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PET CARRIER SYSTEM FOR VEHICLE SEAT

Abstract

A carrier system for carrying a pet in a vehicle includes a seat having a seat bottom and a seat back. A carrier is integrated into the seat back. The carrier has at least one panel movable between a stowed state in the seat back and a deployed state projecting from the seat back.

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Background/Summary

INTRODUCTION

[0001] The present disclosure generally relates to vehicle seats and more particularly relates to vehicle seats that accommodate carrying a pet.

[0002] Vehicle interiors include any of a number of seating arrangements for one or more

passengers. A driver's seat is provided at the cockpit position and a front passenger seat is positioned alongside the driver's seat. One or more rows of rear seats may be provided vehicle the driver's seat and front passenger seat. The seats are designed for human passengers and generally have a seat bottom on which a passenger sits, and a seat back disposed at an obtuse angle relative to the seat bottom. The passenger generally rests against the seat back when seated on the seat bottom. Some seats may be foldable for stowage, such as to increase cargo carrying ability of the vehicle when the seat is not needed for passenger use.

[0003] Vehicle seats are designed for use by human passengers. The shapes and angles of the seat bottom and seat back are not necessary the most accommodating for pet use. In addition, the seat area is open with no restrictions on a pet's movements. It would be advantageous to provide a vehicle seat having features designed for carrying a pet as a passenger in the vehicle. It would also be advantageous if such features require minimal space so as to not interfere with human passenger comfort or cargo loading when not in use.

[0004] Accordingly, it is desirable to provide vehicle seats with systems or features that various requirements of accommodating pets as passengers in a vehicle and require minimal space when not in use for use in various vehicle seat applications. Furthermore, other desirable features and characteristics of the present invention will become apparent from the subsequent detailed description and the appended claims, taken in conjunction with the accompanying drawings and the foregoing introduction.

SUMMARY

[0005] A carrier system for carrying a pet in a vehicle includes, in a number of embodiments, a seat having a seat bottom and a seat back. A carrier is integrated into the seat back. The carrier has at least one panel movable between a stowed state in the seat back and a deployed state projecting from the seat back.

[0006] In additional embodiments, a tether system is connected with the seat and has an end for coupling with a pet.

[0007] In additional embodiments, when the carrier is stowed in the seat back, the seat back includes a rear surface that is substantially continuous without projecting the carrier rearward from the rear surface.

[0008] In additional embodiments, a monitoring system operates to evaluate restraint and positioning of a pet.

[0009] In additional embodiments, a monitoring system operates to determine whether a pet is positioned in the carrier.

[0010] In additional embodiments, the carrier operates to unfold upward from the seat back, when the seat back is folded against the seat bottom.

[0011] In additional embodiments, the panel is a base panel of the carrier that, when the carrier is in the deployed state, is oriented substantially horizontal. The carrier includes at least two side panels projecting upward from the base panel when the carrier is in the deployed state.

[0012] In additional embodiments, the seat back serves as a forward side of the carrier, when the carrier is in the deployed state.

[0013] In additional embodiments, the carrier includes a forward side to limit movement of a pet in a forward direction.

[0014] In additional embodiments, the carrier is connected with a rear side of the seat back and projects from the seat back when the carrier is in the deployed state.

[0015] In a number of additional embodiments, a carrier system for a vehicle includes a seat having a seat bottom and a seat back. A carrier is integrated into the seat back. The carrier has a panel connected with the seat back that is movable between a stowed state in the seat back and a deployed state projecting from the seat back. The carrier, when in the deployed state, is constructed to carry a pet.

[0016] In additional embodiments, a tether system is connected with the seat and has an end for

coupling with the pet. The tether system extends into the carrier.

[0017] In additional embodiments, when the carrier is in the stowed state, it is contained in the seat back. The seat back includes a rear surface that is substantially continuous, when the carrier is in the stowed state, without projecting the carrier rearward from the rear surface.

[0018] In additional embodiments, a monitoring system is operable to evaluate restraint and positioning of the pet, and to provide an alert based on the evaluation.

