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Child restraint system anchor

Abstract

A vehicle includes a vehicle seat having a seat frame. The vehicle includes a lock fixed relative to the vehicle seat. The lock is movable from an unlocked position to a locked position. The vehicle includes a child restraint system anchor having a loop and a webbing extending from the loop to the lock. The webbing is engageable with the lock and releasably lockable relative to the vehicle seat in the locked position and movable relative to the vehicle seat in the unlocked position.

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Background/Summary

BACKGROUND

(1) Child restraint systems are removable seats for seating and restraining children riding in a vehicle. Types of child restraint systems include rearward-facing child restraint systems, forward-facing child restraint systems, combination seats that can face rearward or forward, and booster seats. Rearward-facing, forward-facing, and combination child restraint systems include a harness for restraining the child occupant. Booster seats rely on the seatbelts included with the vehicle. Child restraint systems may be held in place by the seatbelt of the vehicle and/or may include tethers for attaching to tether attachment brackets of the vehicle.

(2) Vehicles are equipped with anchors for anchoring the child restraint system to the vehicle. Specifically, the anchor may provide for anchoring of the child restraint system to a vehicle seat and/or to a body of the vehicle. Child restraint systems include anchoring for connecting the anchor of the vehicle. The anchor of the vehicle and the anchoring system of the child restraint system may be configured to comply with a standard, e.g., ISOFIX (e.g., ISO216), which is an international standard for attachment points for child safety seats in passenger cars; LATCH (“Lower Anchors and Tethers for Children”) in the United States; LUAS (“Lower Universal Anchorage System”); Canfix in Canada; UCSSS (“Universal Child Safety Seat System”).

Description

BRIEF DESCRIPTION OF THE DRAWINGS

(1) FIG. 1 is a side view of a vehicle having a child restraint system installed in a seat of the vehicle.

(2) FIG. 2 is a side view of the seat with the child restraint system installed.

(3) FIG. 3 is a perspective view of a first example of a child restraint system anchor in a raised position.

(4) FIG. 4 is another perspective view of the first example the child restraint system anchor in a raised position.

(5) FIG. 5 is a perspective view of the first example of the child restraint system anchor in a lowered position.

(6) FIG. 6 is a perspective view of a second example of a child restraint system anchor in a raised position.

(7) FIG. 7 is a perspective view of the second example of the child restraint system anchor in a lowered position.

(8) FIG. 8A is a perspective view of a lock engageable with the child restraint system anchor in a locked position.

(9) FIG. 8B is a perspective view of the lock engageable with the child restraint system anchor in an unlocked position.

DETAILED DESCRIPTION

(10) A vehicle includes a vehicle seat having a seat frame. The vehicle includes a lock fixed relative to the vehicle seat. The lock is movable from an unlocked position to a locked position. The vehicle includes a child restraint system anchor having a loop and a webbing extending from the loop to the lock. The webbing is engageable with the lock and releasably lockable relative to the vehicle seat in the locked position and movable relative to the vehicle seat in the unlocked position.

(11) The vehicle seat may include a seatback and the seatback includes the seat frame. The lock may be fixed to the seatback, and the webbing extending through the seatback to the lock.

(12) The vehicle may include a vehicle body panel adjacent the seatback. The child restraint system anchor may be connected to the vehicle body panel between the vehicle body panel and the seatback of the vehicle seat.

