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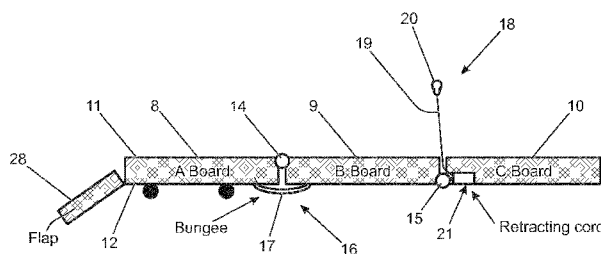


FIG. 3A

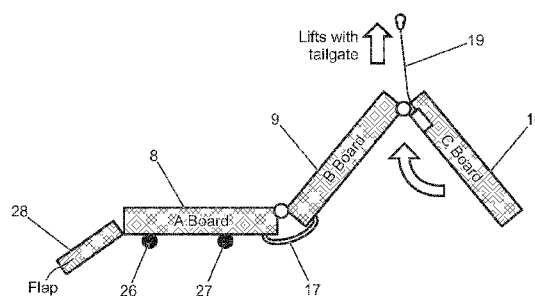


FIG. 3B

(57) Abstract: The present disclosure relates to a loadspace cover (2) for a vehicle (1). The loadspace cover (2) includes a first board (8), a second board (9) and a third board (10). A first hinge (14) hingedly connects the first board (8) to the second board (9). A second hinge (15) hingedly connects the second board (9) to the third board (10). The loadspace cover (2) includes a coupling means (18) for coupling the loadspace cover (2) to a tailgate (5) of the vehicle (1). The present disclosure also relates to a vehicle (1) having a loadspace cover (2).

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VEHICLE LOADBAY COVER

TECHNICAL FIELD

The present disclosure relates to a vehicle loadbay apparatus. Particularly, but not
5 exclusively, the present disclosure relates to a loadspace cover for a vehicle; and to a vehicle incorporating a loadspace cover.

BACKGROUND

It is known to provide a multi-piece, rigid loadspace cover in a vehicle at least partially to
10 cover a loadbay. The loadspace cover may be opened to provide improved access to the loadbay, for example to facilitate loading and/or unloading. However, these types of loadspace cover must be opened manually by the user to gain access to the loadbay. Moreover, these loadspace covers may be unwieldy and can prove difficult to manipulate as the mechanisms may be counter-intuitive.

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At least in certain embodiments, the invention seeks to overcome or ameliorate at least some of the problems associated with the prior art loadspace covers.

SUMMARY OF THE INVENTION

20 Aspects of the present invention relate to a loadspace cover and to a vehicle.

According to a further aspect of the present invention there is provided a loadspace cover for a vehicle, the loadspace cover comprising:

a first board, a second board and a third board;
25 a first hinge hingedly connecting the first board to the second board;
a second hinge hingedly connecting the second board to the third board; and
coupling means for coupling the loadspace cover to a tailgate of the vehicle,
wherein the coupling means comprises a cord connected to the loadspace cover at or proximal to a second hinge axis of the second hinge. The loadspace cover can be
30 configured in an open configuration and a closed configuration. The coupling means may be attached to the loadspace cover such that movement of the tailgate causes the first board to pivot relative to the second board. The coupling means may be attached to the loadspace cover such that movement of the tailgate causes the second board to pivot relative to the third board. By providing first and second hinges, the first, second and third boards may
35 pivot or move relative to each other to enable the loadspace cover to be configured in said open configuration and said closed configuration. The first, second and third boards may be arranged in a substantially planar configuration when the loadspace cover is in said closed

configuration; and in a folded configuration when the loadspace cover is in said open configuration. The first and second hinges may be arranged to enable the loadspace cover to fold in a concertina manner. The coupling means is arranged to reconfigure said loadspace cover from said closed configuration to said open configuration as the tailgate is
5 opened. At least in certain embodiments the loadspace cover may be opened and closed in conjunction with the opening and closing of the tailgate, thereby avoiding or reducing the need for the user to interact with the loadspace cover.

At least in certain embodiments, the loadspace cover may comprise a multi-piece rigid
10 loadspace cover. The first, second and third boards may each have a rigid, inflexible construction.

The first, second and third boards may each have an upper surface and a lower surface. When the loadspace cover is in said closed configuration the upper surfaces of said first,
15 second and third boards are arranged in a substantially planar configuration.

The first hinge may be configured to enable the second board to pivot in a first pivot direction. The second board may, for example, pivot upwardly relative to the first board. The first hinge may be configured to enable the upper surfaces of the first and second boards to
20 pivot towards each other. The first hinge may define a first hinge axis. The first hinge axis may be disposed at or proximal to the upper surface of said first and second boards.

The loadspace cover may comprise a spring biasing means for biasing at least said first and second boards towards a substantially planar configuration. The spring biasing means
25 applies a closing force to the loadspace cover. As least in certain embodiments the spring biasing means may bias the loadspace cover towards its closed configuration as the tailgate is closed. In use, the closing force combined with the inertia of the boards may prove sufficient to close the loadspace cover without additional user interaction. The spring biasing means may also help to retain the loadspace cover in said closed configuration. This may
30 reduce or inhibit movement of the loadspace cover, which may help to reduce vibrations. At least in certain embodiments, the spring biasing means may remove the need for additional retaining means, such as magnets, for retaining the cover in position. At least in certain embodiments, the spring biasing means may provide an anti-trap function. It will be appreciated that the spring biasing means should be configured to provide sufficient closing
35 force to close the cover without applying excessive force that may cause damage to objects projecting above the level of the loadspace cover.

The spring biasing means may be integrated into said first board and/or said second board. The spring biasing means may be disposed in a recess formed in the lower surface of said first board and/or said second board. The spring biasing means may comprise at least one elasticated member. The at least one elasticated member may comprise a bungee cord, for example. The at least one elasticated member may be offset vertically from a first hinge axis of said first hinge. The loadspace cover may, for example, comprise two bungee cords on the underside thereof.

