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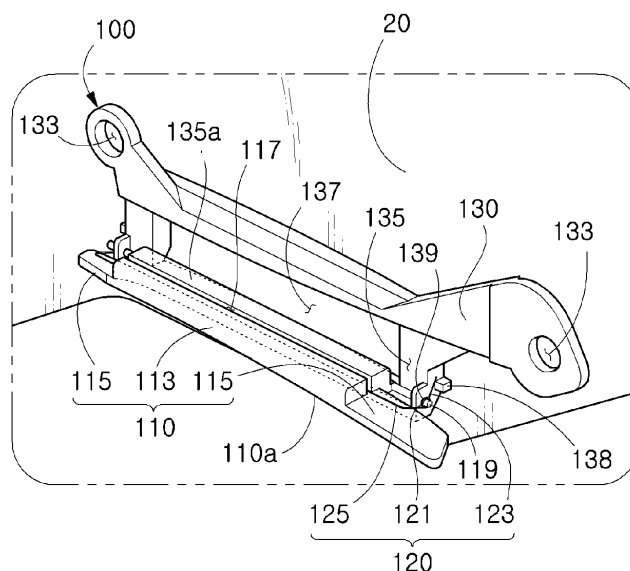
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(54) **CHIN-GUARD GAP ADJUSTMENT MEANS FOR HELMET**

(57) The present disclosure relates to a chin-guard gap adjustment means for a helmet. The chin-guard gap adjustment means (100) for a helmet according to the present disclosure is mounted to a helmet that comprises: a helmet body (10); and a chin guard (20) which is rotatably coupled to the helmet body (10) and can rotate

from a position in front of the chin of a wearer to a position behind or above the helmet body (10). The chin-guard gap adjustment means is coupled to the chin guard (20) and adjusts the space between the chin guard (20) and the helmet body (10).

FIG. 4



Description

[Technical Field]

5 **[0001]** The present disclosure relates to a chin guard gap adjustment means for a helmet.

[Background Art]

10 **[0002]** In general, it is mandatory to wear a helmet while driving a two wheeled vehicle with high speed to protect the wearer's head. The helmet has a front open portion to ensure the wearer's frontal field of view. Additionally, the helmet may include a shield that can selectively open and close the open portion to keep out wind, dust, etc. while driving.

15 **[0003]** Meanwhile, the helmet according to the prior art includes a chin guard (a chin protector) to protect the wearer's chin as disclosed by the patent literature of the related literatures as described below. The chin guard (the chin protector) may be disposed at the rear of an outer shell after pivoting. In this case, an empty space is formed between the chin guard (the chin protector) and the outer shell. Accordingly, when air is introduced into the empty space between the chin guard (the chin protector) and the outer shell while driving, noise is generated and drag increases.

[RELATED LITERATURES]

20 [Patent Literature]

[0004] (Patent Literature 1) KR10-2020-0120051 A

[Disclosure]

25

[Technical Problem]

30 **[0005]** The present disclosure is designed to solve the above-described problem, and therefore an aspect of the present disclosure is directed to a chin guard gap adjustment means for a helmet, including an adjustment member to adjust a space between a chin guard and a helmet body, in order to reduce noise and drag by regulating the infiltration of air into the space between the chin guard and the helmet body while driving.

[Technical Solution]

35 **[0006]** A chin guard gap adjustment means for a helmet according to an embodiment of the present disclosure is mounted in the helmet including a helmet body, and a chin guard which is rotatably coupled to the helmet body and is rotatable from a front side of a wearer's chin to a rear side or an upper side of the helmet body, and is coupled to the chin guard to adjust a space between the chin guard and the helmet body.

40 **[0007]** Additionally, in the chin guard gap adjustment means for the helmet according to an embodiment of the present disclosure, the chin guard gap adjustment means for the helmet includes an adjustment member rotatably coupled to the chin guard, and the adjustment member adjusts an angle between the adjustment member and the chin guard in response to a change of the space between the chin guard and the helmet body.

45 **[0008]** Additionally, in the chin guard gap adjustment means for the helmet according to an embodiment of the present disclosure, the chin guard gap adjustment means for the helmet further includes an elastic member to provide an elastic force to the adjustment member.

50 **[0009]** Additionally, in the chin guard gap adjustment means for the helmet according to an embodiment of the present disclosure, the chin guard gap adjustment means for the helmet includes a fastening member coupled to the chin guard, an adjustment member rotatably coupled to the fastening member, and an elastic member to provide the adjustment member with an elastic force in a direction in which an angle between the adjustment member and the fastening member increases.

[0010] Additionally, in the chin guard gap adjustment means for the helmet according to an embodiment of the present disclosure, the fastening member has a recessed portion in a thicknesswise direction, and when the adjustment member is disposed parallel to the fastening member, the adjustment member is inserted into the recessed portion.

55 **[0011]** Additionally, in the chin guard gap adjustment means for the helmet according to an embodiment of the present disclosure, the adjustment member rotates around a rotation axis in the recessed portion.

[0012] Additionally, in the chin guard gap adjustment means for the helmet according to an embodiment of the present disclosure, an exposed surface of the adjustment member contacts an inner wall of the recessed portion upon the rotation of the adjustment member in a direction in which an angle between the adjustment member and the fastening member

increases.

[0013] Additionally, in the chin guard gap adjustment means for the helmet according to an embodiment of the present disclosure, the recessed portion has an open portion or an auxiliary recessed portion, and the adjustment member includes a body which is inserted into the open portion or the auxiliary recessed portion, and an extended portion which is extended from the body, and comes into contact with a bottom surface of the recessed portion.

[0014] Additionally, in the chin guard gap adjustment means for the helmet according to an embodiment of the present disclosure, the helmet body has a fastening pin which protrudes to be coupled to the chin guard when the chin guard is disposed in front of the wearer's chin, the helmet body has a sloping portion which slopes such that it protrudes as it goes toward the fastening pin from above, and the adjustment member rotates in a direction in which the angle between the adjustment member and the fastening member decreases in contact with the sloping portion.

[0015] The features and advantages of the present disclosure will be apparent from the following detailed description in accordance with the accompanying drawings.

[0016] Prior to the description, it should be understood that the terms or words used in the specification and the appended claims should not be construed as limited to general and dictionary meanings, but rather interpreted based on the meanings and concepts corresponding to the technical spirit of the present disclosure on the basis of the principle that the inventor is allowed to define terms appropriately for the best explanation.

[Advantageous Effects]

[0017] According to the present disclosure, with the adjustment member configured to adjust the space between the chin guard and the helmet body, it is possible to reduce noise and drag by regulating the infiltration of air into the space between the chin guard and the helmet body while driving.

[0018] In addition, according to the present disclosure, since the adjustment member rotates in contact with the sloping portion of the helmet body, it is possible to prevent interferences between the adjustment member and the fastening pin coupled to the chin guard.

[Description of Drawings]

[0019]

FIGS. 1 and 2 are perspective views of a helmet including a chin guard gap adjustment means for a helmet according to an embodiment of the present disclosure.

FIG. 3 is an exploded perspective view of a chin guard gap adjustment means for a helmet according to an embodiment of the present disclosure.