- (13) The vehicle may include a tether fixed to vehicle body panel between the vehicle seat and the vehicle body panel.
- (14) The seatback may include a bolster vehicle-outboard of the loop, the lock being fixed at the bolster.
- (15) The seatback may be elongated along an axis, the webbing extending along the axis.
- (16) The vehicle seat includes a seat bottom and a seatback supported by the seat bottom. The seat bottom and the seatback may include the seat frame. The lock may be fixed relative to the seat bottom. The webbing extends along the seat bottom and the seatback to the lock.
- (17) The seatback may be elongated along a first axis and the seat bottom is elongated along a second axis transverse to the first axis. A first portion of the webbing may extend along the first axis and a second portion of the webbing may extend along the second axis.
- (18) The webbing may extend along the seatback and the seat bottom from the loop to the lock.
- (19) The webbing may be disposed behind the seatback and below the seat bottom from the loop to the lock.
- (20) The seat frame may include a pair of upright frame members spaced cross-seat from each other and a first cross-member extending from one upright frame member to the other upright frame member. The lock may be fixed to one of the upright frame members.
- (21) The seat frame may include a second cross-member extending from one upright frame member to the other upright frame member and a beam extending diagonally from an upright frame member to the second cross-member. The webbing may extend from the loop, around the beam, and to the lock.
- (22) The upright frame members may extend along a first axis and the cross-members extend along a second axis. A first portion of the webbing may extend along the first axis and a second portion of the webbing may extend along the second axis.
- (23) The vehicle may include a vehicle body panel adjacent the vehicle seat. The child restraint system anchor may be connected to the vehicle body panel between the vehicle body panel and the vehicle seat.
- (24) The vehicle seat may include a seat bottom and a seatback supported by the seat bottom and the vehicle seat defines an occupant seating area. The seat bottom may be between the occupant seating area and the webbing.
- (25) The seat bottom may be between the occupant seating area and lock.
- (26) The seatback may be between the occupant seating area and child restraint system anchor.
- (27) The seatback may be between the occupant seating area and the vehicle body panel.
- (28) The vehicle may include a tether fixed to the vehicle body panel and the tether extending from the vehicle body panel to the child restraint system anchor.
- (29) The vehicle may include a vehicle floor. The vehicle seat may be supported by the vehicle floor and the lock is fixed between the vehicle seat and the vehicle floor.
- (30) With reference to the Figures, wherein like numerals indicate like parts throughout the several views, a vehicle **10** includes a vehicle seat **12** having a seat frame **14**. The vehicle **10** includes a lock **16** fixed relative to the vehicle seat **12**. The lock **16** is movable from an unlocked position to a locked position. The vehicle **10** includes a child restraint system anchor **18** (hereinafter referred to as “anchor **18**”) having a loop **20** and a webbing **22** extending from the loop **20** to the lock **16**. The webbing **22** is engageable with the lock **16** and releasably lockable relative to the vehicle seat **12** in the locked position and movable relative to the vehicle seat **12** in the unlocked position.
- (31) The anchor **18** is designed to be connectable to a child restraint system **54** to install the child restraint system **54** into the vehicle **10**. The lock **16**, the webbing **22**, and the loop **20** allow for access to an occupant or a user to connect the child restraint system **54** to the anchor **18**. The locations of the lock **16**, the webbing **22**, and the loop **20** allow for access to be obtained without moving the seat **12** or other components of the vehicle **10** to install the child restraint system **54** in the vehicle **10**. The lock **16** allows the occupant or the user to remove slack from the webbing **22**

and to maintain tension in the webbing **22** after the webbing **22** is tightened.

(32) Two example of the anchor **18** are shown in the Figures and common numerals are used to identify common features in the example embodiments. One example of the anchor **18** is shown in FIGS. **3-5**. In such an example, the anchor **18** extends through the vehicle seat **12** and the lock **16** is fixed to a seatback **32** of the vehicle seat **12**. A second of the anchor **18** is shown in FIGS. **6-7**. In such an example, the anchor **18** extends along the seatback **32** and a seat bottom **34** of the seat **12** with the lock **16** being fixed relative to the seat bottom **34**.

(33) With reference to FIGS. **1-2**, the vehicle **10** may be any suitable type of automobile, e.g., a passenger or commercial automobile such as a sedan, a coupe, a truck, a sport utility, a crossover, a van, a minivan, a taxi, a bus, etc. The vehicle **10**, for example, may be autonomous. In other words, the vehicle **10** may be autonomously operated such that the vehicle **10** may be driven without constant attention from a driver, i.e., the vehicle **10** may be self-driving without human input.

(34) As described further below, the vehicle **10** includes a vehicle body **24** including vehicle body panels **26**, vehicle floor **28**, vehicle roof (not numbered), etc. The vehicle **10** includes a passenger compartment **30** to house occupants, if any, of the vehicle **10**. The passenger compartment **30** may extend across the vehicle **10**, i.e., from one side to the other side of the vehicle **10**. The passenger compartment **30** includes a front end and a rear end with the front end being in front of the rear end during forward movement of the vehicle **10**.

(35) The vehicle **10** includes the vehicle floor **28** that defines the lower boundary of the passenger compartment **30** and may extend from the front end of the passenger compartment **30** to the rear end of the passenger compartment **30**. The vehicle floor **28** may include upholstery, for example, carpet, and may have a class-A surface facing the passenger compartment **30**, i.e., a surface specifically manufactured to have a high quality, finished, aesthetic appearance free of blemishes.