The second hinge may be configured to enable the third board to pivot in a second pivot direction. The third board may, for example, pivot downwardly relative to the second board. The second hinge may be configured to enable the lower surfaces of the second and third boards to pivot towards each other. The second hinge may define a second hinge axis. The second hinge axis may be disposed at or proximal to the lower surface of said second and third boards.

At least in certain embodiments, the first and second hinges may be arranged such that the second and third boards may pivot in opposite pivot directions as the loadspace cover transitions from said closed configuration to said open configuration and vice versa. The loadspace cover may fold in a concertina manner.

The coupling means may comprise a cord connected to the loadspace cover. The cord may be connected to the loadspace cover at or proximal to the second hinge axis. The cord may, for example, be connected to the second board or the third board proximal to said second hinge.

The loadspace cover may comprise a cord retractor for retracting said cord. The cord retractor may comprise a retracting mechanism for retracting at least a portion of said cord. The retracting mechanism may comprise a spring-biasing means, such as a constant force spring.

The cord retractor may comprise a damping mechanism for controlling retraction of said cord. The cord retractor may comprise a damping mechanism, such as a one-way damping mechanism, for controlling retraction of said cord. At least in certain embodiments the one-way damping mechanism may enable rapid extension of the cord upon application of an external force, whilst controllably retracting the cord when the external force is removed. The damping mechanism may thereby help to protect the cord retractor. The cord will reach its maximum extension when the tailgate is opening. In use, when at maximum extension, the

cord will transmit a lifting force to the loadspace cover. As the loadspace cover closes, the cord is at least partially retracted by the cord retractor and a visible portion of the cord may be maintained taught, thereby providing a more premium appearance to the user. The loadspace cover can be removed from the vehicle by detaching the cord from the tailgate.

- 5 The cord retractor will retract the cord, thereby protecting the cord and reducing the likelihood of it being caught on other items.

In an embodiment the cord retractor may be mounted to the loadspace cover. In another embodiment the cord retractor may be mounted on the underside of the loadspace cover.

- 10 This is advantageous as the cord retractor is hidden from view from a user of the vehicle in normal use.

In one embodiment, the cord retractor is mounted on the third board. This is advantageous as the cord retractor is configured to secure the cord proximal to the second hinge thereby enabling movement of the second and third loadspace boards.

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The first board may comprise a first support means for supporting each end thereof. The first support means may comprise one or more lateral projections for cooperating with a guide provided in said vehicle. The guide may, for example, comprise a linear guide. The one or more lateral projections may be adapted to releasably mount the first board.

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According to a further aspect of the present invention there is provided a vehicle comprising a loadspace cover as described herein. The loadspace cover may be supported on first and second guides disposed on opposing sides of a loadbay. The first and second guides may, for example, be linear guides.

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Within the scope of this application it is expressly intended that the various aspects, embodiments, examples and alternatives set out in the preceding paragraphs, in the claims and/or in the following description and drawings, and in particular the individual features thereof, may be taken independently or in any combination. That is, all embodiments and/or features of any embodiment can be combined in any way and/or combination, unless such features are incompatible. The applicant reserves the right to change any originally filed claim or file any new claim accordingly, including the right to amend any originally filed claim to depend from and/or incorporate any feature of any other claim although not originally claimed in that manner.

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BRIEF DESCRIPTION OF THE DRAWINGS

One or more embodiments of the present invention will now be described, by way of example only, with reference to the accompanying Figures, in which:

Figure 1 shows a vehicle comprising a loadspace cover in accordance with an embodiment of the present invention;

Figure 2 shows a perspective view of the loadbay of the vehicle shown in Figure 1 with the loadspace cover in an open configuration;

Figures 3A and 3B show side elevations of the loadspace cover in a closed configuration and an open configuration respectively;

Figures 4A and 4B show perspective views of a top view and a bottom view respectively of the loadspace cover;

Figure 5 shows a sectional view through a portion of the loadspace cover in accordance with an embodiment of the present invention; and

Figures 6A and 6B illustrate a cord guide in a modified arrangement of the loadspace cover.

DETAILED DESCRIPTION

A vehicle 1 incorporating a loadspace cover 2 in accordance with an embodiment of the present invention will now be described with reference to the accompanying Figures. The loadspace cover 2 in accordance with the present invention is a rigid multi-piece loadspace cover 2.

A schematic representation of the vehicle 1 is shown in Figure 1. The vehicle 1 in the present embodiment is a sports utility vehicle (SUV), but it will be appreciated that the loadspace cover 2 may be used in other vehicle types, such as an automobile having an estate, fastback or station wagon body style. The vehicle one has a longitudinal axis X, a transverse axis Y and a vertical axis Z.

The vehicle 1 comprises a loadbay 3 disposed at the rear of the vehicle 1 behind a second row of vehicle seats 4. The loadbay 3 is accessible via a tailgate 5. As shown in Figure 2, the tailgate 5 has a top-hinge arrangement and is hingedly connected to a roof 6 of the vehicle 1. The tailgate 5 may be raised to provide access to the loadbay 3 and lowered to close the loadbay 3. The loadspace cover 2 is provided over the loadbay 3. As described herein, the loadspace cover 2 can be arranged in an open configuration to provide access to the loadbay 3 and in a closed configuration at least partially to cover the loadbay 3. First and second linear supports 7-1, 7-2 are provided on opposing sides of the loadbay 3 to support the respective ends of the loadspace cover 2. The first and second linear supports 7-1, 7-2 may, for example, comprise a linear guide or track.