FIGS. 4 to 6 are perspective views of a chin guard gap adjustment means for a helmet according to an embodiment of the present disclosure.

FIG. 7 is a top view of a helmet including a chin guard gap adjustment means for a helmet according to an embodiment of the present disclosure.

FIGS. 8 to 10 are perspective views showing an operation process of a chin guard gap adjustment means for a helmet according to an embodiment of the present disclosure.

FIG. 11 is an exploded perspective view of a chin guard gap adjustment means for a helmet according to another embodiment of the present disclosure.

[Best Mode]

[0020] The objectives, particular advantages and new features of the present disclosure will be apparent from the following detailed description and exemplary embodiments in association with the accompanying drawings. In affixing the reference numbers to the elements of each drawing in the present disclosure, it should be noted that identical elements are given as identical numbers as possible although they are depicted in different drawings. Additionally, the terms such as "first", "second" or the like are used to distinguish one element from another, and the elements are not limited by the terms. Hereinafter, in describing the present disclosure, when it is determined that a certain description of related known technology may unnecessarily obscure the subject matter of the present disclosure, the detailed description is omitted.

[0021] Hereinafter, exemplary embodiments of the present disclosure will be described in detail with reference to the accompanying drawings.

[0022] FIGS. 1 and 2 are perspective views of a helmet including a chin guard gap adjustment means for a helmet according to an embodiment of the present disclosure.

[0023] As shown in FIGS. 1 and 2, a helmet body 10 plays a role in protecting a wearer's head. The helmet body 10

may be made of a shock absorbing material. For example, the helmet body 10 may include an outer shell of hard synthetic resin and having high strength, and an absorber disposed in the outer shell, made of an expanded polystyrene (EPS) foam and having proper strength and elasticity. A pad may be present inside the absorber to improve a snug fit.

[0024] Additionally, a chin guard 20 plays a role in protecting the wearer's chin, and may be extended in an arc shape as a whole so that it is disposed in front of the wearer's chin. In this instance, the chin guard 20 is, at two ends, rotatably coupled to two sides (for example, a ratchet 30) of the helmet body 10, and thus is rotatable from a first predetermined position to a second predetermined position. For example, the first predetermined position may refer to a position (Full Face Mode) when the chin guard 20 is disposed in front of the wearer's chin (see FIG. 1), and the second predetermined position may refer to a position (Open Face Mode) when the chin guard 20 is disposed at the rear of the helmet body 10 (see FIG. 2). However, the second predetermined position does not necessarily refer to the position when the chin guard 20 is disposed at the rear of the helmet body 10, and may refer to a position when the chin guard 20 is disposed above the helmet body 10 (for example, above a shield). The chin guard gap adjustment means 100 for the helmet according to this embodiment is disposed between the helmet body 10 and the chin guard 20, and hereinafter, the chin guard gap adjustment means 100 for the helmet will be described in detail.

[0025] FIG. 3 is an exploded perspective view of the chin guard gap adjustment means for the helmet according to an embodiment of the present disclosure, and FIGS. 4 to 6 are perspective views of the chin guard gap adjustment means for the helmet according to an embodiment of the present disclosure.

[0026] As shown in FIGS. 1 to 6, the chin guard gap adjustment means 100 for the helmet according to this embodiment is mounted in the helmet including the helmet body 10, and the chin guard 20 that is rotatably coupled to the helmet body 10 and is rotatable from the front side of the wearer's chin to the rear side or the upper side of the helmet body 10, and the chin guard gap adjustment means 100 is coupled to the chin guard 20 to adjust a space between the chin guard 20 and the helmet body 10.

[0027] The chin guard gap adjustment means 100 for the helmet may be coupled to the chin guard 20 to adjust the space between the chin guard 20 and the helmet body 10. As shown in FIGS. 3 to 6, the chin guard gap adjustment means 100 for the helmet may include an adjustment member 110. The adjustment member 110 may be formed in a flat plate shape and rotatably coupled to the inner side of the chin guard 20. In this instance, when the space between the chin guard 20 and the helmet body 10 changes, the adjustment member 110 may adjust the angle between the adjustment member 110 and the chin guard 20. For example, when the space between the chin guard 20 and the helmet body 10 becomes wider by the rotation of the chin guard 20, the adjustment member 110 increases the angle between the adjustment member 110 and the chin guard 20 (see FIG. 4). That is, the adjustment member 110 may adjust the widened space between the chin guard 20 and the helmet body 10 by rotation toward being perpendicular to the chin guard 20. On the contrary, when the space between the chin guard 20 and the helmet body 10 becomes narrower by the rotation of the chin guard 20, the adjustment member 110 reduces the angle between the adjustment member 110 and the chin guard 20 (see FIG. 6). That is, the adjustment member 110 may respond to the narrowed space between the chin guard 20 and the helmet body 10 by rotation toward being parallel to the chin guard 20.

[0028] As described above, to allow the adjustment member 110 to rotate in response to the change of the space between the chin guard 20 and the helmet body 10, the chin guard gap adjustment means 100 for the helmet may include an elastic member 120 (see FIGS. 3 to 6). Here, the elastic member 120 provides the adjustment member 110 with an elastic force in a direction in which the angle between the adjustment member 110 and the chin guard 20 increases. In the end, since one side of the adjustment member 110 is rotatably coupled to the inner side of the chin guard 20, and the elastic force is provided to the adjustment member 110 by the elastic member 120 in the direction in which the angle between the adjustment member 110 and the chin guard 20 increases, the other side of the adjustment member 110 (the opposite side to the side coupled to the inner side of the chin guard 20) is kept in contact with the outer surface of the helmet body 10. Accordingly, the adjustment member 110 may rotate with respect to the chin guard 20 in response to the change of the space between the chin guard 20 and the helmet body 10 by the rotation of the chin guard 20. As a result, the adjustment member 110 may adjust the space between the chin guard 20 and the helmet body 10 in response to the change of the space between the chin guard 20 and the helmet body 10. However, the other side of the chin guard 20 is not necessarily kept in contact with the outer surface of the helmet body 10, and may be spaced apart from the outer surface of the helmet body 10.

[0029] As shown in FIG. 7, when the chin guard 20 is in the second predetermined position (Open Face Mode), air may be introduced into the space between the chin guard 20 and the helmet body 10 while driving, and the adjustment member 110 may adjust (for example, close) the space, to prevent the infiltration of air, in order to reduce noise and drag.

[0030] More specifically, the chin guard gap adjustment means 100 for the helmet may further include a fastening member 130 (see FIGS. 3 to 6). Here, the fastening member 130 may be coupled to the inner side of the chin guard 20, and the adjustment member 110 may be rotatably coupled to the fastening member 130. Specifically, the fastening member 130 may be coupled to the inner side of the chin guard 20 by inserting screws (not shown) into fastening holes 133 at two ends. Additionally, the fastening member 130 may have a recessed portion 135 in the thicknesswise direction, and when the adjustment member 110 is disposed parallel to the fastening member 130 (when the angle between the

adjustment member 110 and the fastening member 130 is minimum, see FIG 6), the adjustment member 110 may be inserted into the recessed portion 135 of the fastening member 130. As described above, when the adjustment member 110 is inserted into the recessed portion 135 of the fastening member 130, the adjustment member 110 may not protrude toward the helmet body 10.