(36) With continued reference to FIGS. **1-2**, the vehicle **10** may include one or more vehicle seats **12**, herein referred to as seats **12**, supported by the vehicle floor **28**. Specifically, the vehicle **10** may include any suitable number of seats **12**. The seats **12** are supported by the vehicle floor **28**. The seats **12** may be arranged in any suitable arrangement in the passenger compartment **30**. One or more of the seats **12** may be at the front end of the passenger compartment **30**, e.g., a driver seat and/or a passenger seat. In other examples, one or more of the seats **12** may be behind the front end of the passenger compartment **30**, e.g., at the rear end of the passenger compartment **30**. The seats **12** may be movable relative to the vehicle floor **28** to various positions, e.g., movable fore-and-aft and/or cross-vehicle.

(37) As in the examples shown in the Figures, the seat **12** at the rear of the vehicle **10** may be a bench seat **12**, i.e., the seat **12** extends from one side of the passenger compartment **30** to the other side of the passenger compartment **30**. In such an example, multiple occupants may be seated on the rear seat **12**. In the examples shown in the Figures, three occupants may be properly seated along the rear seat **12** with two of the occupants being vehicle-outboard occupants and one of the occupants being between the vehicle-outboard occupants, i.e., a middle occupant. The seat **12** may be segmented into separate portions to accommodate the occupants. For example, the seat **12** may include two outboard portions and a middle portion with the outboard portions accommodating vehicle-outboard portions and the middle portion accommodating a middle occupant. As described further herein, the disclosure discusses one of the vehicle-outboard portions, however, this disclosure may apply to other seating locations within the vehicle **10**. In other examples, the seat **12** may be of any suitable type, e.g., a bucket seat, a captain's seat, etc.

(38) The seats **12** include a seatback **32**, a seat bottom **34**, and a head restraint **36**. The head restraint **36** may be supported by and extending upwardly from the seatback **32**. The head restraint **36** may be stationary or movable relative to the seatback **32**. The seatback **32** may be supported by the seat bottom **34** and may be stationary or movable relative to the seat bottom **34**. The seatback **32** may extend from an upper end to a lower end. The lower end may be connected to the seat bottom **34**. The upper end of the seatback **32** may be spaced upwardly from the lower end of the

seatback **32**, i.e., upwardly from the seat bottom **34**. The seatback **32**, the seat bottom **34**, and the head restraint **36** may be adjustable in multiple degrees of freedom. Specifically, the seatback **32**, the seat bottom **34**, and the head restraint **36** may themselves be adjustable. In other words, adjustable components within the seatback **32**, the seat bottom **34**, and the head restraint **36** may be adjustable relative to each other.

(39) With reference to FIGS. 3-7, the seatback **32** includes the seat frame **14** and a covering **38** supported on the seat frame **14**. The seat frame **14** may include tubes, beams, etc. The seatback **32** and the seat bottom **34** may include the seat frame **14**. The seat frame **14** of the seatback **32** may include a pair of upright frame members **40**. The upright frame members **40** are elongated, and specifically, are elongated in a generally upright direction when the seatback **32** is in a generally upright position. The upright frame members **40** are spaced cross-seat from each other. The seat frame **14** of the seatback **32** includes one or more cross-members **42**, **44** extending from one upright frame member **40** to the other upright frame member **40**. Specifically, in the examples shown in the Figures, the seat frame **14** of the seatback **32** includes a first cross-member **42** and a second cross-member **44** spaced from each other along the upright frame members **40**. One may be near the upper end of the seatback **32** and the other may be at the lower end of the seatback **32**. The seat frame **14**, including the upright frame members **40**, may be of any suitable plastic material, e.g., carbon fiber reinforced plastic (CFRP), glass fiber-reinforced semi-finished thermoplastic composite (organosheet), etc. As another example, some or all components of the seat frame **14** may be formed of a suitable metal, e.g., steel, aluminum, etc.

(40) The covering **38** may include upholstery, padding, and/or plastic portions. The upholstery may be cloth, leather, faux leather, or any other suitable material. The upholstery may be stitched in panels around the seat frame **14**. The padding may be between the covering **38** and the seat frame **14** and may be foam or any other suitable material.

(41) The seatback **32** may be elongated upwardly from the seat bottom **34** along a first axis A. The seat bottom **34** may be elongated along a second axis B transverse to the first axis A. In other words, the upright frame members **40** of the seatback **32** extend upwardly from the seat bottom **34** along the first axis A. The cross-members **42**, **44** may each be elongated along a third axis C between the upright frame members **40** that is transverse to the first axis A.