[0019] In additional embodiments, the monitoring system operates to determine whether the pet is positioned in the carrier and whether the tether is connected to the pet.

[0020] In additional embodiments, the seat back is foldable against the seat bottom so that the seat back is disposed in a substantially horizontal state. The carrier unfolds upward from the seat back, when the seat back is folded against the seat bottom.

[0021] In additional embodiments, the panel is a base panel of the carrier that, when the carrier is in the deployed state, is oriented substantially horizontal. The carrier includes two side panels projecting upward from the base panel when the carrier is in the deployed state. When the carrier is in the stowed state, the two side panels are contained in the seat back and concealed by the base panel.

[0022] In additional embodiments, the seat back acts as a forward side of the carrier to limit movement of the pet in a forward direction, when the carrier is in the deployed state.

[0023] In additional embodiments, the carrier includes a forward side to limit movement of a pet in a forward direction. The carrier includes an openable side configured to be open for the pet to enter the carrier.

[0024] In a number of other embodiments, a carrier system for a vehicle includes a seat that has a seat bottom and a seat back. A carrier is integrated into the seat back. The carrier has a panel connected with the seat back that is movable between a stowed state in the seat back and a deployed state projecting from the seat back. A monitoring system is operable to determine whether a pet is positioned in the carrier.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] The exemplary embodiments will hereinafter be described in conjunction with the following drawing figures, wherein like numerals denote like elements, and wherein:

[0026] FIG. 1 is a schematic diagram of a part of a vehicle with a seat that has a pet carrier system, in accordance with various embodiments;

[0027] FIG. 2 is a perspective illustration of a pet carrier system for the vehicle seat of FIG. 1 shown in an undeployed state, in accordance with various embodiments;

[0028] FIG. 3 is a perspective illustration of a pet carrier system for the vehicle seat of FIG. 1 shown in partially deployed state, in accordance with various embodiments;

[0029] FIG. 4 is a perspective illustration of a pet carrier system for the vehicle seat of FIG. 1 shown in a fully deployed state, in accordance with various embodiments;

[0030] FIG. 5 is a perspective illustration of a pet carrier system for the vehicle seat of FIG. 1 shown in an undeployed state, in accordance with various embodiments;

[0031] FIG. 6 is a perspective illustration of a pet carrier system for the vehicle seat of FIG. 1 shown in a deployed state, in accordance with various embodiments;

[0032] FIG. 7 is a side illustration of a pet carrier system for the vehicle seat of FIG. 1 shown in an undeployed state, in accordance with various embodiments;

[0033] FIG. 8 is a perspective illustration of a pet carrier system for the vehicle seat of FIG. 1 shown in a partially deployed state, in accordance with various embodiments;

[0034] FIG. 9 is a perspective illustration of a pet carrier system for the vehicle seat of FIG. 1

shown in a fully deployed state, in accordance with various embodiments; and [0035] FIG. **10** is a schematic illustration of the pet carrier system of FIG. **1** illustrating an alternative use, in accordance with various embodiments.

DETAILED DESCRIPTION

[0036] The following detailed description is merely exemplary in nature and is not intended to limit the application and uses. Furthermore, there is no intention to be bound by any expressed or implied theory presented in the preceding introduction, brief summary or the following detailed description.

[0037] With reference to FIG. **1**, illustrated is one example of a vehicle **20** having a body **22** on which a front seat row **40** and a rear seat row are mounted. In general, a representative seat **24** has a seat bottom **26**, a seat back **28** and a pet carrier system **30**. The pet carrier system **30** may be at least partly integrated into the seat **24** (and/or any other seat of the vehicle **20**) and may be provided as original equipment in the vehicle **20**. For example, the seat **24** may have components of the pet carrier system in or on the seat back **28**, the seat bottom **26** and/or a frame **32** that supports the seat **24** and may connect it with a floor **34** of the vehicle **20**. It will be appreciated that the vehicle **20** may have a plural number of seats arranged in multiple rows.

