US 20250027330A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2025/0027330 A1**

(43) **Pub. Date: Jan. 23, 2025**

MAYER et al.

(54) **PORTABLE SHELTER SYSTEMS AND METHODS**

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(21) Appl. No.: **18/778,730**

(22) Filed: **Jul. 19, 2024**

Related U.S. Application Data

(60) Provisional application No. 63/559,140, filed on Feb. 28, 2024, provisional application No. 63/515,060, filed on Jul. 21, 2023.

Publication Classification

(51) **Int. Cl.**

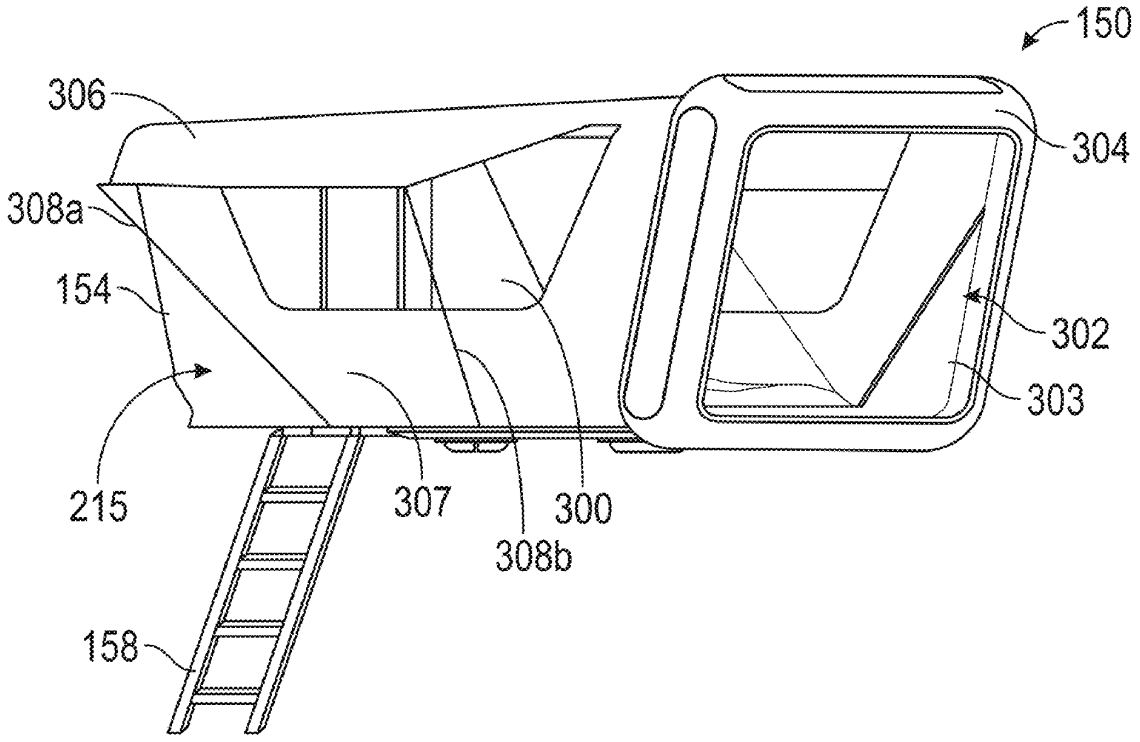
E04H 15/06	(2006.01)
E04H 15/14	(2006.01)
E04H 15/36	(2006.01)
E04H 15/58	(2006.01)

(52) **U.S. Cl.**

CPC ***E04H 15/06*** (2013.01); ***E04H 15/14*** (2013.01); ***E04H 15/36*** (2013.01); ***E04H 15/58*** (2013.01)

(57) **ABSTRACT**

Aspects of the subject technology relate to a removable shelter that electrically and/or communicatively integrates with an electric vehicle when the removable shelter is mounted to the vehicle. The removeable shelter may leverage electrical contacts in accessory mounting ports on the roof, crossbars, and/or truck bed of the vehicle. The removeable shelter may also communicate wirelessly with the electric vehicle. The removable shelter may include any of various integrated electronic accessories that can be powered by the vehicle battery, including, but not limited to, external lighting, external proximity sensing, proximity-based external lighting, interior lighting, air temperature control, other temperature control, speakers, charging ports for mobile phones and/or other devices, and/or other features.