(42) The vehicle **10** includes a plurality of vehicle body panels **26**. One of the vehicle body panels **26** may be at the rear end of the passenger compartment **30**. For example, the vehicle body panels **26** may be a bulkhead **46** elongated along the rear end of the passenger compartment **30**. The bulkhead **46** may extend from one side of the vehicle **10** to the other side of the vehicle **10**. The bulkhead **46** is vehicle-rearward of the seat **12**, specifically, the rear seats **12** of the vehicle **10**. In other words, the seats **12** are vehicle-forward of the bulkhead **46**. The seatback **32** of the seat **12** may be adjacent the bulkhead **46**. The bulkhead **46** is made of the same material as the rest of the body of the vehicle **10**, e.g., metal.

(43) The seat **12**, specifically, the seatback **32** and the seat bottom **34**, defines an occupant seating area **48** of the seat **12**. The occupant seating area **48** is the area occupied by an occupant when properly seated on the seat bottom **34** and the seat **12** back. The occupant seating area **48** is in a seat-forward direction of the seatback **32** and above the seat bottom **34**. In the example shown in the Figures, the occupant seating area **48** faces the front end of the passenger compartment **30** when the seat **12** is in the forward-facing position and the occupant seating area **48** faces the rear end of the passenger compartment **30** when the seat **12** is in the rearward-facing position. The seatback **32** of the seat **12** is between the occupant seating area **48** and the vehicle body panels **26**. Specifically, the seatback **32** of the seat **12** is between the occupant seating area **48** and the bulkhead **46**.

(44) The seatback **32** may have one or more bolsters **50** on sides of the occupant seating area **48**. The bolsters **50** are elongated, and specifically, are elongated in a generally upright direction when the seatback **32** is in a generally upright position. The bolsters **50** may define cross-seat boundaries of the seatback **32**, i.e., the seatback **32** may terminate at the bolsters **50**. The bolsters **50** may

extend in a seat-forward direction relative to the occupant seating area **48**, i.e., on opposite sides of the torso and shoulders of an occupant seated on the seat **12**. The extension of the bolsters **50** relative to the occupant seating area **48** may be defined by the upright frame members **40** and/or the covering **38**. In the example shown in the Figures, the size and shape of both the upright frame members **40** and the covering **38** form the bolsters **50**. In the example shown in the Figures, the seatback **32** may define a bolster **50** at the outboard portions of the bench seat. For example, the bolster **50** may be only on the vehicle-outboard most portion of the seatback **32**.

(45) With continued reference to FIGS. **3-7**, the vehicle **10** includes the anchor **18** that is designed to be connectable to a child restraint system **54** when the child restraint system **54** is installed into the vehicle **10**. Specifically, the child restraint system **54** includes a connection point **52**, that is connectable to the anchor **18** to install the child restraint system **54**. The connection point **52** may be a clip such as a clip including an open loop and flexible gate, an “alligator” style clip defining a slot with a button actuated latch, or any other suitable configuration for connecting to the respective anchor **18**, including in some examples that are currently known. The connection point **52** may be configured for attachment to the anchor **18** that meets a standard, e.g., ISOFIX, LATCH, LUAS, UCSSS, etc. The example shown in the Figures includes a child restraint system **54** having a strap **56** and a clip **58** that is connectable to the anchor **18**. The child restraint system **54** may include further attachment points that connect to other features of the vehicle **10**, e.g., other portions of the seat **12** or vehicle body **24** such as anchors meeting a standard, ISOFIX, LATCH, LUAS, UCSSS, etc., including in some examples those that are currently known.

(46) In the illustrations in the Figures, the anchor **18** and the child restraint system **54** are shown in one of the seating locations of the seat **12**. The anchor **18** may be positioned at any suitable seating location in the vehicle **10**.

(47) The anchor **18** and at least the connection point **52** of the child restraint system **54** is behind the seatback **32** when the connection point **52** is connected to the anchor **18**. In other words, the seatback **32** is between the occupant seating area **48** and at least a portion of the anchor **18**, e.g., at least the connection point **52** of the child restraint system **54** when the connection point **52** is connected to the anchor **18**.

(48) At least a portion of the anchor **18** is between the seat **12** and at least one of the vehicle body panels **26**. Specifically, in the example shown in the Figures, the anchor **18** is between the seatback **32** of the seat **12** and the bulkhead **46**. The anchor **18** is connected to one of the vehicle body panels **26**. Specifically, in the example shown in the Figures, the anchor **18** is connected to the bulkhead **46** behind the seatback **32**. As described further below, in the examples shown in the Figures, the anchor **18** may be connected indirectly to the vehicle body panels **26**. In such examples, the vehicle **10** may include a tether **62** fixed to the vehicle body panel **26**. Specifically, the tether **62** is fixed to the bulkhead **46** between the seat **12** and the bulkhead **46**. In other examples, the anchor **18** may be directly connected to the bulkhead **46** such that the anchor **18** is movable relative to the seat **12**.