[0031] Meanwhile, the adjustment member 110 may rotate around a rotation axis in the recessed portion 135. As shown in FIGS. 3 and 4, the recessed portion 135 may have an insertion hole 139 in two sidewalls, and the adjustment member 110 may have an insertion protrusion 119 at two ends, and when the insertion protrusions 119 of the adjustment member 110 are inserted into the insertion holes 139 of the recessed portion 135, the adjustment member 110 may rotate with respect to the insertion protrusion 119. That is, the insertion protrusions 119 may be the rotation axis of the adjustment member 110. In this instance, since the rotation axis of the adjustment member 110 is disposed in the recessed portion 135, when the adjustment member 110 rotates in a direction in which the angle between the adjustment member 110 and the fastening member 130 increases, as a result, an exposed surface 110a of the adjustment member 110 contacts an inner wall 135a of the recessed portion 135 (see FIGS. 3 and 4). That is, the adjustment member 110 may rotate in a direction in which the angle between the adjustment member 110 and the fastening member 130 increases, and stop rotating when the exposed surface 110a of the adjustment member 110 contacts the inner wall 135a of the recessed portion 135. In the end, the adjustment member 110 may not rotate any more after rotating up to the predetermined angle (for example, perpendicular to the fastening member 130) between the adjustment member 110 and the fastening member 130.

[0032] In addition, the recessed portion 135 of the fastening member 130 may have an open portion 137 penetrating therethrough in the thicknesswise direction. In this instance, the adjustment member 110 may include a body 113 that is inserted into the open portion 137 of the recessed portion 135, and an extended portion 115 extended from two ends of the body 113 and having a smaller thickness than the body 113. Here, the extended portion 115 comes into contact with a bottom surface (an area without the open portion 137) of the recessed portion 135. As described above, since the body 113 of the adjustment member 110 is inserted into the open portion 137 of the recessed portion 135, it is possible to design the fastening member 130 with the minimum thickness while preventing the adjustment member 110 from protruding toward the helmet body 10. However, the recessed portion 135 of the fastening member 130 may not have the open portion 137 penetrating therethrough, and as shown in FIG. 11, the recessed portion 135 may have an auxiliary recessed portion 137a that does not penetrate therethrough and is recessed in the thicknesswise direction, and the body 113 of the adjustment member 110 may be inserted into the auxiliary recessed portion 137a.

[0033] Additionally, when the adjustment member 110 rotates in a direction in which the angle between the adjustment member 110 and the fastening member 130 decreases, as a result, the extended portion 115 of the adjustment member 110 comes into contact with the bottom surface of the recessed portion 135 (see FIG. 6). That is, the adjustment member 110 may rotate in the direction in which the angle between the adjustment member 110 and the fastening member 130 decreases, and stop rotating when the extended portion 115 of the adjustment member 110 comes into contact with the bottom surface of the recessed portion 135. In the end, the adjustment member 110 may not rotate any more after rotating up to the predetermined angle (for example, parallel to the fastening member 130) between the adjustment member 110 and the fastening member 130.

[0034] Meanwhile, the elastic member 120 is not limited to a particular type, but may be, for example, a torsion spring. As shown in FIGS. 3 and 4, a coil portion 121 of the elastic member 120 may be disposed around the insertion protrusion 119, a first connection portion 123 of the elastic member 120 may be attached to a fixing protrusion 138 (formed adjacent to the insertion hole 139) of the fastening member 130, and a second connection portion 125 of the elastic member 120 may be inserted into a fastening groove 117 that is recessed along the lengthwise direction on one surface (a surface facing the chin guard 20) of the adjustment member 110. In the end, when the first connection portion 123 is attached to the fixing protrusion 138 of the fastening member 130 and the second connection portion 125 is inserted into the fastening groove 117 of the adjustment member 110, the elastic member 120 may provide the elastic force to the adjustment member 110. More specifically, the elastic member 120 may have two coil portions 121 that may be each disposed around each of the insertion protrusions 119 at two ends of the adjustment member 110, and the two coil portions 121 may be connected to each other by the second connection portion 125 inserted into the fastening groove 117 of the adjustment member 110. In the end, the second connection portion 125 of the elastic member 120 may be provided with the elastic force from the two coil portions 121 on two sides, and by the contact with the adjustment member 110 all along the lengthwise direction of the adjustment member 110, the elastic force of the elastic member 120 may be stably transmitted to the adjustment member 110.

[Mode for Invention]

[0035] As shown in FIG. 8, the helmet body 10 may have a fastening pin 15 that protrudes to be coupled to the chin guard 20 when the chin guard 20 is in the first predetermined position (the position (Full Face Mode) when the chin guard 20 is disposed in front of the wearer's chin). In this instance, the helmet body 10 may have a sloping portion 17

to prevent interferences between the adjustment member 110 and the fastening pin 15. Specifically, the sloping portion 17 may be formed at the rear of the fastening pin 15 of the helmet body 10, and slope such that it protrudes as it goes toward the fastening pin 15 (downward) from the above. In this instance, the sloping portion 17 at the rear of the fastening pin 15 may be formed at higher position than the fastening pin 15, taking into account the angle of the adjustment member 110.

[0036] As shown in FIGS. 8 to 10, while the chin guard 20 rotates from the second predetermined position (Open Face Mode) to the first predetermined position (Full Face Mode), the adjustment member 110 rotates in the direction in which the angle between the adjustment member 110 and the fastening member (130, the chin guard 20) decreases in contact with the sloping portion 17 that protrudes as it goes toward the fastening pin 15 (downward). That is, the adjustment member 110 may rotate so that it is disposed parallel to the fastening member 130 by the sloping portion 17 and may be inserted into the recessed portion 135 of the fastening member 130 (see FIG. 9). Accordingly, the adjustment member 110 may not protrude toward the helmet body 10, and as a result, it is possible to prevent interferences between the adjustment member 110 and the fastening pin 15 (see FIGS. 9 and 10).

[0037] While the present disclosure has been hereinabove described in detail through the specific embodiments, this is provided to describe the present disclosure in detail, and the present disclosure is not limited thereto, and it is obvious that modifications or changes may be made thereto by those having ordinary skill in the art within the technical spirit of the present disclosure.

[0038] Such modifications and changes of the present disclosure fall in the scope of the present disclosure, and the scope of protection of the present disclosure will be apparent by the appended claims.

[Detailed Description of Main Elements]

[0039]

10:	Helmet body	15:	Fastening pin
17:	Sloping portion	20:	Chin guard
100:	Chin guard gap adjustment means for helmet		
110:	Adjustment member		
113:	Body	115:	Extended portion
117:	Fastening groove	119:	Insertion protrusion
120:	Elastic member	121:	Coil portion
123:	First connection portion	125:	Second connection portion
130:	Fastening member	133:	Fastening hole
135:	Recessed portion	137:	Open portion
138:	Fixing protrusion	139:	Insertion hole

[Industrial Applicability]

[0040] The present disclosure provides the chin guard gap adjustment means for the helmet, including the adjustment member to adjust the space between the chin guard and the helmet body in order to reduce noise and drag by regulating the infiltration of air into the space between the chin guard and the helmet body while driving.

