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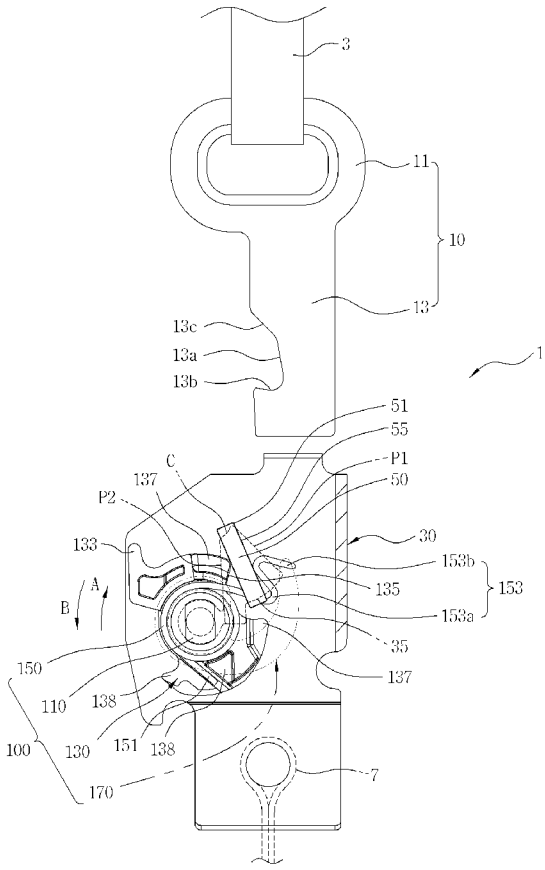
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(54) Title: SEAT BELT COUPLING APPARATUS FOR VEHICLE



(57) Abstract: Provided is a seat belt coupling apparatus. The apparatus includes: a belt tongue having a latching groove; a housing member comprising an accommodating room to receive the belt tongue; a latch member coupled to the housing member to reciprocally rotate between a first position and a second position in the housing member, the latch member being engaged with the latching groove of the belt tongue at the first position, the latch member being disengaged from the latching groove of the belt tongue at the second position; and an elastic rotation member disposed in the housing member to rotate clockwise and counterclockwise according to fastening and releasing operations of the belt tongue, the elastic rotation member configured to elastically press the latch member upon releasing the belt tongue and configured to restrain the latch member at the first position when the latch member is latched to the latching groove.

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Description

Title of Invention: SEAT BELT COUPLING APPARATUS FOR VEHICLE

Technical Field

[1] The present invention relates to a seat belt coupling apparatus for a vehicle, capable of easily coupling a seat belt to a vehicle structure and releasing the seat belt from the vehicle structure.

Background Art

[2] A seat belt system includes two basic elements, a buckle portion and a seat belt having a belt tongue detachably coupled to the buckle portion. The buckle portion is typically anchored to a vehicle body or a seat structure by seat belts, such as webbings or cables or other equivalent means.

[3] The seat belt as described above is generally coupled to a retractor. The retractor is coupled at one point of the vehicle, and one end of the seat belt is coupled at another anchor point of the vehicle.

[4] Generally, the anchor point is below the occupant, and the retractor is at or above the occupant shoulder. In order to secure the webbing of the seat belt to the vehicle at the anchor point, a pneumatic tool is used/required to fasten anchor bolts or rivets to the vehicle or seat frame. However, there typically is not a lot of available room to operate the tools for securing the seat belt at the anchor point.

[5] Moreover, in larger vehicles, such as mini-vans wherein the seats are removable or re-locatable, it is required that one end of the seat belt be re-moveable from the seat structure.

Disclosure of Invention

Technical Problem

[6] An object of the present invention is to provide an apparatus which allows the seat belt to be rapidly and strongly coupled to a vehicle and to be easily released from the vehicle.

Solution to Problem

[7] According to an embodiment of the invention, there is provided with a seat belt coupling apparatus for a vehicle. The apparatus includes: a belt tongue having a latching groove; a housing member comprising an accommodating room to receive the belt tongue; a latch member coupled to the housing member to reciprocally rotate between a first position and a second position in the housing member, the latch member being engaged with the latching groove of the belt tongue at the first position, the latch member being disengaged from the latching groove of the belt tongue at the

second position; and an elastic rotation member disposed in the housing member to rotate clockwise and counterclockwise according to fastening and releasing operations of the belt tongue, the elastic rotation member configured to elastically press the latch member upon releasing the belt tongue, and to restrain the latch member at the first position when the latch member may be engaged with the latching groove.

[8] The elastic rotation member may include a releasing member rotatably coupled to the housing member to rotate the latch member to the second position.

[9] The latch member may be configured in a flat plate shape such that the latch member may be inclined by a predetermined angle relative to the belt tongue inserted into the housing member at the first position, and the latch member may be parallel to the belt tongue inserted into the housing member at the second position.

[10] The latching groove may be formed at one side of the belt tongue such that an end portion of the latch member may be fitted into the latching groove upon insertion of the belt tongue.

[11] The elastic rotation member may be disposed at a space facing the accommodating room receiving the belt tongue with respect to the latch member.

[12] The elastic rotation member may include: a rotational shaft member rotatably coupled to the housing member; a stopper member fitted onto an outer circumferential surface of the rotational shaft member; and a biasing member fitted around a central protruding portion of the stopper member. The biasing member may be configured to comprise one end portion supported to the stopper member and an opposite end portion pressing the latch member upwardly and coming into contact with the belt tongue upon insertion of the belt tongue.

[13] The releasing member of the elastic rotation member may be coupled to the rotational shaft member, and the releasing member may include a rotational block having a pressing leg to press the latch member such that the latch member is rotated from the first position to the second position when the rotational shaft member is rotated in a direction for releasing the belt tongue.

