

PET TRAVEL CARRIER**CROSS REFERENCE TO RELATED APPLICATIONS**

This application claims the benefit of U.S. Application No. 63/512,453, filed on July 7, 2023, U.S. Application No. 63/602,214, filed on November 22, 2023, U.S. Application No. 63/605,277, filed on December 1, 2023, U.S. Application No. 63/619,421, filed on January 10, 2024, U.S. Application No. 63/556,119, filed on February 21, 2024, and U.S. Application No. 63/644,804, filed on May 9, 2024, which is incorporated herein by reference in its entirety.

BACKGROUND

[0001] The present disclosure relates generally to an animal containment unit or carrier for installation in a vehicle, and more particularly to an animal containment unit or carrier that includes connectors for installation in a vehicle.

[0002] A crate or another type of carrier can be used to transport animals in a vehicle (e.g., automobile, airplane, train, bicycle, or the like). However, many existing carriers suffer from various deficiencies. For example, some carriers are insufficiently anchored to contain and protect the animal in the event of a car crash. In another example, a carrier may be difficult to install in the vehicle. In still another example, a carriers may not be sized for airline carry-on travel (e.g., able to fit underneath a conventional airplane seat).

SUMMARY

[0003] According to an embodiment, a pet carrier for containing animals on a vehicle seat including at least one vehicle seat anchor includes a body defining an enclosure having an interior within which an animal is receivable. At least one rigid latch connector is mounted to the body and is movable relative to the body along a connector path. The at least one rigid latch connector is connectable to the at least one vehicle seat anchor at any position along the connector path.

[0004] In addition to one or more of the features described above, or as an alternative, in further embodiments the at least one rigid latch connector is translatable along the connector path.

[0005] In addition to one or more of the features described above, or as an alternative, in further embodiments the body has a front, back, left side, and right side, and the connector path is oriented parallel to at least one of the front and the back.

[0006] In addition to one or more of the features described above, or as an alternative, in further embodiments a latch position lock is operable to lock the at least one rigid latch connector along the connector path.

[0007] In addition to one or more of the features described above, or as an alternative, in further embodiments the latch position lock and the at least one rigid latch connector are arranged at a same side of the body.

[0008] In addition to one or more of the features described above, or as an alternative, in further embodiments the body includes a lower section having a rigid member and a reinforcement assembly. The reinforcement assembly includes at least one reinforcement member connected to the rigid member.

[0009] In addition to one or more of the features described above, or as an alternative, in further embodiments the body further comprises an upper section positioned vertically above the lower section, the at least one reinforcement member extending about one or more sides of the body.

[0010] In addition to one or more of the features described above, or as an alternative, in further embodiments the at least one reinforcement member extends about a front of the body and a top of the body.

[0011] In addition to one or more of the features described above, or as an alternative, in further embodiments the at least one reinforcement member is affixed to the front of the body at an anchor point.

[0012] In addition to one or more of the features described above, or as an alternative, in further embodiments the at least one reinforcement member encircles the upper section.

[0013] In addition to one or more of the features described above, or as an alternative, in further embodiments a release mechanism is operably coupled to the at least one rigid latch connector to unlock the at least one rigid latch connector.

[0014] In addition to one or more of the features described above, or as an alternative, in further embodiments the release mechanism includes a release actuator and at least one transmitter operatively connecting the at least one rigid latch connector to the release actuator.

[0015] In addition to one or more of the features described above, or as an alternative, in further embodiments the release actuator and the at least one rigid latch connector are arranged at opposite sides of the body.

[0016] In addition to one or more of the features described above, or as an alternative, in further embodiments the release actuator is arranged at a front of the body.

[0017] In addition to one or more of the features described above, or as an alternative, in further embodiments the at least one rigid latch connector is transformable relative to the body between a stowed position and a deployed position. The at least one rigid latch connector is receivable within a cavity formed in the body when in the stowed position.

[0018] In addition to one or more of the features described above, or as an alternative, in further embodiments the at least one rigid latch connector is rotatable about an axis between the stowed position and the deployed position.

[0019] In addition to one or more of the features described above, or as an alternative, in further embodiments the connector path is parallel to the axis of the at least one rigid latch connector.

[0020] In addition to one or more of the features described above, or as an alternative, in further embodiments at least one biasing mechanism operably coupled to the at least one rigid latch connector is operable to bias the at least one rigid latch connector to the deployed position.

[0021] In addition to one or more of the features described above, or as an alternative, in further embodiments the body includes a frame, containment materials extending at least partially about the frame, and a base. The frame is connectable to the base.

[0022] In addition to one or more of the features described above, or as an alternative, in further embodiments the cavity is formed in the base.

[0023] In addition to one or more of the features described above, or as an alternative, in further embodiments a latch deployment mechanism is operable to automatically transform the at least one rigid latch connector from the stowed position to the deployed position in response to an input.

[0024] In addition to one or more of the features described above, or as an alternative, in further embodiments the at least one rigid latch connector includes a first rigid latch connector and a second rigid latch connector.

[0025] In addition to one or more of the features described above, or as an alternative, in further embodiments the body includes a base and the first rigid latch connector and the second rigid latch connector are part of a latch assembly. The latch assembly includes a cover fixedly mounted to the base and a connection member operably coupled to both the first rigid latch connector and the second rigid latch connector and arranged within an interior of the cover. The connection member is rotatable with the first rigid latch connector and the second rigid latch connector between the stowed position and the deployed position.

[0026] In addition to one or more of the features described above, or as an alternative, in further embodiments the at least one channel is formed in the cover. The at least one channel is configured to guide a transmitter extending from one of the first rigid latch connector and the second rigid latch connector to an actuator.

[0027] In addition to one or more of the features described above, or as an alternative, in further embodiments the at least one channel extends axially through an opening formed in the cover.

[0028] In addition to one or more of the features described above, or as an alternative, in further embodiments the latch assembly is movably mounted to the base. The base has a slot through which the transmitter extends between the cover and the actuator.

[0029] In addition to one or more of the features described above, or as an alternative, in further embodiments the body includes a lower section having a rigid member and at least one tension member coupling the latch assembly to the rigid member.

[0030] In addition to one or more of the features described above, or as an alternative, in further embodiments the rigid member is a metallic plate.

[0031] In addition to one or more of the features described above, or as an alternative, in further embodiments the at least one tension member is configured as a continuous loop.

[0032] In addition to one or more of the features described above, or as an alternative, in further embodiments the at least one tension member includes a first tension member and a second tension member spaced apart from one another. A first portion of each of the first tension member and the second tension member is coupled to the latch assembly and a second portion of each of the first tension member and the second tension member is coupled to the rigid member.

[0033] In addition to one or more of the features described above, or as an alternative, in further embodiments the first portion of the first tension member and the second tension member is connected to the latch assembly between the first rigid latch connector and the second rigid latch connector.

[0034] In addition to one or more of the features described above, or as an alternative, in further embodiments the first portion of the first tension member and the second tension member is coupled to a webbing connection located at the rigid member.

[0035] In addition to one or more of the features described above, or as an alternative, in further embodiments the first portion of the first tension member and the second tension member extends from a bottom of the rigid member.

[0036] In addition to one or more of the features described above, or as an alternative, in further embodiments the first portion of the first tension member and the second tension member extends from a top of the rigid member.

[0037] According to an embodiment, a pet carrier for containing animals on a vehicle seat includes a body defining an enclosure having an interior within which an animal is receivable. The body includes a cavity. At least one rigid latch connector is movably mounted to the body. The at least one rigid latch connector is movable relative to the body in a first direction between a stowed position and a deployed position and is movable relative to the body in a second direction.

[0038] In addition to one or more of the features described above, or as an alternative, in further embodiments the first direction is rotation about an axis and the second direction is translation along the axis.

[0039] In addition to one or more of the features described above, or as an alternative, in further embodiments the first direction is translation along a first axis and the second direction is translation along a second axis, the first axis having a non-parallel orientation relative to the second axis.

[0040] According to an embodiment, a pet carrier for use in a vehicle includes a base and a frame including a first frame member and a second frame member. The frame is transformable between a deployed configuration and a stowed configuration. In the stowed configuration, the first frame member and the second frame member are collapsed against the base. A handle for lifting the pet carrier is connected to the first frame member and the second frame member. The handle has a pivot axis and is rotatable about the pivot axis to transform the frame between the deployed configuration and the stowed configuration. The handle remains connected to the first frame member and the second frame member as the frame transforms between the deployed and stowed configurations.

[0041] In addition to one or more of the features described above, or as an alternative, in further embodiments the pivot axis is at a position spaced from both the first frame member and the second frame member.

[0042] In addition to one or more of the features described above, or as an alternative, in further embodiments the handle has a first end connected to the first frame member and a second end connected to the second frame member. The pivot axis is arranged between the first end and the second end.

[0043] In addition to one or more of the features described above, or as an alternative, in further embodiments the first end of the handle is rotatably coupled to the first frame member and the second end of the handle is rotatable coupled to the second frame member.

[0044] In addition to one or more of the features described above, or as an alternative, in further embodiments the handle has a first orientation relative to the base when the frame is in the deployed configuration and the handle has a second orientation relative to the base when the frame is the stowed configuration. The second orientation is opposite the first orientation.

[0045] In addition to one or more of the features described above, or as an alternative, in further embodiments the pivot axis is arranged at a central portion of the handle.