(49) The vehicle **10** includes the lock **16** that is fixed relative to the seat **12**. As discussed further below, the anchor **18** is releasably lockable by the lock **16** relative to the seat **12**. The lock **16** may engage with the anchor **18** to tighten the connection point **52** of the child restraint system **54** when the child restraint system **54** is installed in the vehicle **10**. The lock **16** may be disengaged from the anchor **18** to loosen the connection point **52** to remove the child restraint system **54** from the vehicle **10**. The lock **16** is fixed relative to the seat **12**. Depending on the example, as discussed further below, the lock **16** may be fixed relative to the seatback **32** or the lock **16** may be fixed relative to the seat bottom **34**. The lock **16** may be fixed at any suitable location relative to the seat **12**. The lock **16** may be fixed in any suitable way, e.g., fasteners, welding, etc.

(50) With continued reference to FIGS. **3-7**, the anchor **18** includes the loop **20** and the webbing **22**. The loop **20** of the anchor **18** is designed to engage with a child restraint system **54**. The connection point **52** of the child restraint system **54** is connectable to the loop **20** of the anchor **18** to install the child restraint system **54** into the vehicle **10**. For example, as shown in the Figures, the child

restraint system **54** includes the strap **56** and the clip **58** that is connectable to the loop **20** of the anchor **18**. The bolster **50** is vehicle-outboard of the loop **20**.

(51) The webbing **22** extends from the loop **20** to the lock **16**. The webbing **22** extends through the lock **16**. In other words, the webbing **22** includes a distal end **60** and the lock **16** is between the loop **20** and the distal end **60**. A user may grasp the distal end **60** to tighten the webbing **22** relative to the child restraint system **54**. The webbing **22** may be any suitable material. For example, the webbing **22** may be fabric, e.g., woven nylon, polyester, etc. In the example shown in the Figures, the connection point **52** is a loop at an end of the webbing **22**. Specifically, in such an example, the connection point **52** may be an end of the webbing **22** looped and sewn to itself.

(52) The vehicle **10** may include the tether **62** fixed to the vehicle body panel **26** between the seat **12** and the vehicle body panel **26**. Specifically, in the examples shown in the Figures, the tether **62** is fixed to the bulkhead **46** between the seat **12** and the bulkhead **46**. The tether **62** extends from the vehicle body panel **26** to the anchor **18**. Specifically, the tether **62** extends from the vehicle body panel **26** to the webbing **22** of the anchor **18**. The tether **62** is connected to the anchor **18**.

Specifically, the tether **62** is fixed to the anchor **18**. The tether **62** is fixed to the anchor **18** in any suitable way such that the tether **62** remains connected to the anchor **18**. For example, the tether **62** is fixed by stitching or fasteners such that the tether **62** remains connected to the anchor **18**. The tether **62** allows the occupant or the user to pull the anchor **18**, e.g., the webbing **22**, from behind the seatback **32** to connect the connection point **52** of the child restraint system **54** to the loop **20**. The tether **62** may be fixed in any suitable way to the bulkhead **46**, e.g., fasteners, welding, etc.

(53) The anchor **18** is movable relative to the bulkhead **46** and the seat **12**. Specifically, the webbing **22** of the anchor **18** is movable relative to the bulkhead **46** and the seat **12**. The webbing **22** of the anchor **18** is movable from a raised position to a lowered position. The user may connect the connection point **52** to the loop **20** when the webbing **22** is in the raised position and the connection point **52** may be concealed behind or in the seatback **32** when the webbing **22** is in the lowered position. The movability of the webbing **22** of the anchor **18** allows the connection point **52** of the child restraint system **54** to be moved relative to the bulkhead **46** and the seat **12** without having to move the seat **12** relative to the bulkhead **46**. In other words, the webbing **22** of the anchor **18** may be pulled by the occupant or the user to tighten the strap **56** of the child restraint system **54** to install the child restraint system **54** in the vehicle **10**. As the user pulls the webbing **22**, the anchor **18** moves from the raised position to the lowered position. As the user pulls the anchor **18**, specifically, the webbing **22** of the anchor **18**, the anchor **18** moves relative to the seat **12** and the strap **56** of the child restraint system **54** is tightened relative to the seat **12** to install the child restraint system **54** in the vehicle **10**. In other words, any slack in the webbing **22** and strap **56** of the connection point **52** is removed and the webbing **22** is tightened relative to the seatback **32**.