[14] The stopper member, the rotational block, and the rotational shaft member may be configured to rotate in a same direction.

[15] The rotational shaft member may include a tool inserting hole formed in at least one end of the rotational shaft member such that a tool may be inserted into the tool inserting hole.

[16] The housing member may include a fan-shaped latching hole to rotatably support the latch member between the first position and the second position, and the latch member may be rotatably coupled to the latching hole. The latch member may have an anti-separation protrusion to prevent the latch member from being separated from the latching hole.

[17] The one end portion of the biasing member may be supported to one side of the stopper member, and the opposite end portion of the biasing member may be configured to comprise a latch member receiving portion to receive one end of the latch member and a tongue contacting portion extending from the latch member receiving portion to come into contact with the belt tongue.

[18] The stopper member may include a latching protrusion to press an upper end portion of the latch member when a lower end portion of the latch member is engaged with the latching groove of the belt tongue.

[19] The apparatus may further include a casing member to receive the housing member, and the casing member may include a through hole formed at a position corresponding to the tool inserting hole.

Advantageous Effects of Invention

[20] According to an embodiment of the present invention, the seat belt can be easily and strongly coupled to the vehicle body or seat frame and can be easily released from the vehicle body or seat frame.

Brief Description of Drawings

[21] FIG. 1 is a perspective view showing the whole seat belt coupling apparatus according to an embodiment of the present invention.

[22] FIG. 2 is an exploded view showing the seat belt coupling apparatus of FIG. 1.

[23] FIG. 3 is a view showing an initial state of a seat belt coupling apparatus according to an embodiment of the present invention.

[24] FIG.4 is a view showing an insertion state of a belt tongue of a seat belt coupling apparatus according to an embodiment of the present invention.

[25] FIG. 5 is a view showing a latching state of a seat belt coupling apparatus according to an embodiment of the present invention.

[26] FIG. 6 is a view showing an unlatching state of a seat belt coupling apparatus according to an embodiment of the present invention.

Mode for the Invention

[27] Hereinafter, exemplary embodiments of the present invention will be described in detail with reference to accompanying drawings. However, the present invention is not limited to the following embodiments, but various modifications may be realized. The present embodiments are provided to make the disclosure of the present invention perfect and to make those skilled in the art perfectly comprehend the scope of the present invention.

[28] Hereinafter, a “downward direction” refers to a direction along which a belt tongue is inserted into a housing member, and an “upward direction” refers to a direction along which the belt tongue is withdrawn from the housing member.

[29] FIG. 1 is a perspective view showing the whole seat belt coupling apparatus according to an embodiment of the present invention, FIG.2 is an exploded view showing the seat belt coupling apparatus of FIG.1, and FIG.3 is a view showing an initial state of a seat belt coupling apparatus according to an embodiment of the present invention.

[30] Referring to FIGS. 1 to 3, a seat belt coupling apparatus 1 includes a belt tongue 10, a casing member 20, a housing member 30, a latch member 50, and an elastic rotation member 100.

[31] The casing member 20 includes a first casing 21 and a second casing 23 made of flexible materials, such as plastic materials.

[32] The housing member 30 is received in the casing member 20 and includes metallic materials. The housing member 30 includes an accommodating room in which the belt tongue 10 is inserted. The latch member 50 and the elastic rotation member 100 are rotatably disposed in the housing member 30.

[33] The housing member 30 includes two housing plates 31 and 33 which are spaced apart from each other by a predetermined distance so as to face each other.

[34] The belt tongue 10 includes a belt connecting portion 11 to which the seat belt 3 is coupled and a latching portion 13 inserted into the housing member 10. The latching portion 13 is inserted into one side of the housing member 30 and includes a latching groove 13a formed at one side of the latching member 13 in a length direction of the latching portion 13. The belt tongue 10 is received in one side of the housing member 30 such that an open portion of the latching groove 13a of the belt tongue is directed to the center of the housing member 30.

[35] The latch member 50 is coupled to the housing member 30 so that the latch member 50 can rotate between a first position P1 and a second position P2 in the housing member 30. The latch member 50 is substantially disposed at the central portion of the housing member 30 so as to correspond to the latching groove 13a of the latch member 50 upon fastening the belt tongue 10. The latch member 50 is engaged with the latching groove 13a of the belt tongue 10 at the first position P1, and is disengaged from the latching groove 13a of the belt tongue 10 at the second position P2. The first position P1 refers to a latching position of the latch member 50, and the second position P2 refers to an unlatching position of the latch member 50.

[36] The housing plates 31 and 33 include a substantially fan-shaped latching hole 35. The latch member 50 is rotatably inserted in the latching hole 35 and includes an anti-separation protrusion 51 to prevent the latch member 50 from being separated from the latching hole 35. The latch member 50 includes a flat plate shape to be substantially disposed perpendicular to the housing plates 31 and 33. The latch member 50 substantially has an “I” shape.

[37] The upper end of the latch member 50 comes into contact with an apex portion C of the fan-shaped latching hole 35. The latch member 50 is rotated about the apex portion C of the fan-shaped latching hole 35.

[38] The latching hole 35 is configured to include the first position P1 at which the latch member 50 is latched and the second position P2 at which the latch member 50 is unlatched. At the first position P1, a length L2 of the latching hole 35 is substantially similar to a length L1 of the latch member 50, and at the second position P2, a length L3 of the latching hole 35 is greater than the length L1 of the latch member 50. By this configuration, the latch member 50 is firmly positioned at the first position P1 without movement. In addition, the latch member 50 is capable of moving at the second position P2, so that the belt tongue 10 can be easily released.