Claims

1. A chin guard gap adjustment means for a helmet, wherein the chin guard gap adjustment means is mounted in the helmet comprising a helmet body, and a chin guard which is rotatably coupled to the helmet body and is rotatable from a front side of a wearer's chin to a rear side or an upper side of the helmet body, wherein the chin guard gap adjustment means is coupled to the chin guard to adjust a space between the chin guard and the helmet body.
2. The chin guard gap adjustment means for the helmet according to claim 1, wherein the chin guard gap adjustment means for the helmet comprises an adjustment member rotatably coupled to the chin guard, and wherein the adjustment member adjusts an angle between the adjustment member and the chin guard in response to a change of the space between the chin guard and the helmet body.

3. The chin guard gap adjustment means for the helmet according to claim 2, wherein the chin guard gap adjustment means for the helmet further comprises an elastic member to provide an elastic force to the adjustment member.

5 4. The chin guard gap adjustment means for the helmet according to claim 1, wherein the chin guard gap adjustment means for the helmet comprises:

10 a fastening member coupled to the chin guard;
an adjustment member rotatably coupled to the fastening member; and
an elastic member to provide the adjustment member with an elastic force in a direction in which an angle
between the adjustment member and the fastening member increases.

15 5. The chin guard gap adjustment means for the helmet according to claim 4, wherein the fastening member has a recessed portion in a thicknesswise direction, and
wherein when the adjustment member is disposed parallel to the fastening member, the adjustment member is
inserted into the recessed portion.

6. The chin guard gap adjustment means for the helmet according to claim 5, wherein the adjustment member rotates
around a rotation axis in the recessed portion.

20 7. The chin guard gap adjustment means for the helmet according to claim 6, wherein an exposed surface of the
adjustment member contacts an inner wall of the recessed portion upon the rotation of the adjustment member in
a direction in which an angle between the adjustment member and the fastening member increases.

25 8. The chin guard gap adjustment means for the helmet according to claim 5, wherein the recessed portion has an
open portion or an auxiliary recessed portion, and
wherein the adjustment member includes:

30 a body which is inserted into the open portion or the auxiliary recessed portion; and
an extended portion which is extended from the body, and comes into contact with a bottom surface of the
recessed portion.

9. The chin guard gap adjustment means for the helmet according to claim 4, wherein the helmet body has a fastening
pin which protrudes to be coupled to the chin guard when the chin guard is disposed in front of the wearer's chin,

35 wherein the helmet body has a sloping portion which slopes such that it protrudes as it goes toward the fastening
pin from above, and
wherein the adjustment member rotates in a direction in which the angle between the adjustment member and
the fastening member decreases in contact with the sloping portion.

