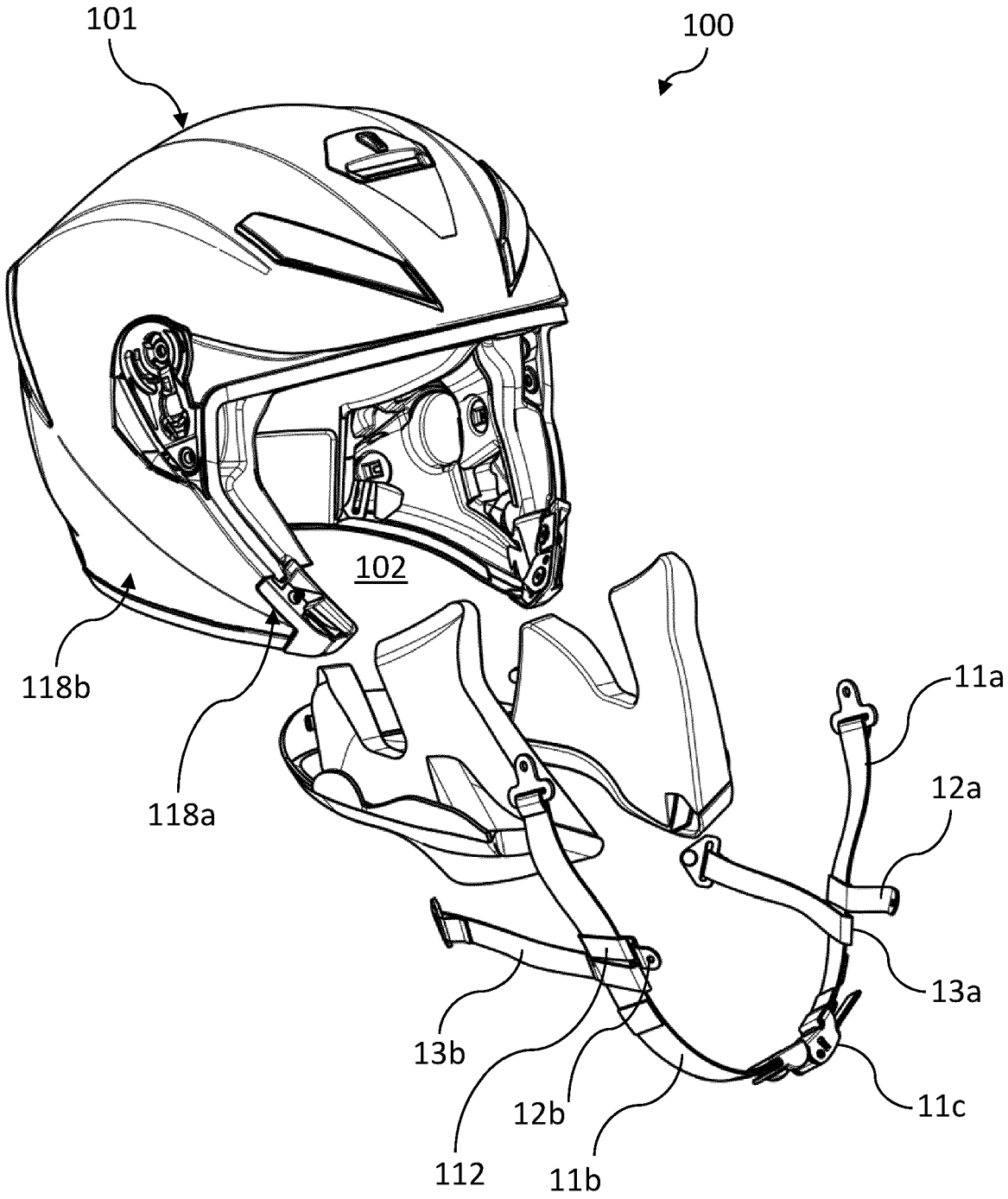

FIG. 4

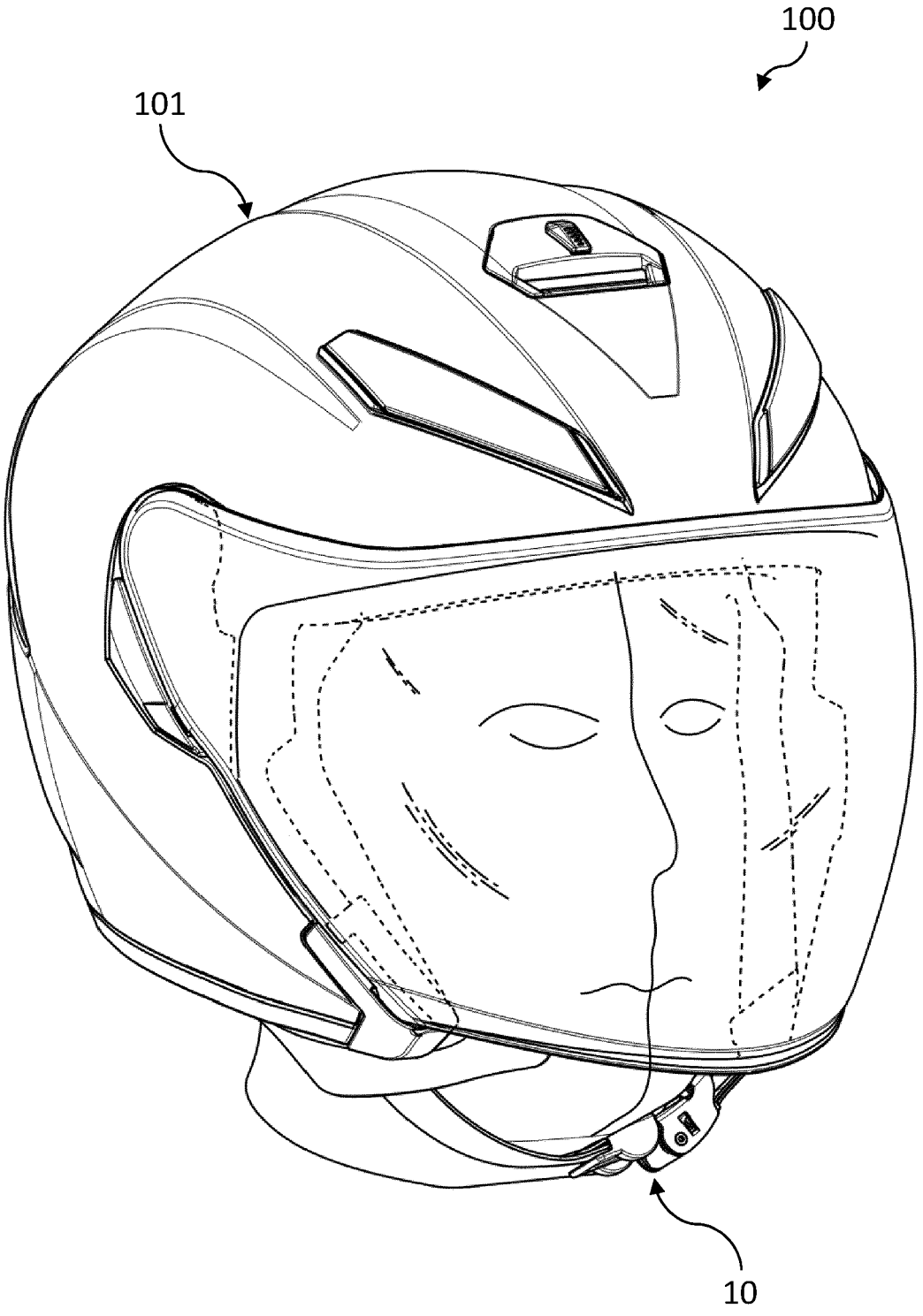

FIG. 5

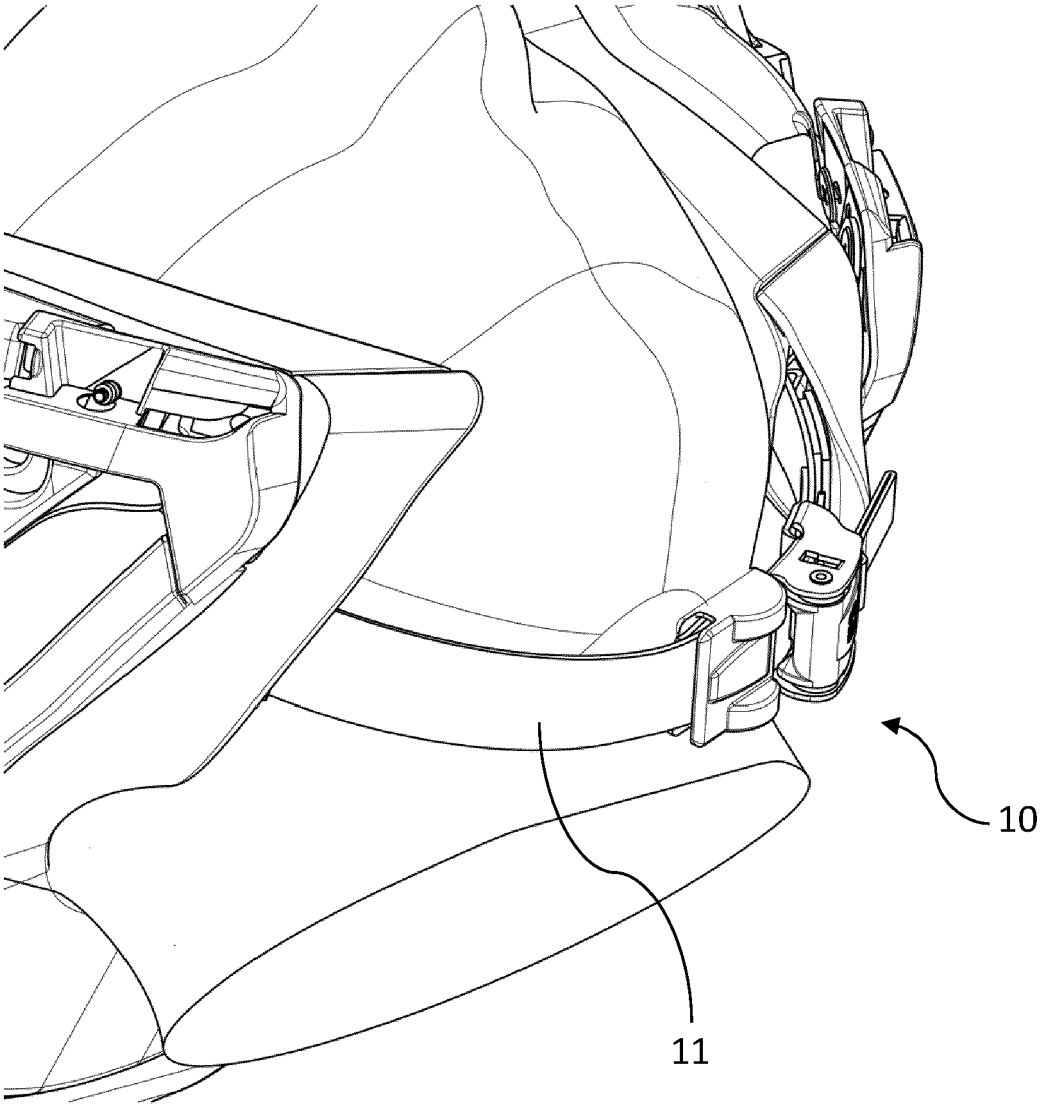

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 23 17 9596

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	DE 33 25 250 A1 (GERICKE HEIN GMBH CO KG [DE]) 24 January 1985 (1985-01-24) * claim 1; figures 1,2 *	1-15	INV. A42B3/08
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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	2 November 2023	D'Souza, Jennifer

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02-11-2023

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