[39] The latch member 50 is inclinedly disposed by a predetermined angle relative to the latching portion 13 of the belt tongue 10 inserted into the housing member 30 at the first position p1, and the latch member 50 is substantially parallel to the latching portion 13 of the belt tongue 10 inserted into the housing member 30 at the second position P2.

[40] The latching groove 13a of the belt tongue 10 includes a concave surface 13b to which a lower end of the latch member 50 is latched and an inclined surface 13c extending upwardly from the concave surface 13b to prevent the latch member 50 from interfering with the belt tongue 10.

[41] The latch member 50 includes metallic materials so as to sufficiently endure a force coming into contact with the belt tongue 10.

[42] The elastic rotation member 100 is rotatably coupled to the housing member 30 so that the elastic rotation member 100 is adjacent to the second position P2 of the latching hole 35. The elastic rotation member 100 includes a rotational shaft member 110, a stopper member 130, a biasing member 150, and a releasing member 170.

[43] The belt tongue 10 is received in one side of the housing member 30 with respect to the latch member 50, and the elastic rotation member 100 is rotatably disposed at an opposite side in the housing member 30. The opposite side faces the belt tongue 10.

[44] The rotational shaft member 110 passes through a through hole 37 of the housing member 30, and both ends of the rotational shaft member 110 are protruding out of the housing member 30. The rotational shaft member 110 is rotatably supported in the through hole 37 of the housing member 30. The rotational shaft member 110 may include metallic bolt members. The rotational shaft member 110 includes a tool inserting hole 113 formed in at least one end thereof so that a tool T for rotating the rotational shaft member 110 can be inserted into the tool inserting hole 113.

[45] For example, the tool inserting hole 113 may include a hexagonal wrench hole to allow a hexagonal wrench to be inserted into the hexagonal wrench hole. In another

embodiment, the tool inserting hole 113 may be modified in various shapes, such as straight and cross shapes.

[46] The rotational shaft member 110 may be coupled to the housing member 30 by coupling schemes, such as rivetting schemes. In another embodiment, the rotational shaft member 110 may be coupled to the housing member 30 by special fastening members, such as E-ring or C-ring members so as to prevent the rotational shaft member 110 from being separated from the housing member 30. The stopper member 130 is fitted onto an outer circumferential surface of the rotational shaft member 110 to be rotatably supported in the housing member 30. The stopper member 130 may include plastic materials.

[47] The biasing member 150 includes a coil coiled in a helical shape to be fitted around a protrusion of the stopper member 130. One end portion 151 of the biasing member 150 is supported to the stopper member 130, and an opposite end portion 153 of the biasing member 150 elastically upwardly presses the latch member 50.

[48] The opposite end portion 153 of the biasing member 150 includes a latch member receiving portion 153a, into which a lower end portion of the latch member 50 is inserted, and a tongue contacting portion 153b extending from the latch member receiving portion 153a to come into contact with the belt tongue 10.

[49] The one end portion 151 of the biasing member 150 includes a substantially straight shape, and the opposite end portion 153 of the biasing member 150 substantially includes a“ ”shape.

[50] The stopper member 130 is configured to press the latch member 150 by an elastic force of the biasing member 150 upon fastening the belt tongue 10. When the belt tongue 10 is inserted into the accommodating room of the housing member 30 and the lower end of the latch member 50 is engaged with the latching groove 13a of the belt tongue 10, the stopper member 130 is rotated clockwise (in an arrow A direction) by the elastic force of the biasing member 150. Here, the stopper member 130 includes a latching protrusion 133 to press the upper end portion of the latch member 50.

[51] The stopper member 130 is substantially formed in a disc shape of which the central portion is penetrated, and includes a cutting portion 135 to receive the latch member 50. Tongue grooves 137 are formed at both sides of the stopper member 130, which are adjacent to the cutting portion 135, so as to prevent stopper member 130 from interfering with the belt tongue 10 upon movement of the belt tongue 10.

[52] The stopper member 130 includes a locking protrusion 138 to which the one end portion 151 of the biasing member 150 is locked.

[53] The releasing member 170 is disposed at the outside of the housing plate 33 of the housing member 130 and includes a rotational block (hereinafter referred to as

"rotational block") fitted onto the outer circumferential surface of the rotational shaft member 110. The rotational block 170 includes a shaft fitting portion 171 having a shaft hole 171a fitted onto the outer circumferential surface of the rotational shaft member 110 and a pressing leg 173 extending from the shaft fitting portion 171. When the rotational shaft member 110 is rotated counterclockwise (in the arrow B direction), the pressing leg 171 presses the latch member 50 while coming into contact with the latch member 50 so as to allow the latch member 50 to be rotated from the first position P1 to the second position P2. The pressing leg 173 includes a curved bar shape and is configured such that when the latch member 50 is rotated in order to release the latch member 50, the latch member 150 is located between the shaft fitting portion 171 and the pressing leg 173. As a result, when the latch member 50 is rotated in order to release the latch member 50, the latch member 50 is rotated while the lower end portion of the latch member 50 is slidably moved along the curved surface of the pressing leg 173. The rotational block 170 substantially includes a reversed "6" shape. When the rotational block 170 is further rotated, a distal end 173a of the pressing leg 173 presses an upper portion of an surface 55 of the latch member 50.

[54] The stopper member 130 and the rotational block 170 are configured to rotate together with the rotational shaft member 110 upon operation for fastening and releasing the belt tongue 10. For this, the rotational shaft member 110 is configured to have cutting surfaces 115 formed by straight cutting both sides of the rotational shaft member 110, and the stopper member 130 and the rotational block 170 include long shaped shaft holes 132 and 171a to be fitted onto the outer circumferential surface of the rotational shaft member 110 having the cutting surfaces 115.