With reference to Figures 3A and 3B, the loadspace cover 2 comprises a first board 8, a second board 9 and a third board 10 each having an upper surface 11 and a lower surface 12. It will be understood that the upper surface 11 forms an A-surface of the loadspace cover 2. The first, second and third boards, 8, 9, 10 are moulded from a plastics material and each have a rigid construction. In the present embodiment the first, second and third boards, 8, 9, 10 each comprise a honeycomb core with a plastic (polyurethane) sprayed cover (for example, Baypreg (RTM) construction). Each of said first, second and third boards 8, 9, 10 is hingedly connected to an adjacent one of said first, second and third boards 8, 9, 10. The first and second boards 8, 9 are hingedly connected to each other by a first hinge 14. The first hinge 14 is configured to enable the second board 9 to pivot upwardly relative to the first board 8 such that their upper surfaces 11 pivot towards each other. The first hinge 14 has a first hinge axis Y1 disposed proximal to the upper surfaces 11 of the first and second boards 8, 9. The second and third boards 9, 10 are hingedly connected to each other by a second hinge 15. The second hinge 15 is configured to enable the third board 10 to pivot downwardly relative to the second board 9 such that their lower surfaces 12 pivot towards each other. It will be appreciated that, due to the first and second linear supports 7-1, 7-2, the third board 10 may pivot downwardly only when the second board 9 is raised. The second hinge 15 has a second hinge axis Y2 disposed proximal to the lower surface 12 of the second and third boards 9, 10. The first and second hinge axes Y1, Y2 are arranged substantially parallel to a transverse axis Y of the vehicle 1. The arrangement of the first and second hinges 14, 15 is such that the second and third boards 9, 10 pivot in first and second pivot directions which are opposite to each other as the loadspace cover transitions from said closed configuration to said open configuration and vice versa. The loadspace cover 2 may thereby be folded in a concertina manner. In the present embodiment the first and second hinges 14, 15 are adapted to enable the first, second and third boards 8, 9, 10 to be folded into a face-to-face configuration. The first hinge 14 comprises a first live hinge, for example comprising a first resilient element, which connects the first and second boards 8, 9. The second hinge 15 comprises a second live hinge, for example comprising a second resilient element, which connects the second and third boards 9, 10. The first and second hinges 14, 15 could be formed integrally with the first, second and third boards 8, 9, 10 or may be affixed to the respective boards 8, 9, 10 using an adhesive and/or one or more mechanical fastener. In a modified arrangement, the first and second hinges 14, 15 may each comprise one or more mechanical hinge assemblies.

As shown in Figure 3A, a spring biasing means 16 is provided for biasing the first and second boards 8, 9 towards a planar configuration adopted when the loadspace cover 2 is in

said closed configuration. The spring biasing means 16 in the present embodiment comprises one or more elastic members 17 extending between the first and second boards 8, 9. In the present embodiment, the elastic members 17 each comprise a bungee cord. The elastic members 17 are offset vertically from the first hinge axis Y1. Thus, the elastic members 17 are deformed (elongated) when the first and second boards 8, 9 pivot relative to each other. The internal restorative force of the elastic members 17 apply a spring biasing force which biases said first and second boards 8, 9 towards said planar configuration. Alternatively, or in addition, the spring biasing means 16 may comprise a resilient member which is compressed when said first and second boards 8, 9 are pivoted relative to each other. It will be understood that the spring biasing means 16 could be incorporated into said first hinge 14

As shown in Figures 4A and 4B, the loadspace cover 2 also comprises a coupling means 18 for coupling the loadspace cover 2 to the tailgate 5. The coupling means 18 in the present embodiment comprises a cord 19 which couples the loadspace cover 2 to the tailgate 5. The cord 19 comprises a plastic covered steel cord having a connector 20 for releasably connecting the cord 19 to said tailgate 5. It will be appreciated that the cord 19 could take other forms, for example a nylon cord. The connector 20 in the present embodiment comprises a hoop for cooperating with a connector pin disposed on said tailgate 5. A breakaway feature may optionally be provided, for example comprising a hook claw and pin, to disengage if excess force is applied, thereby protecting the cord 19 and/or the loadspace cover 2. As shown in Figure 5, a cord retractor 21 is provided for retracting the cord 19. The cord retractor 21 comprises a return spring 22 and a spindle 23 disposed in a housing 24. In use, the return spring 22 is deformed when an external force is applied to extend the cord 19, for example as the tailgate 5 is raised. When the external force is reduced, for example as the tailgate 5 is lowered, the return spring 22 rotates the spindle 23 to retract the cord 19 into the housing 24. The cord retractor 21 may comprise a control mechanism, such as a one-way damping mechanism 29, for controlling retraction of the cord 19. The control mechanism may, for example, help to ensure that retraction of the cord 19 occurs at a uniform rate. The cord 19 extends through an aperture 25 formed in the housing 24. The cord retractor 21 is mounted to the third board 10 such that the aperture 25 is disposed proximal to the second hinge axis Y2. Thus, the cord 19 is arranged to transmit a lifting force to the loadspace cover 2 at a location proximal to the second hinge axis Y2 of the second hinge 15. It will be understood that the coupling means 18 may comprise more than one cord 19, for example first and second cords disposed on opposite sides of the loadspace cover 2.

The first board 8 comprises first and second lateral projections 26, 27 for supporting the loadspace cover 2 on said first and second linear supports 7-1, 7-2. In particular, the first and second linear supports 7-1, 7-2 comprise respective first and second guide channels (not shown) for receiving the first and second lateral projections 26, 27. The first and second lateral projections 26, 27 are arranged to enable longitudinal movement of the loadspace cover 2 (i.e. movement along a longitudinal axis X of the vehicle one).

A flap 28 is mounted to the first board 8 and arranged for positioning adjacent to the back of the vehicle seats 4. The flap 28 is pivotally mounted to accommodate changes in the position and/or configuration of the vehicle seat for, for example changes in the longitudinal seat position and/or backrest incline. The flap 28 is hingedly mounted to the first board 8 to accommodate relative movement between the loadspace cover 2 and the vehicle seat 4.

