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B7B BVRD

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Other: **Online: WPI, EPODOC, JAPIO**

(54) Abstract Title

A vehicle seat belt retainer and seat

(57) A vehicle seat belt retaining structure for retaining a vehicle seat belt 40a to a vehicle body and a vehicle seat 30a, comprises a short belt 45a having one end anchored to the vehicle body floor and the other end portion connected with a buckle 44a which passes through a gap between the seat cushion 31a and the seat back 32a, a long belt 41a designed to be placed across a body of a vehicle occupant has a tongue 43a which releasably engages said buckle 44a, and a resilient member 36 for resiliently retaining a connecting portion 46a which connects the buckle 44a and the short belt 45a to either one of the seat cushion 31a and seat back 32a so that the buckle 44a is retained against withdrawal from the seat cushion 31a or the seat back 32a. Preferably the resilient member 36 is a rubber band which prevents the buckle 44a from withdrawal from the seat cushion 31a or back 32a when the seat cushion 31a and/or the seat back 32a are moved.

FIG. 2

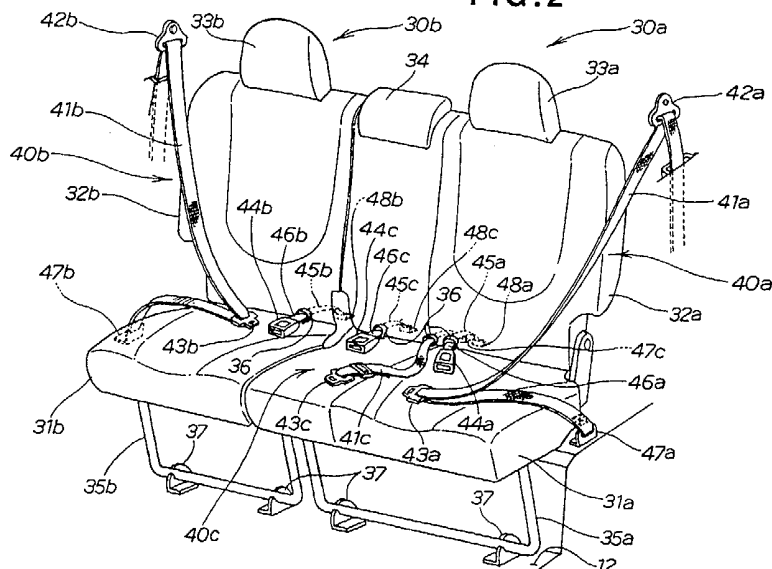


FIG. 1

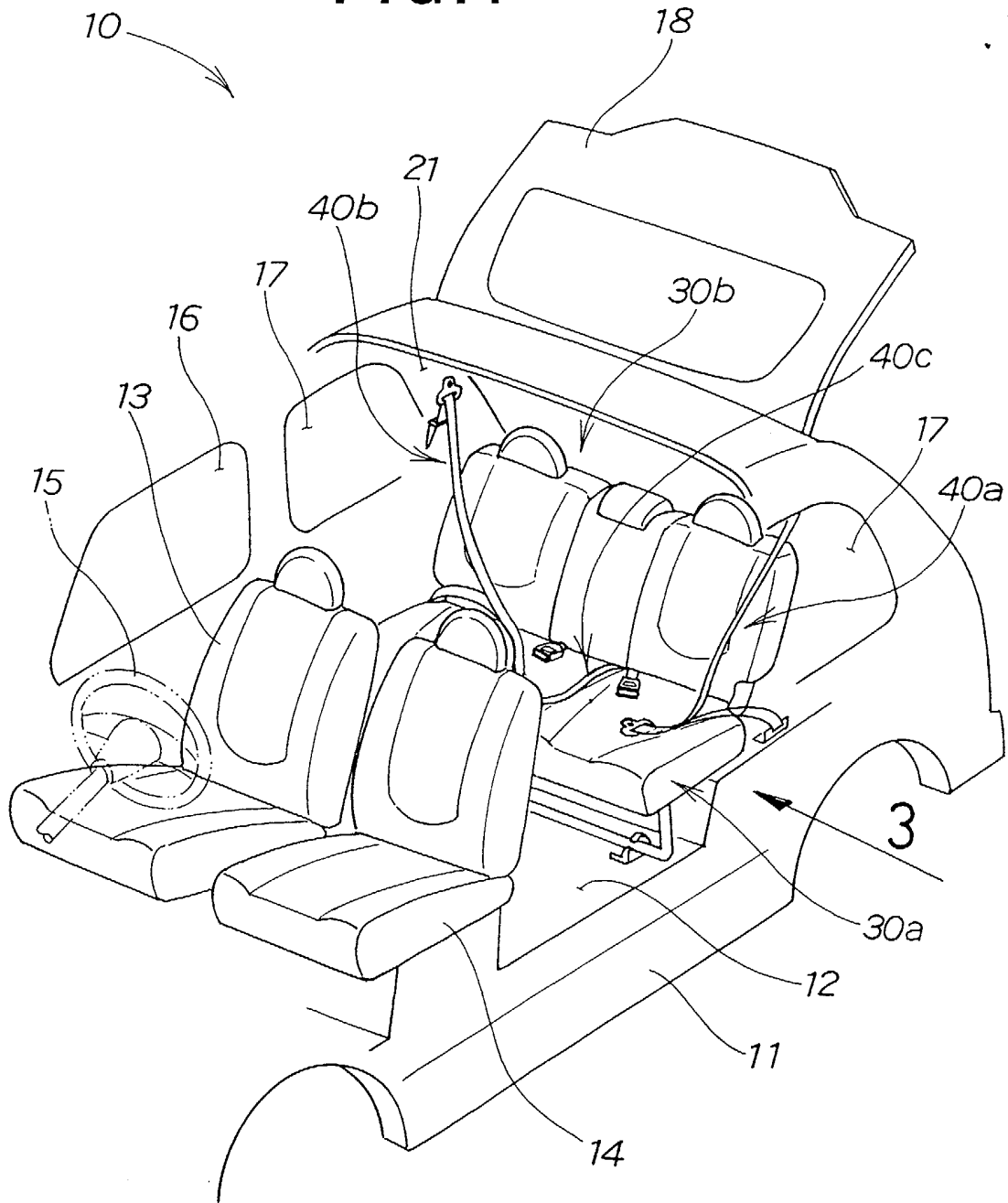


FIG. 2

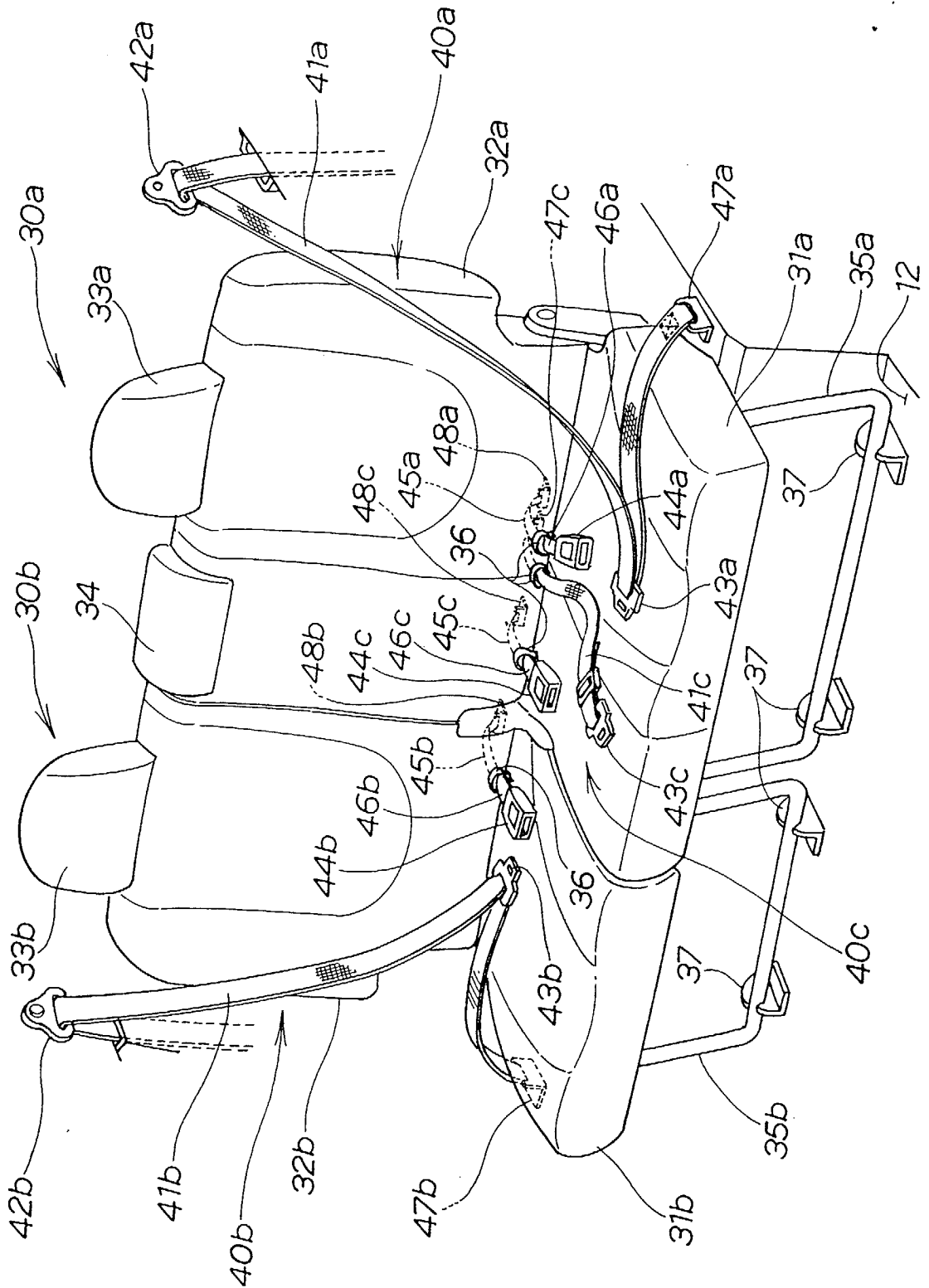


FIG. 3

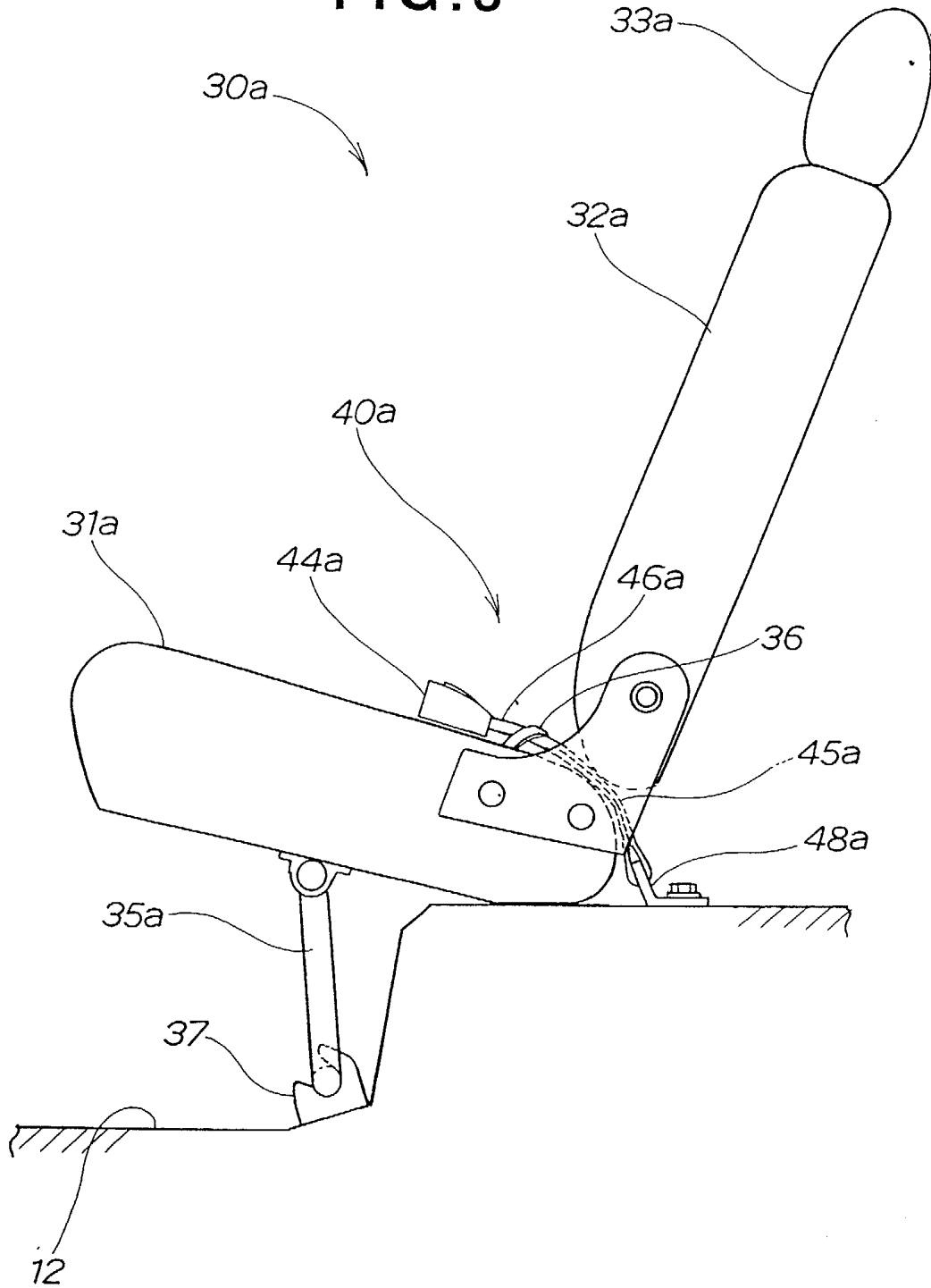


FIG. 4B

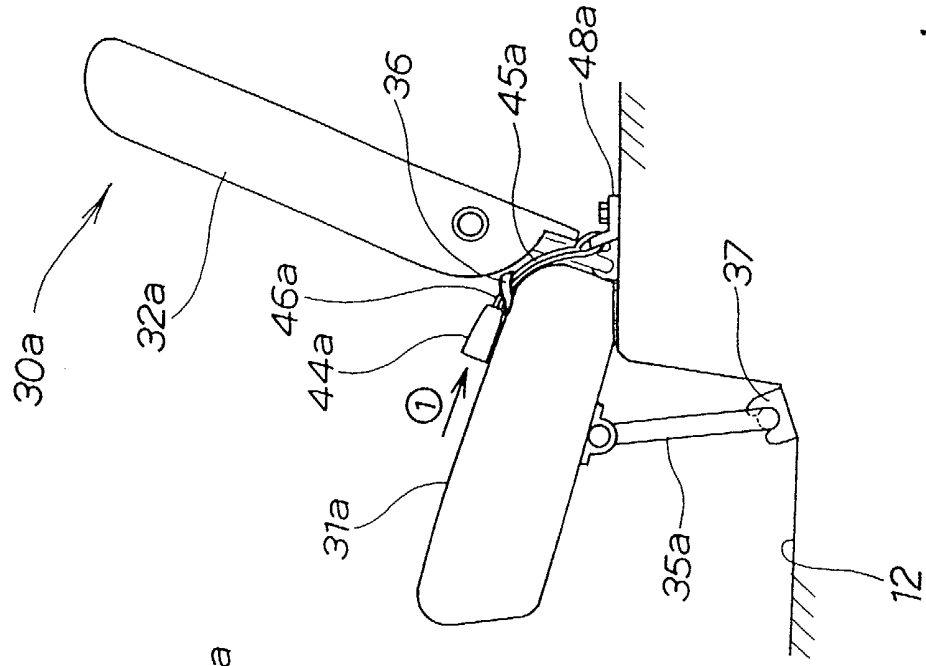


FIG. 4A

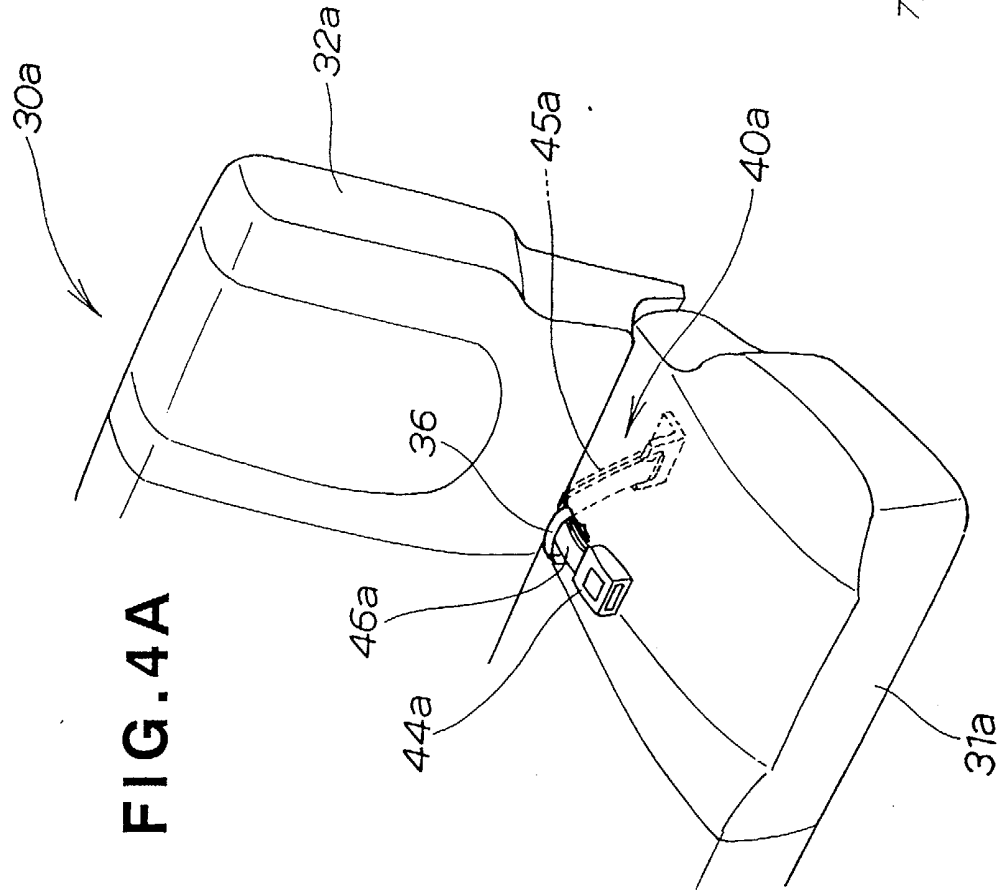


FIG. 5B

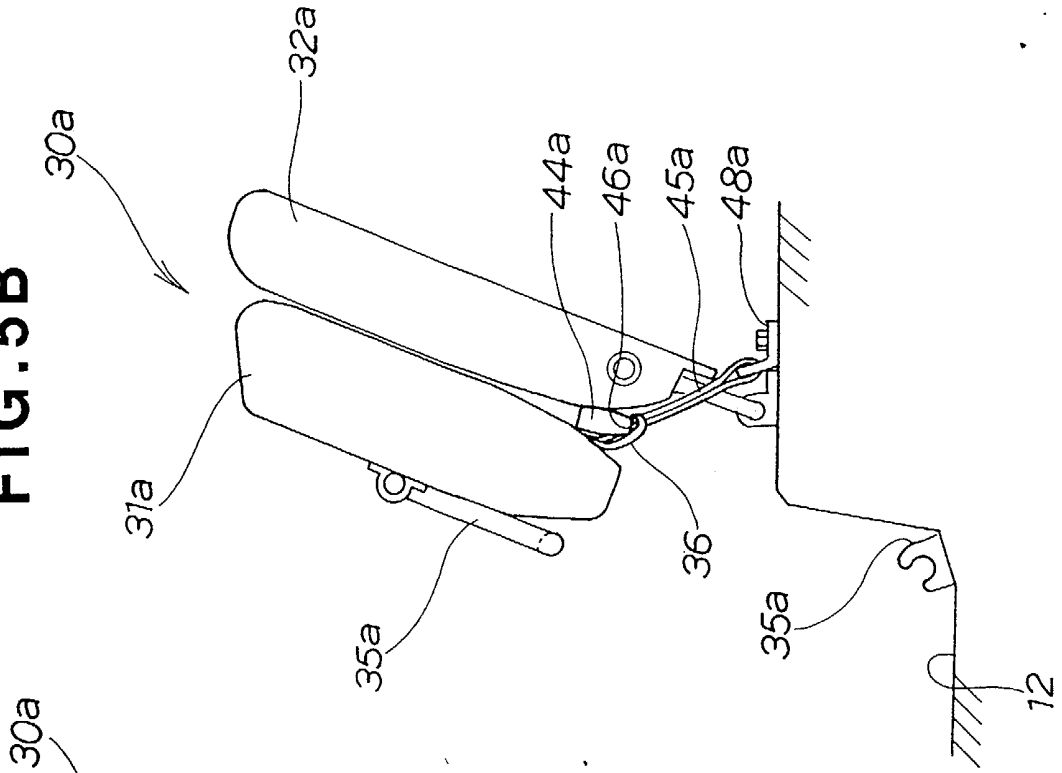