[55] The latching protrusion 133 of the stopper member 130 and the pressing leg 173 of the rotational block 170 are disposed to substantially face each other with respect to the rotational shaft member 110.

[56] The casing member 20 includes a tongue inserting opening 25 to allow insertion of the belt tongue 10, and a cable inserting opening 27 disposed opposite the tongue inserting opening 25 to allow insertion of the cable 7. The casing member 20 includes a through hole 29 corresponding to the tool inserting hole 113 of the rotational shaft member 110. The through hole 29 exposes the tool inserting hole 113 to the outside of the casing member 20. Through this configuration, when the belt tongue 10 is released, the releasing tool T can be inserted into the tool inserting hole 29 of the latch member 50 via the through hole 29. As a result, a process for releasing the belt tongue 10 can be easily performed without disassembling the casing member 20.

[57] The cable 7 includes one end coupled to the inside of the housing member 30 through the cable inserting opening 27 and an opposite end coupled to a pre-tensioner(not shown)so as to be pulled by the pre-tensioner when the vehicle

emergency states, such as crashes or pre-crashes are sensed. Through this configuration, upon vehicle emergency states, such as crash or pre-crash states, the seat belt 3 is tightened, thereby increasing the restraint force of the occupant.

[58] In the below descriptions, latching and unlatching operations of the seat belt coupling apparatus configured as described above will be described.

[59] FIG.3 is a view showing an initial state of a seat belt coupling apparatus according to an embodiment of the present invention.

[60] Referring to FIG. 3, in a state that the belt tongue 10 is not inserted into the accommodating room of the housing member 30, by the latch member receiving portion 153 of the biasing member 150, the lower end portion of the latch member 50 is substantially upwardly pressed. As a result, the upper end portion of the latch member 50 comes into close contact with the apex portion C of the latching hole 35. In this state, the latch member 50 is substantially located between the first position P1 and the second position P2.

[61] Likewise, in such a state that the latch member 50 is restrained by the biasing member 150 at a certain position, the latching protrusion 133 is spaced apart from the upper end portion of the latch member 50 by a predetermined distance. Here, it is required that the elasticity coefficient of the biasing member 150 for sufficiently supporting the latch member 50 be considered.

[62] FIG.4 is a view showing an insertion state of a belt tongue of a seat belt coupling apparatus according to an embodiment of the present invention.

[63] Referring to FIG. 4, when the belt tongue 10 is inserted into the housing member 30, the lower end portion of the latching portion 13 of the belt tongue 10 is slidably moved along the surface 55 of the latch member 50. Subsequently, the lower end portion of the latching portion 13 of the belt tongue 10 comes into contact with the tongue contacting portion 153b of the biasing member 150. While the surface 55 of the latch member 50 comes into contact with the latching portion 13 of the belt tongue, the latch member 50 is temporarily pushed toward the second position P2 of the latch member 50.

[64] When the user subsequently downwardly pushes the belt tongue 10, the tongue contacting portion 153a of the biasing member 150 is lowered. As a result, the latch member 150 is separated from the latch member receiving portion 153a.

[65] Here, the stopper member 130, the rotational block 170, and the rotational shaft member 110 are rotated together clockwise (A direction) by a force caused by the belt tongue 10 pressing the tongue contacting portion 153b of the biasing member 150.

[66] FIG. 5 is a view showing a latching state of a seat belt coupling apparatus according to an embodiment of the present invention.

[67] Referring to FIG. 5, when the belt tongue 10 is further inserted into the housing

member 30, the tongue contacting portion 153b of the biasing member 150 is further downwardly pressed by the lower end portion of the latching portion 13 of the belt tongue 10, and the lower end portion of the latch member 50 is inserted into the latching groove 13a of the latching portion 13 of the belt tongue 10.

[68] At a moment when the lower end portion of the latching portion 13 of the belt tongue 10 is inserted into the latching groove 13a, the stopper member 130 is rapidly clockwise (A direction) rotated by the elastic force of the biasing member 150, and the latching protrusion 133 of the stopper member 130 presses the upper end portion of the latch member 50. As a result, the latch member 50 is prevented from being separated from the latching groove 13a.

[69] Since the latch member 50 and the housing member 30 include metallic materials, at the moment when the latch member 50 is inserted into the latching groove 13a and is located at the first position P1 of the latching hole 35, the latch member 50 makes a clicking sound with the housing member 30. Accordingly, the user easily understands the latching status of the latch member 50.

[70] In the state that the latch member 50 is inserted into the latching groove 13a of the belt tongue 10, when the user releases a force pushing the belt tongue 10 into the housing member 30, the tongue contacting portion 153b of the biasing member 150 upwardly presses the lower end portion of the latching portion 13 of the belt tongue 10. As a result, the latch member 50 inserted into the latching groove 13a of the belt tongue 10 is upwardly pressed, and the upper end portion of the latch member 50 comes into contact with the apex portion C, so that the latch member 50 is firmly latched at the first position P1.

[71] At this time, the latch member 50 is firmly located at the first position P1 without being separated from the latching hole 35 of the housing member 30 by the anti-separation protrusion 51 formed at the both sides of the latch member 50.

[72] As described above, the seat belt coupling apparatus 1 according to an embodiment of the present invention, allows the user to easily couple the seat belt 3 to the seat frame or the vehicle body.

[73] FIG. 6 is a view showing an unlatching state of a seat belt coupling apparatus according to an embodiment of the present invention.

[74] Referring to FIGS. 2, 3, and 6, the user inserts the releasing tool T into the tool inserting hole 113 formed in at least one end of the rotational shaft member 110, which is exposed to the outside of the casing member 20 by the through hole 29 of the casing member 20.

[75] When the user rotates the releasing tool T in the releasing direction of the latch member 50, for example, counterclockwise (arrow B direction) after inserting the releasing tool T into the tool inserting hole 113, the rotational shaft member 110 is

rotated counterclockwise (B direction).