(54) The lock **16** may be movable from the unlocked position to the locked position. As discussed above, the anchor **18** is releasably lockable by the lock **16** relative to the seat **12**. Specifically, the webbing **22** is releasably lockable by the lock **16** relative to the seat **12**. The anchor **18** is engageable with the lock **16**. Specifically, the webbing **22** is engageable with the lock **16**. The webbing **22** is engageable with the lock **16** such that when the lock **16** is in the locked position, the webbing **22** is not movable relative to the lock **16** in one direction but is movable in the other direction. In the locked position, the lock **16** may allow the webbing **22** to be movable relative to the lock **16** in one direction and disallow the webbing **22** to be movable relative to the lock **16** in the other direction. The lock **16** may allow the webbing **22** to be movable to the lowered position but disallows the webbing **22** from moving back to the raised position without the lock **16** being moved to the unlocked position. The lock **16** may include teeth, clamps, etc. that engage with the webbing **22** to restrict movement of the webbing **22** relative to the lock **16** in one direction but allows the webbing **22** to move relative to the lock **16** in the other direction. In other words, by default, the lock **16** remains in the locked position. The webbing **22** being moveable in one direction but not the other direction when the lock **16** is in the locked position allows an occupant

or a user to pull the webbing 22 through the lock 16 in one direction to tighten the connection point 52 of the child restraint system 54 when the child restraint system 54 is installed in the vehicle 10. The webbing 22 being locked in the other direction allows tension in the connection point 52 and webbing 22 to be maintained during use of the vehicle 10 because the webbing 22 remains engaged with the lock 16. In other words, the webbing 22 being locked in one direction maintains the removal of any slack in the webbing 22 and the connection point 52.

(55) With reference to FIGS. 8A and 8B, the lock 16 may include a paddle 66 and a lock housing 68. The paddle 66 moves the lock 16 from the locked position to the unlocked position. As shown in FIG. 8A, in the locked position, the paddle 66 may extend upwardly from the lock housing 68, e.g., the paddle 66 may be angled upwardly relative to the lock housing 68. To move the lock 16 from the locked position to the unlocked position, and as shown in FIG. 8B the paddle 66 of the lock 16 may be pushed downwardly toward the lock housing 68. As stated above, the lock 16 remains in the locked position by default. In other words, the paddle 66 extends upwardly by default and a user may push the paddle 66 downwardly toward the lock housing 68 to move the lock 16 to the unlocked position. The lock 16 shown in FIG. 8A is in the locked position and the lock 16 shown in FIG. 8B is in the unlocked position.

(56) With continued reference to FIGS. 3-7, the webbing 22 is movable relative to the seat 12 in the unlocked position. Specifically, the webbing 22 is movable in both directions relative to the seat 12 when the lock 16 is in the unlocked position. In other words, when the lock 16 is in the unlocked position, the webbing 22 may freely move through the lock 16. Moving the lock 16 to the unlocked position releases tension in the webbing 22 and the connection point 52 to aid in removal of the child restraint system 54 from the vehicle 10. To move the lock 16 to the unlocked position, the lock 16 must be acted on by an outside force, e.g., an occupant or a user, to move the lock 16 to the unlocked position. Specifically, when the lock 16 is not acted on by an outside force, e.g., an occupant of the vehicle 10 or a user, the lock 16 remains in the locked position. As described above, the lock 16 remains in the locked position by default. The lock 16 may include features, such as springs, which bias the lock 16 to the locked position when the lock 16 is not being acted on by an outside force.

(57) With reference to the example shown in FIGS. 3-5, the lock 16 is fixed relative to the seatback 32. Specifically, the lock 16 is fixed to the seatback 32 of the seat 12. The lock 16 is fixed to the seat frame 14 of the seatback 32. Specifically, the lock 16 is fixed to one of the upright frame members 40 of the seat frame 14. In other words, the lock 16 is fixed at the bolster 50. In the example shown in FIGS. 3-5, the lock 16 is fixed to the upright frame member 40 that is vehicle-outboard to provide easier access to the lock 16 by the user who is tightening the anchor 18.