[0046] In addition to one or more of the features described above, or as an alternative, in further embodiments a locking mechanism is operably coupled to the handle. The locking mechanism is configured to restrict rotation of the handle about the pivot axis.

[0047] In addition to one or more of the features described above, or as an alternative, in further embodiments the locking mechanism is arranged at an interior of the handle.

[0048] In addition to one or more of the features described above, or as an alternative, in further embodiments the locking mechanism includes a protrusion and a handle lock. The handle lock is engageable with the protrusion to selectively restrict the rotation of the handle about the pivot axis.

[0049] In addition to one or more of the features described above, or as an alternative, in further embodiments the handle lock is movable between an engaged position and a disengaged position. In the engaged position, the handle lock is arranged within a path of movement of the protrusion about the pivot axis. In the disengaged position, the handle lock is offset from the path of movement of the protrusion about the pivot axis.

[0050] In addition to one or more of the features described above, or as an alternative, in further embodiments the locking mechanism includes an actuator operably coupled to the handle lock to move the handle lock from the engaged position to the disengaged position.

[0051] In addition to one or more of the features described above, or as an alternative, in further embodiments the locking mechanism includes a biasing mechanism operably coupled to the handle lock to bias the handle lock to the engaged position.

[0052] In addition to one or more of the features described above, or as an alternative, in further embodiments at least one rigid latch connector is coupled to the base. The at least one rigid latch connector is movable between a stowed position within the base and a deployed position protruding beyond an exterior of the base.

BRIEF DESCRIPTION OF THE DRAWINGS

[0053] The following descriptions should not be considered limiting in any way. With reference to the accompanying drawings, like elements are numbered alike:

[0054] FIG. 1A is a front perspective view of a pet carrier according to an embodiment;

[0055] FIG. 1B is a front view of the pet carrier of FIG. 1A according to an embodiment;

[0056] FIG. 2A is a front perspective view of view of a frame and a base of a pet carrier according to an embodiment;

[0057] FIG. 2B is a rear perspective view of the frame and the base of the pet carrier of FIG. 2A according to an embodiment;

[0058] FIG. 3 is a perspective view of a portion of a pet carrier transformable between an extended configuration and a stowed configuration according to an embodiment;

[0059] FIG. 4 is a plane view of a frame of a pet carrier according to an embodiment;

[0060] FIG. 5A is a cross-sectional view of a locking mechanism associated with a frame of a pet carrier in a locked configuration according to an embodiment;

[0061] FIG. 5B is a cross-sectional view of the locking mechanism of FIG. 5A as it transforms to an unlocked configuration according to an embodiment;

[0062] FIG. 5C is a cross-sectional view of the locking mechanism of FIG. 5A in an unlocked configuration according to an embodiment;

[0063] FIG. 6 is an end view of a pet carrier during transformation between an extended configuration and a stowed configuration according to an embodiment;

[0064] FIG. 7A-7D are various end views showing a progression of a pet carrier as it transforms between an extended configuration and a stowed configuration according to an embodiment;

[0065] FIG. 8A is a perspective view of a pet carrier having a latch connector in a deployed position according to an embodiment;

[0066] FIG. 8B is a bottom perspective view of the pet carrier of FIG. 8A with the latch connector in a stowed position according to an embodiment;

[0067] FIG. 9A is a schematic diagram of a latch release mechanism of a pet carrier in a plan view according to an embodiment;

[0068] FIG. 9B is a cross-sectional view of a latch release mechanism of a pet carrier according to an embodiment;

[0069] FIG. 10A is a partially exploded view of a latch assembly of a pet carrier according to an embodiment;

[0070] FIG. 10B is a further exploded view of the latch assembly of FIG. 10A according to an embodiment;

[0071] FIG. 10C is a detailed view of a portion of the latch assembly of FIG. 10A according to an embodiment;

[0072] FIG. 11 is a perspective view of a portion of a latch assembly installed within a base of a pet carrier according to an embodiment;

[0073] FIG. 12 is another perspective view of a portion of a latch assembly installed within a base of a pet carrier according to an embodiment;

[0074] FIGS. 13A-13C are views of an interface between a transmitter and a latch assembly as the latch assembly transforms from a stowed position to a deployed position according to an embodiment;

[0075] FIG. 14A is a bottom perspective view of a pet carrier having a latch connector in a deployed position according to an embodiment;

[0076] FIG. 14B is a cross-sectional view of a pet carrier having a latch connector in a deployed position according to an embodiment;

[0077] FIG. 15 is a perspective view of a latch deployment mechanism of a pet carrier according to an embodiment;

[0078] FIG. 16A is a plan view of the latch deployment mechanism of FIG. 15 in an unactuated configuration according to an embodiment;

[0079] FIG. 16B is a plan view of the latch deployment mechanism of FIG. 15 in an actuated configuration according to an embodiment;

[0080] FIG. 16C is a perspective view of a latch connector when the latch deployment mechanism of FIG. 15 in an actuated configuration according to an embodiment;

[0081] FIG. 17 is a plan view of an integral latch release mechanism and latch deployment mechanism in an unactuated configuration according to an embodiment;

[0082] FIG. 18A is a bottom view of a pet carrier having a deployed latch assembly in a first lateral position according to an embodiment

[0083] FIG. 18B is a bottom view of the pet carrier having of FIG. 18A having the deployed latch assembly in a second lateral position according to an embodiment;

[0084] FIG. 19 is a perspective view of a portion of a base of a pet carrier according to an embodiment;

[0085] FIG. 20 is a detailed view of a latch position lock of the pet carrier according to an embodiment;

[0086] FIG. 21A is a side view of a base of a pet carrier including a latch position lock according to an embodiment;

[0087] FIG. 21B is a cross-sectional view of a portion of the pet carrier of FIG. 21A according to an embodiment;

[0088] FIG. 22 is a perspective view of a pet carrier mounted on a vehicle seat according to an embodiment;

[0089] FIG. 23A is a bottom perspective view of a portion of a pet carrier according to an embodiment;

[0090] FIG. 23B is a rear view of the portion of the pet carrier of FIG. 23A according to an embodiment;

[0091] FIG. 23C is a top perspective view of the portion of the pet carrier of FIG. 23A according to an embodiment;

[0092] FIG. 23D is a top perspective view of the portion of the pet carrier of FIG. 23A with the frame removed according to an embodiment;

[0093] FIG. 24 is a perspective view of the base of a pet carrier including a reinforcement assembly according to an embodiment;

[0094] FIG. 25 is a perspective view of an interface between a latch assembly and a reinforcement assembly of a pet carrier according to an embodiment;

[0095] FIG. 26A is a bottom perspective view of a pet carrier including webbing straps connected to a latch assembly according to an embodiment;

[0096] FIG. 26B is a bottom perspective view of the pet carrier of FIG. 26A with the webbing straps removed according to an embodiment; and

[0097] FIG. 27 is a bottom perspective view of a pet carrier including a latch assembly according to an embodiment.

DETAILED DESCRIPTION

[0098] A detailed description of one or more embodiments of the disclosed apparatus and method are presented herein by way of exemplification and not limitation with reference to the Figures.

[0099] With reference now to FIGS. 1A and 1B, an example of a pet carrier 20 is illustrated. As shown, the pet carrier 20 may be an enclosed containment device or crate having a bottom 22, top 24, front 26, rear 28, left side 30, and right side 32. In an

embodiment, the pet carrier 20 includes a first section 40 and a second section 42. In some embodiments, the first section 40 may be considered an upper section and the second section 42 may be considered a lower section such that the first section 40 is positioned vertically above or on top of the second section 42. In an embodiment, the first section 40 and the second section 42 are removably connectable to one another. However, in other embodiments, the first section 40 and the second section 42 are permanently connected. As used herein the term “permanently connected” represents embodiments where the first section 40 is not intended to be disassembled from the second section 42 by a user.

[0100] The first section 40 may define the top 24 and at least a portion of the front 26, rear 28, left side 30, and right side 32 of the pet carrier 20. In an embodiment, the first section defines the substantial entirety of the front 26, rear 28, left side 30, and right side 32 of the pet carrier 20. With reference to FIGS. 2A and 2B, the first section 40 of the pet carrier 20 may include a structural frame 44 that defines an internal space of the pet carrier 20 and a covering 46 (see FIGS. 1A and 1B) associated with the frame 44. Examples of the covering 46 include but are not limited to containment materials or soft goods like nylon fabric or a semi-rigid material. The covering 46 may be removably connected to the frame 44, such as positionable in overlapping arrangement with the frame 44. In other embodiments, the covering 46 may be permanently attached to the frame 44, such as by sewing the covering 46 about one or more portions of the frame 44 for example.

[0101] In an embodiment, the covering 46 cooperates with the frame 44 to form an enclosed interior area within which a pet is contained during normal use of the pet carrier 20. The pet carrier 20 may include one or more doors 48 (see FIG. 1A) transformable between an open position and a closed position to selectively provide access to the interior of the pet carrier 20. In an embodiment, the one or more doors 48 are formed in the first section 40, such as within a portion of the covering 46 for example. Alternatively, or in addition, one or more windows or viewing panels 50 may be formed in the covering 46 of the first section 40 to allow a user to view an animal within the pet carrier 20 and to allow the animal within the pet carrier 20 to see its surroundings.