[76] The rotational shaft member 110 is rotated counterclockwise (B direction), and the stopper member 130 and the rotational block 170 are rotated counterclockwise (B direction).

[77] While the pressing leg 173 is rotated counterclockwise, the lower end portion of the latch member 50 comes into contact with the curved surface of the pressing leg 173, so that the latch member 150 is rotated to the second position P2. When the latch member 50 is rotated to approach the second position P2, the distal end 173a of the pressing leg 173 presses the upper portion of the surface 55 of the latch member 50, thereby firmly locating the latch member 50 at the second position P2.

[78] Meanwhile, when the user rotates the rotational shaft member 110 forcedly counter-clockwise (B direction) by using the releasing tool T, the stopper member 130 fitted onto the outer circumferential surface of the rotational shaft member 110 is rotated counterclockwise (B), and the latching protrusion 133 of the stopper member 130 is separated from the upper end portion of the latch member 50, thereby allowing the latch member 50 to be rotated to the second position P2.

[79] In the state that the latch member 50 is located at the second position P2, when the belt tongue 10 is slightly downwardly pushed, the latch member 50 is completely disengaged from the latching groove 13a of the belt tongue 10. At this time, since the lower end portion of the belt tongue 10 is upwardly pressed by the restoring force of the opposite end portion 153 of the biasing member 150, the belt tongue 10 springs up from the housing member 30.

[80] Although the exemplary embodiments of the present invention have been described, it is understood that the exemplary embodiments help one ordinary skilled in the art to easily realize the present invention should not be limited to these exemplary embodiments and accompanying drawings. Therefore, various changes and modifications can be apparently made by the skilled in the art without departing from the technical sprit of the present invention. In addition, it is understood that parts that can be easily changed by the skilled in the art are within the spirit and scope of the present invention as hereinafter claimed.

Claims

[Claim 1] A seat belt coupling apparatus for a vehicle, comprising:
a belt tongue comprising a latching groove;
a housing member comprising an accommodating room to receive the belt tongue;
a latch member coupled to the housing member to reciprocally rotate between a first position and a second position in the housing member, the latch member being engaged with the latching groove of the belt tongue at the first position, the latch member being disengaged from the latching groove of the belt tongue at the second position; and
an elastic rotation member disposed in the housing member to rotate clockwise and counterclockwise according to fastening and releasing operations of the belt tongue, the elastic rotation member configured to elastically press the latch member upon releasing the belt tongue and configured to restrain the latch member at the first position when the latch member is engaged with the latching groove,
wherein the elastic rotation member comprises a releasing member rotatably coupled with the housing member to rotate the latch member to the second position.

[Claim 2] The apparatus of claim 1,
wherein the latch member is configured in a flat plate shape such that the latch member is inclined by a predetermined angle relative to the belt tongue inserted into the housing member at the first position, and the latch member is parallel to the belt tongue inserted into the housing member at the second position,
the latching groove is formed at one side of the belt tongue such that an end portion of the latch member is fitted into the latching groove upon insertion of the belt tongue, and
the elastic rotation member is disposed at a space facing the accommodating room receiving the belt tongue with respect to the latch member.

[Claim 3] The apparatus of claim 2,
wherein the elastic rotation member comprises:
a rotational shaft member rotatably coupled to the housing member;
a stopper member fitted onto an outer circumferential surface of the rotational shaft member; and
a biasing member fitted around a central protruding portion of the

stopper member, the biasing member configured to comprise one end portion supported to the stopper member and an opposite end portion pressing the latch member upwardly and coming into contact with the belt tongue upon insertion of the belt tongue.

[Claim 4] The apparatus of claim 3,
wherein the releasing member of the elastic rotation member is coupled to the rotational shaft member, and
the releasing member comprises a rotational block having a pressing leg to press the latch member such that the latch member is rotated from the first position to the second position when the rotational shaft member is rotated in a direction for releasing the belt tongue.

[Claim 5] The apparatus of claim 4,
wherein the stopper member, the rotational block, and the rotational shaft member are configured to rotate in a same direction.

[Claim 6] The apparatus of claim 3,
wherein the rotational shaft member comprises a tool inserting hole formed in at least one end of the rotational shaft member such that a tool is inserted into the tool inserting hole.

[Claim 7] The apparatus of claim 3,
wherein the housing member comprises a fan-shaped latching hole to rotatably support the latch member between the first position and the second position, and
the latch member is rotatably coupled to the latching hole, the latch member having an anti-separation protrusion to prevent the latch member from being separated from the latching hole.