FIG. 5A

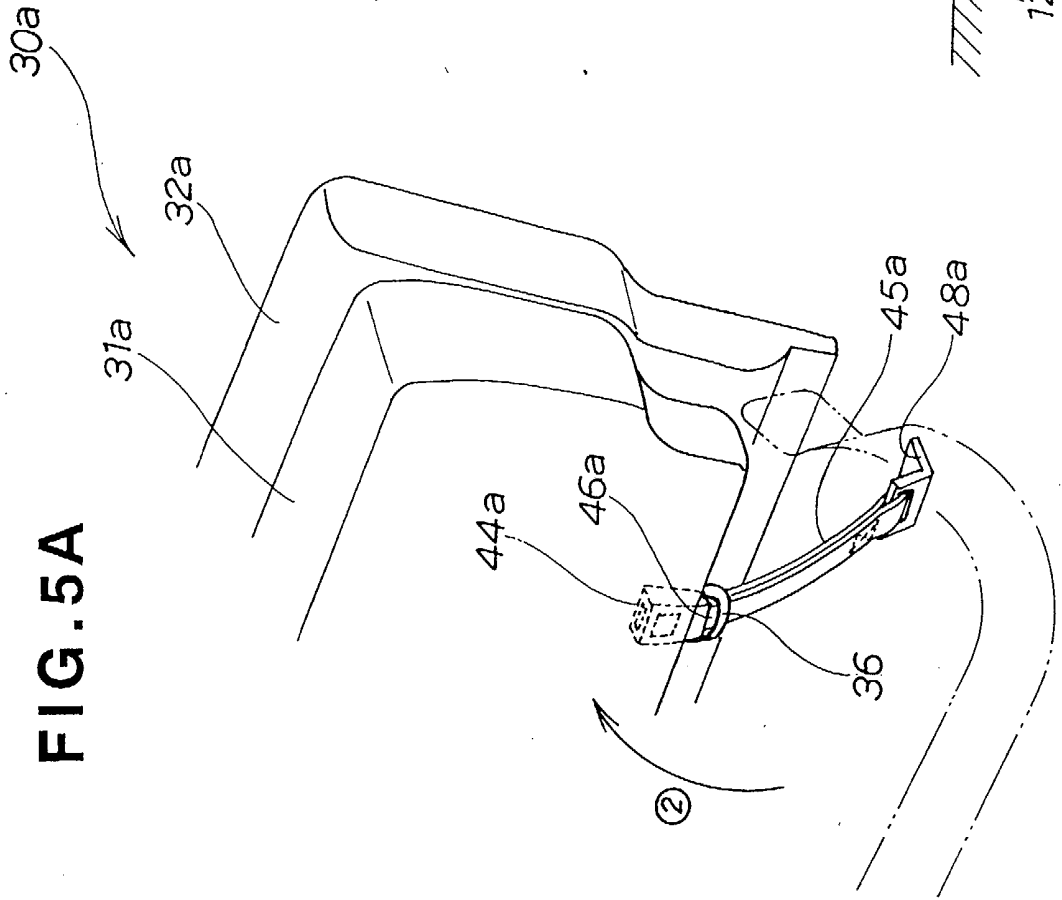


FIG. 6A

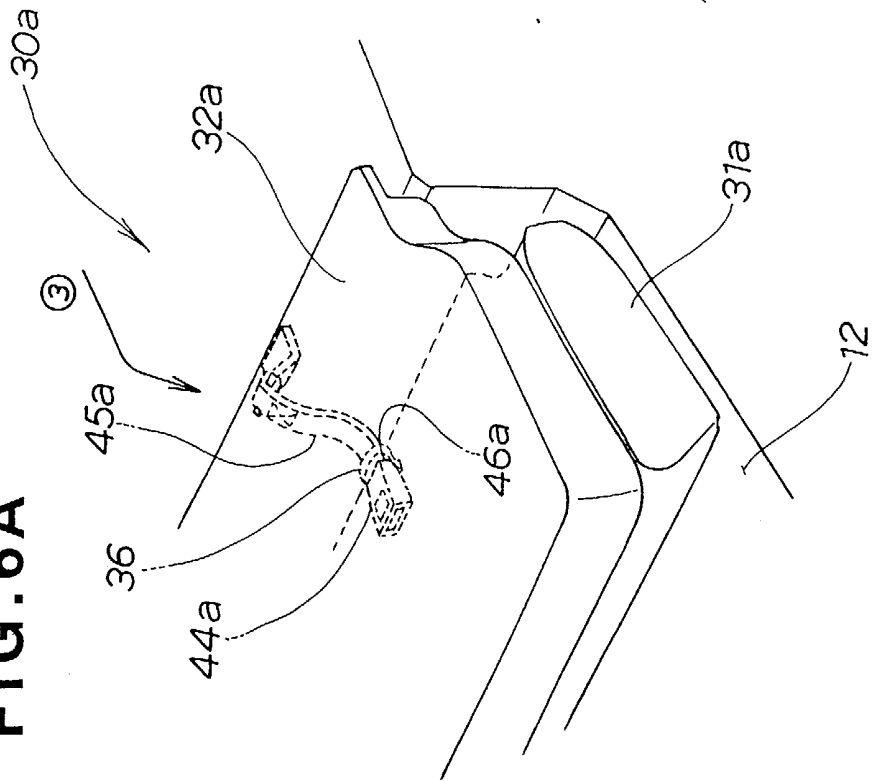


FIG. 6B

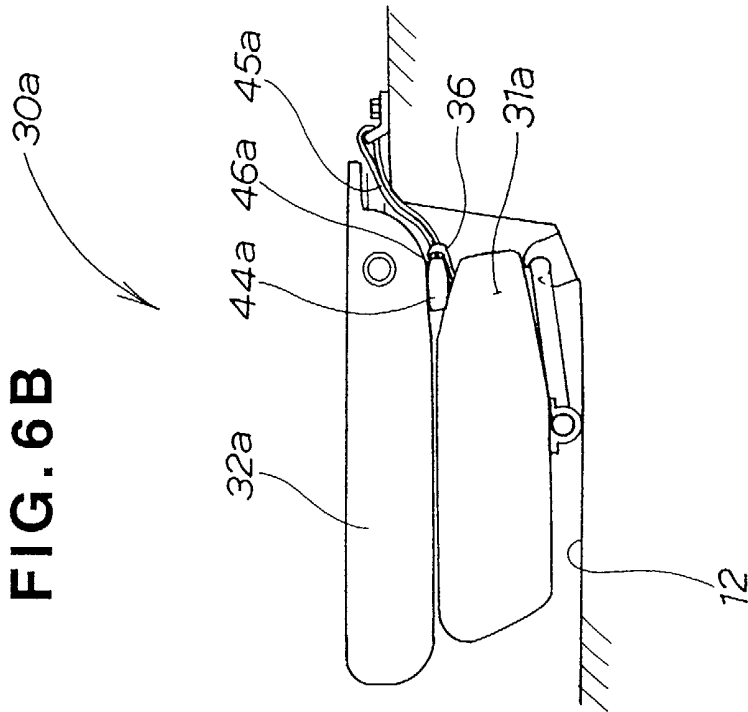


FIG. 7A
(PRIOR ART)

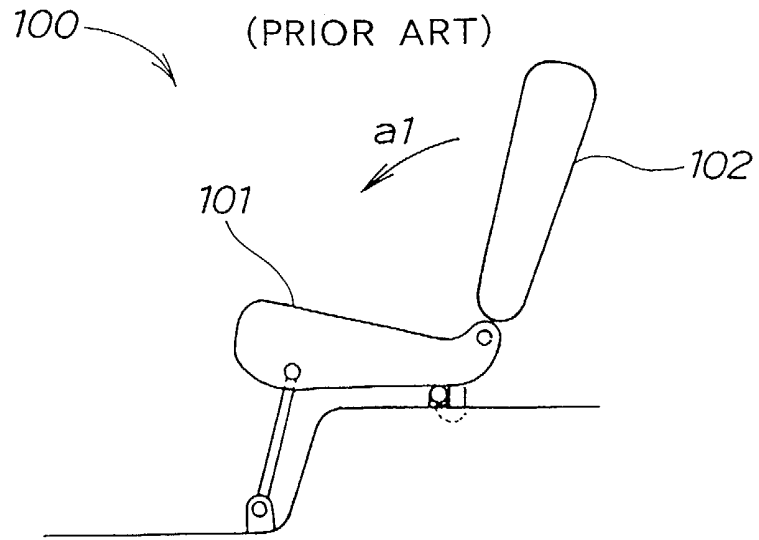


FIG. 7B
(PRIOR ART)

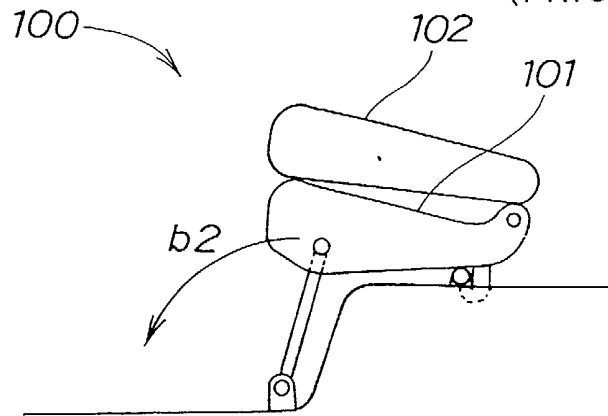


FIG. 7C
(PRIOR ART)

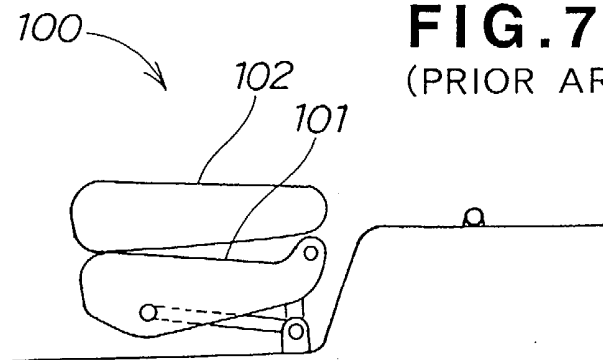


FIG. 8A
(PRIOR ART)