[0102] With continued reference to FIGS. 2A-2B, the frame 44 may include one or more frame members, such as a first frame member 52 and a second frame member 54 spaced from the first frame member 52 along an axis. As shown, the first and second frame members 52, 54 may be substantially identical and/or in some embodiments may be different. In the illustrated, non-limiting embodiment, the first and second frame members 52, 54 have an upside-down u-shaped configuration. It should be understood that embodiments where a frame

member, such as frame member 52 or 54 for example, defines at least one entire side (front, rear, left, and/or right side) of the first section 40, rather than only a portion thereof, are also within the scope of the disclosure. Although the first frame member 52 is illustrated as being generally parallel to the front 26 of the pet carrier 20 and the second frame member 54 is illustrated as being generally parallel to the rear 28 of the pet carrier 20, embodiments where one or more frame members 52, 54 has another orientation are also contemplated herein.

[0103] Alternatively, or in addition, the frame 44 may include additional frame members, such as a third frame member 56 associated with the left side 30 and/or a fourth frame member 58 associated with the right side 32. In an embodiment, the third frame member 56 is oriented substantially parallel to the left side 30 and the fourth frame member 58 is oriented generally parallel to the right side 32. As shown, at least one of the third and fourth frame members 56, 58 may define the periphery of a door, such as door 48 for example, through which an animal can enter into or exit from the interior of the pet carrier 20.

[0104] In some embodiments, such as shown in FIGS. 2A and 2B, the one or more of the frame members, such as the first and second frame members 52, 54 for example, are not connected to one another. Rather, the covering 46 of the upper or first section 40 may be respectively connected to the plurality of frame members 52, 54. In other embodiments, one or more connecting frame members 60 extend between and connect the first and second frame members 52, 54, to one another. For example, as shown in FIGS. 1A-2B, a connecting frame member 60 extends between the first and second frame members 52, 54, such as at a central portion of the top thereof. In some embodiments, the connecting frame member 60 may be visible or arranged at an exterior surface of the pet carrier 20. In embodiments where the connecting frame member 60 is arranged at an exterior surface, such as at the top 24 of the pet carrier 20, the connecting frame member 60 may be configured as a handle for lifting and/or carrying the pet carrier 20. It should be understood that the frame 44 illustrated and described herein is intended as an example only and that a frame 44 having any suitable construction is within the scope of the disclosure.

[0105] In embodiments where the first section 40 is separable from the second section 42, one or more of the plurality of frame members 52, 54, 56, 58 may be releasably connectable to the second section 42 to restrict unintended movement of the first section 40 relative to the second section 42. In an embodiment, one or more of the plurality of frame members 52, 54, 56, 58 includes a frame connector (not shown) alignable with and operable to engage a corresponding interlock feature (not shown) formed in an adjacent portion of the second section.

[0106] The frame 44 may be formed from any suitable material, such as plastic, or metal. For example, a frame 44 may be formed from tubing, wiring, or another suitable material. In the non-limiting embodiment of FIGS. 2A and 2B, at least a portion of the frame 44 is formed from a thermoformed material and may include soft goods laminated thereon. In other embodiments, the substantial entirety of the frame 44 is formed from thermoformed materials and soft goods may be laminated over a portion or substantially all of the frame 44. In such embodiments, the frame 44 may form a semi-rigid envelope that can be at least partially collapsed, such as to adapt the first section 40 to a space for receiving the pet carrier 20, while remaining attached to the second section 42. Such a frame 44 may also create a soft restraint for a pet within the pet carrier 20 in the event of a vehicle crash or accident.

[0107] In an embodiment, the plurality of frame members 52, 54, 56, 58 of the frame 44 may be integrally formed as a single body. However, in other embodiments, such as shown in FIG. 3, at least one frame member of the frame 44, such as first frame member 52 for example, is movable relative to at least one other frame member, such as the second frame member 54 of the frame 44 for example. In such embodiments, the at least one frame member 52, 54, 56, 58 may be movable relative to the second or lower section 42, while remaining connected thereto, such as to allow the frame to collapse for storage or to absorb forces during a crash event.

[0108] With continued reference to FIG. 3, in the illustrated, non-limiting embodiment, the first frame member 52 and the second frame member 54 are arranged in a first position when the frame 44 is in a deployed configuration and the first frame member 52 and the second frame member 54 are in a second position when the frame 44 is in a stowed configuration. As shown, the first frame member 52 may be configured to fold or rotate about an axis between a first position in which the first frame member 52 extends at a non-parallel angle relative to the second section 42, such as perpendicular to an upper surface of the second section for example, and a second position in which the first frame member 52 is oriented generally parallel to the second section 42. Similarly, the second frame member 54 may also be configured to fold or rotate about an axis between a first position in which the second frame member 54 extends at a non-parallel angle relative to the second section 42, and a second position in which the second frame member 54 is oriented generally parallel to the second section 42. When in the second position, the first frame member 52 and the second frame member 54 may be vertically stacked one on top of the other. The at least one connecting member 60 operably coupled to the first frame member 52 and the second frame member 54 may have a first orientation relative to the base 42 when the frame 44 is in the deployed configuration. As will be described in more detail

below, the at least one connecting member 60 operably coupled to the first frame member 52 and the second frame member 54 may have a second orientation relative to the base 42 when the frame 44 is in the deployed configuration. The second orientation is rotated relative to the first orientation, and in some embodiments may be substantially opposite the first orientation. In an embodiment, the at least one connecting member 60 has a generally linear configuration and is facing upward when the frame 44 is deployed and the at least one connecting member 60 has a generally linear configuration and is facing downward when the frame 44 is stowed.

[0109] The one or more connecting frame members 60, such as a handle, may be operable to restrict movement of at least one frame member, such as the first frame member 52 and/or the second frame member 54 relative to the second section 42. In the illustrated, non-limiting embodiment shown in FIG. 4, the connecting frame member 60 includes a first connector portion 62, a second connector portion 64, and a central connector portion 66 extending between and operably coupled to the first and second connector portions 62, 64, respectively. The first connector portion 62 may be coupled to a first frame member, such as frame member 52 for example, and the second connector portion 64 may be coupled to a second frame member, such as frame member 54 for example. In an embodiment, the connecting frame member 60 has one or more hinge or fold points formed therein. The connecting frame member 60 may be operable to bend about these one or more hinge points to transform the frame 44 between the extended configuration and the stowed configuration. As shown, an outside 68 end of the first connector portion 62 may be pivotally coupled to the first frame member 52 for rotation about a first axis X1. The opposite, inside end 70 of the first connector portion 62 may be hingedly attached to an adjacent end 72 of the central connector portion 66 about a second axis X2. In operation, the first connector portion 62 is configured to rotate relative to the first frame member 52 and the central connector portion 66 is configured to bend about the second axis X2 relative to the first connector portion 62. Accordingly, the second axis X2 may be considered a pivot axis between the first connector portion 62 and the central connector portion 66.

[0110] In an embodiment, the second connector portion 64 is pivotally or hingedly connected at a middle thereof to the second frame member 54. Accordingly, the second connector portion 64 may be divided into two parts: a first part 74, such as including the outside end 76 of the second connector portion 64 and that is fixedly connected to the second frame member 54, and a second part 78 connected to the central connector portion 66. As shown, the second part 78 of the second connector portion 64 is rotatable relative to the first part 74 of the second connector portion 64 about an axis X3. In the illustrated, non-limiting embodiment, the

central connector portion 66 is integrally formed with the second part 78 of the second connector portion 64. However, embodiments where the central connector portion 66 is hingedly or pivotally coupled to the first part 74 or the second part 78 of the second connector portion 64 are also contemplated herein.

[0111] A locking mechanism 80 operable to retain the frame in an upright or deployed configuration may be integrated into the connecting frame member 60. Such a locking mechanism may be operable to restrict transformation of the frame 44 to a stowed configuration by restricting relative movement between one or more portions of the connecting frame member 60. In an embodiment, the locking mechanism 80 is arranged at the interface between the first connector portion 62 and the central connector portion 66. However, embodiments where a locking mechanism 80 is arranged at another hinge within the connecting frame member 60 are also contemplated herein.

[0112] An example of such the locking mechanism 80 is illustrated in more detail in FIGS. 5A-5C. In the illustrated, non-limiting embodiment, the second or inside end 70 of the first connector portion 62 may include a protrusion 82 configured to extend beyond the hinging axis X2 defined between the first connector portion 62 and the central connector portion 66. When the first connector portion 62 and the central connector portion 66 are arranged in a coplanar configuration, such as shown in FIG. 5A, the protrusion 82 overlaps with a portion of the body of the central connector portion 66. The locking mechanism 80 may additionally include a handle lock 84, such as arranged within an interior of the central connector portion 66. The handle lock 84 is movable between an engaged position (FIG. 5A) and a disengaged position (FIG. 5C). In an embodiment, a biasing mechanism 86, such as a coil spring for example, is operably coupled to the handle lock 84 and is operable to bias the handle lock 84 toward the engaged position. When the handle lock 84 is in the engaged position, a portion of the handle lock 84, such as a distal end 88 thereof for example, is positioned directly adjacent to the protrusion 82 of the first connector portion 62. As shown, the distal end 88 of the handle lock 84 may be positioned upwardly adjacent to the protrusion 82, within a path of movement of the protrusion about the axis X2, thereby restricting rotation of the central connector portion 66 relative to the first connector portion 62.