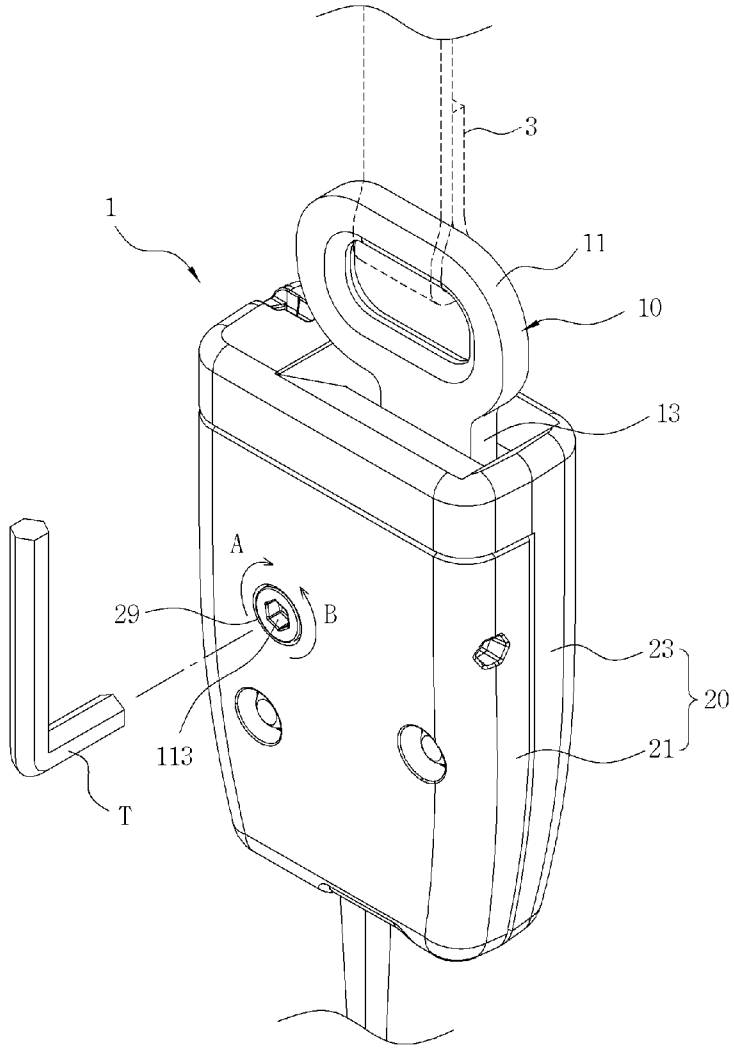
[Claim 8] The apparatus of claim 7,
wherein the one end portion of the biasing member is supported to one side of the stopper member, and
the opposite end portion of the biasing member is configured to comprise a latch member receiving portion to receive one end of the latch member and a tongue contacting portion extending from the latch member receiving portion to come into contact with the belt tongue.

[Claim 9] The apparatus of claim 8,
wherein the stopper member comprises a latching protrusion to press an upper end portion of the latch member when a lower end portion of the latch member is engaged with the latching groove of the belt tongue.

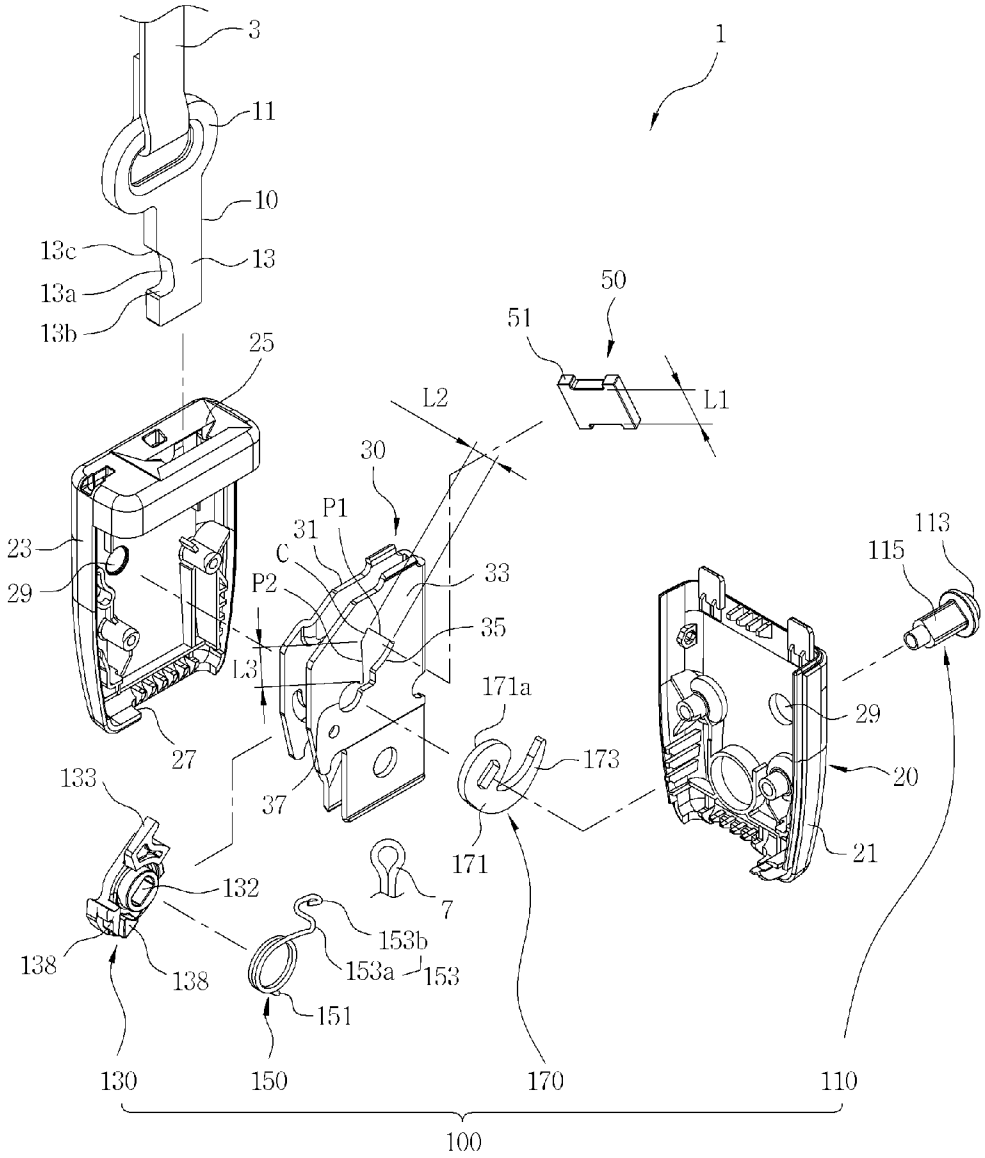
[Claim 10] The apparatus of claim 6,
further comprising a casing member to receive the housing member,

wherein the casing member comprises a through hole formed at a position corresponding to the tool inserting hole.