[0038] As depicted in FIG. **1**, the body **22** of the vehicle **20** may be supported on wheel assemblies (not shown), such as by a suspension assembly (not shown). The body **22** may be of various types that define a physical shape for desired purposes. The body **22** substantially encloses components of the vehicle **20**, defines exterior surfaces, and defines an interior **38**. The wheel assemblies may each be rotationally coupled near a respective corner of the body **22**. In various embodiments, the vehicle **20** may be a front wheel drive vehicle, a rear wheel drive vehicle, or an all-wheel drive vehicle with any number of wheels, however other drive arrangements are contemplated.

[0039] Propulsion of the vehicle **20**, such as on a roadway, is provided by a propulsion system (not shown). The propulsion system may be any of various types such as electric, internal combustion, hybrid, or others. Torque generated by the propulsion system is transferred to the wheel assemblies to propel the vehicle **20**, which may be done under manual and/or autonomous control.

[0040] In the embodiment illustrated in FIG. **1**, the interior **38** of the vehicle **20** includes the front seat row **40** and the rear seat row **42**. In other embodiments, additional or fewer seat rows may be included. The front seat row **40** includes a seat back **28** that is generally intended to remain upright as shown. The rear seat row **42** includes the seat **24**, which may be operable to fold, such as in a fold flat or other configuration. The pet carrier system **30** may be used in any seat row such as the front set row **40** and/or the rear seat row **42**.

[0041] The pet carrier system **30** may include various aspects such as a carrier **44** that is stowable in the seat back **28**, an anchor **46** connected with the seat frame **32**, a restraint system **48** connectable with the anchor **46** and a pet **50** and a monitoring system **52**. For example, the carrier **44** may fold into the seat **24** and may unfold out of the seat **24**. Including the carrier **44** provides the options of carrying the pet **50**, or plural pets **50**, in the carrier(s) **44** (when deployed) and/or on the seat bottom **26**, while benefitting from the restraint system **48** and the monitoring system **52** in either or both options.

[0042] As illustrated in FIG. **1**, the pet **50** is carried on the seat bottom **26**. The restraint system **48** includes a tether **54** connected with the anchor **46** and a harness **56** on the pet **50**. When used for this option, the tether **54** passes through a gap **58** between the seat bottom **26** and the seat back **28**. In other embodiments, the anchor **46** may be located, or may include an extension (not shown) that is located at the forward side of the gap **58**. A connector **60** may be included to releasably connect the tether **54** with the anchor **46** and another connector **62** may be included for releasably connecting the tether **54** with the harness **56**. The connectors **60**, **62** may be snap clips or another type of connector to provide a secure, quick and easy releasable connection. The length of the tether **54** may be adjustable to accommodate different sizes of the pet **50**. In the current embodiment, the pet **50** may be carried on the seat bottom **26** with benefit of the monitoring system

52.

[0043] The monitoring system **52** includes various aspects for evaluating the state of the restraint system **48** and of the pet **50** and reporting the results of those evaluations to a driver and/or other occupant of the vehicle **20**. As illustrated in FIG. **1**, the monitoring system is shown as an optional use configuration and is also intended for use with the pet **50** in the carrier **44**. In either case, the monitoring system includes a tether sensor **64** for monitoring whether the tether **54** is connected with the anchor **46**. The tether sensor **64** may be any type of sensor that is capable of providing an output signal indicative of whether the connector **60** is coupled with the anchor **46** and/or with the pet **50**. For example, the tether sensor **64** may be a proximity or position sensor or may be a type of switch that provides an open or closed indication corresponding to a connected or disconnected state, respectively of the connector **60** and anchor **46** connection.

[0044] The monitoring system **52** includes a pet sensor **68**. The pet sensor **68** may be located at, in or on the seat **24** or remote as shown in FIG. **1**. The pet sensor **68** may be a pressure sensor, a proximity sensor, a vision system, an infrared sensor, an ultrasonic sensor, a radar system, or any type of sensor that provides a signal indicative of whether the pet **50** is properly positioned.