[0113] An actuator 90, such as a button for example, may be arranged at an exterior surface of the connecting frame member 60. The actuator 90 may be movable into engagement with a corresponding surface of the handle lock 84 to move the handle lock 84 from the engaged position to the disengaged position. In the illustrated, non-limiting embodiment, the handle lock 84 includes a first ramped or sloped surface 92, and the body of the actuator 90 includes

a second sloped surface 94 facing towards and at least partially engaged with the handle lock 84. The angle of the first sloped surface 92 may but need not be equal to the angle of the second sloped surface 94. When a user operates the actuator 90, such as by applying a downward force to the actuator 90, the actuator 90 slides relative to the handle lock 84. Because the engagement between the handle lock 84 and the actuator 90 occurs along the sloped surfaces 92, 94, the downward movement of the actuator 90 results in a corresponding lateral translation of the handle lock 84 relative to the central connector portion 66, such as in a direction away from the first connector portion 62. This translation of the handle lock 84 opposes the biasing force of the biasing mechanism 86 such that the handle lock 84 moves out of engagement or alignment with the protrusion 82 of the first connector portion 62. In this retracted or disengaged position, the handle lock 84 is spaced from the path of movement of the protrusion 82, thereby allowing the protrusion to pivot about the axis X2. Accordingly, the central connector portion 66 may be rotated relative to the first connector portion 62, such as in a direction indicated by arrow A (FIG. 5B). Further, rotation of the central connector portion 66 relative to the first connector portion 62 will cause a similar rotation relative to the second connector portion 64 about axis X3. For example, the central connector portion 66 and the second part 78 of the second connector portion 64 may be configured to rotate about axis X3 relative to the first part 74 of the second connector portion 64.

[0114] With continued reference to FIGS. 3-5C and further reference to FIGS. 6 and 7A-7D, once the connecting frame member 60 is in this rotated position, the first frame member 52 may be rotated about an axis toward the second stowed position. As the first frame member 52 approaches the second position, where the first frame member 52 is oriented parallel to the second section 42 of the pet carrier 20 (see FIG. 7C), the connecting frame member 60 is rotated about its one or more hinges to a generally coplanar configuration. In the illustrated, non-limiting embodiment, when the first frame member 52 is in the second position and the second frame member 54 is in the first position, the connecting frame member 60 may extend generally vertically therebetween. In this configuration, the second frame member 54, and the parallel the connecting frame member 60 coupled thereto, are rotated about an axis toward the second position. In this configuration, the hinge connection between the second connector portion 64 and the second frame member 54 may be positioned adjacent to the pivotal interface between the first frame member 52 and the second section 42.

[0115] With reference again to FIGS. 1A-3, the second section 42 of the pet carrier 20 may include a base 100, and in some embodiments, the base 100 may define the general shape of the pet carrier 20. Although the base 100 illustrated in the FIGS. is generally rectangular in

shape, it should be appreciated that a base having another shape is also contemplated herein. The second section 42 forms the bottom 22 of the pet carrier 20, and in some embodiments may additionally form at least a portion of one or more of the front 26, rear 28, left side 30, and right side 32 of the pet carrier 20.

[0116] In an embodiment, the base 100 includes a lower tray 102 and an upper tray 104 mounted in overlapping arrangement with the lower tray 102 (see FIG. 9B). The lower tray 102 may form the bottom surface 22 of the pet carrier 20 and the upper tray 104 may form the surface of the base 100 facing the interior of the pet carrier 20 and on which an animal is positioned.

[0117] The pet carrier 20, as described herein, may include one or more latch connectors 120a and 120b operable to engage with a corresponding anchor of a vehicle seat. In the illustrated, non-limiting embodiments, such as shown in FIGS. 2B, and 8A-8B, the pet carrier 20 has a plurality of latch connectors including a first latch connector 120a and a second latch connector 120b. However, embodiments having only a single latch connector or more than two latch connectors are also contemplated herein. The at least one latch connector 120a, 120b may be integral with the pet carrier. For example, the at least one latch connector may be permanently connected to the pet carrier 20. Alternatively, the at least one latch connector may be removably connected to the pet carrier 20.

[0118] In the illustrated, non-limiting embodiments, the at least one latch connector 120a, 120b is arranged at the second section 42 or the base 100 of the pet carrier 20. It should be understood that embodiments where a latch connector is arranged at another suitable location about the pet carrier 20 are also within the scope of the disclosure. Further, although the latch connectors 120a, 120b are illustrated as being positioned adjacent to the rear 28 of the pet carrier 20, in other embodiments one or more latch connectors 120a, 120b may be arranged at another side of the pet carrier 20, such as at the right side 32, the left side 30, or the front 26 of the pet carrier for example.

[0119] In an embodiment, a latch connector or the plurality of latch connectors 120a, 120b may be transformable between a locked configuration in which a catch member (see FIGS. 10A and 10B) of the latch connector 120a, 120b is closed or extended, and an unlocked configuration in which a catch member of the latch connector 120a, 120b is open or retracted (not shown) and therefore separable from a vehicle seat anchor. A latch release mechanism 130 operable to transform the at least one latch connector 120a, 120b to an unlocked configuration may include a release actuator 132, such as arranged at a location remote from at least one of latch connectors 120a, 120b. As shown in FIGS. 9A and 9B, the pet carrier 20 may have a latch

release mechanism 130 including a release actuator 132 and at least one linkage or transmitter 134 operably coupling the release actuator 132 to at least one latch connector 120a, 120b. Although the release actuator 132 is illustrated in FIGS. 9A and 9B as being arranged at the second section 42, such as at an exterior surface of the base 100 for example, it should be understood that the release actuator 132 may be located at any suitable position about the pet carrier 20 accessible by a user, including at a location about the first section 40 for example.

[0120] In embodiments including a plurality of latch connectors 120a, 120b, a plurality of respective transmitters 134 may be operably coupled to a single release actuator 132. As shown, a first transmitter 134a forms a linkage between and operably couples the first latch connector 120a to the release actuator 132 and a second transmitter 134b forms a linkage between and operably couples a second latch connector 120b to the release actuator 132. However, embodiments where each transmitter 134a, 134b is operatively connected to a separate actuator are also within the scope of the disclosure. It should be appreciated that a transmitter may be hidden within (or under) the hardware of the pet carrier (e.g., within or under the frame 44 and/or base 100, such that the transmitter is not visible at the exterior of the pet carrier 20. In an embodiment, the at least one transmitter 134a, 134b may be routed at least partially through the base, such as between the upper tray 104 and the lower tray 102 for example.

[0121] In response to operation of the release actuator 132, a force may be transmitted to a latch connector 120a, 120b via a transmitter 134a, 134b, respectively, causing the latch connector 120a, 120b to open or unlock for disengagement from a vehicle seat anchor. Although the at least one transmitter 134a, 134b is described as providing a mechanical connection, in other embodiments, a transmitter 134a, 134b may provide an electrical connection to the latch connectors. For example, a transmitter 134a, 134b may be one or more wires configured for transmitting electric or electronic signals to a supplemental actuator (not shown) within a LATCH connector to release the latch connector. In alternative embodiments, a transmitter 134a, 134b may represent wireless signals between a release actuator 132 and a supplemental actuator (not shown) for the latch connectors 120a, 120b.

[0122] The at least one latch connector 120a, 120b may be movable between a first, retracted or stowed position (FIG. 8B) in which the at least one latch connector 120a, 120b is not connectable to a vehicle seat anchor and a second, deployed or extended position (FIGS. 2B, 8A) in which the at least one latch connector 120a, 120b protrudes from the pet carrier 20 for connection to a vehicle seat anchor. A cavity 150 may be formed within the pet carrier 20, such as within the base 100 of the pet carrier 20 and in an embodiment, the at least one latch

connector 120a, 120b is positionable within the cavity 150 when in the stowed position. As shown, the cavity 150 may be formed at the bottom surface 22 of the second section 42 of the pet carrier 20. However, embodiments where a cavity 150 for receiving the at least one latch connector 120a, 120b is arranged at another location about the second section 42 are also within the scope of the disclosure.

[0123] The at least one latch connector 120a, 120b may be considered a “rigid latch” in that the latch connector is not mounted to the pet carrier 20 by a flexible structure (e.g., a strap). Further, when the at least one rigid latch connector 120a, 120b is deployed, the latch connectors 120a, 120b extend a fixed distance from the pet carrier 20. In this manner, when the pet carrier 20 is installed in a vehicle and connected to at least one vehicle seat anchor, any relative movement between the pet carrier 20 and the vehicle seat is minimized or eliminated.

[0124] Various types of movement of the latch connectors 120a, 120b during transformation between the stowed position and the deployed position are contemplated herein. In the non-limiting embodiment of a pet carrier 20 illustrated in FIGS. 8A and 8B, the at least one latch connector 120a, 120b is rotatable about an axis relative to the pet carrier 20. For example, the first latch connector 120a and the second latch connector 120b are rotatably mounted at the bottom 22 of the pet carrier 20, such as within the cavity 150 near the rear of thereof. The latch connectors 120a, 120b may be pivotable independently about respective axes. In embodiments where a plurality of latch connectors 120a, 120b are independently movable between the stowed and deployed positions, the latch connectors 120a, 120b may be rotatable about the same axis or different axes, such as axes oriented parallel to but offset from one another or arranged at a non-parallel angle relative to one another. Alternatively, each of the plurality of latch connectors 120a, 120b may move in a different manner between the stowed position and the deployed position.