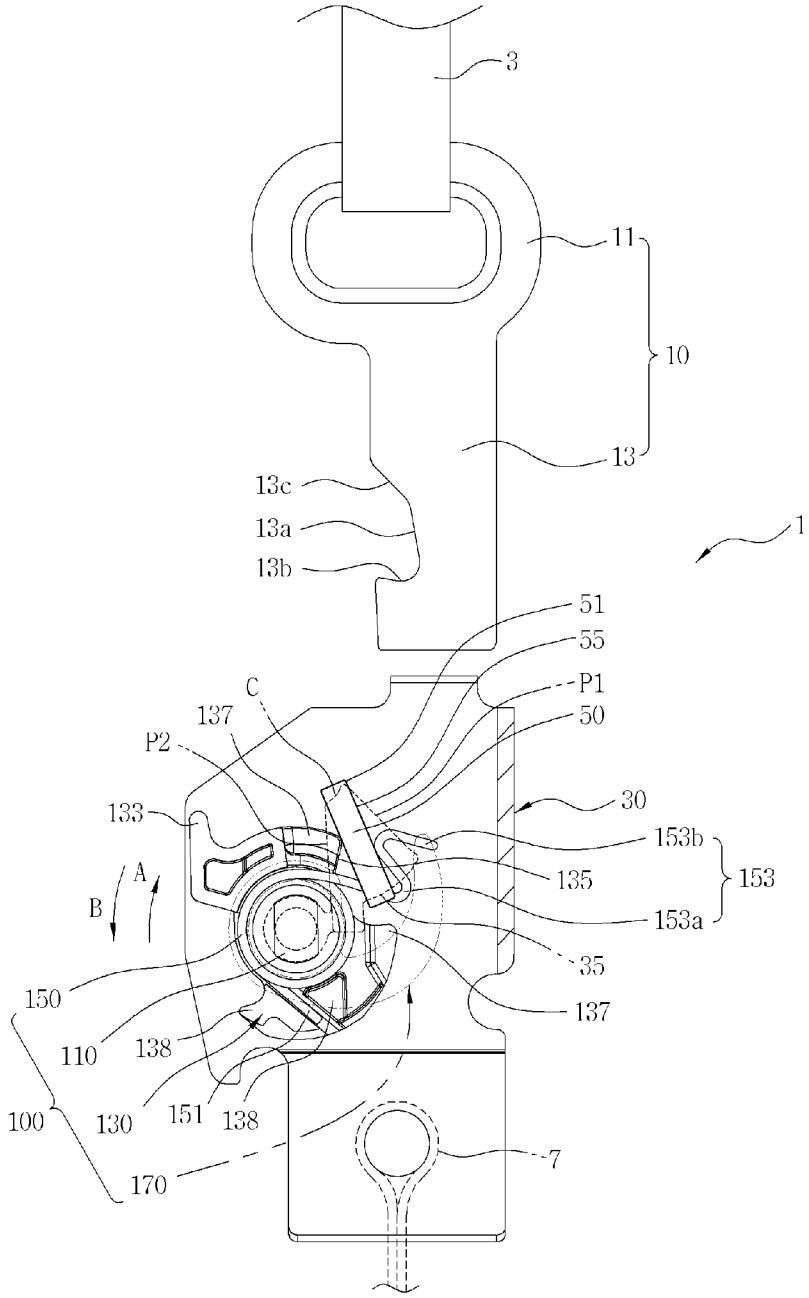
[Fig. 1]



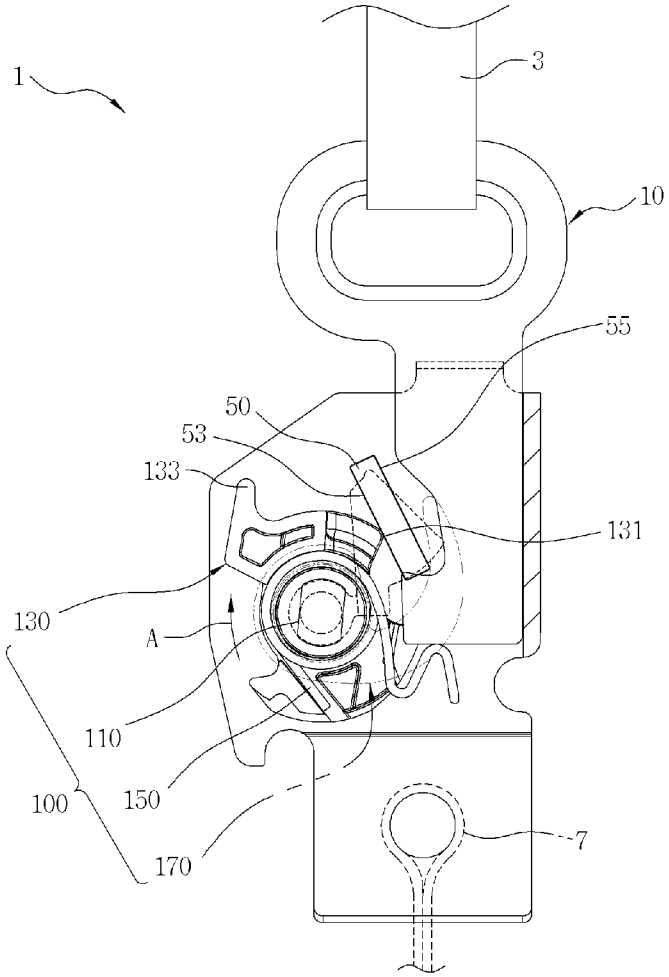
[Fig. 2]