FIG. 1

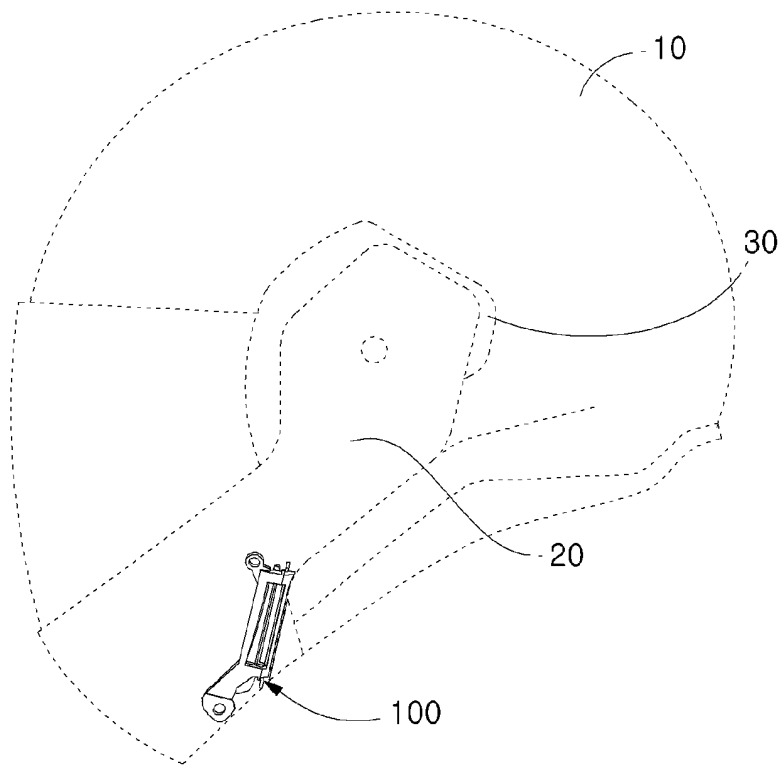


FIG. 2

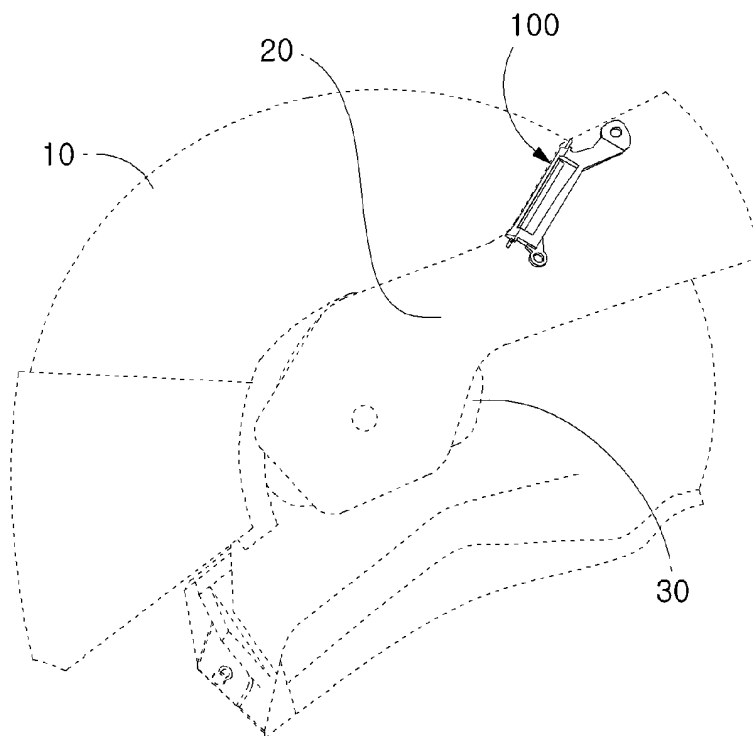


FIG. 3

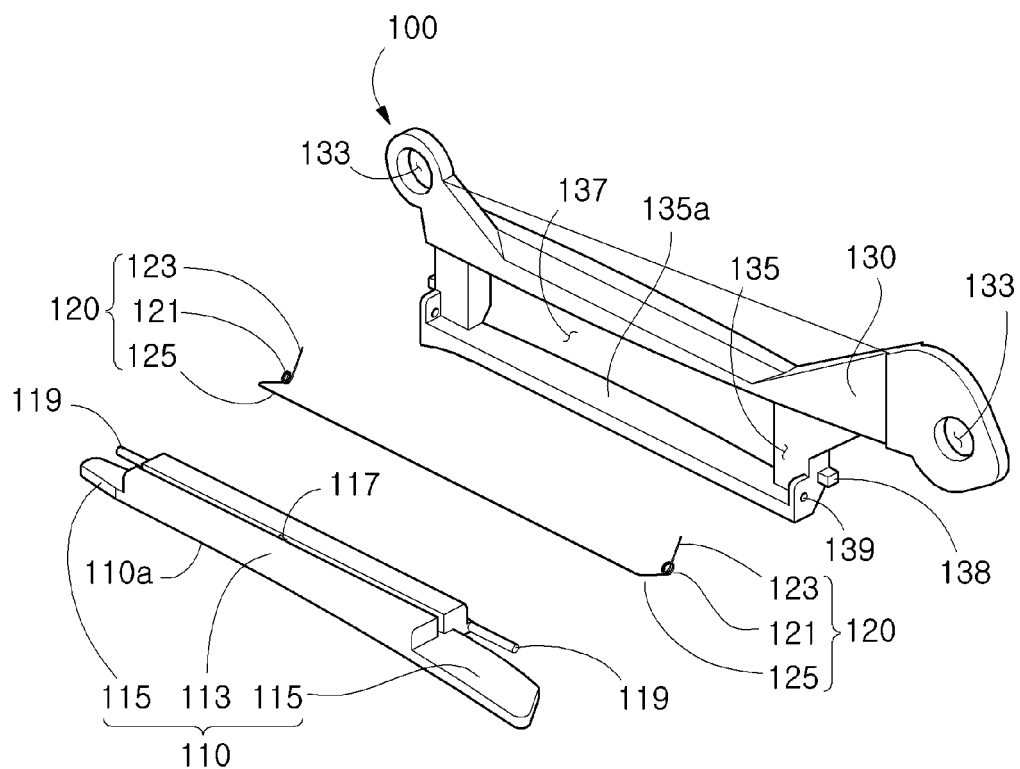


FIG. 4

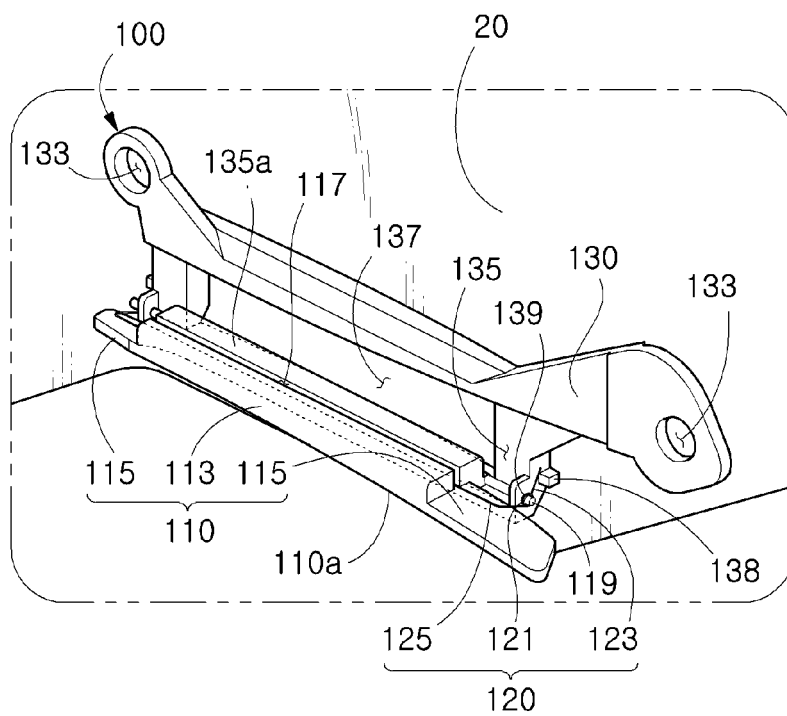


FIG. 5

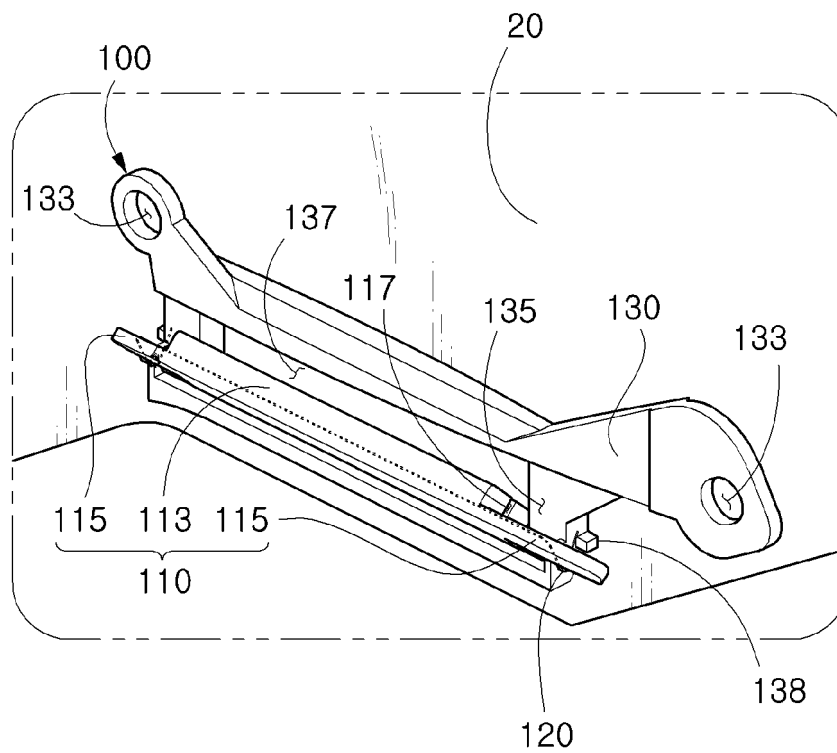


FIG. 6

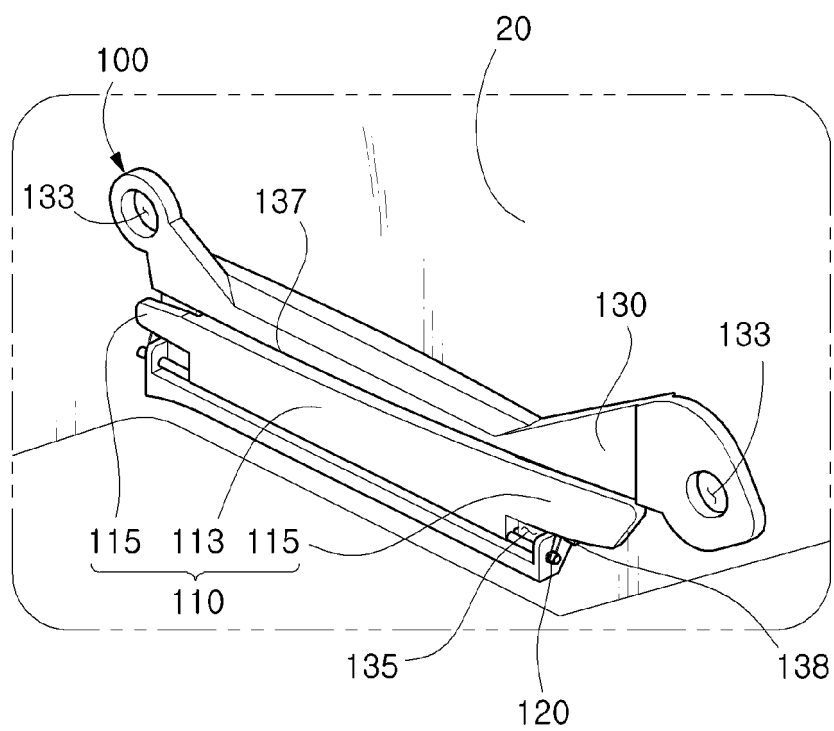


FIG. 7

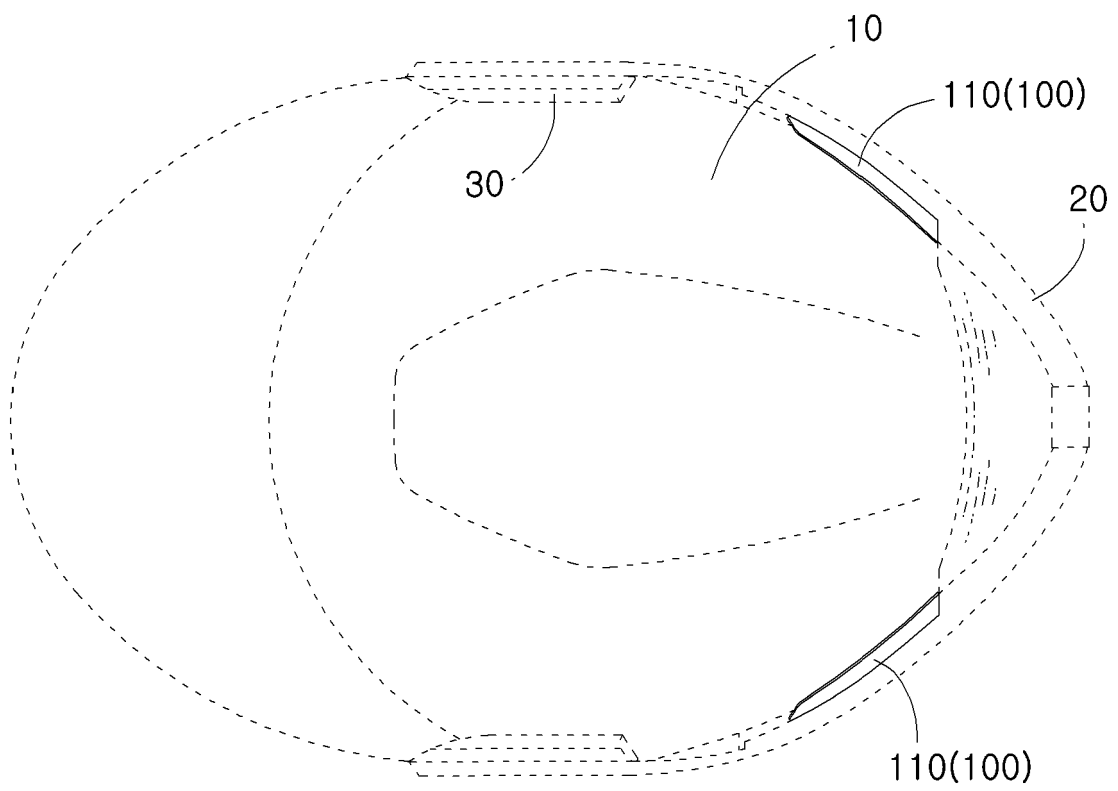


FIG. 8

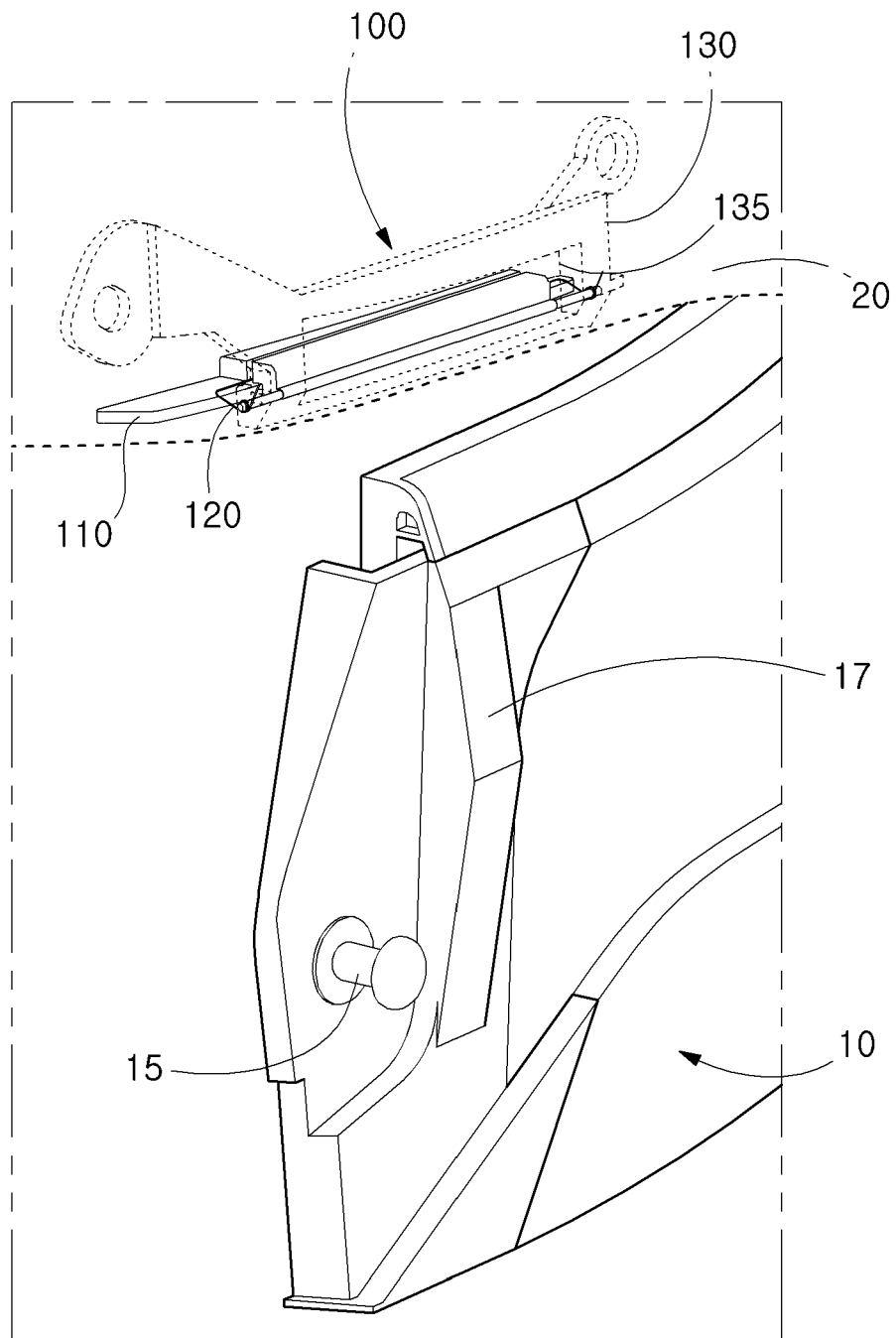


FIG. 9

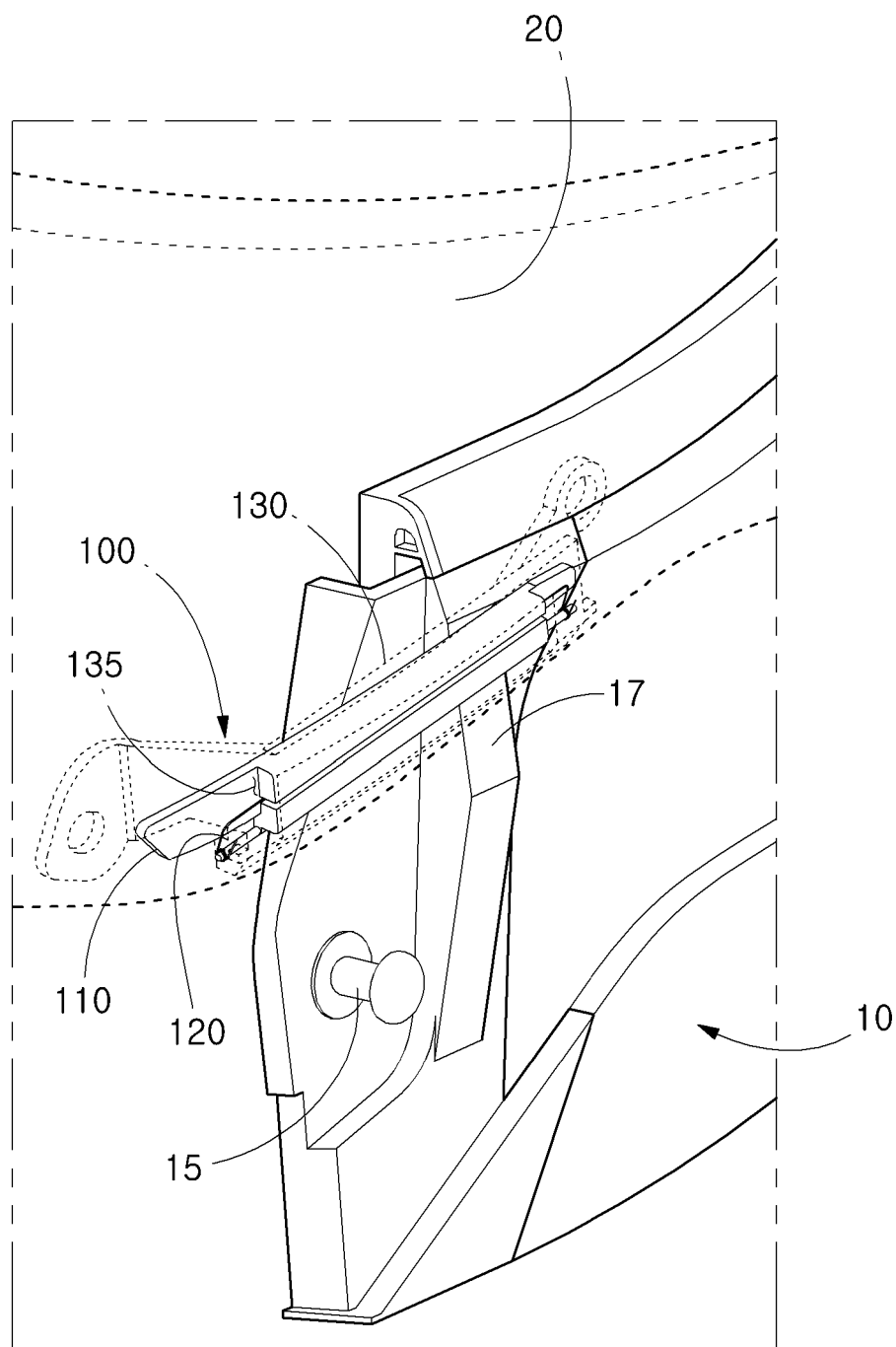


FIG. 10

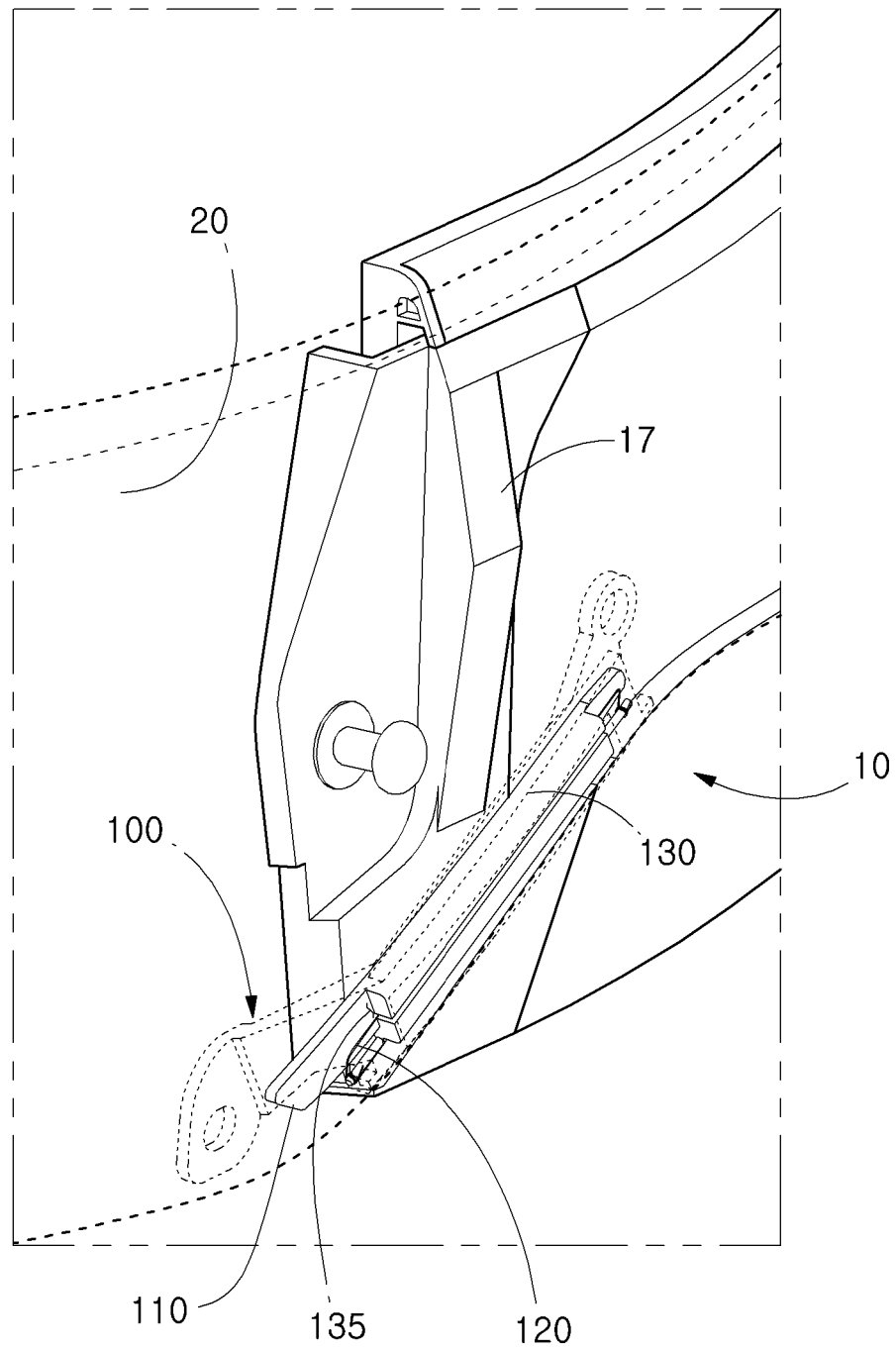
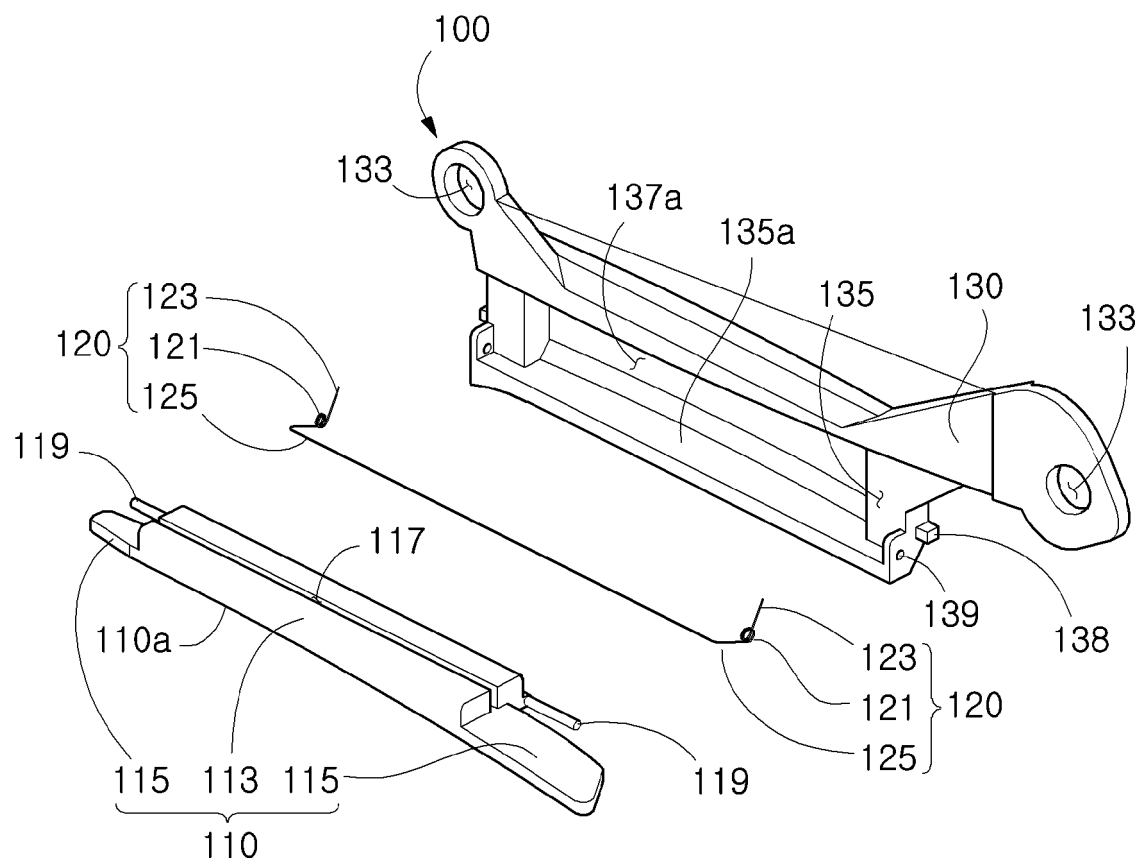


FIG. 11



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2021/017161

A. CLASSIFICATION OF SUBJECT MATTER A42B 3/20(2006.01)i; A42B 3/08(2006.01)i; A42B 3/06(2006.01)i According to International Patent Classification (IPC) or to both national classification and IPC																		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) A42B 