[0125] In other embodiments, the first latch connector 120a and the second latch connector 120b are configured to transform, such as translate or rotate for example, between the stowed position and the deployed position in unison. In the illustrated, non-limiting embodiment, the first and second latch connectors 120a, 120b are coaxially mounted and an axis of rotation X_r of the first and second latch connectors 120a, 120b is oriented generally parallel to the rear 28 of the pet carrier 20. In embodiments where a plurality of latch connectors 120a, 120b move in unison, the latch connectors 120a, 120b may but need not be mechanically coupled to one another to form a unitary body. In the illustrated, non-limiting embodiment, the first and second latch connectors 120a, 120b may be part of a latch

assembly, where the latch connectors 120a, 120b are rotationally fixed relative to one another and therefore rotate as a unitary body about the axis Xr relative to the pet carrier 20.

[0126] With reference now to FIGS. 10A-10C, an example of a carriage assembly of latch assembly 160 including the first latch connector 120a and the second latch connector 120b coupled to one another and movable as a unitary body is illustrated in. As shown, a hole or opening 162 may be formed in the body of each latch connector 120a, 120b, such as near a first end 164 thereof, opposite the end of each latch connector 120a, 120b including the catch. A portion of a connection member 166, such as an end thereof, may be receivable within each hole 162. In an embodiment, the connection member 166 extends through and beyond the hole 162 formed in each latch connector 120a, 120b. In the illustrated, non-limiting embodiment, the connection member 166 is a cylindrical tube. However, it should be understood that a connection member 166 having another suitable configuration is also within the scope of the disclosure. When the latch assembly 160 is mounted to the pet carrier 20, the first latch connector 120a, the second latch connector 120b, and the connection member 166 move between the stowed and deployed positions in unison. For example, the first latch connector 120a and the second latch connector 120b may rotate together with the connection member 166 about an axis.

[0127] A cover 170 may be positioned about the exterior of the connection member 166 and used to mount the latch assembly 160 about the pet carrier 20. As shown, the connection member 166 may be movably coupled to the cover 170. In the illustrated, non-limiting embodiment, the cover 170 is an assembly formed by joining a first or front cover 172 and a second or rear cover 174 to define a hollow interior within which the body of the connection member 166 is receivable; however, embodiments where the cover 170 is a single body, or alternatively is formed by connecting more than two pieces are also within the scope of the disclosure. In the illustrated, non-limiting embodiment, the axial length of the cover 170 is less than the axial length of the connection member 166. In such embodiments the cover 170 may be designed to have an axial length approximately equal to or shorter than the distance between inward facing surfaces of the respective latch connectors 120a, 120b. Accordingly, the first latch connector 120a is positioned adjacent to a first end of the cover 170 and the second latch connector 120b is positioned adjacent to the second end of the cover 170.

[0128] In an embodiment, the cover 170 includes at least one engagement feature 176, such as a flange extending radially outwardly therefrom over a portion of the axial length of the cover 170. As will be described in more detail below, the one or more

engagement features 176 may be engageable with a corresponding portion of the second section 42 of the pet carrier 20 to at least partially connect or mount the latch assembly 160 to the pet carrier 20.

[0129] With continued reference to FIGS. 10A-10C and further reference to FIS. 11-13C, in an embodiment, the cover 170 includes at least one opening or channel 180 through which a transmitter associated with the catch of the latch connector 120a, 120b, such as transmitter 134a, 134b for example, is extendable. In an embodiment, the cover 170 includes a first channel 180a through which a transmitter 134a associated with a first latch connector 120a is receivable and a second channel 180b through which the transmitter 134b for a second latch connector 120b is receivable. Although each channel 180a, 180b is illustrated as being arranged near an end of the cover 170, it should be appreciated that in other embodiments, one or more of the channels 180a, 180b may be located at any suitable axial position. When the cover 170 is installed about the second section 42 of the pet carrier 20, as shown in FIG. 12, the at least one channel 180a, 180b may be in communication with a corresponding slot 182 formed in the bottom 22 or lower tray 102 of the second section 42, thereby providing a pathway for the transmitter 134b extending into the interior of the second section 42.

[0130] FIGS. 13A-13C represent the channel 180b and the transmitter 134b arranged therein as the latch assembly 160 transforms from a stowed position (FIG. 13A) to a deployed position (FIG. 13C). As shown in the cross-sectional views, the channel 180b for receiving the transmitter 134b may wrap about at least a portion of the inner periphery of the cover 170. For example, when a latch connector 120a, 120b is in the stowed position, the transmitter 134, 134b may wrap about more than 180 degrees of the axis of the latch connector 120a, 120b. In an embodiment, the end of the channel 180a, 180b may be defined by a portion of the latch connector 120a, 120b. Accordingly, as the latch connector 120a, 120b moves relative to the cover 170 toward the deployed position, the wrap of the channel 180a, 180b about the axis, and therefore the length of the transmitter 134, 134b within the channel 180a, 180b, decreases. When the latch connector 120a, 120b is in the deployed position, the wrap of the channel 180a, 180b may extend about 90 degrees or less around the axis of the latch connector 120a, 120b. This reduced channel 180a, 180b wrap positions the transmitter 134, 134b having a straightened path resulting in smooth operation thereof while also maintaining complete coverage of the transmitter 134, 134b.

[0131] The movement of the one or more rigid latch connectors 120a, 120b, may be manually performed by an operator. In such embodiments, a latch deployment mechanism

operably coupled to the at least one latch connector may be operable to unlock the one or more latch connectors from the stowed position in response to an input from a user.

Alternatively, the pet carrier 20 may include a latch deployment mechanism 200 (FIGS. 15-16C) operable to automatically transform the at least one latch connector 120a, 120b from a stowed position to a deployed position in response to an input from a user. An example of such a latch deployment mechanism 200 will be described in more detail below.

[0132] In embodiments where the latch deployment mechanism 200 unlocks the one or more latch connectors 120a, 120b from the stowed position, the latch connectors 120a, 120b may or may not be automatically biased toward the deployed position. In instances where the latch connectors 120a, 120b are not biased toward the deployed position, manual application of a force to the latch assembly 160 by a user may be required to transform the latch connectors 120a, 120b to the deployed position. To retain the latch connectors 120a, 120b in the deployed position in embodiments where the latch connectors 120a, 120b are not biased thereto, a latch connector 120a, 120b may have a magnet 190 operably coupled thereto. The magnet 190 may be arranged at an exterior surface of the latch connector 120a, 120b, as shown, or alternatively, may be embedded within the body of the latch connector 120a, 120b. In such embodiments, a corresponding magnetic component 192, such as a steel plate for example, is positioned at a portion of the pet carrier 20 adjacent to the latch connector 120a, 120b, such as at the lower tray 102 of the base 100 for example. When the latch assembly 160 is moved to the deployed position, the magnetic field of the magnet 190 will interact with the induced magnetic field in the magnetic component 192 to couple the latch connector 120a, 120b thereto. Application of a force greater than the attractive force between the magnet 190 and the magnetic component 192 will separate the magnet 190 from the magnetic component 192, allowing the latch connector 120a, 120b to transform to the stowed position.

[0133] With reference to FIGS. 15-16C, an example of a latch deployment mechanism 200 operable to unlock the at least one latch connector 120a, 120b from the stowed position, and in some embodiments, automatically move the at least one latch connector 120a, 120b from the stowed position to the deployed position relative to a pet carrier 20 is illustrated. As shown, the latch deployment mechanism 200 may be embedded within a portion of a base 100 of the pet carrier 20, such as between the upper and lower trays 102, 104 for example. The latch deployment mechanism 200 includes a deployment actuator 202 and a deployment assembly 204 operatively coupled to the at least one latch connector 120a, 120b and to the deployment actuator 202. Configuration of the deployment assembly 204 may depend on the type of

movement desired of the latch connectors 120a, 120b between the stowed and deployed positions.

[0134] In the illustrated, non-limiting embodiment the latch connectors 120a and 120b are rotatable about a common axis as described above and illustrated in FIGS. 8A and 8B. As shown in FIG. 15-16C, the deployment assembly 204 may include a latch lock slider 206. The latch lock slider 206 may be movably mounted, such as along a first track defined by one or more ribs or guides 208 extending from a surface of the base 100, generally adjacent to a latch connector 120a, 120b. In some embodiments, one or more of the upper and lower trays 102, 104 of the base 100 have features 208 formed therein to define the track along which the latch lock slider 206 is movable. A latch engagement feature 210 (see FIGS. 16A-16C), such as a rib for example, may protrude from a surface of the latch lock slider 206 located closest to a latch connector 120a, 120b. In an embodiment, a latch biasing mechanism 212, such as a coil spring for example, is associated with the latch lock slider 206. The biasing force of the latch biasing mechanism 212 is operable to bias the latch lock slider 206 towards and into engagement with at least one latch connector 120a, 120b in a stowed position.