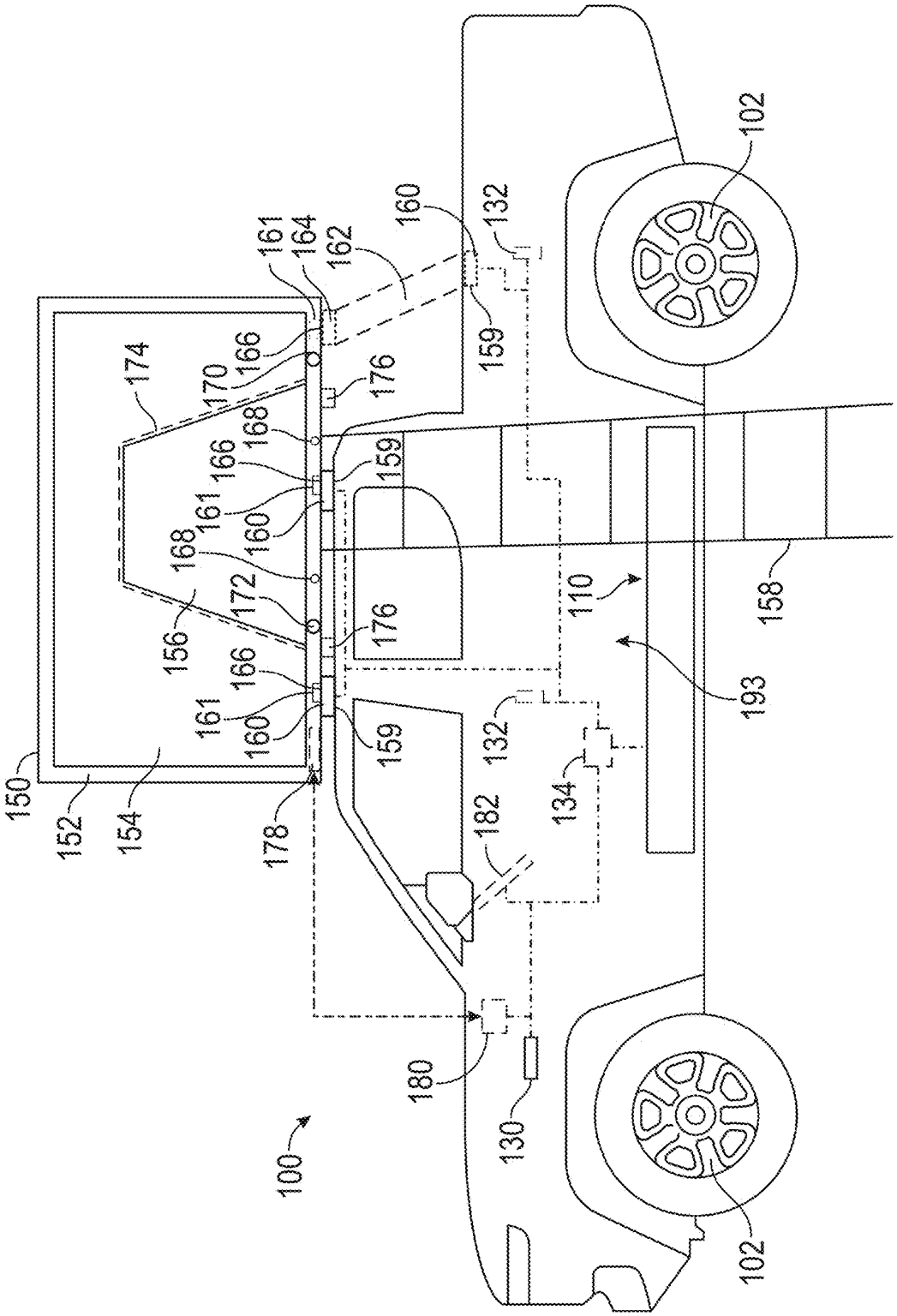

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FIG. 1A

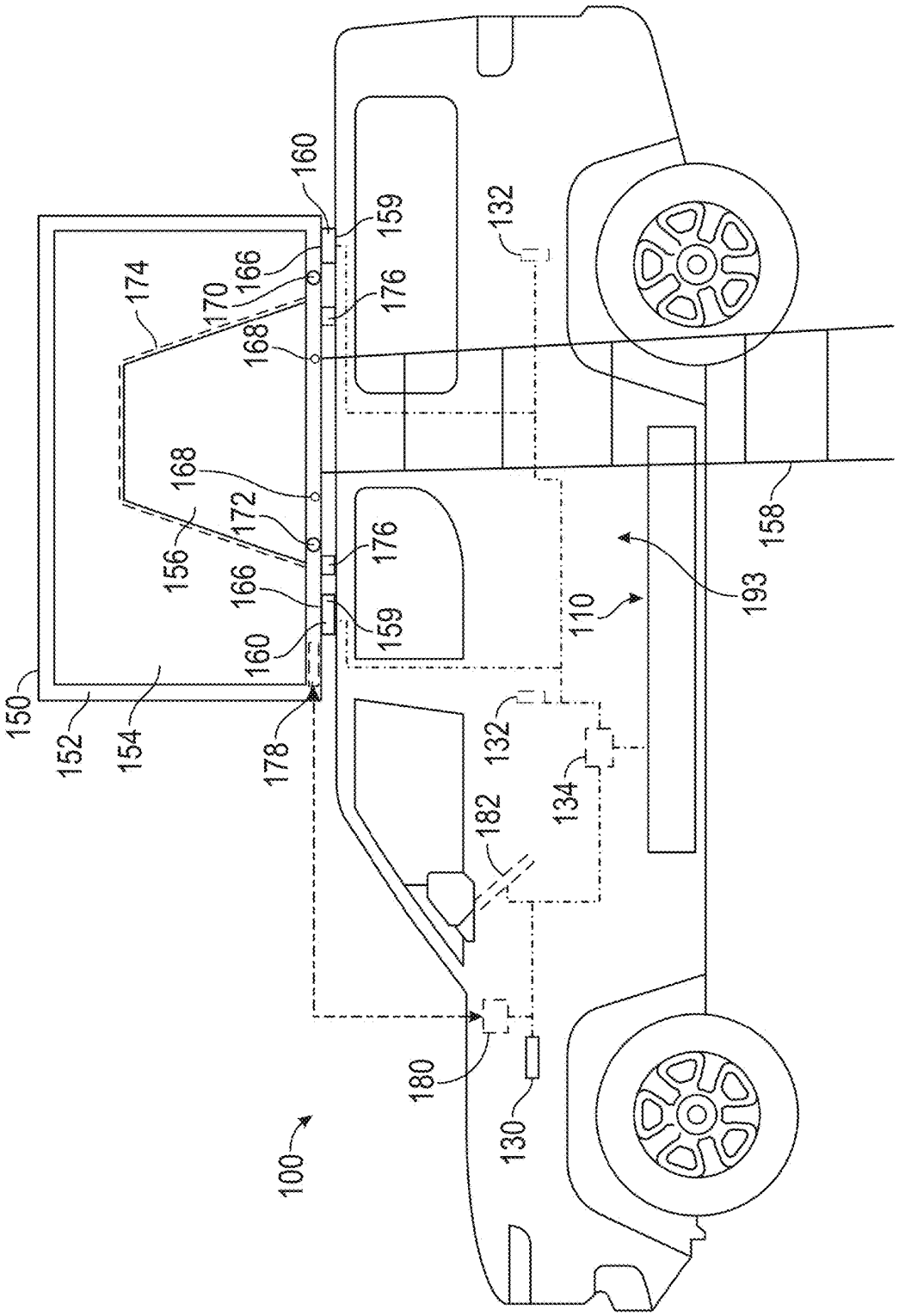
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FIG. 1B

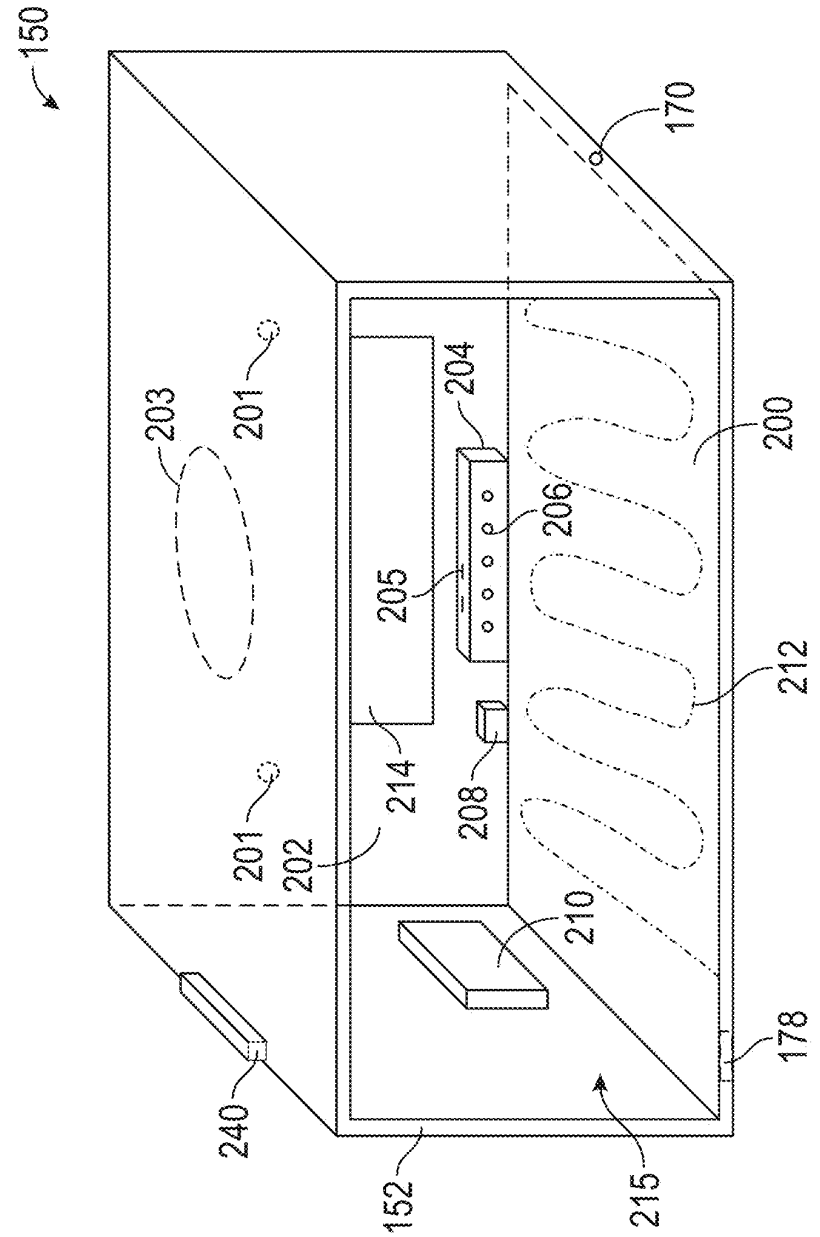
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FIG. 2