[0045] The monitoring system **52** includes an interface **70** for communicating information to and/or from the driver and/or other occupant of the vehicle **20**. The interface **70** may include an indicator light or symbol that provides information about the state of the connection between the connector **60** and the anchor **46** as provided by the tether sensor **64**. The interface **70** may provide audio outputs. The interface **70** may include an indicator light or symbol that provides information about the state of the positioning of the pet **50** as provided by the pet sensor **68**. The interface **70** may be in the driver information center **72** of the vehicle **20**.

[0046] The monitoring system **52** includes a controller **74**. In other embodiments, any number of controllers may be used in place of the controller **74**. For purposes of the current embodiment, the controller **74** controls operation of the monitoring system **52** and may provide other functions. The controller **74** may comprise any number of electronic control modules and may receive various inputs including from the tether sensor **64** and the pet sensor **68**. The inputs are analyzed, and results are computed from the data and applied to the interface **70** and may be applied to other responsive devices as appropriate. The controller **74** may receive various signals, including from tether sensor **64** and the pet sensor **68**, conduct analyses, and send control signals to various destinations, including to the interface **70**. The controller **74** may include a processor **75**, a memory device (not shown), and may include or be coupled with a storage device (not shown). The processor may generate control signals for the monitoring system **52** based on the logic, calculations, methods, and/or algorithms. For example, the monitoring system **52** may provide an indication that the tether **54** is connected to the anchor **46** and/or that the pet **50** is in a proper position. The monitoring system **52** may provide alerts, such as that the tether **54** is disconnected and/or that the pet **50** is outside a defined position.

[0047] Referring to FIG. **2**, the seat **24** is shown in isolation. The carrier **44** is shown in a stowed state in the seat back **28**. In the stowed state, the carrier **44** is closed and may be contained within the seat back **28** so that the surface **80** is substantially continuous without projecting rearward from the surface **80**. The carrier **44** may be maintained in the stowed/closed state by a latch or catch (not shown). The carrier **44** is shown in a partially deployed state in FIG. **3**. The carrier **44** includes a base panel **82** and two side panels **84** and **86**. The side panels **84** and **86** are connected with the base panel **82** to create a four sided structure with the surface **80**. The seat back **28** includes a recess **88** into which the base panel **82** fits and two slots **90** and **92** that receive the side panels **84** and **86**, respectively. The carrier **44** is connected with the seat back by a hinge **94** that connects with the base panel **82**. When in the stowed state of FIG. **2**, the base panel **82** conceals the side panels **84** and **86** in the seat back **28**. FIG. **4** shows the carrier **44** in a fully deployed state ready for use by a pet **96**. The base panel **82** is disposed in a horizontal or substantially horizontal state for supporting the pet **96**. The side panels **84** and **86** are substantially vertical and extend upward from opposite

ends of the base panel **82**. As a result, a dedicated space **98** is provided for the pet **96**. In the case of a rapid deceleration of the vehicle **20**, the pet **96** is maintained in the space **98** and is limited in moving forward by the seat back **28**. A tether, screen cover or other device may be used to prevent the pet **96** from exiting the space **98**, if desired.

[0048] Referring to FIGS. **5** and **6**, a carrier **100** is contained in the seat back **28** of the seat **24** and illustrated in a stowed state in FIG. **5**. In the stowed state, the carrier **100** is closed and may be contained within the seat back **28** so that the surface **80** is substantially continuous without projecting rearward from the surface **80**. The carrier **100** is shown in a deployed state in FIG. **6**. The carrier **100** includes a base panel **102**, two side panels **104** and **106**, and a top panel **108**. The side panels **104** and **106** are connected with the base panel **102** and with the top panel **108** to create a five sided structure, including with the surface **80**. The seat back **28** includes a recess **110** into which the carrier **100** fits.