[0135] A connection member 214 operably couples the deployment actuator 202 to the latch lock slider 206. The connection member 214 may be in slotted engagement with both the deployment actuator 202 and the latch lock slider 206. In the illustrated, non-limiting embodiment, a slot 216 formed in the deployment actuator 202 is engaged with a pin 218, such as formed at a first end for example, of the connection member 214. This slot 216 is arranged at a non-parallel angle relative to axis of movement of the deployment actuator 202. Similarly, a slot 220 formed in the latch lock slider 206 and engaged with a pin 222, such as formed at a second, opposite end for example, of the connection member 214 is arranged at a non-parallel angle relative to the axis of the track associated with the latch lock slider 206. Accordingly, when a force is applied to the deployment actuator 202, such as represented by F1 (FIG. 16A), the deployment actuator 202 moves, for example translates, relative to the base 100 of the pet carrier 20, to the position shown in FIG. 16B. This translation causes the connection member 214 to translate in a direction toward the deployment actuator 202 via the orientation of the slot 216. As the pin 222 of the connection member 214 translates within the slot 220 formed in the latch lock slider 206, the engagement between the pin 222 and the angled slot 220 causes the latch lock slider 206 to translate along its track away from an adjacent latch connector 120a, 120b. In an embodiment, the latch lock slider 206 is operable to translate in the same direction as the deployment actuator 202 when operated. As the latch lock slider 206 translates, the latch engagement feature 210 of the latch lock slider 206 separates from the latch connector 120a,

120b. Accordingly, in the translated position, the latch lock slider 206 no longer locks or restricts movement of the latch connector 120a, 120b from the stowed position.

[0136] In some embodiments, at least one biasing mechanism (not shown), such as a torsion spring for example, is operably coupled to the latch connector 120a, 120b. The biasing force of the biasing mechanism may be operable to bias the latch connector 120a, 120b toward to deployed position. In such embodiments, separation of the latch engagement feature 210 of the latch lock slider 206 from the latch connector 120a, 120b not only unlocks the latch connector 120a, 120b, but also results in automatic movement of the latch connector 120a, 120b to the deployed position via the biasing mechanism. It should be appreciated that although the latch deployment mechanism 200 is illustrated and described herein with respect to a single latch lock slider 206, embodiments including a latch lock slider associated with each respective latch connector 120a, 120b are also contemplated herein. In such embodiments, a single deployment actuator 202 may be operably coupled to each latch lock slider 206, or alternatively, each latch lock slider 206 may be operable via an independent deployment actuator.

[0137] A release actuator associated with locking and unlocking a catch of a latch connector 120a, 120b, such as release actuator 132 for example, and a deployment actuator associated unlocking a position and/or movement of the latch connectors 120a, 120b relative to the pet carrier 20, such as deployment mechanism 200 for example, are described herein as separate actuators. However, in some embodiments, a single actuator may be operable as both the release actuator and the deployment actuator. In such embodiments, operation of the actuator may simultaneously cause the catch of the latch connectors 120a, 120b to unlock and the latch connectors 120a, 120b to unlock and/or deploy relative to the pet carrier 20. However, embodiments where different operations of the same actuator are required to perform the unlocking of the catch and the unlocking and/or deployment of the latch connector 120a, 120b relative to the pet carrier 20 are also contemplated herein. In such embodiments, application of a force to the actuator in a first direction may perform either the unlocking of the catch of a latch connector 120a, 120b and application of another force to the actuator in the first direction, or alternatively, in a second opposite direction, may unlock and/or deploy that latch connectors relative to the pet carrier 20. Further, it should be understood that in any of the embodiments of an actuator described herein, the actuator may include a force multiplier.

[0138] With reference to FIG. 17, an example of a release assembly and a deployment assembly operably coupled to the same actuator is illustrated. As shown, the latch deployment mechanism 300 is substantially identical to the latch deployment mechanism 200 described

with respect to FIGS. 15-16C. Accordingly, corresponding components are similarly numbered. In the non-limiting embodiment, the release assembly 330 includes a first release linkage or cable 332a operably coupled to the first latch connector 120a and a second release linkage or cable 332b operably coupled to the second latch connector 120b. The first and second release linkages 332a, 332b may be coupled directly or indirectly to the deployment mechanism or actuator 302. For example, the first release linkage 332a may be coupled to a first toggle or cable pull 334a and the second release linkage 332b may be coupled to a second toggle or cable pull 334b. The first and second cable pulls 334a, 334b may be pivotally mounted to the base 100 at a location adjacent to the actuator 302.

[0139] Movement of the actuator 302 causes the first and second cable pulls 334a, 334b to pivot about their respective axes to transmit a force to the release linkages 332a, 332b. In the illustrated, non-limiting embodiment, the cable pulls 334a, 334b are mounted within a path of movement of the actuator 302. For example, at least one engagement feature 336 of the actuator 302 may be configured to engage a portion of each cable pulls 334a, 334b as the actuator 302 moves. In the illustrated embodiment, this engagement causes a rotation of the cable pulls 334a, 334b; however, it should be understood that any suitable interface between the actuator 302 and an intermediate component such as a cable pull 334a, 334b is contemplated herein. Accordingly, operation of the actuator 302, such as by applying a pulling force thereto, shown at F2, not only operates the latch deployment mechanism 300 as previously described, but also operates a release mechanism, causing the catch of at least one latch connector 120a, 120b operably coupled thereto to unlock.

[0140] As previously described, the latch assembly 160 is movable between the stowed position and the deployed position in a first direction, such as about or along an axis. With reference now to FIGS. 18A and 18B, in an embodiment, the latch assembly 160 may also be movable relative to the pet carrier 20 in a second direction, such as about or along the same axis or a different axis. The latch assembly 160 may remain in the deployed position or in the stowed position during movement in the second direction. Further, it should be appreciated that the latch assembly 160 may be movable between the stowed position and the deployed position at each position of the latch assembly 160 along a connector path in the second direction. However, it should be understood that embodiments where the orientation of the latch assembly 160 remains fixed relative to the base 100, but is movable in at least one direction, such as laterally relative to the base 100 for example, are also within the scope of the disclosure.

[0141] In the illustrated, non-limiting embodiment of FIGS. 18A-18B, the latch assembly 160 is not only rotatable about an axis X_r extending parallel to the rear 28 of the pet carrier between the stowed position and the deployed position, but also is translatable along the axis X_r of rotation between a first lateral position and a second lateral position. At the first lateral position, shown in FIG. 18A, the latch assembly 160 may be located at a position closer to the left side 30 of the pet carrier 20 than the right side 32 of the pet carrier 20, and at the second lateral position, shown in FIG. 18B, the latch assembly 160 may be positioned closer to the right side 32 of the pet carrier 20 than to the left side 30. In an embodiment, the flange 176 extending from the cover 170 surrounding the connector of the latch assembly 160 is connected to the second section 42 of the pet carrier 20 via a slotted engagement. Although an elongated slot 400 is illustrated as being formed in the flange 176 and a pin 402 extending from the second section 42 is receivable within the slot 400, embodiments where the slot 400 is formed in the second section 42 of the pet carrier 20 and a pin 402 extending from the flange 176 is received therein are also within the scope of the disclosure. Accordingly, the configuration of the slot 400, such as formed in the flange 176 for example, defines the connector path of the latch assembly 160 in the second direction.

[0142] With reference to FIGS. 19-21B, an example of a latch position lock 420 operable to lock the latch assembly 160 at a position along the connector path in the second direction, such as at a translational position along axis X_r for example, is illustrated. The latch position lock 420 includes a housing 422 and at least one engagement member 424 protruding from the housing 422. The latch position lock 420 may be movably mounted to the pet carrier 20 at a position adjacent to, and in some embodiments forward of the cover 170 of the latch assembly. In the illustrated non-limiting embodiment, a surface of the cover 170, such as a surface of the rear cover 174, opposite the flange 176 for example, has one or more receiving features 426, such as detents or grooves formed therein. The at least one engagement member 424 of the latch position lock 420 is receivable within or engageable with at least one corresponding receiving feature 426 formed in the cover 170. A contour of the receiving features 426 may be complementary to a contour of the at least one engagement member 424. The total number of receiving features 426 is greater than the total number of engagement members 424 of the housing 422, and when the latch assembly 160 is centered relative to the base 100, at least one receiving feature, and in some embodiments a plurality of receiving features, is located beyond the at least one engagement member 424 in both directions. In some embodiments, the latch position lock 420 is biased by a biasing

mechanism 428, such as a coil spring, into engagement with the grooves 426 formed in the cover 170 to lock the latch assembly 160 at a lateral position relative to the pet carrier 20.

[0143] In an embodiment, best shown in FIG. 21B, a slot 430 formed in the housing 422 is oriented at an angle relative to the axis X_r and the adjacent surface of the cover 170. In the illustrated, non-limiting embodiment, the slot 430 is substantially perpendicular to the surface of the cover 170; however, embodiments where the slot 430 has another orientation relative to the surface of the cover 170. A pin 432, such as extending from the base 100, is arranged within the slot 430. Accordingly, the pin 432 and slot 430 in combination define a connector path of the housing 422 relative to the base 100.

[0144] To adjust the lateral position of the latch assembly 160, a user applies a force to the housing 422 in a direction opposite the biasing force of the biasing mechanism 428. This force will move the housing 422 along this path of movement defined by the slot 430, resulting in movement of the engagement members 424 out of engagement with the receiving features 426 formed in the cover 170. Once disengaged, the latch assembly 160 is movable relative to the base 100. When the latch assembly 160 is in the desired position, the force is removed from the housing 422. As a result, the biasing mechanism 428 will bias the engagement members 424 of the housing 422 into corresponding receiving features 426 to lock the latch assembly 160 in position relative to the latch position lock 420. The engagement between the engagement members 424 and the receiving features 426 may provide a user with audible, visual, and/or tactile feedback to indicate that the latch assembly 160 is locked in position.