1
3
11
10
13c
13
13a
13b
50
51
L1
L2
25
30
P1
31
C
P2
33
35
23
29
L3
27
37
171a
173
171
7
133
132
138
138
153b
153a
153
151
130
150
170
110
100
113
115
29
20
21

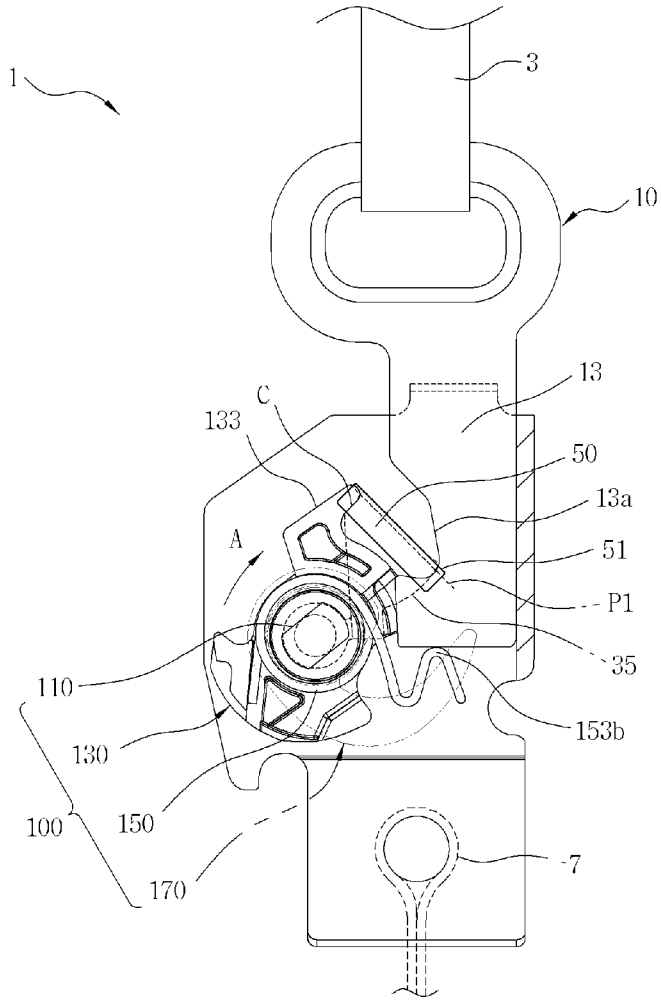
[Fig. 3]


3
11
10
13
13c
13a
13b
1
51
55
P1
50
C
137
P2
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150
137
110
138
130
151
138
100
170
7

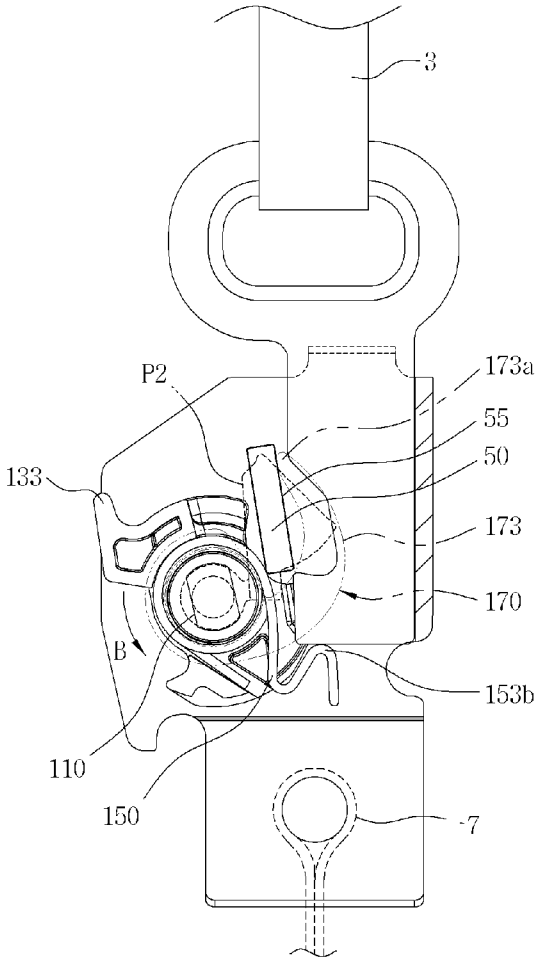
[Fig. 4]



[Fig. 5]



[Fig. 6]



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2015/003723

A. CLASSIFICATION OF SUBJECT MATTER

B60R 22/00(2006.01)i, B60R 22/18(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)
B60R 22/00; B60R 22/46; B60R 22/48; B60R 22/18; B60R 22/40; B60R 22/26

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
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: seat, belt, vehicle, buckle, latch, rotate, housing, release, shaft, housing and bias

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2012-0324685 A1 (KATAOKA et al.) 27 December 2012 See paragraphs [0030]-[0038], [0054]-[0062] and figures 1-2.	1-10
A	CN 102666215 A (AUTOLIV DEVELOPMENT AB) 12 September 2012 See paragraphs [0042]-[0049] and figure 1.	1-10
A	US 2003-0111836 A1 (TAJIMA et al.) 19 June 2003 See paragraphs [0048]-[0054] and figures 1-2.	1-10
A	KR 10-2006-0011485 A (LEE et al.) 03 February 2006 See claims 1-3 and figure 1.	1-10
A	JP 2014-065371 A (AUTOLIV DEVELOPMENT AB) 17 April 2014 See paragraphs [0031]-[0041] and figure 4.	1-10

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
10 August 2015 (10.08.2015)	**10 August 2015 (10.08.2015)**

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2015/003723

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