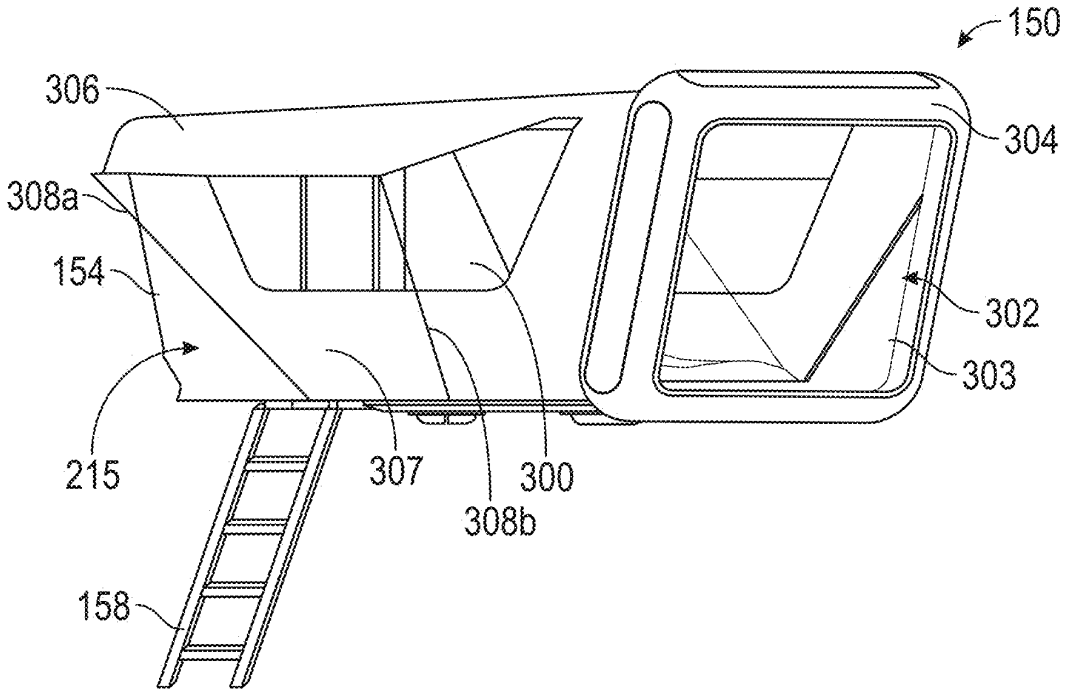

FIG. 3

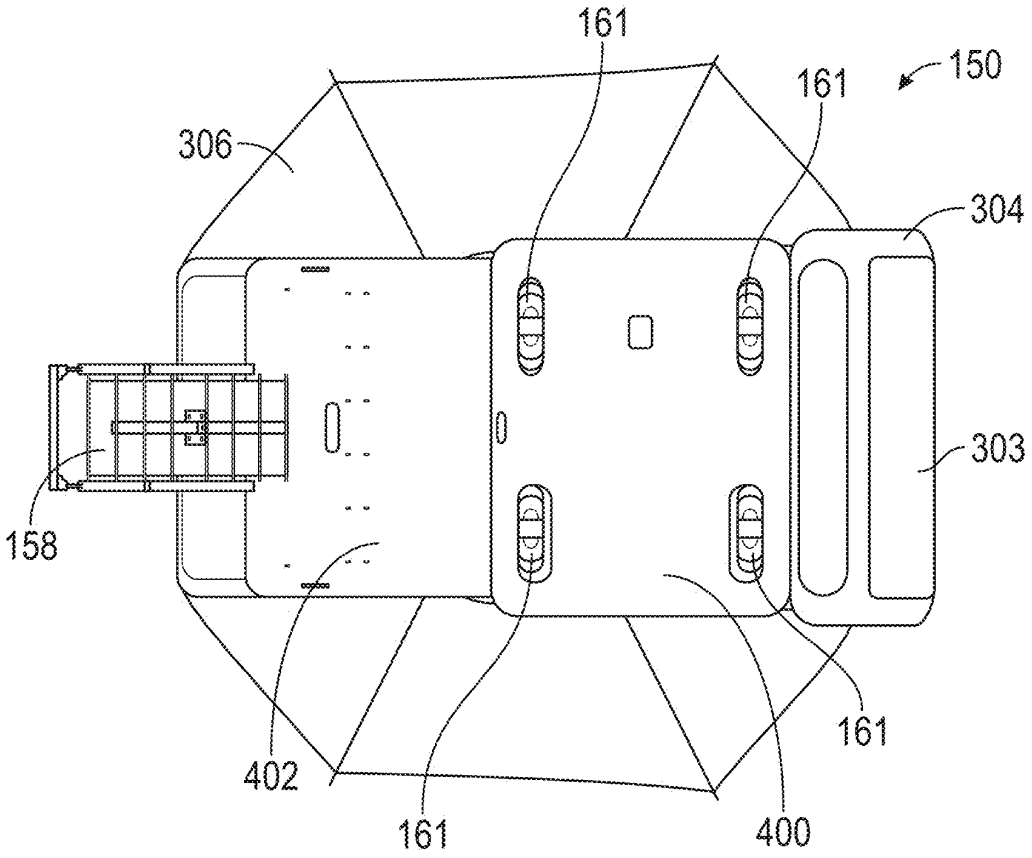

FIG. 4

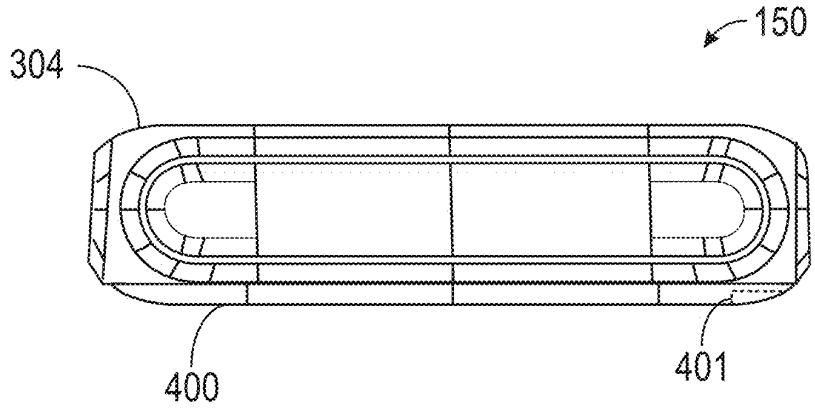
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FIG. 5A

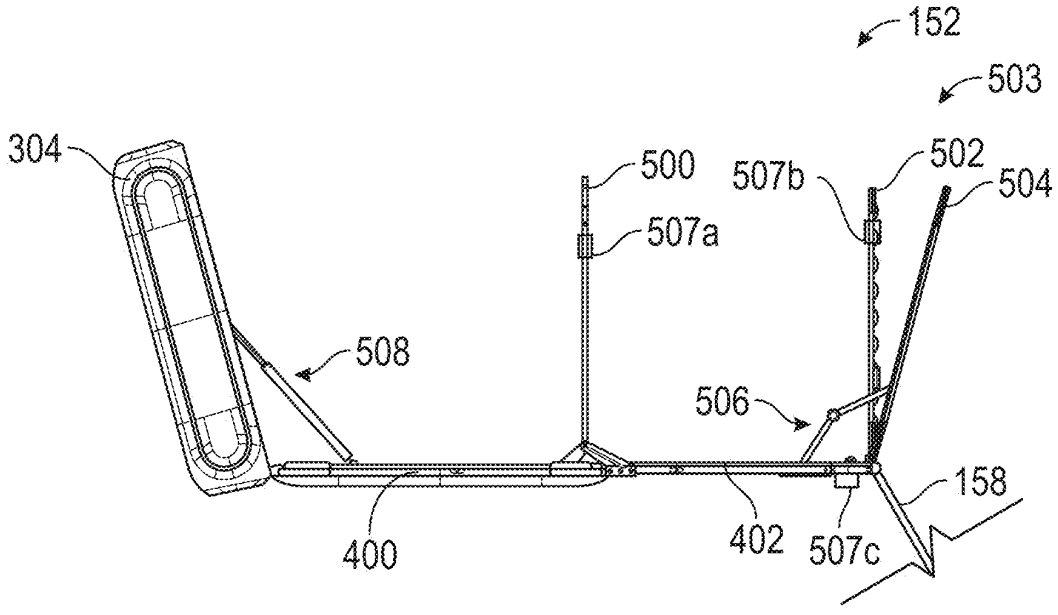
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FIG. 5B