[0145] With reference now to FIGS. 22-23D, another embodiment of a pet carrier 500 is illustrated. The pet carrier 500 may have an upper section 502 including a frame 504 and a lower section 506 including a base 508 as previously described herein. In the illustrated, non-limiting embodiment, the pet carrier 500 includes having a reinforcement assembly 510 operable to attach the pet carrier 500 to a vehicle seat 501 (FIG. 22). The reinforcement assembly 510 includes at least one reinforcement member configured to wrap about one or more sides of the pet carrier 500. In the illustrated, non-limiting embodiment shown in the FIGS., the reinforcement assembly 510 includes a first reinforcement member 512a and a second reinforcement member 512b; however, embodiments having a single reinforcement member, or alternatively, more than two reinforcement members are also contemplated herein. In an embodiment, the reinforcement members 512a, 512b are formed of, e.g., nylon webbing with a relatively high tensile strength relative to other components of the pet carrier 500. In embodiments including a plurality of reinforcement members, the reinforcement

members 512a, 512b may be independently positionable, or alternatively, may be connected together by one or more intermediate members 516.

[0146] In the illustrated, non-limiting embodiment, the at least one reinforcement member 512a, 512b is wrappable about a front 518 and a top 520 of the pet carrier 500. However, in other embodiments, the at least one reinforcement member 512a, 512b may be configured to wrap about an exterior of the frame 44 to substantially encircle the upper section 502 of the pet carrier 500 (see FIG. 22). In some embodiments where the one or more reinforcement members 512a, 512b are not a continuous loop, as shown in FIGS. 23A-23D, the one or more reinforcement members 512a, 512b are extendable beyond the top 520 of the pet carrier 500 to engage a portion of an adjacent vehicle seat 501, such as a seat back of a vehicle seat 501 for example. In such embodiments, a respective tether 514a, 514b connectable to an anchor or other interface on the vehicle seat may be mounted at or near a first end of the at least one reinforcement member 512a, 512b. Accordingly, the reinforcement assembly 510 may provide crash safety performance by transferring crash forces from vehicle anchors around at least a portion of the body of the pet carrier 500 while minimizing any point loads and preventing collapse of the pet carrier 500.

[0147] As shown, the reinforcement members 512a, 512b may be routed between an upper tray (not shown) and a lower tray 522 of the base 508. The upper tray, the lower tray 522, or an interface therebetween, may have one or more slots formed therein through which the reinforcement members 512a, 512b are routed to the interior of the base. In an embodiment, a portion of the one or more reinforcement members 512a, 512b may be affixed or fastened to a portion of the base 508, such as at an anchor point. As used herein, the term “anchor point” is intended to define a location where a reinforcement member, such as either reinforcement members 512a, 512b for example, is mechanically or chemically connected to the pet carrier 500. The total number of anchor points and their respective locations may be dependent on the configuration of the reinforcement member and its positioning about the pet carrier.

[0148] In the illustrated, non-limiting embodiment, each of the reinforcement members 512a, 512b has an anchor point arranged at a second, opposite end 524a, 524b thereof. The ends 524a, 524b of the reinforcement members 512a, 512b may be mechanically coupled to the base 508, such as to the lower tray 522 of the base 508, or a corresponding component located at the lower tray 522 for example. In the non-limiting embodiment of FIG. 19, a rigid member 526, such as a structural metallic plate for example, may be arranged at and/or mounted to the base 508, such as the lower tray 522, and the ends 524a, 524b of the

reinforcement members 512a, 512b may be anchored to the rigid member 526. Although the reinforcement members 512a, 512b are described herein as having a first end and a second end, it should be understood that embodiments where the reinforcement members 512a, 512b are configured as continuous loops are also contemplated herein. In such embodiments, each loop may be configured to pass through an anchoring member arranged at the bottom of the rigid member 526. Similarly, the tether 514a, 514b may be fixedly or movably connected to each continuous loop.

[0149] With reference to FIG. 24, one or both of the upper and lower trays 522 may have guides or supporting ribs 527 to properly position the reinforcement members 512a, 512b arranged within the base 508 and the ends 524a, 524b thereof. Inclusion of the guides or ribs 527 may also provide additional strength to the lower tray 522.

[0150] In an embodiment, at least one of the reinforcement members 512a, 512b may be affixed to a first frame member 528 arranged at the front 518 of the pet carrier 500 at an anchor point. Anchoring the reinforcement members 512a, 512b may result in a desired tension being applied to the reinforcement members 512a, 512b when the pet carrier 500 is in an extended configuration. Further, in such embodiments, the reinforcement members 512a, 512b will be configured to collapse with the first frame member 528 relative to the base 508.

[0151] As previously described, soft goods (not shown) positionable about the frame 504, may be provided to enclose the pet carrier 500 and provide various features such as ventilation, visibility, UV protection, etc. In an embodiment, soft goods may enclose all or at least a portion of the reinforcement assembly 510. For example, soft goods may extend between the upper tray (not shown) and the lower tray 522. In such embodiments, attachment features of the upper tray, such as ribs or feet for example, may extend through the soft goods to engage the lower tray 522. The rigid connection between the upper and lower trays 522 results in a unitary base 508.

[0152] With continued reference to FIGS. 23A-24 and further reference to FIGS. 25-28, in an embodiment, the pet carrier 500 includes a latch assembly 530, such as substantially identical to the latch assembly 160 previously described herein. As shown, the latch assembly 530 may be coupled to a portion of the base 508 via at least one tension member 532, such as a piece of webbing for example. Although two tension members 532a, 532b are illustrated in the FIGS., it should be understood that embodiments including only a single tension member, or alternatively, more than two tension members are contemplated herein.

[0153] In an embodiment, a first portion of each of the first tension member 532a and the second tension member 532b is connected to the latch assembly 530, such as wrapped about

the latch assembly 530 for example. A second portion of each tension member 532a, 532b is connectable to a corresponding webbing connection 534a, 534b positioned at the base 508. The tension members 532a, 532b may be configured as continuous loops, or alternatively, may be straps having one or both ends thereof arranged at the corresponding webbing connection 534a, 534b. As shown, the second portion of the tension members 512a, 512b may pass from a bottom of the rigid member 526 through a first opening of the webbing connection 534a, 534b and may further extend from the top of the rigid member 526 back to the bottom of the rigid member 526 through a second opening of the webbing connection 534a, 534b. In such embodiments, the first portion of the tension members 512a, 512b extends from the bottom of the rigid member 526. However, embodiments where the first portion of the tension members 532a, 532b extends from the top of the rigid member 526 are also contemplated herein.

[0154] In the illustrated, non-limiting embodiment, the tension members 532a, 532b are configured to wrap about the latch assembly 530 at a location between a first and second latch connector 536a, 536b, such as about a cover 538 of the latch assembly 530 for example. In such embodiments, the webbing connections 534a, 534b may be located at the base 508 at a position between the anchor points of the ends 524a, 524b of the reinforcement members 512a, 512b. For example, both the anchor points of the ends 524a, 524b of the reinforcement members 512a, 512b and the webbing connections 534a, 534b may be located at the rigid member 526. However, in other embodiments, at least one tension member 532a, 532b may be positioned between an outwardly facing surface 540a, 540b of a latch connector 536a, 536b and an adjacent surface of the base 508. In such embodiments, the tension member 532a, 532b may be configured to wrap about the connection member 542 of the latch assembly 530 instead of the cover 538. In such embodiments, the webbing connections 534a, 534b may also be located laterally outward of the ends 524a, 524b of the reinforcement members 512a, 512b relative to the base 508. As shown in FIG. 26B, the connection member 542 may span the entire width of a cavity 531 within which the latch connectors 536a, 536b are receivable in a stowed configuration. In some embodiments, the ends of the connection member 542 may be receivable within corresponding compartments or pockets 533 formed at the base 508 and may be mounted therein via an end cover 543 fastened to the base at the pocket 533.

[0155] To properly position the rigid member 526 that forms an anchor point or connection means for at least one of a reinforcement members 512a, 512b and a tension member 532a, 532b relative to the base 508, in an embodiment, the base includes one or more positioning features 544, such as protrusions or ridges for example. The structural plate may have corresponding or complementary receiving features, such as detents or grooves for

example that cooperate with the positioning features to position the rigid member 526. Although the positioning features are shown as being received within the receiving features 546, in other embodiments, the features may be arranged in any other suitable configuration, such as in overlapping arrangement for example, that restricts movement of the rigid member 526 relative to the base 508 in at least one direction. In an embodiment, the positioning features 544 snap into engagement with the receiving features 546 of the rigid member 526.

[0156] With reference to FIG. 27, in an embodiment, a cover 550 is positionable in overlapping arrangement with at least a portion of the latch assembly 530. The cover 550 may alternatively or additionally be positioned in overlapping arrangement with the rigid member 526. The cover 550 may be permanently or removably affixed to the adjacent portions of the base 508, such as portions that are raised or offset from the cavity 531. In embodiments where the cover 550 is removably connectable to the base 508, a connection mechanism may be arranged at an interface between the cover 550 and at least one adjacent surface of the base 508. The connection mechanism may include a first portion and a complementary second portion, one of which is arranged at the cover 550 and the other of which is arranged at the base 508. In an embodiment, the connection mechanism forms a snap fit engagement between the cover 550 and the base 508. However, embodiments including a different type of connection mechanism, such as a fastener, magnets, or hook and loop fastenings for example are also within the scope of the disclosure.