The operation of the loadspace cover 2 will now be described in more detail. The loadspace cover 2 is removably mounted on the first and second linear supports 7-1, 7-2 provided on opposing sides of the loadbay 3. The loadspace cover 2 is configurable in a closed configuration and an open configuration. When the loadspace cover 2 is in said closed configuration, the first, second and third boards 8, 9, 10 are arranged in a substantially planar configuration (disposed in a plane substantially parallel to a virtual plane defined by the longitudinal axis X and the transverse axis Y of the vehicle 1) and cover the loadbay 3. The loadspace cover 2 is adapted to transition between said closed configuration and said open configuration as the tailgate 5 is raised and lowered. When the tailgate 5 is raised, an external force is applied to the cord 19 which overcomes the return spring 22 and extends the cord 19 from the cord retractor 21. When the cord 19 is fully extended, the continued movement of the tailgate 5 causes the extended cord 19 to apply a lifting force to the loadspace cover 2 proximal to the second hinge axis Y2. The lifting force raises the second and third boards 9, 10 into a pitched arrangement. The second board 9 pivots upwardly relative to the first board 8 and the third board 10 pivots downwardly relative to the second board 9. The inclined arrangement of the second and third boards 9, 10 reduces the longitudinal extent of the loadspace cover 2 and the loadspace cover 2 is thereby reconfigured to said open configuration. When the tailgate 5 is lowered, the lifting force applied by the cord 19 is reduced and the third board 10 returns to its closed position on the action of gravity. The spring biasing means 16 is operative to bias the second board 9 towards its closed position as the tailgate 5 is lowered. The loadspace cover 2 is thereby returned to its closed configuration when the tailgate 5 is closed. The cord retractor 21 is operative to maintain the cord 19 under tension irrespective of the position of the tailgate 5. Moreover, retracting the cord 19 helps to ensure that it does not inhibit the folding action of

the loadspace cover 2. When the cord 19 is retracted, the first, second and third boards 8, 9, 10 may be folded into a face-to-face configuration to facilitate carrying. The cord 19 may be detached from the tailgate 5 to enable the loadspace cover 2 to be removed from the vehicle 1.

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The second and third boards 9, 10 can optionally be positioned on top of the first board 8 for storage. For example, the first, second and third boards 8, 9, 10 may be pivoted such that they are arranged in a face-to-face configuration and stacked on top of each other. The second and third boards 9, 10 may be manually pivoted onto the first board 8. One or more additional spring biasing means may be provided to facilitate positioning of the first, second and third boards 9, 10 in a stacked arrangement, for example to apply a biasing force to one or more of said first, second and third boards 8, 9, 10. The routing of the cord 19 may be modified to facilitate stacking of the first, second and third boards 8, 9, 10, for example by providing one or more pulley or guide member on the body of the vehicle 1.

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In the embodiment described herein, the cord 19 extends from an aperture 25 formed in the housing 24 in a sidewall of the third board 10. In a modified arrangement illustrated in Figures 6A and 6B, a cord guide 30 is provided in the third board 10. The cord guide 30 may comprise a cup-shaped member 31 which is mounted in a recess formed in the upper surface 11 of the third board 10. The cup-shaped member 31 may comprise a bezel or flange 32 to engage the upper surface 11 of the third board 10. As shown in Figure 6B, an aperture 33 is formed in a sidewall of the cup-shaped member 31. The cord 19 extends through said aperture 33 and is connected to the cord retractor 21. In the illustrated arrangement, the connector 20 comprises a C-shaped member or claw for releasably engaging a fixing pin (not shown) provided on the tailgate 5. As illustrated in Figure 6A, the connector 20 is at least partially received within the cup-shaped member 31 when the cord 19 is retracted. Thus, when the cord 19 is retracted, only a portion of the connector 20 protrudes above the upper surface 11 of the third board 11, thereby reducing the chance of the connector 20 catching on external items. The cup-shaped member 31 is sized to ensure that there is sufficient space available for a user to grip the connector 20 to facilitate extension of the cord 19. The bezel 32 acts as a low-friction guide for the cord 19. It is envisaged that the cord guide 30 may help prevent the cord 19 and/or the connector 20 from becoming trapped between the first, second and third boards 8, 9, 10 when they are folded or unfolded. The cup-shaped member 31 may comprise an acoustic damping element (not shown) for reducing rattles and other sounds which might otherwise be caused by the connector 20 vibrating against the cup-shaped member 31. The acoustic damping element may, for example, comprise a resilient coating, a resilient moulding or a resilient insert. The

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cup-shaped member 31 could be moulded using a 2k (two-shot) moulding technique to integrally mould the acoustic damping element on an interior of the cup-shaped member 31.

5 It will be understood that various changes and modifications may be made to the loadspace cover 2 described herein without departing from the scope of the present application. For example, the embodiment described herein could be modified such that the first board 8 does not undergo translation as the loadspace cover 2 transitions between said open and closed configurations. The first board 8 could, for example, be fastened to said first and second linear supports 7-1, 7-2. A releasable fastening mechanism may be provided to
10 enable the first board 8 to be released for removal of the loadspace cover 2.

CLAIMS:

1. A loadspace cover for a vehicle, the loadspace cover comprising:
a first board, a second board and a third board;
5 a first hinge hingedly connecting the first board to the second board;
a second hinge hingedly connecting the second board to the third board; and
coupling means for coupling the loadspace cover to a tailgate of the vehicle,
wherein the coupling means comprises a cord connected to the loadspace cover at or
proximal to a second hinge axis of the second hinge.
- 10 2. A loadspace cover as claimed in claim 1, wherein the first hinge is configured to
enable the second board to pivot in a first pivot direction.
3. A loadspace cover as claimed in claim 1 or claim 2 comprising a spring biasing
15 means for biasing at least said first and second boards towards a substantially planar
configuration.
4. A loadspace cover as claimed in claim 3, wherein said spring biasing means
comprises at least one elasticated member.
- 20 5. A loadspace cover as claimed in claim 4 wherein said at least one elasticated
member is offset vertically from a first hinge axis of said first hinge.
6. A loadspace cover as claimed in any one of the preceding claims, wherein the
25 second hinge is configured to enable the third board to pivot in a second pivot direction.
7. A loadspace cover as claimed in any preceding claim comprising a cord retractor for
retracting said cord.
- 30 8. A loadspace cover as claimed in claim 7, wherein said cord retractor comprises a
damping mechanism for controlling retraction of said cord.
9. A loadspace cover as claimed in claim 7 or 8, wherein the cord retractor is mounted
to the loadspace cover.
- 35 10. A loadspace cover as claimed in any of claims 7 to 9, wherein the cord retractor is
mounted on the underside of the loadspace cover.