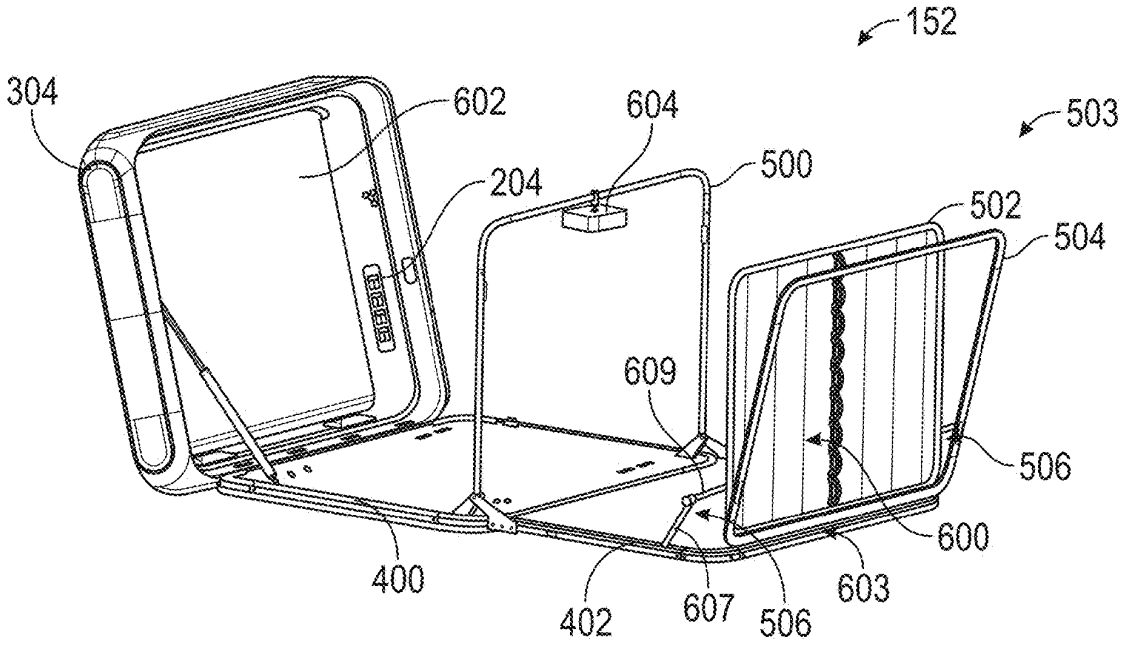
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FIG. 6

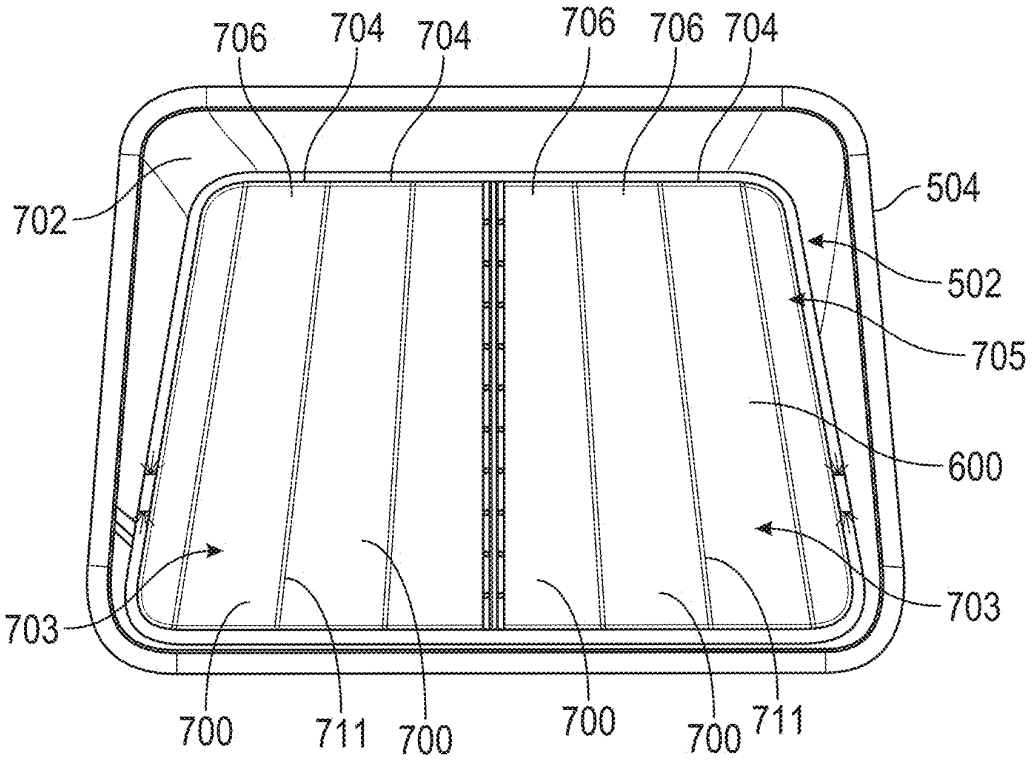
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FIG. 7

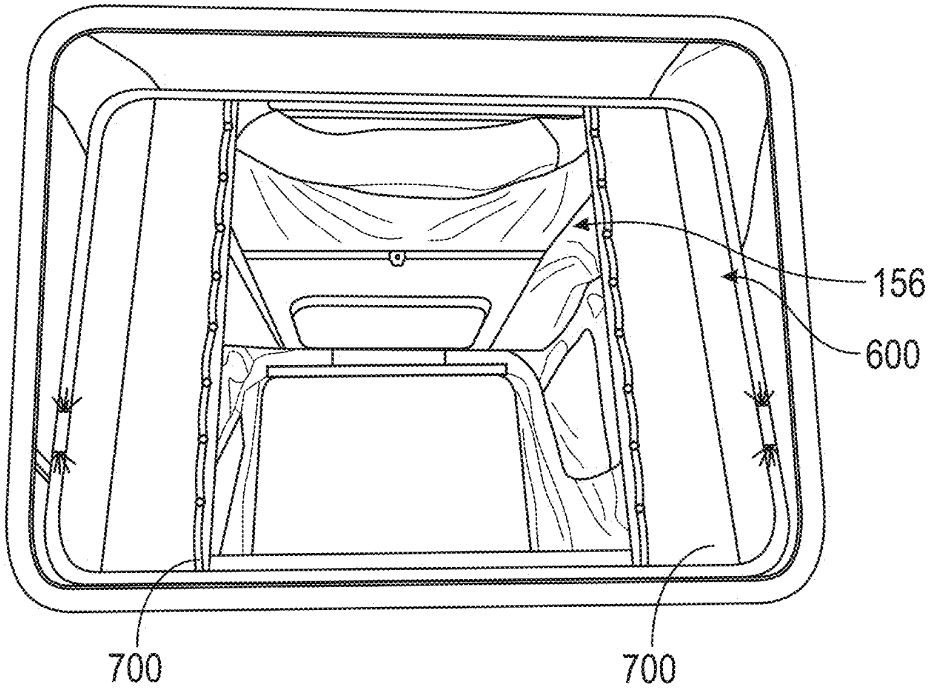
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FIG. 8