[0157] The term “about” is intended to include the degree of error associated with measurement of the particular quantity based upon the equipment available at the time of filing the application.

[0158] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the present disclosure. As used herein, the singular forms “a,” “an” and “the” are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms “comprises” and/or “comprising,” when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, element components, and/or groups thereof.

[0159] While the present disclosure has been described with reference to an exemplary embodiment or embodiments, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the present disclosure. In addition, many modifications may be

made to adapt a particular situation or material to the teachings of the present disclosure without departing from the essential scope thereof. Therefore, it is intended that the present disclosure not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out this present disclosure, but that the present disclosure will include all embodiments falling within the scope of the claims.

CLAIMS:

What is claimed is:

1. A pet carrier for containing animals on a vehicle seat including at least one vehicle seat anchor, the pet carrier comprising:
 - a body defining an enclosure having an interior within which an animal is receivable; and
 - at least one rigid latch connector mounted to the body, the at least one rigid latch connector being movable relative to the body along a connector path, wherein the at least one rigid latch connector is connectable to the at least one vehicle seat anchor at any position along the connector path.
2. The pet carrier of claim 1, wherein the at least one rigid latch connector is translatable along the connector path.
3. The pet carrier of claim 1, wherein the body has a front, back, left side, and right side, and the connector path is oriented parallel to at least one of the front and the back.
4. The pet carrier of claim 1, further comprising a latch position lock operable to lock the at least one rigid latch connector along the connector path.
5. The pet carrier of claim 4, wherein the latch position lock and the at least one rigid latch connector are arranged at a same side of the body.
6. The pet carrier of claim 1, wherein the body further comprises a lower section having a rigid member and a reinforcement assembly, the reinforcement assembly including at least one reinforcement member connected to the rigid member.
7. The pet carrier of claim 6, wherein the body further comprises an upper section positioned vertically above the lower section, the at least one reinforcement member extending about one or more sides of the body.
8. The pet carrier of claim 7, wherein the at least one reinforcement member extends about a front of the body and a top of the body.
9. The pet carrier of claim 8, wherein the at least one reinforcement member is affixed to the front of the body at an anchor point.
10. The pet carrier of claim 7, wherein the at least one reinforcement member encircles the upper section.
11. The pet carrier of claim 1, further comprising a release mechanism operably coupled to the at least one rigid latch connector to unlock the at least one rigid latch connector.

12. The pet carrier of claim 11, wherein the release mechanism further comprises:
a release actuator; and
at least one transmitter operatively connecting the at least one rigid latch connector to the release actuator.
13. The pet carrier of claim 12, wherein the release actuator and the at least one rigid latch connector are arranged at opposite sides of the body.
14. The pet carrier of claim 12, wherein the release actuator is arranged at a front of the body.
15. The pet carrier of claim 1, wherein the at least one rigid latch connector is transformable relative to the body between a stowed position and a deployed position, the at least one rigid latch connector being receivable within a cavity formed in the body when in the stowed position.
16. The pet carrier of claim 15, wherein the at least one rigid latch connector is rotatable about an axis between the stowed position and the deployed position.
17. The pet carrier of claim 16, wherein the connector path is parallel to the axis of the at least one rigid latch connector.
18. The pet carrier of claim 15, further comprising at least one biasing mechanism operably coupled to the at least one rigid latch connector to bias the at least one rigid latch connector to the deployed position.
19. The pet carrier of claim 15, wherein the body includes a frame, containment materials extending at least partially about the frame, and a base, the frame being connectable to the base.
20. The pet carrier of claim 19, wherein the cavity is formed in the base.
21. The pet carrier of claim 15, further comprising a latch deployment mechanism operable to automatically transform the at least one rigid latch connector from the stowed position to the deployed position in response to an input.
22. The pet carrier of claim 15, wherein the at least one rigid latch connector includes a first rigid latch connector and a second rigid latch connector.
23. The pet carrier of claim 22, wherein the body includes a base and the first rigid latch connector and the second rigid latch connector are part of a latch assembly, the latch assembly further comprising:
a cover fixedly mounted to the base; and
a connection member operably coupled to both the first rigid latch connector and the second rigid latch connector and arranged within an interior of the cover, the connection

member being rotatable with the first rigid latch connector and the second rigid latch connector between the stowed position and the deployed position.

24. The pet carrier of claim 23, wherein further comprising at least one channel formed in the cover, the at least one channel being configured to guide a transmitter extending from one of the first rigid latch connector and the second rigid latch connector to an actuator.

25. The pet carrier of claim 24, wherein the at least one channel extends axially through an opening formed in the cover.

26. The pet carrier of claim 24, wherein the latch assembly is movably mounted to the base, the base having a slot through which the transmitter extends between the cover and the actuator.

27. The pet carrier of claim 23, wherein the body further comprises a lower section having a rigid member and at least one tension member coupling the latch assembly to the rigid member.

28. The pet carrier of claim 27, wherein the rigid member is a metallic plate.

29. The pet carrier of claim 27, wherein the at least one tension member is configured as a continuous loop.

30. The pet carrier of claim 27, wherein the at least one tension member includes a first tension member and a second tension member spaced apart from one another, wherein a first portion of each of the first tension member and the second tension member is coupled to the latch assembly and a second portion of each of the first tension member and the second tension member is coupled to the rigid member.

31. The pet carrier of claim 30, wherein the first portion of the first tension member and the second tension member is connected to the latch assembly between the first rigid latch connector and the second rigid latch connector.

32. The pet carrier of claim 30, wherein the first portion of the first tension member and the second tension member is coupled to a webbing connection located at the rigid member.

33. The pet carrier of claim 32, wherein the first portion of the first tension member and the second tension member extends from a bottom of the rigid member.

34. The pet carrier of claim 32, wherein the first portion of the first tension member and the second tension member extends from a top of the rigid member.

35. A pet carrier for containing animals on a vehicle seat, the pet carrier comprising:

a body defining an enclosure having an interior within which an animal is receivable, the body including a cavity; and

at least one rigid latch connector movably mounted to the body, wherein the at least one rigid latch connector is movable relative to the body in a first direction between a stowed position and a deployed position and is movable relative to the body in a second direction.

36. The pet carrier of claim 35, wherein the first direction is rotation about an axis and the second direction is translation along the axis.

37. The pet carrier of claim 35, wherein the first direction is translation along a first axis and the second direction is translation along a second axis, the first axis having a non-parallel orientation relative to the second axis.

38. A pet carrier for use in a vehicle, comprising:

a base;

a frame including a first frame member and a second frame member, the frame being transformable between a deployed configuration and a stowed configuration, and in the stowed configuration, the first frame member and the second frame member are collapsed against the base;

a handle for lifting the pet carrier, the handle being connected to the first frame member and the second frame member, the handle having a pivot axis and being rotatable about the pivot axis to transform the frame between the deployed configuration and the stowed configuration; and

wherein the handle remains connected to the first frame member and the second frame member as the frame transforms between the deployed and stowed configurations.

39. The pet carrier of claim 38, wherein the pivot axis is at a position spaced from both the first frame member and the second frame member.

40. The pet carrier of claim 38, wherein the handle has a first end connected to the first frame member and a second end connected to the second frame member, the pivot axis being arranged between the first end and the second end.

41. The pet carrier of claim 40, wherein the first end of the handle is rotatably coupled to the first frame member and the second end of the handle is rotatably coupled to the second frame member.

42. The pet carrier of claim 40, wherein the handle has a first orientation relative to the base when the frame is in the deployed configuration and the handle has a second

orientation relative to the base when the frame is the stowed configuration, the second orientation being opposite the first orientation.

43. The pet carrier of claim 38, wherein the pivot axis is arranged at a central portion of the handle.

44. The pet carrier of claim 38, further comprising a locking mechanism operably coupled to the handle, wherein the locking mechanism is configured to restrict rotation of the handle about the pivot axis.

45. The pet carrier of claim 44, wherein the locking mechanism is arranged at an interior of the handle.

46. The pet carrier of claim 44, wherein the locking mechanism further comprises:
a protrusion; and
a handle lock, wherein the handle lock is engageable with the protrusion to selectively restrict the rotation of the handle about the pivot axis.

47. The pet carrier of claim 46, wherein the handle lock is movable between an engaged position and a disengaged position, in the engaged position, the handle lock is arranged within a path of movement of the protrusion about the pivot axis, and in the disengaged position, the handle lock is offset from the path of movement of the protrusion about the pivot axis.

48. The pet carrier of claim 47, wherein the locking mechanism further comprises an actuator operably coupled to the handle lock to move the handle lock from the engaged position to the disengaged position.

49. The pet carrier of claim 47, wherein the locking mechanism further comprises a biasing mechanism operably coupled to the handle lock to bias the handle lock to the engaged position.

50. The pet carrier of claim 38, further comprising at least one rigid latch connector coupled to the base, wherein the at least one rigid latch connector is movable between a stowed position within the base and a deployed position protruding beyond an exterior of the base.