[0049] The top panel **108** is connected with the seat back **28** by a hinge **114** and the base panel **102** is connected with the seat back by a hinge **116**. FIG. **6** shows the carrier **100** in a fully deployed state ready for use by a pet. The base panel **102** is disposed in a horizontal or substantially horizontal state for supporting the pet. The side panels **104** and **106** are substantially vertical and extend upward from opposite ends of the base panel **102** to opposite ends of the top panel **108**. The base panel **102** and the top panel **108** may be rigid. The side panels **104** and **106** may be made of a flexible or pliable material so that when the carrier **100** is closed, they are sandwiched between the top panel **108** and the base panel **102**. As the base panel **102** is opened by rotating on the hinge **116**. The side panels **104** and **106** may be pulled along and may unfold and may pull the top panel **108**. In other embodiments, the side panels **104** and **106** may also be hinged to the seat back by hinges (not shown), that are vertically disposed. When the base panel **102** is opened, the side panels **104** and **106** may be rotated into the positions shown in FIG. **6**. As a result, a dedicated space **120** is provided for a pet. It will be appreciated that articles other than a pet may be carried in the carrier **100**. In the case of a rapid deceleration of the vehicle **20**, the pet is maintained in the space **120** and is limited in moving forward by the seat back **28**. A tether, screen cover or other device may be used to prevent the pet from exiting the space **120**, through the open rear facing side **122**, if desired.

[0050] Referring to FIG. **7**, the seat **24** is shown in a folding form connected with the floor **34** of the vehicle **20** by the frame **32**. A carrier **130** is shown in a stowed state in the seat back **28**. In the stowed state, the carrier **130** is closed and may be contained within the seat back **28** so that the surface **80** is substantially continuous without projecting the carrier **130** rearward from the surface **80**. The carrier **130** may be maintained in the stowed/closed state by a latch or catch (not shown). In FIG. **8**, the seat **24** is shown in a folded state with the seat back **28** rotated forward to a position flat against the seat **24**. While the seat **24** remains above the floor **34** in this illustration, in other embodiments, the seat **24** may fold into or through the floor **34**. With the seat **24** folded, the carrier **130** remains stowed in the seat back **28**.

[0051] The carrier **130** is shown in a deployed state in FIG. **9**. The carrier **130** includes four side panels **131-134** (with side panel **134** in the background behind side panel **131**). The side panels **131-134** are rotated to open positions so as to be vertically, or substantially vertically oriented. The seat back **28** serves as the base panel or bottom of the carrier **130**. The side panels **132** and **133** may be hinged to the seat back **28** and may open in opposite directions to become front and rear sides of the carrier **130**. The side panels **131** and **134** may be hinged to the seat back **28** or may be a pliable/flexible material connected with the seat back **28** and the side panels **132** and **133** and serve as lateral sides of the carrier **130**. With four sides and a bottom, only the top of the carrier remains open. In some embodiments, a lid **138** may be provided for the carrier with a lid panel **140** hinged to the side panel **132** and another lid panel **142** hinged to the side panel **133**. A latch **144** may be provided to hold the lid **138** closed. In other embodiments, a tether, a screen cover or other device may be used to prevent the pet from exiting the carrier **130**, if desired.

[0052] Referring to FIG. **10**, use of the monitoring system **52** with the carrier **100** of FIG. **6** is

shown. The tether **54** includes an end **150** connected with the anchor **46** and an end **152** that is disposed within the space **120** of the carrier **100** for connection with the pet such as through the harness **56**. The tether sensor **64** may be disposed at either or both ends **150/152** of the tether **54**. The per sensor **68** may be disposed in or on the carrier **100** to sense the positioning of the pet. The monitoring system **52** may provide an indication to the driver that the pet is present and properly positioned. The monitoring system **52** may provide alerts if the pet becomes improperly positioned or the tether **54** becomes disconnected. The monitoring system **52** may provide an alert if the pet is present and the driver exits the vehicle **20**, such as through the interface **70**, or the horn or alarm system of the vehicle **20**.

[0053] Accordingly, an integrated pet carrier system is provided for a vehicle seat that provides the benefit of providing the option of placing the pet in a contained space or on the seat. The carrier is foldable into a vehicle seat and deployable from the seat for use when desired. When stowed, the carrier does not require any vehicle space other than within the seat. While at least one exemplary embodiment has been presented in the foregoing detailed description, it should be appreciated that a vast number of variations exist. It should also be appreciated that the exemplary embodiment or exemplary embodiments are only examples, and are not intended to limit the scope, applicability, or configuration of the disclosure in any way. Rather, the foregoing detailed description will provide those skilled in the art with a convenient road map for implementing the exemplary embodiment or exemplary embodiments. It should be understood that various changes can be made in the function and arrangement of elements without departing from the scope of the disclosure as set forth in the appended claims and the legal equivalents thereof.