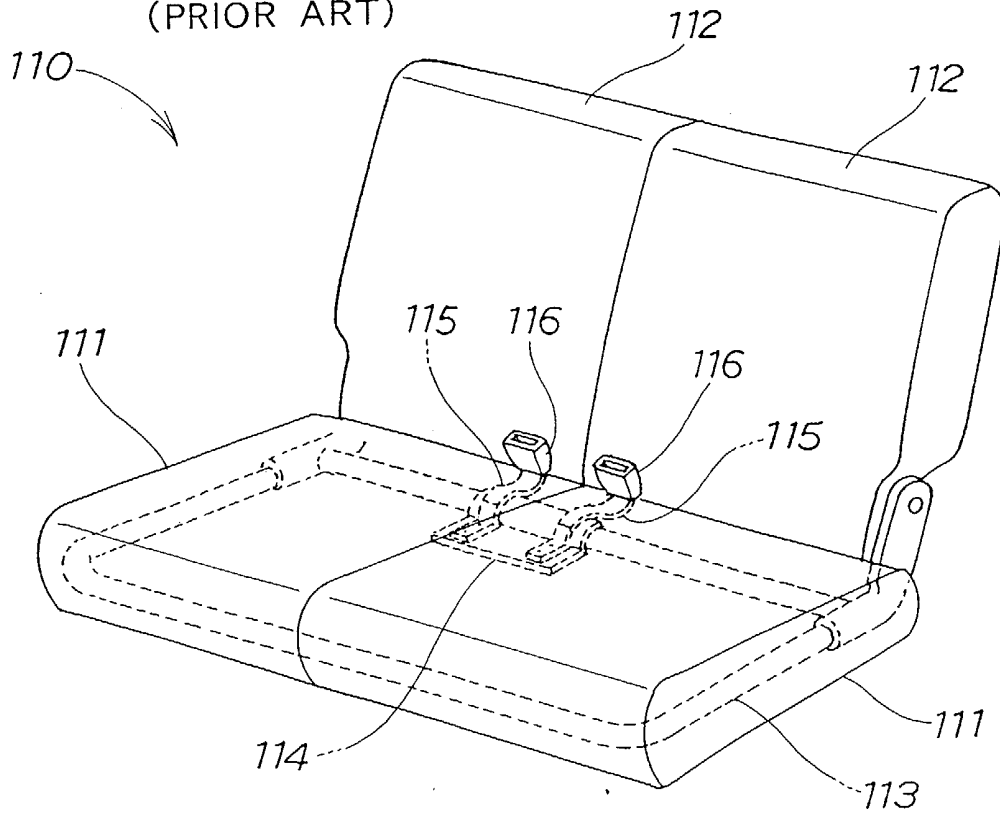
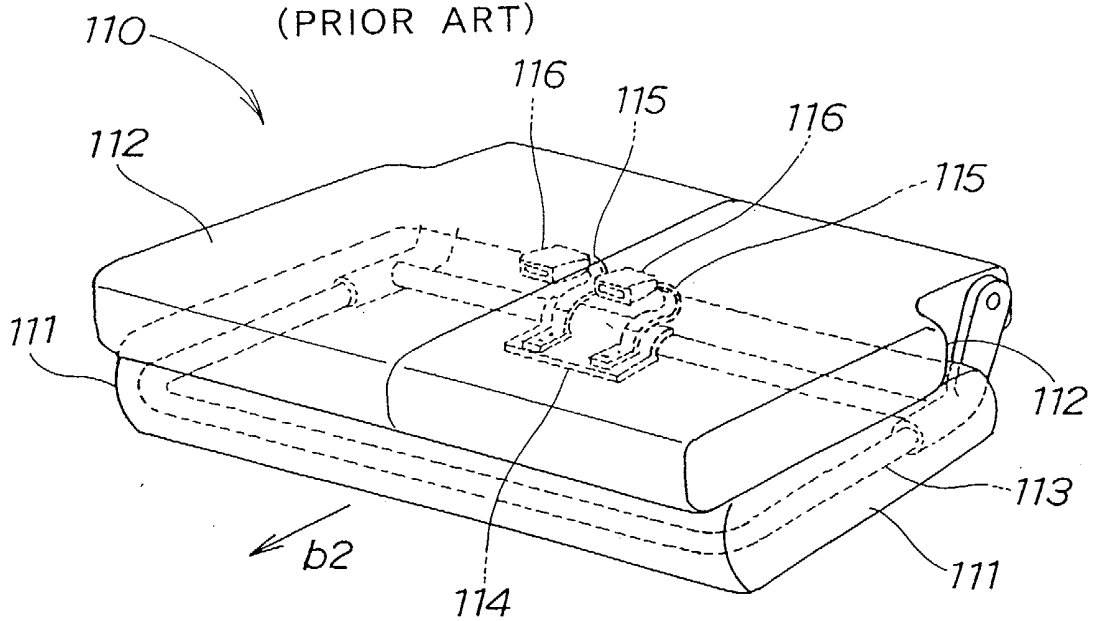


FIG. 8B
(PRIOR ART)



VEHICLE SEAT BELT RETAINING STRUCTURE

This invention relates to a structure for retaining a vehicle seat belt which constricts, among a waist portion and an upper part of a torso of an occupant seated on a vehicle seat, at least the waist portion.

Various vehicle seats have been conventionally known. An example of such known seats is shown in FIGS. 7A to 7C hereof. The example vehicle seat 100 includes a seat cushion 101 and a seat back 102 foldable relative thereto, the seat cushion and the seat back being movable in unison.

When folding the seat back 102 in a direction shown by arrow a1 as shown in FIG. 7A, the seat back 102 assumes a folded condition or posture as shown in FIG. 7B. When moving the seat back 102, held in a folded condition, together with the seat cushion 101 in a direction shown by arrow b2 of FIG. 7B, the vehicle seat 100 is placed in a forwardly shifted position under the folded condition, as shown in FIG. 7C.

In normal practice, the seat belt, which is not shown, has terminal ends anchored to a pillar or a floor of the vehicle body. With such a seat belt 100 adapted to be foldable, movable and rotatable in a variety of arrangements (hereinafter referred to as a seat arrangement), there may be instances where it is easy to operate the vehicle seat or the seat belt if the seat belt is moved following the movement of the vehicle seat 100.

To this end, an example of a seat belt mounting structure adapted

to enable movement of the seat belt in unison with the vehicle seat is shown in FIGS. 8A and 8B hereof.

The conventional seat belt mounting structure shown in FIG. 8A is arranged such that one end portion of a short belt 115 is secured to a frame 113 of a seat cushion 111 of a vehicle seat 100 via a holder 114 while an opposite end portion of the short belt is connected to a buckle 116.

With this arrangement, even when the vehicle seat 110 is moved in a forward direction, as shown by arrow b2 in FIG. 8B, with a seat back 112 folded over the seat cushion 111, the buckle 116 and the short belt 115 move together with the vehicle seat 110. Thus, the buckle 116 and the short belt 115 are blocked from withdrawal from the vehicle seat 110.

However, with the seat belt mounting structure as set forth above, for instance, it is required for the vehicle seat 100 to be firmly mounted or for the frame 113 of the seat cushion 111 to be formed in a strong configuration, with a resultant increase in weight of the vehicle to cause increased fuel consumption.

Further, firmly mounting the vehicle seat 100 or forming the frame 113 of the seat cushion 111 in the strong configuration causes an increase in the cost of manufacture of the vehicle. That is, there arises a demand for the provision of a retaining structure which capable of retaining the buckle of the seat belt at the vehicle seat in an easy way even when the terminal end portion of the seat belt is secured to the floor of the vehicle body.

It is therefore an object of the present invention to provide a seat belt retaining device which allows component parts of a seat belt to be placed across a vehicle seat without seriously increasing the manufacturing cost of a vehicle and without
5 remarkably increasing the weight of the vehicle.

According to an aspect of the present invention, there is provided a vehicle seat belt retaining structure for retaining a vehicle seat belt at a vehicle body and a vehicle seat, which structure comprises a short belt having one end portion anchored
10 to a floor of the vehicle body and the other end portion connected with a buckle which passes through a gap between a seat cushion and a seat back of said vehicle seat, a long belt designed to be placed across a body of a vehicle occupant and having one end portion connected with a tongue which releasably engages said
15 buckle, and a resilient member for resiliently retaining a connecting portion, which connects the buckle and the short belt to one another, to either one of the seat cushion and the seat back, so that the buckle is blocked from withdrawal from the seat cushion or the seat back.