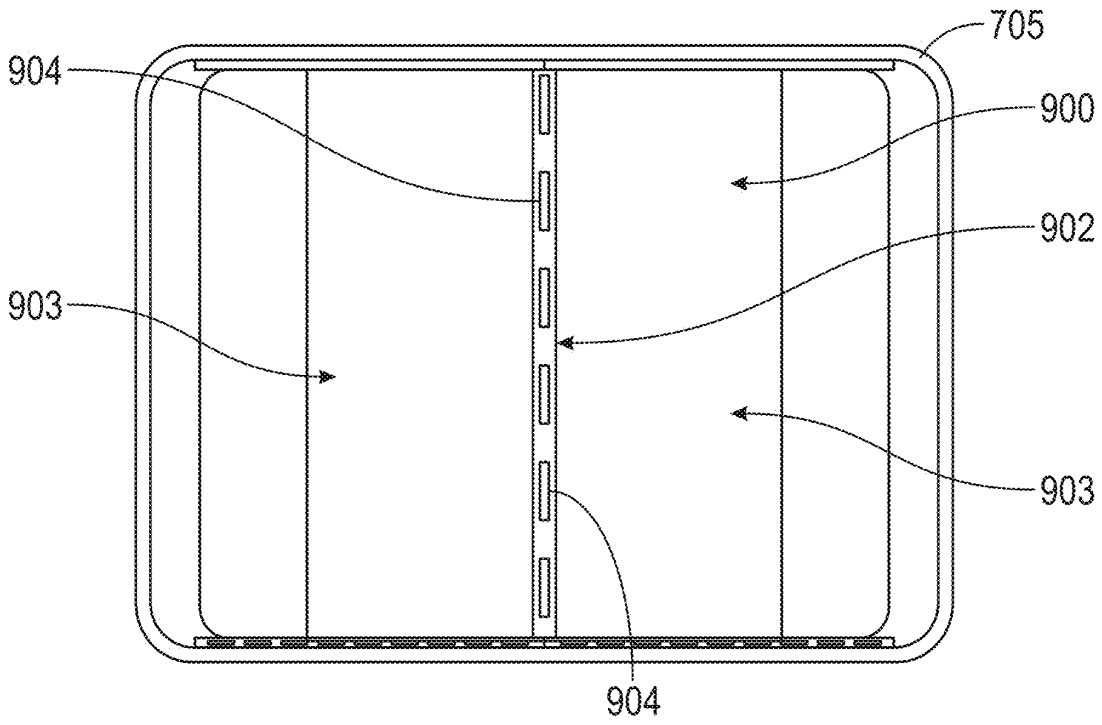

FIG. 9

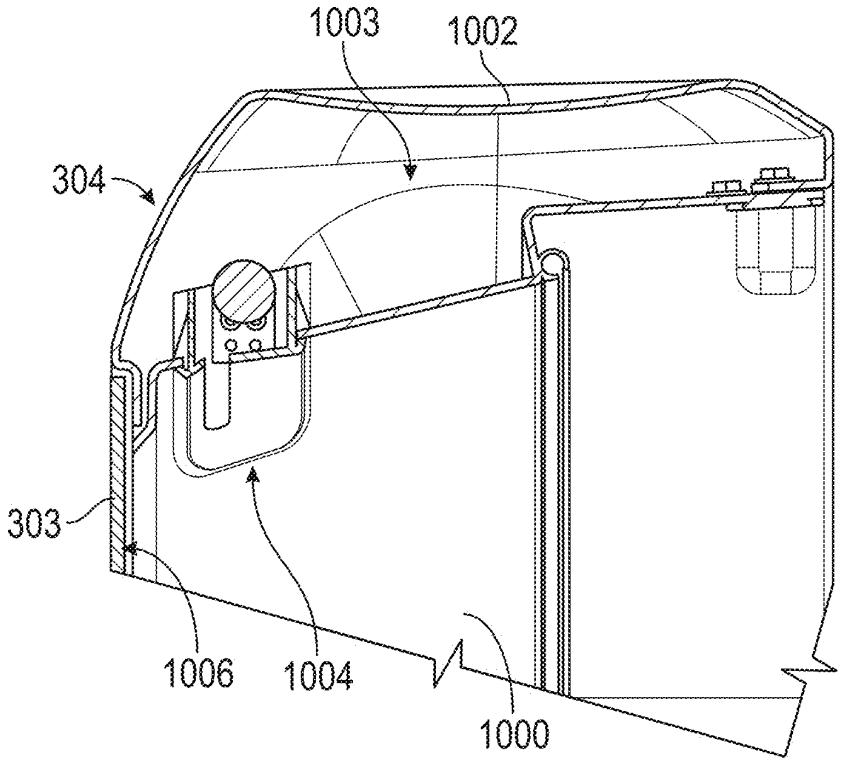

FIG. 10

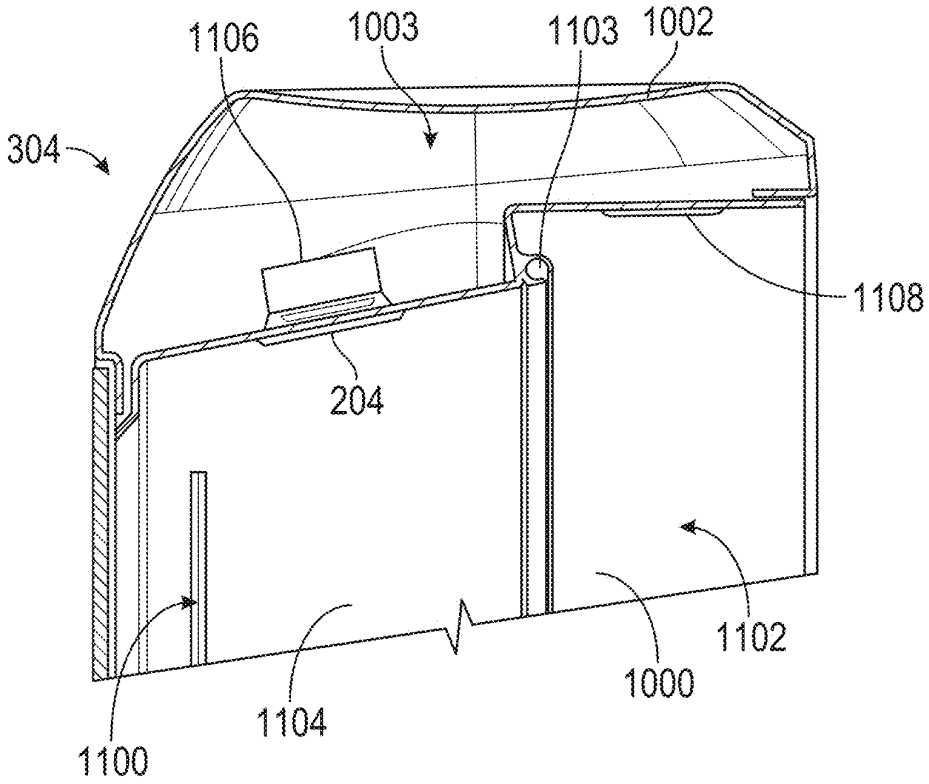

FIG. 11

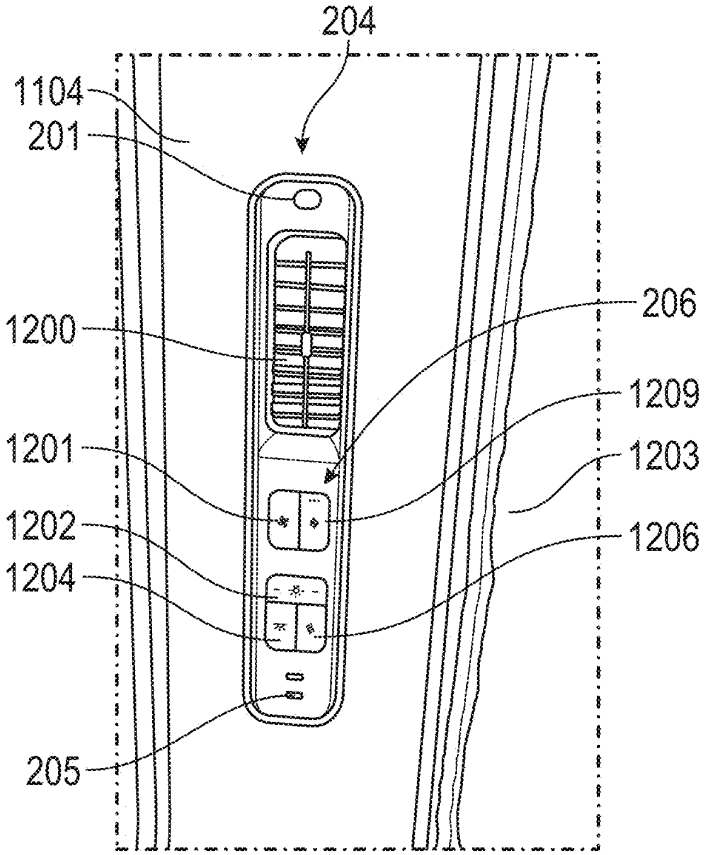

FIG. 12