(58) The seat 12 may include a beam 64 that extends diagonally from one of the upright frame members 40 to one of the cross-members 42, 44. Specifically, the beam 64 extends diagonally from the vehicle-inboard upright frame member 40 to the second cross-member 44. The beam 64 is fixed to the upright frame member 40 and the second cross-member 44. In other words, the beam 64 is immovable relative to the upright frame member 40 and the second cross-member 44. The beam 64 may be of any suitable material. For example, the beam 64 may be of the same material as the seat frame 14.

(59) With continued reference to the example shown in FIGS. 3-5, the webbing 22 of the anchor 18 extends through the seatback 32 to the lock 16. In other words, the webbing 22 of the anchor 18 may extend into the covering 38 of the seat 12 and the seat frame 14 through, for example, a hole (not shown), in the back side of the seatback 32. The webbing 22 is routed around the beam 64 from the loop 20 to the lock 16. In other words, the webbing 22 extends from the loop 20, around the beam 64, and to the lock 16. The webbing 22 extends from along the seatback 32 from the loop 20 to the beam 64. The webbing 22 extends around the beam 64 and to the lock 16. In other words, the webbing 22 extends along the first axis A from the loop 20 to the beam 64 and the webbing 22 extends along the third axis C from the beam 64 and to the lock 16. Specifically, the webbing 22

changes directions when the webbing 22 extends around the beam 64. The changing of directions of the webbing 22 allows the webbing 22 to be pulled by a user from the bolster 50 of the seat 12 to remove slack from the webbing 22 and connection point 52. In other words, the changing of directions allows the connection point 52 of the child restraint system 54 to be tightened from the side of the seat 12, i.e., the bolster 50 of the seat 12.

(60) With reference to the example shown in FIGS. 6-7, the lock 16 is fixed relative to the seat bottom 34. Specifically, the lock 16 is supported by the seat frame 14 of the seat bottom 34. The lock 16 may be fixed below the seat bottom 34. The lock 16 may be between the seat 12 and the vehicle floor 28. At least a portion of the seat bottom 34 is between the occupant seating area 48 and the lock 16. The lock 16 may be fixed in a position such that the user has access to the lock 16 to move it to the unlocked position when necessary. In other examples not shown in the Figures, the lock 16 may be fixed to the vehicle floor 28.

(61) The webbing 22 is disposed behind the seatback 32 and below the seat bottom 34 from the loop 20 to the lock 16. The webbing 22 extends along the seatback 32 and along the seat bottom 34 from the loop 20 to the lock 16. Specifically, the webbing 22 extends along the first axis A and along the second axis B. In other words, the webbing 22 includes a first portion extending along the first axis A and a second portion extending along the second axis B. The first portion is elongated from the loop 20 to the seat bottom 34. The second portion is elongated from the seat bottom 34 to the lock 16. In other words, the seat bottom 34 is between the occupant seating area 48 and the webbing 22.

(62) With continued reference to the example shown in FIGS. 6-7, the second portion being elongated along the seat bottom 34 and the lock 16 being between the seat bottom 34 and the vehicle floor 28 allows the occupant or the user to pull the webbing 22 through the lock 16 from the front of the seat 12. The webbing 22 may be pulled by the occupant toward the front end of the vehicle 10 to remove the slack from the webbing 22 and the connection point 52 of the child restraint system 54.

(63) In both examples described above, when installing the child restraint system 54 into the vehicle 10, the connection point 52 of the child restraint system 54 may be connected to the loop 20 of the anchor 18. The user may pull on the tether 62 upwardly to reveal the loop 20 above the seatback 32 to provide accessibility of the loop 20 to connect the connection point 52. In other words, pulling the tether 62 upwardly may move the webbing 22 to the raised position if the lock 16 is in the unlocked position. After the connection point 52 is connected to the loop 20, the webbing 22 may be pulled through the lock 16 in a single direction to tighten the connection point 52 of the child restraint system 54. In other words, any slack in the connection point 52 and the webbing 22 is removed by pulling the webbing 22 through the lock 16 and the webbing 22 is moved to the lowered position. Once the webbing 22 is pulled to the desired tightness, the lock 16 remains in the locked position to maintain tension in the webbing 22 and the connection point 52 of the child restraint system 54 and the webbing 22 remains in the lowered position.

(64) When the user removes the child restraint system 54 from the vehicle 10, the occupant applies a force to the lock 16 to move the lock 16 to the unlocked position. Moving the lock 16 to the unlocked position allows the tension to be released in the webbing 22 and the connection point 52 of the child restraint system 54 to aid in removing the child restraint system 54 from the vehicle 10. After the tension is released and slack has been added back to the connection point 52 and the webbing 22, the user may pull the tether 62 upwardly relative to the seatback 32 to reveal the loop 20 to move the webbing 22 to the raised position. The connection point 52 may then be released from the loop 20 to remove the child restraint system 54 from the vehicle 10.