20 In a preferred form, the above resilient member is comprised of a rubber band.

Inserting the buckle through a gap, or through its vicinity, between the seat cushion and the seat back and fixing the connecting portion between the buckle and the short belt with the resilient
25 member allow the resilient member, which fixes the connecting portion, to be extended or retracted following the movements of the seat cushion or the seat back, for instance, when the seat

back is folded over the seat cushion, when the seat cushion,
remaining in a folded condition, and the seat back are raised
~~up~~ together, and when the seat cushion, remaining in the folded
condition, and the seat back are moved together. That is, providing
5 the buckle at the other end of the short belt whose one end is
anchored to the vehicle body side, such as the floor, and
resiliently fixing the connecting portion between the buckle and
the short belt to the seat cushion or the seat back using the
resilient member, such as the rubber band, block the buckle from
10 withdrawal from the seat cushion or the seat back.

A preferred embodiment of the present invention will be
described in detail below, by way of example only, with reference
to the accompanying drawings, in which:

15 FIG. 1 is a perspective view of a vehicle body employing a
vehicle seat belt retaining structure according to the present
invention;

FIG. 2 is a perspective view illustrating a rear seat to which
the vehicle seat belt is applied;

20 FIG. 3 is a view as seen in the direction of arrow 3 of FIG.
1;

FIGS. 4A and 4B are perspective and cross sectional views of
a left vehicle seat to which a short seat belt according to the
present invention is applied;

25 FIGS. 5A and 5B are perspective and side views illustrating
the seat cushion raised to be folded over the seat back to
remain in a folded condition from an unfolded condition shown

in FIGS. 4A and 4B;

FIGS. 6A and 6B are perspective and side views illustrating a condition wherein the vehicle seat is moved forward in the folded condition shown in FIGS. 5A and 5B;

FIGS. 7A, 7B and 7C are side views illustrating an example wherein a conventional vehicle seat is folded and subsequently moved forward; and

FIGS. 8A and 8B are views illustrating, as an example, a conventional vehicle seat belt mounting structure.

In FIG. 1, reference numeral 10 denotes a vehicle; 11, a vehicle body; 12, a floor; 13, a driver's seat; 14, a front passenger's seat; 15, a steering wheel; 16, a front window glass; 17, 17, rear window glasses; 18, a tailgate; 21, 21, rear pillars; 30a, 30b, rear seats deployed for use by passengers; and 40a, 40b and 40c, vehicle seat belts.

A seat belt retaining structure according to the present invention serves as a structure for retaining the vehicle seat belts 40a, 40b and 40c at the left and right vehicle seats 30a, 30b when the left and right rear seats are folded or raised.

FIG. 2 is a perspective view of the vehicle seat which forms the vehicle seat belt retaining structure according to the present invention.

The left rear seat 30a comprises a seat cushion 31a, a seat back 32a mounted to the seat cushion 31a at a rear part thereof for foldable movement, a left head rest 33a mounted to the seat back 32a at a top thereof for sliding movement, and a central head rest 34. The seat cushion 31a includes a supporting stay 35a by which the seat cushion 31a is supported on the floor 12 and also includes rubber bands 36 which serve as

resilient members for fixing left, central and right seat belts 40a, 40b, 40c.

As set forth below, the left rear seat 30a has the seat back 32a enabled to be folded over the seat cushion 31a, with the seat cushion 31a and the seat back 32a being also enabled to be raised.

The right rear seat 30b has substantially the same structure as the left rear seat 30a, and the right rear seat 30b has a smaller seat width than the left rear seat 30a, having no portion corresponding to the central head rest 34, and a rubber band 36 is mounted for fixing the right seat belt 40b. Reference numeral 31b denotes a seat cushion; 32b, a seat back; 33b, a head rest, and 35b, a supporting stay. The left and right supporting stays 35a, 35b are retained with a plurality of holders 37.

The left seat belt 40a comprises a long belt 41a with one end portion secured to the vehicle body 11 (see FIG. 1) and an opposite end portion wound on a winding-up unit (not shown) mounted to the vehicle body 11, a slip guide 42a, mounted to the vehicle body 11, permitting the long belt 41a to pass therethrough, a tongue 43a movable along the long belt 41a to allow the same to be placed across the waist portion and the upper portion of the torso of a seat occupant, a buckle 44a for fixing the tongue 43a, and a short belt 45a with one end portion connected with the buckle 44a and the other end portion secured to the floor 12 of the vehicle body 11. The left seat belt 40a forms a three

point seat belt configuration which, when the long belt 41a is connected to the short belt 45a through interconnection between the tongue 43a and the buckle 44a, has a fixing point for the long belt 41a to be anchored to the floor 12, a fixing point for connection to the vehicle body 11 and a fixing point for the short belt 45a to be secured to the floor 12.

Here, reference numeral 46a denotes a connecting portion between the buckle 44a and the short belt 45a; 47a, a fixture fastened to the other end of the long belt 41a; and 48a, a fixture fastened to the other end of the short belt 45a.

The right seat belt 40b has the same structure as the left seat belt 40a and is mounted to the vehicle body in a symmetric relationship with respect to the center of the vehicle body. Reference numeral 41b denotes a long belt; 42b, a slip guide; 43b, a tongue; 44b, buckle; 45b, a short belt; 46b, a connecting portion; and 47b, 48b, fixtures.

The central seat belt 40c is comprised of a long belt 41c with one end portion anchored to the floor 12 of the vehicle body 11 (see FIG. 1) and the other opposite end portion connected with a tongue 43c, a buckle 44c for allowing the tongue 43c to be fixed after the belt 41c is placed across the waist portion of the vehicle occupant, and a short belt 45c with one end portion connected with the buckle 44c and the other opposing end portion secured to the floor 12 of the vehicle body 11. The central seat belt 40c forms a two point seat belt configuration which, when the tongue is connected with the buckle 44a, has a fixing point for the long belt 41c to be secured to the floor 12, and a fixing point for

the short belt 45c to be anchored to the floor 12.

Here, reference numeral 46c denotes a connecting portion between the buckle 44c and the short belt 45c; 47c, a fixture mounted to the other end of the long belt 41c; and 48c, a fixture
5 mounted to the other end of the short belt 45c.

FIG. 3 shows the rear seat 30a as viewed from the side.