11. A loadspace cover as claimed in any of claims 7 to 10, wherein the cord retractor is mounted on the third board.

5 12. A loadspace cover as claimed in any one of the preceding claims, wherein said first board comprises a first support means for supporting each end thereof.

13. A vehicle comprising a loadspace cover as claimed in any one of the preceding claims.

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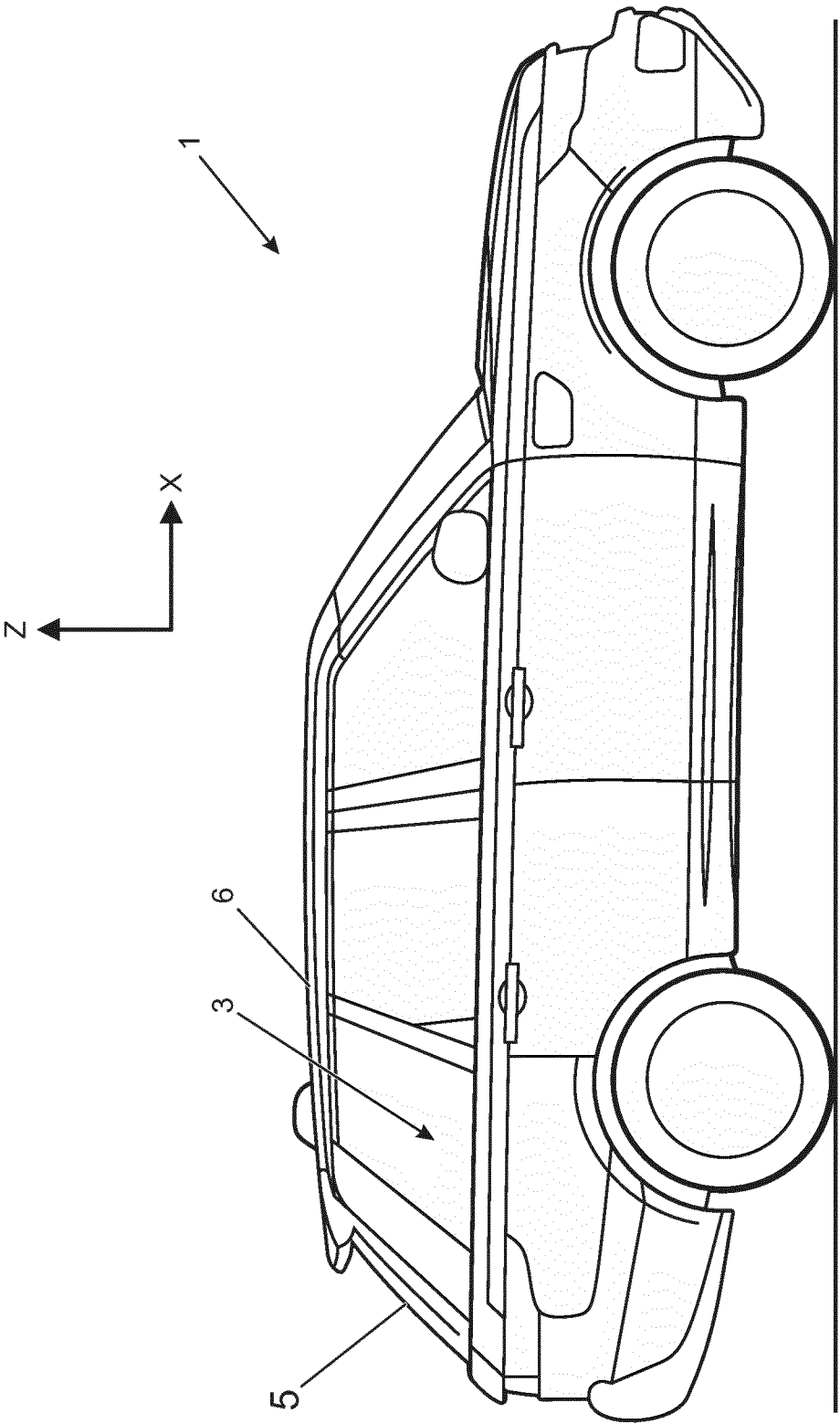