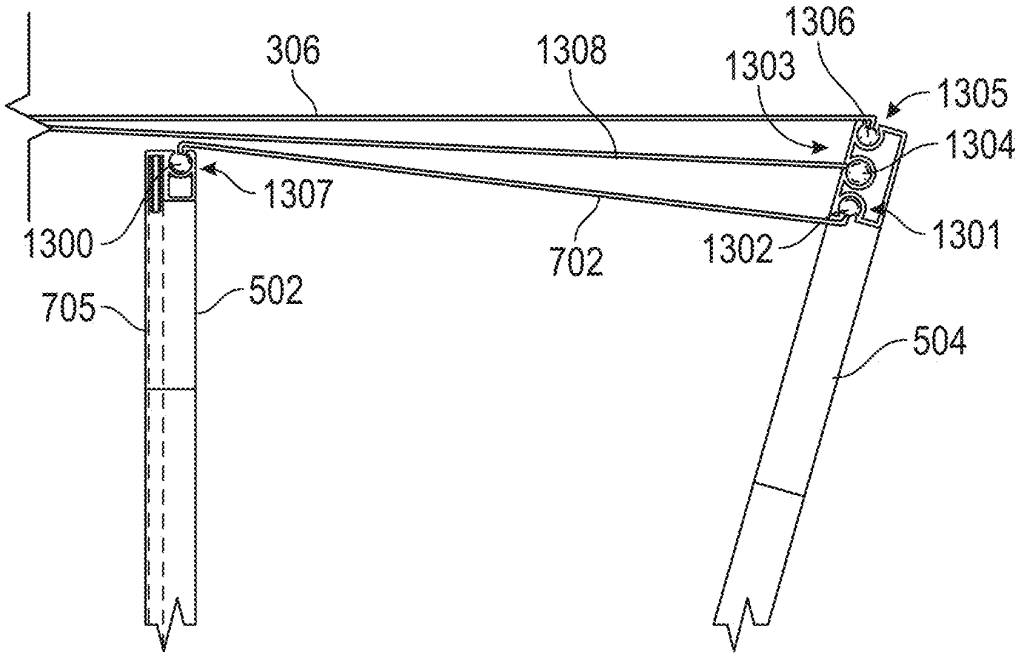
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FIG. 13

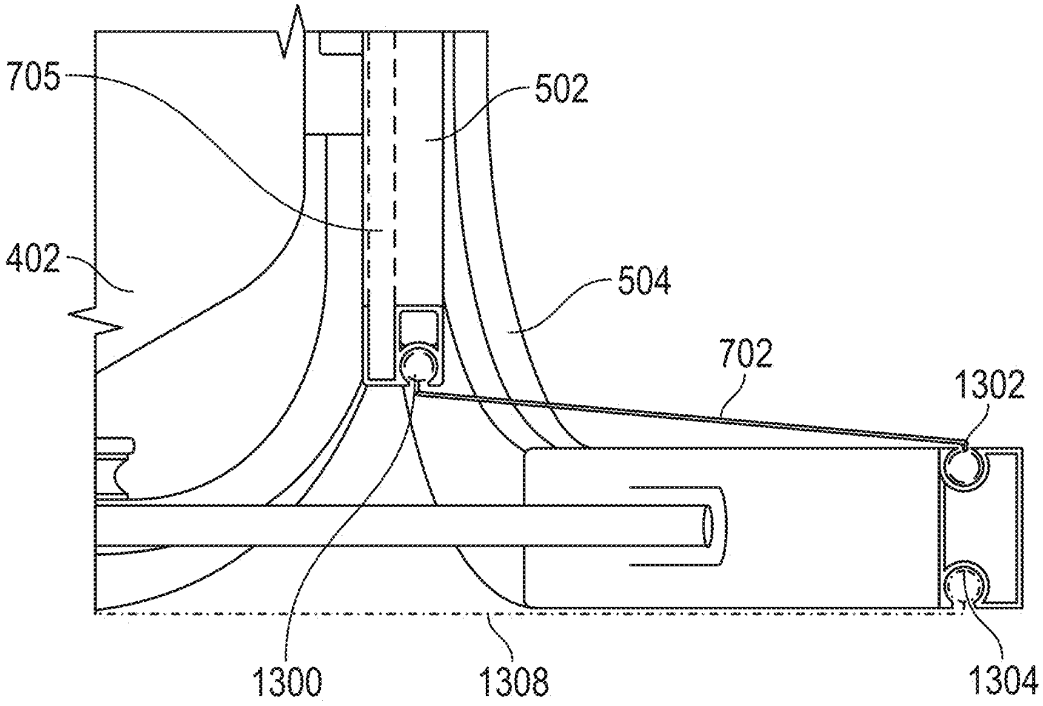
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FIG. 14