(65) The disclosure has been described in an illustrative manner, and it is to be understood that the terminology which has been used is intended to be in the nature of words of description rather than of limitation. The numerical adverbs “first,” “second,” and “third” are used herein merely as identifiers and do not signify order or importance. Many modifications and variations of the present

disclosure are possible in light of the above teachings, and the disclosure may be practiced otherwise than as specifically described.

Claims

1. A vehicle comprising: a vehicle seat having a seat frame; a lock fixed to the vehicle seat, the lock being movable from an unlocked position to a locked position; and a child restraint system anchor having a loop and a webbing, the webbing extending from the loop to the lock, the lock being between the distal end and the loop; and the webbing extending through the lock, the lock allowing the webbing to move relative to the lock in a tightening direction and in a loosening direction when the lock is in the unlocked position, and the lock allowing the webbing to move in the tightening direction and preventing the webbing from moving in the loosening direction when the lock is in the locked position, the loop moving toward the lock in the tightening direction and away from the lock in the loosening direction.
2. The vehicle of claim 1, wherein the vehicle seat includes a seatback and the seatback includes the seat frame, the lock being fixed to the seatback, and the webbing extending through the seatback to the lock.
3. The vehicle of claim 2, further comprising a vehicle body panel adjacent the seatback, the child restraint system anchor being connected to the vehicle body panel between the vehicle body panel and the seatback of the vehicle seat.
4. The vehicle of claim 3, further comprising a tether fixed to the vehicle body panel between the vehicle seat and the vehicle body panel, the tether extending from the vehicle body panel to the child restraint system anchor.
5. The vehicle of claim 2, wherein the seatback includes a bolster vehicle-outboard of the loop, the lock being fixed to the seat frame at the bolster.
6. The vehicle of claim 1, wherein: the vehicle seat includes a seat bottom and a seatback supported by the seat bottom; the seat bottom and the seatback including the seat frame; the lock being fixed relative to the seat bottom; and the webbing extends along the seat bottom and the seatback to the lock.
7. The vehicle of claim 6, wherein the seatback is elongated along a first axis and the seat bottom is elongated along a second axis transverse to the first axis, a first portion of the webbing extending along the first axis and a second portion of the webbing extending along the second axis.
8. The vehicle of claim 6, wherein the webbing extends along the seatback and the seat bottom from the loop to the lock.
9. The vehicle of claim 6, wherein the webbing is disposed behind the seatback and below the seat bottom from the loop to the lock.
10. The vehicle of claim 1, wherein the seat frame includes a pair of upright frame members spaced cross-seat from each other and a first cross-member extending from one upright frame member to the other upright frame member, the lock being fixed to one of the upright frame members.
11. The vehicle of claim 10, wherein the seat frame includes a second cross-member extending from one upright frame member to the other upright frame member and a beam extending diagonally from an upright frame member to the second cross-member, the webbing extending from the loop, around the beam, and to the lock.
12. The vehicle of claim 10, wherein the upright frame members extend along a first axis and the cross-members extend along a second axis, a first portion of the webbing extending along the first axis and a second portion of the webbing extending along the second axis.
13. The vehicle of claim 1, further comprising a vehicle body panel adjacent the vehicle seat, the child restraint system anchor being connected to the vehicle body panel between the vehicle body panel and the vehicle seat.
14. The vehicle of claim 13, wherein the vehicle seat includes a seat bottom and a seatback

supported by the seat bottom and the vehicle seat defines an occupant seating area, the seat bottom being between the occupant seating area and the webbing.

15. The vehicle of claim 14, wherein the seat bottom is between the occupant seating area and lock.

16. The vehicle of claim 14, wherein the seatback is between the occupant seating area and child restraint system anchor.

17. The vehicle of claim 14, wherein the seatback is between the occupant seating area and the vehicle body panel.

18. The vehicle of claim 13, further comprising a tether fixed to the vehicle body panel and the tether extending from the vehicle body panel to the child restraint system anchor.

19. The vehicle of claim 1, further comprising a vehicle floor, the vehicle seat being supported by the vehicle floor and the lock is fixed between the vehicle seat and the vehicle floor.

20. The vehicle of claim 1, wherein the loop is connectable to a connection point of a child restraint system.