FIG. 1

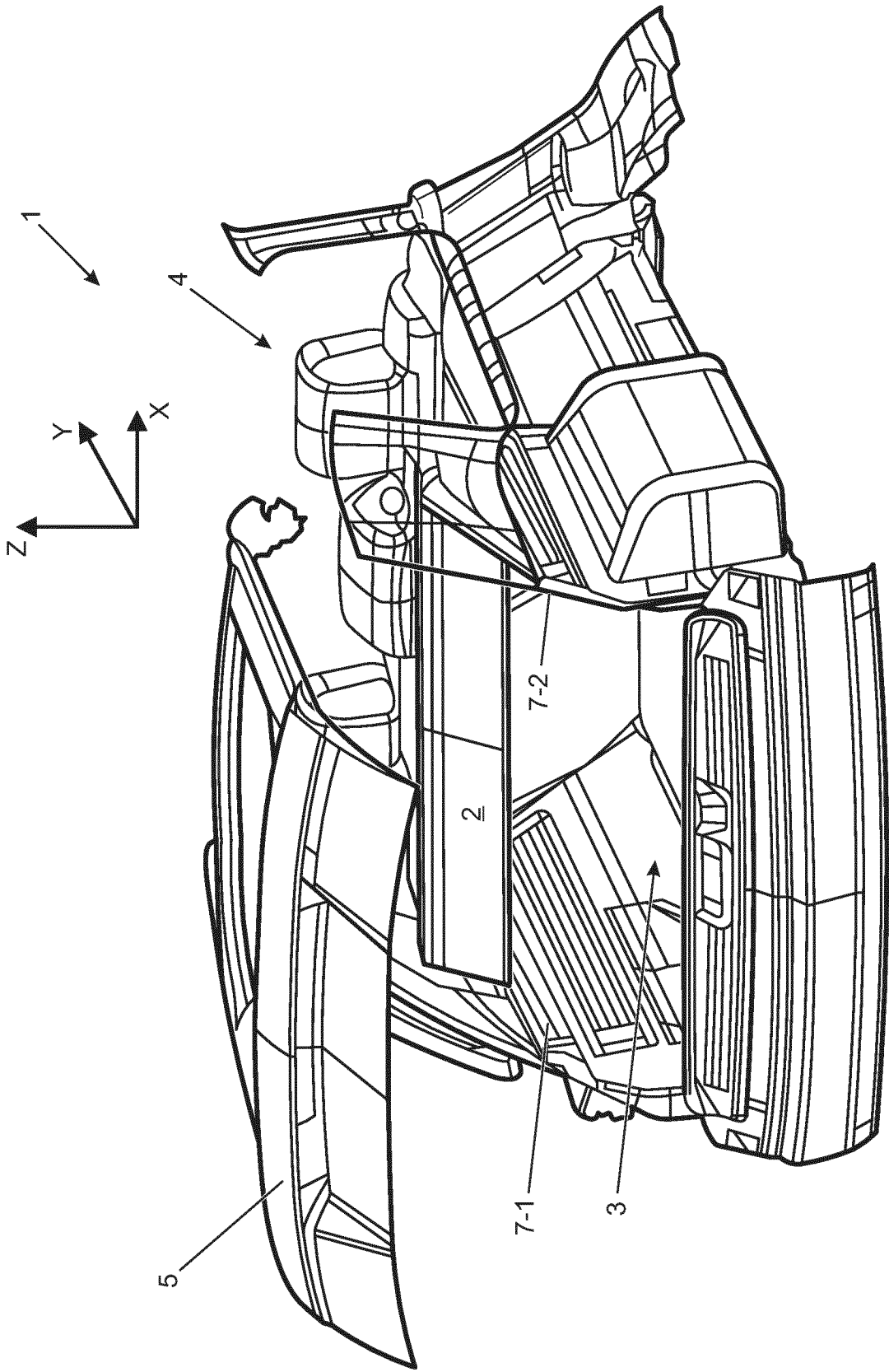


FIG. 2

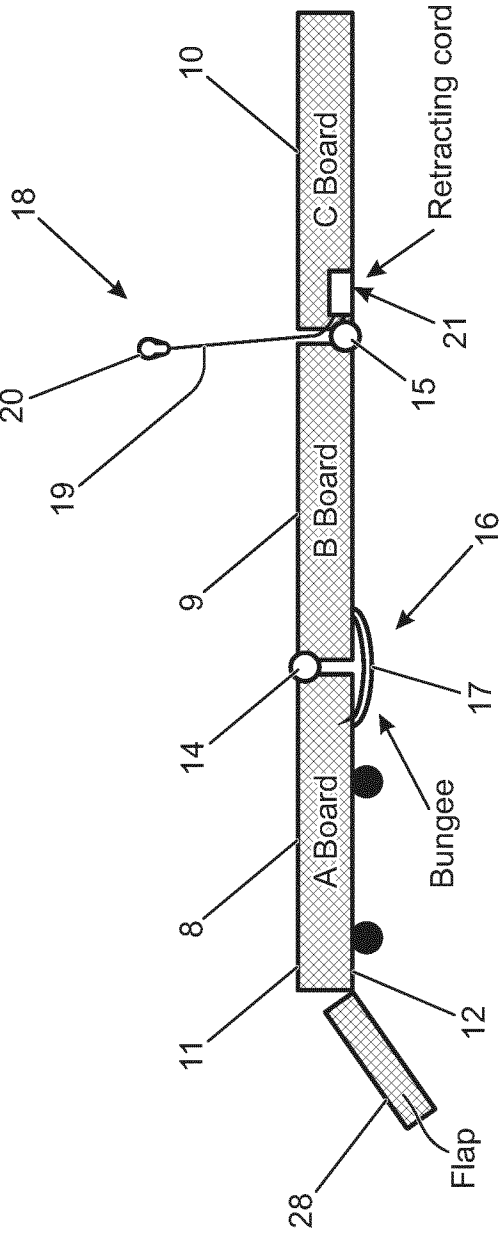


FIG. 3A

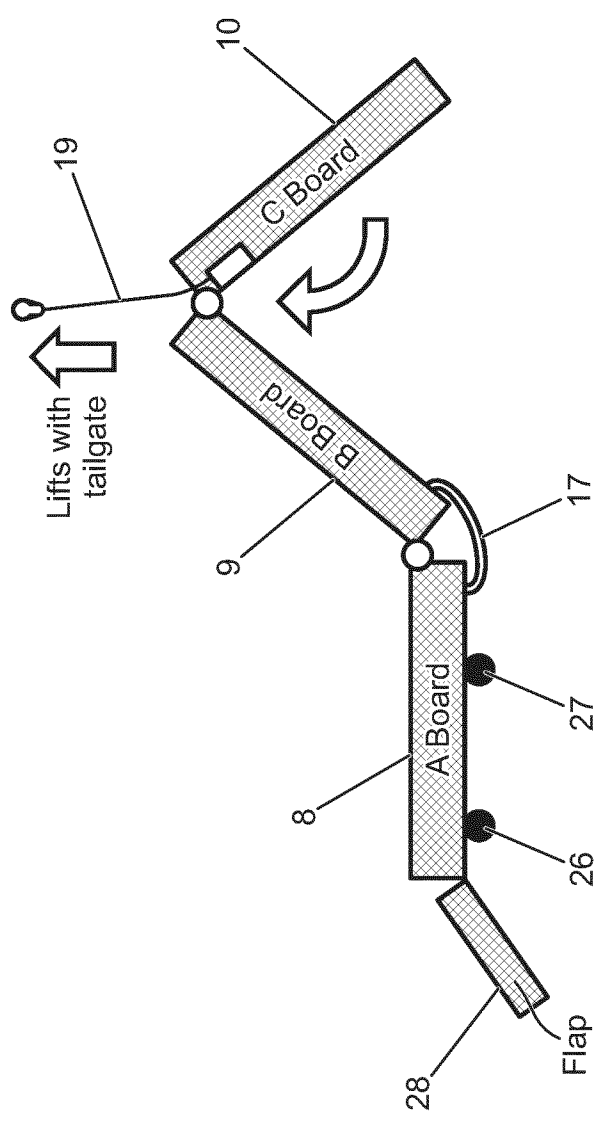


FIG. 3B

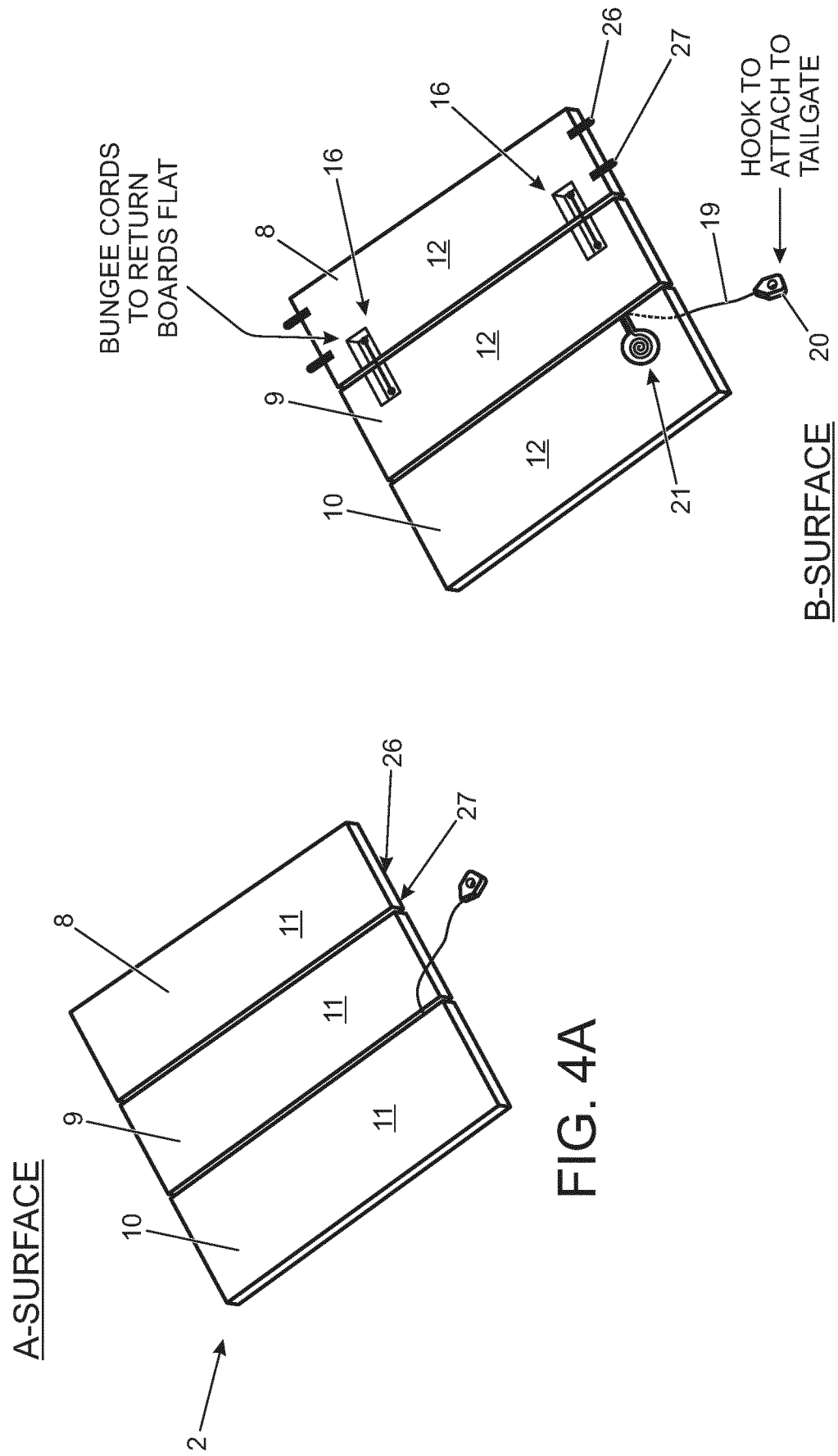


FIG. 4B

FIG. 4A

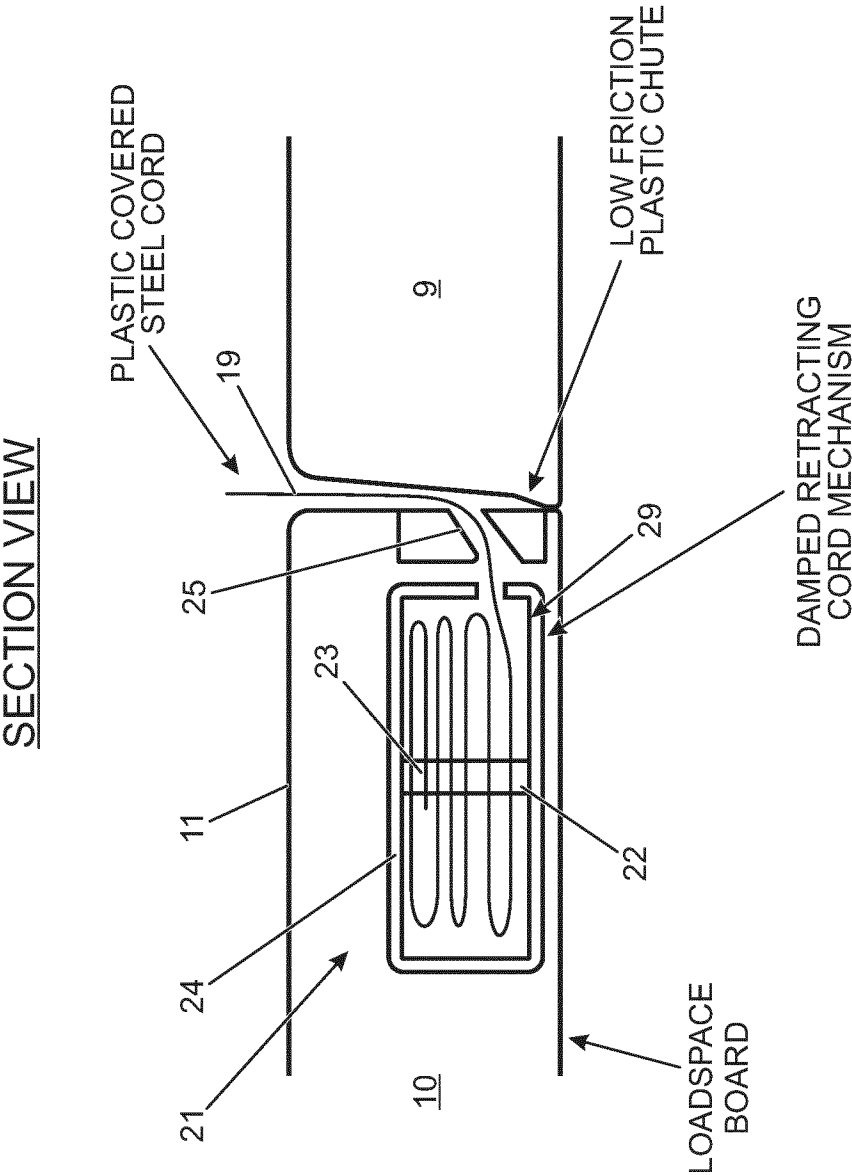
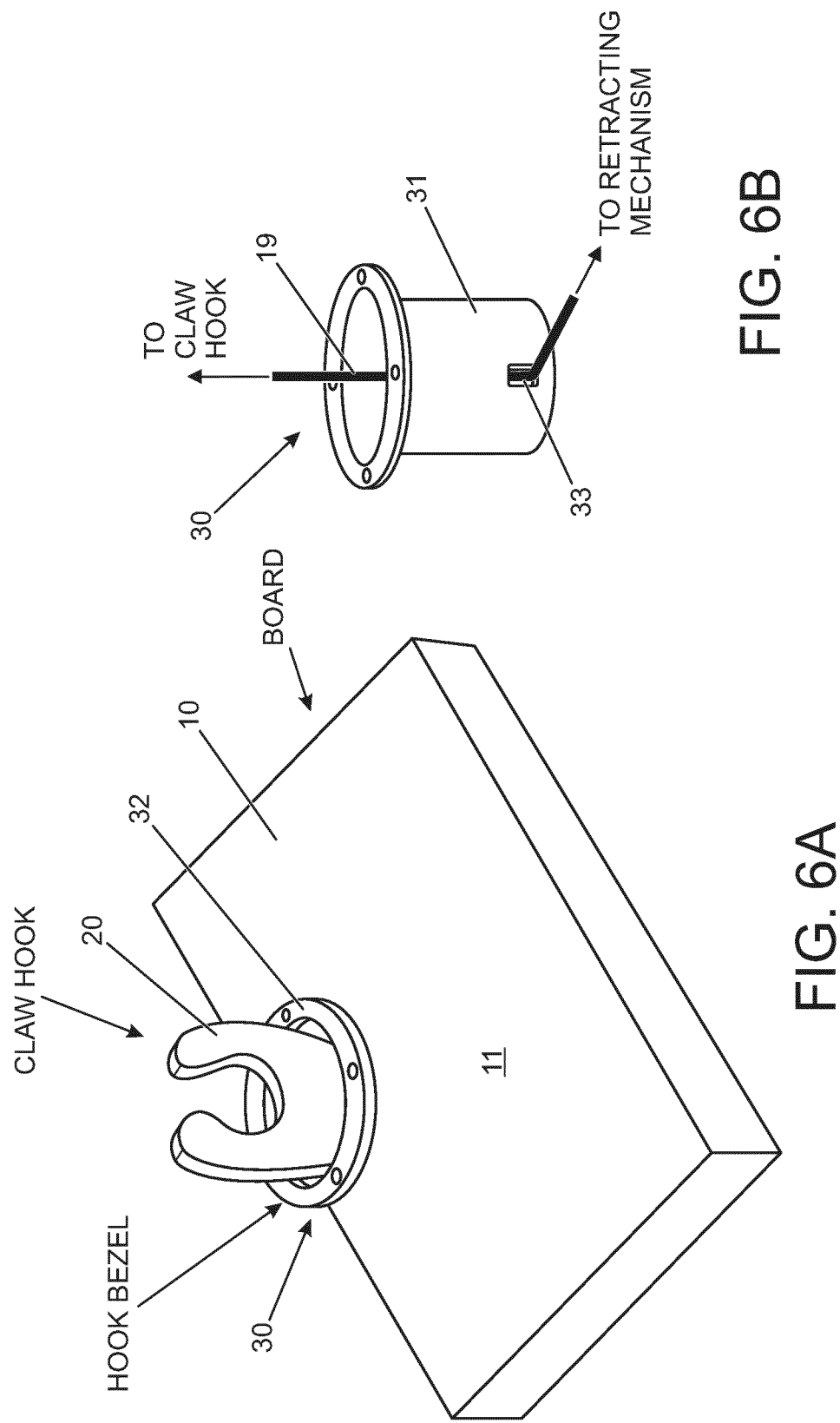


FIG. 5



INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2017/077112

A. CLASSIFICATION OF SUBJECT MATTER

INV. B60R5/04

ADD.

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

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011/241372 A1 (KUSU HIROTAKA [JP]) 6 October 2011 (2011-10-06)	1-6,12, 13
Y	claim 1; figures 7-9	8-11
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Further documents are listed in the continuation of Box C.



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Information on patent family members

International application No

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