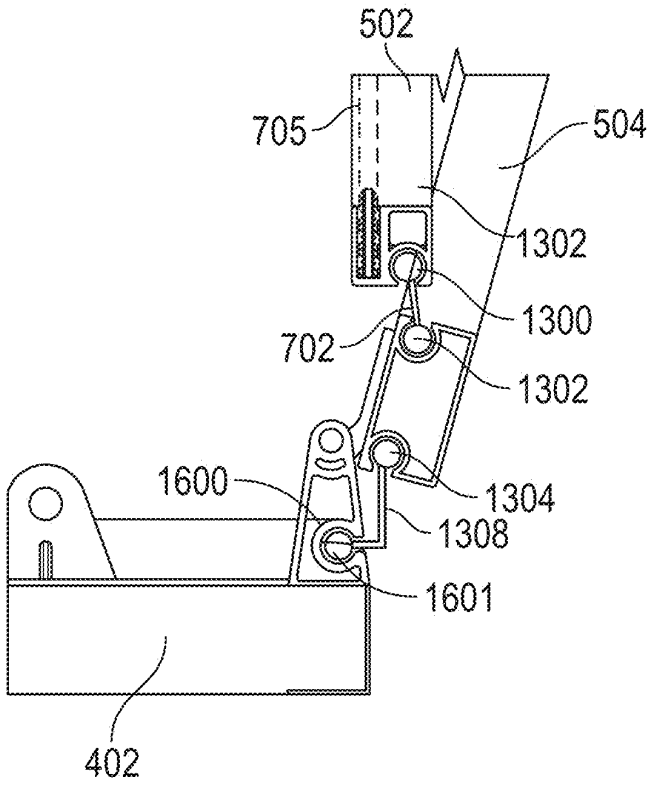

FIG. 15

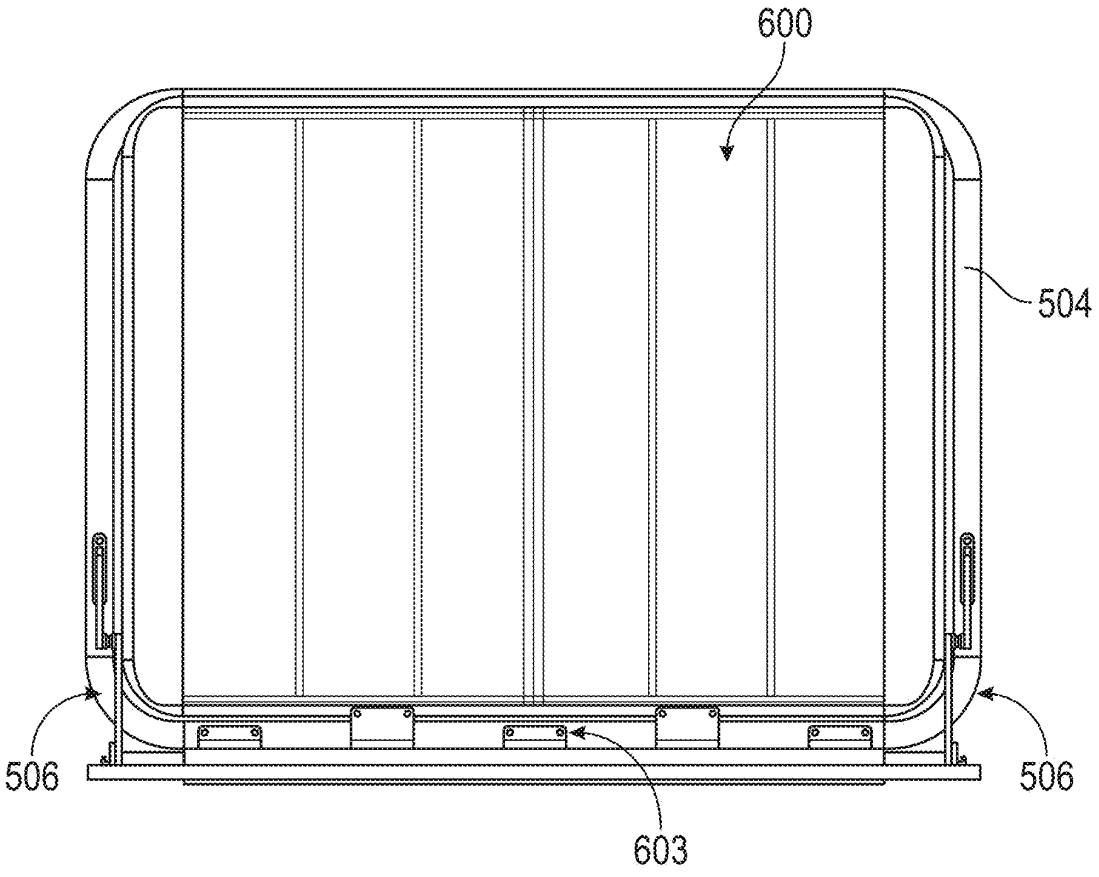

FIG. 16

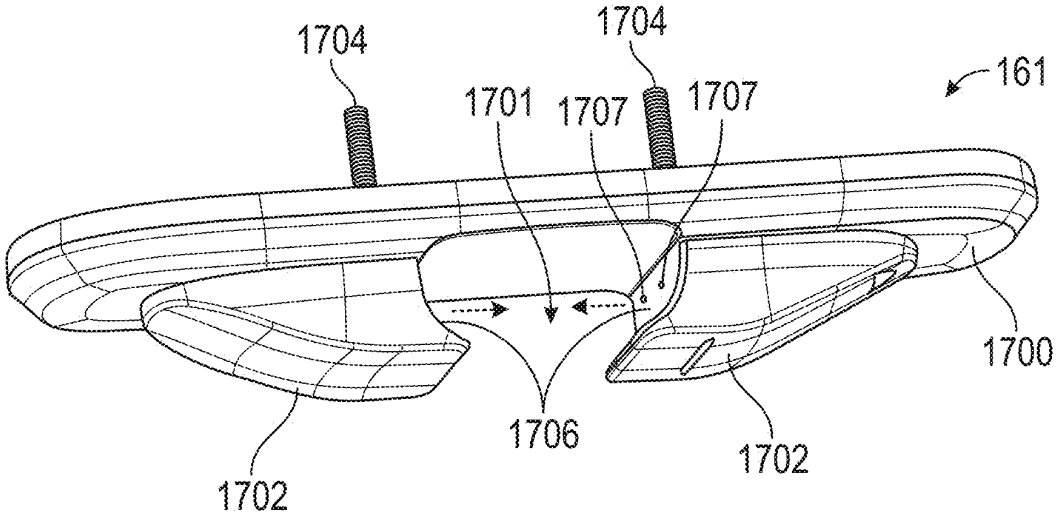
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FIG. 17

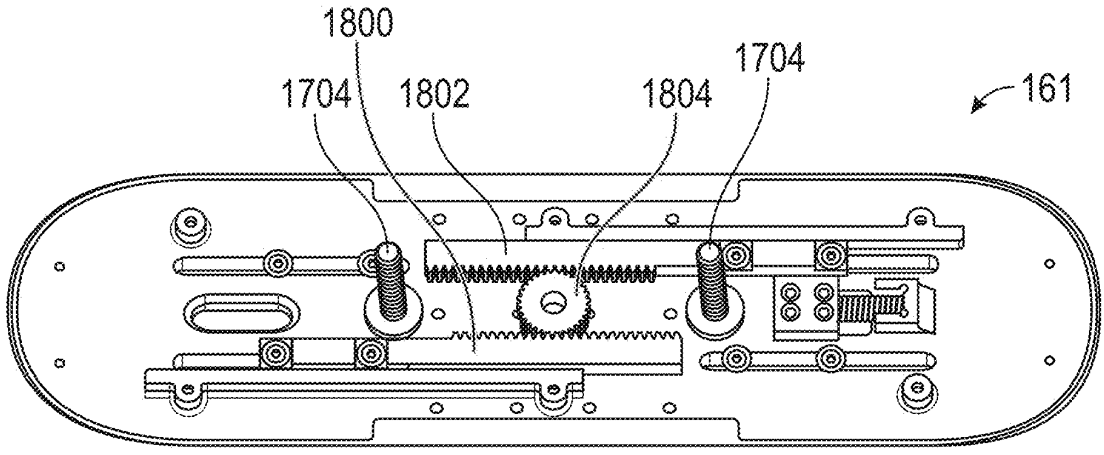
1800
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FIG. 18