Claims

1. A carrier system for a vehicle comprising: a seat having a seat bottom and a seat back; and a carrier integrated into the seat back, the carrier having at least one panel movable between a stowed state in the seat back and a deployed state projecting from the seat back.
2. The carrier system of claim 1, comprising a tether system connected with the seat and having an end configured for coupling with a pet.
3. The carrier system of claim 1, wherein when the carrier is stowed in the seat back, the seat back includes a rear surface that is substantially continuous without projecting the carrier rearward from the rear surface.
4. The carrier system of claim 1, comprising a monitoring system configured to evaluate restraint and positioning of a pet.
5. The carrier system of claim 1, comprising a monitoring system configured to determine whether a pet is positioned in the carrier.
6. The carrier system of claim 1, wherein the carrier is configured to unfold upward from the seat back, when the seat back is folded against the seat bottom.
7. The carrier system of claim 1, wherein: the at least one panel comprises a base panel of the carrier that, when the carrier is in the deployed state, is oriented substantially horizontal, and the carrier includes at least two side panels projecting upward from the base panel when the carrier is in the deployed state.
8. The carrier system of claim 1, wherein the seat back is configured as a forward side of the carrier, when the carrier is in the deployed state.
9. The carrier system of claim 1, wherein the carrier includes a forward side to limit movement of a pet in a forward direction.
10. The carrier system of claim 1, wherein the carrier is connected with a rear side of the seat back and projects from the seat back when the carrier is in the deployed state.
11. A carrier system for a vehicle comprising: a seat having a seat bottom and a seat back; and a carrier integrated into the seat back, the carrier having at least one panel connected with the seat

back and movable between a stowed state in the seat back and a deployed state projecting from the seat back, wherein the carrier, when in the deployed state, is configured to carry a pet.

12. The carrier system of claim 11, comprising a tether system connected with the seat and having an end configured for coupling with the pet, the tether system configured to extend into the carrier.

13. The carrier system of claim 11, wherein the carrier, when in the stowed state, is contained in the seat back, the seat back includes a rear surface that is substantially continuous, when the carrier is in the stowed state, without projecting the carrier rearward from the rear surface.

14. The carrier system of claim 11, comprising a monitoring system configured to evaluate restraint and positioning of the pet, and to provide an alert based on the evaluation.

15. The carrier system of claim 11, comprising a monitoring system configured to determine whether the pet is positioned in the carrier and whether the tether is connected to the pet.

16. The carrier system of claim 11, wherein the seat back is foldable against the seat bottom so that the seat back is disposed in a substantially horizontal state, wherein the carrier is configured to unfold upward from the seat back, when the seat back is folded against the seat bottom.

17. The carrier system of claim 11, wherein: the at least one panel comprises a base panel of the carrier that, when the carrier is in the deployed state, is oriented substantially horizontal, and the carrier includes at least two side panels projecting upward from the base panel when the carrier is in the deployed state, wherein, when the carrier is in the stowed state, the at least two side panels are contained in the seat back and concealed by the base panel.

18. The carrier system of claim 11, wherein the seat back is configured as a forward side of the carrier to limit movement of the pet in a forward direction, when the carrier is in the deployed state.

19. The carrier system of claim 11, wherein the carrier includes a forward side to limit movement of a pet in a forward direction, wherein the carrier includes an openable side configured to be open for the pet to enter the carrier.

20. A carrier system for a vehicle comprising: a seat having a seat bottom and a seat back; a carrier integrated into the seat back, the carrier having at least one panel connected with the seat back and movable between a stowed state in the seat back and a deployed state projecting from the seat back; and a monitoring system configured to determine whether a pet is positioned in the carrier.