With the vehicle seat belt retaining structure according to the present invention, will be appreciated that, in the vehicle seat belt 40a of the type wherein the other opposing end portion of the
10 short belt 45a, whose one end portion is fixed to the vehicle body 11 (see FIG. 1) such as the floor 12, is connected with the buckle 44a which in turn passes through a gap, or through the vicinity thereof, between the seat cushion 31a and the seat back
32a to permit the tongue 43a of the long belt 41a (see FIG. 2),
15 which is placed across the body of the vehicle occupant, to be coupled to the buckle 44a for biting engagement, resiliently fixing the connecting portion 46a between the buckle 44a and the short belt 45a to the seat cushion 31a or the seat back 32a using the resilient member such as the rubber band 36 blocks the buckle
20 44a from withdrawal from the seat cushion 31a or the seat back 32a.

It is preferable for the buckle 44a, which forms the component parts of the left seat belt 40a, to be retained at the left vehicle seat 30a in an easy manner.

25 Permitting the buckle 44a to be inserted through the gap, or through the vicinity thereof, between the seat cushion 31a and the seat back 32a to allow the connecting portion 46a between

the buckle 44a and the short belt 45a to be fixed with the resilient member such as the rubber band 36 causes the rubber band 36 (resilient member), which fixes the connecting portion 46a, to be extended or contracted along with the movements of the seat cushion 31a or the seat back 32a, for instance, when the seat back 32a is folded over the seat cushion 31a, when the seat cushion 31a, remaining in a folded condition, and the seat back 32a are raised together, and when the seat cushion 31a, remaining in the folded condition, and the seat back 32a are moved together.

10 Namely, the vehicle seat belt retaining structure according to the present invention is structured such that the buckle 44a is connected to the other end portion of the short belt 45a, whose one end portion is anchored to the vehicle body 11 (see FIG. 1),

for example to the floor 12, and the connecting portion 46a is resiliently

15 fixed between the buckle 44a and the short belt 45a to the seat cushion 31a or the seat back 32a using the resilient member such as the rubber band 36 to block the buckle 44a from withdrawal from the seat cushion 31a or the seat back 32a. This results in improvement in a handling capability and operability of the left
20 seat belt 40a.

Operation of the vehicle seat belt retaining structure according to the present invention set forth above is described below with reference to FIGS. 4A to 6B.

25 In FIG. 4A, since the connecting portion 46a between the buckle 44a and the short belt 45a is resiliently fixed to the seat cushion 31a or the seat back 32a using the resilient member such as the rubber band 36, the movement of the buckle 44a can be limited

in a widthwise direction of the vehicle.

In FIG. 4B, even if, for instance, the buckle 44a is exerted with a force oriented in a direction of an arrow ① when the vehicle occupant sits on the seat, there is no danger of the buckle 44a becoming detached from the left vehicle seat 30a.

In FIG. 5A, if the seat cushion 31a is folded up toward the seat back 32a as shown by arrow ②, there is no danger of the buckle 44a passing through the gap between the seat cushion 31a and the seat back 32a. That is, in FIG. 5B, when in a folded up condition of the seat cushion 31a, the rubber band 36 is extended, enabling the buckle 44a to accompany the movement of the seat cushion 31a.

In FIG. 6A, even when the left vehicle seat belt 30a remaining in a folded condition is moved forward as shown by an arrow ③, there is no danger of the buckle 44a passing through the gap between the seat cushion 31a and the seat back 32a. That is, as shown in FIG. 6B, even under a condition where the left vehicle seat 30a is moved, the rubber band 36 is extended, with no withdrawal of the buckle 44a through the gap between the seat cushion 31a and the seat back 32a.

As shown in FIG. 3, while the preferred embodiment has been shown in conjunction with an example where the rubber band 36 is mounted to the seat cushion 41a, the present invention is not limited thereto and the rubber band 36 may be mounted to the seat back 32a.

Further, as shown in FIG. 2, while the preferred embodiment has been shown with respect to an example wherein the vehicle

seat belts 40a, 40b form the three point seat belt configuration and the central vehicle seat belt 40c forms the two point seat belt configuration, the present invention may be of a seat belt of any configurations.

5 While the preferred embodiment shown in FIG. 2 has been shown in conjunction with an example where only the short belt 45c is retained with the resilient member 36, the present invention is not limited thereto and the long belt 41c may also be retained with the resilient member 36. Namely, retaining the long belt
10 41c of the vehicle seat belt 40c with the resilient member 36 enables the long belt 41c to be retained at the seat cushion 31a. This results in improvement in a handling capability and operability of the vehicle seat belt 40c.

As shown in FIG. 3, while the preferred embodiment is shown
15 as structured such that the connecting portion 46a between the buckle 44a and the short belt 45a are retained with the resilient member (rubber band 36), the present invention is not limited thereto and the buckle 44a per se may be retained with the seat cushion 31a or the resilient member 36 mounted to the seat back
20 33a.

It will be appreciated that the connecting portion 46a may comprise a portion of the short belt 45a, or may comprise a separate component extending between the short belt 45a and the buckle 44a.

CLAIMS

1. A vehicle seat belt retaining structure for retaining a vehicle seat belt (40a, 40b, 40c) to a vehicle body (11) and a vehicle seat (30a, 30b), comprising:
 - a short belt (45a, 45b, 45c) having one end portion anchored to a floor of said vehicle body and the other end portion connected with a buckle (44a, 44b, 44c) which passes through a gap between a seat cushion (31a, 31b) and a seat back (32a, 32b) of said vehicle seat;
 - a long belt (41a, 41b, 41c) designed to be placed across a body of a vehicle occupant and having a tongue (43a, 43b) which releasably engages said buckle; and
 - a resilient member (36) for resiliently retaining a connecting portion (46a, 46b, 46c), which connects said buckle and said short belt, to either one of said seat cushion and said seat back, so that said buckle is retained against withdrawal from said seat cushion or said seat back.
2. A vehicle seat belt retaining structure as claimed in claim 1, wherein said resilient member comprises a rubber band (36).
3. A vehicle seat belt retaining structure as claimed in claim 1 or 2, wherein the seat (30a, 30b) is movable to a folded configuration while the buckle (44a, 44b, 44c) remains retained by the resilient member (36).
4. A vehicle seat belt retaining structure substantially as described herein with reference to, and as shown in, Figures 1 to 6 of the accompanying drawings.



Application No: GB 0213003.7
Claims searched: 1 - 4

Examiner: Beverley Lloyd
Date of search: 25 September 2002

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in: UK Cl (Ed.T): B7B (BVRD, BVRJ) Int Cl (Ed.7): B60R 22/00 Other: Online: WPI, EPODOC, JAPIO
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Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	EP 0516512 A1 (AUTOMOBILES) See Figs & Abstract	-
A	AU 636855 (TACHI) See Figs	-

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art.
Y Document indicating lack of inventive step if combined with one or more other documents of same category.	P Document published on or after the declared priority date but before the filing date of this invention.
& Member of the same patent family	E Patent document published on or after, but with priority date earlier than, the filing date of this application.