3/20(2006.01); A42B 1/08(2006.01); A42B 3/22(2006.01); A42B 3/32(2006.01); A42B 7/00(2006.01); A61F 9/04(2006.01) Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Korean utility models and applications for utility models: IPC as above Japanese utility models and applications for utility models: IPC as above Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) eKOMPASS (KIPO internal) & keywords: 헬멧(helmet), chin가드(chin guard), 각도(degree), 탄성부재(elastic component), 회전(rotation)																		
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>Y A</td> <td>US 2016-0015114 A1 (SHARK) 21 January 2016 (2016-01-21) See paragraphs [0057] and [0115]; claim 1; and figures 1-2.</td> <td>1 2-9</td> </tr> <tr> <td>Y</td> <td>US 4794652 A (PIECH VON PLANTA, Corina et al.) 03 January 1989 (1989-01-03) See column 5, lines 61-64; and figure 1.</td> <td>1</td> </tr> <tr> <td>A</td> <td>US 2008-0196148 A1 (MORIN, Claude) 21 August 2008 (2008-08-21) See paragraph [0034]; and figures 1-4.</td> <td>1-9</td> </tr> <tr> <td>A</td> <td>WO 2013-021264 A1 (CECCOTTI, Antonio) 14 February 2013 (2013-02-14) See pages 3-7; and figures 1-2.</td> <td>1-9</td> </tr> <tr> <td>A</td> <td>WO 2019-242811 A1 (WAGNER, Michael) 26 December 2019 (2019-12-26) See page 4, line 20 - page 6, line 9; and figures 4-5.</td> <td>1-9</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	Y A	US 2016-0015114 A1 (SHARK) 21 January 2016 (2016-01-21) See paragraphs [0057] and [0115]; claim 1; and figures 1-2.	1 2-9	Y	US 4794652 A (PIECH VON PLANTA, Corina et al.) 03 January 1989 (1989-01-03) See column 5, lines 61-64; and figure 1.	1	A	US 2008-0196148 A1 (MORIN, Claude) 21 August 2008 (2008-08-21) See paragraph [0034]; and figures 1-4.	1-9	A	WO 2013-021264 A1 (CECCOTTI, Antonio) 14 February 2013 (2013-02-14) See pages 3-7; and figures 1-2.	1-9	A	WO 2019-242811 A1 (WAGNER, Michael) 26 December 2019 (2019-12-26) See page 4, line 20 - page 6, line 9; and figures 4-5.	1-9
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<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex. * Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "D" document cited by the applicant in the international application "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family																		
Date of the actual completion of the international search 14 March 2022	Date of mailing of the international search report 14 March 2022																	
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2021/017161

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REFERENCES CITED IN THE DESCRIPTION

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