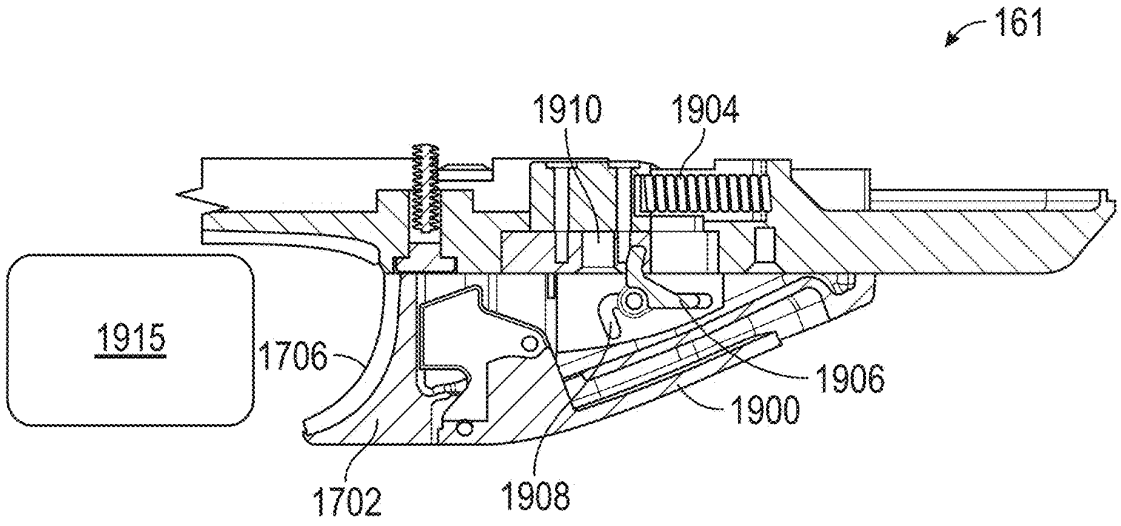
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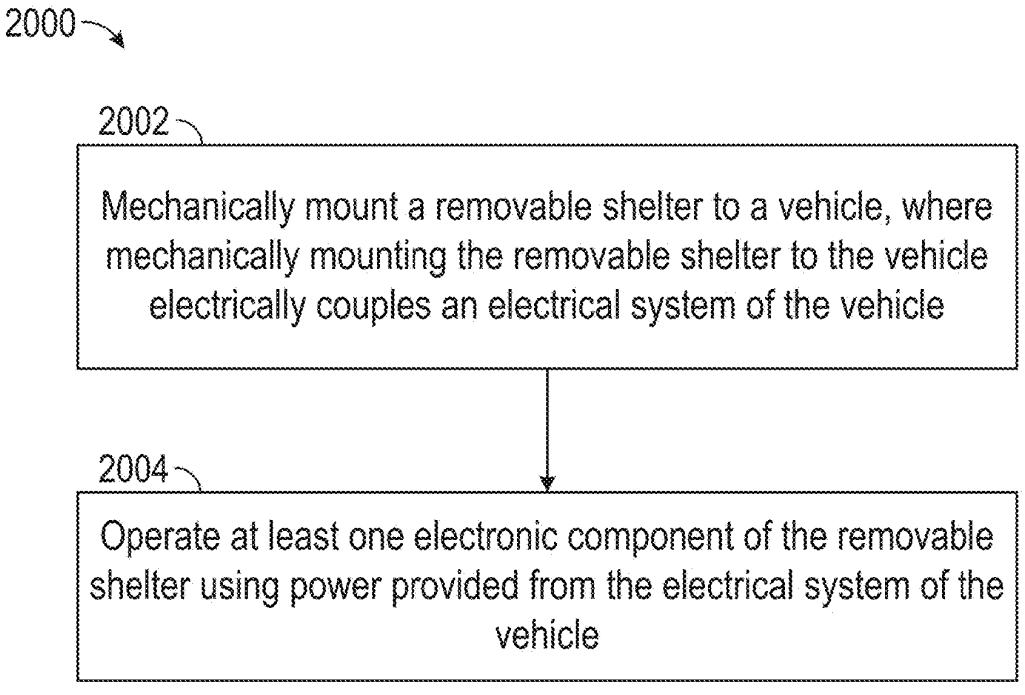
FIG. 19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Mechanically mount a removable shelter to a vehicle, where mechanically mounting the removable shelter to the vehicle electrically couples an electrical system of the vehicle
2004
Operate at least one electronic component of the removable shelter using power provided from the electrical system of the vehicle

FIG. 20

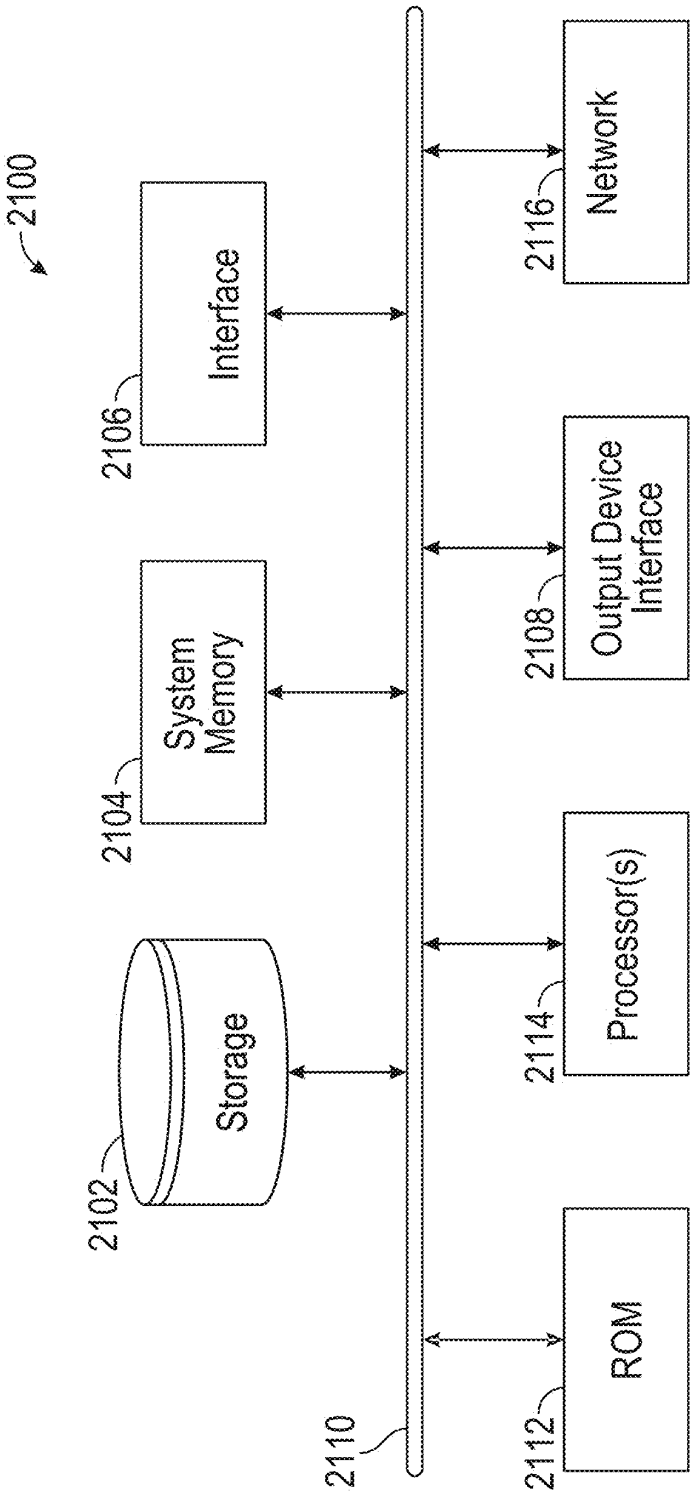
2100
2102
Storage
2104
System Memory
2106
Interface
2108
Output Device Interface
2110
2112
ROM
2114
Processor(s)
2116
Network

FIG. 21

PORTABLE SHELTER SYSTEMS AND METHODS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of priority to U.S. Provisional Patent Application No. 63/515,060, entitled, "PORTABLE SHELTER SYSTEMS AND METHODS", filed on Jul. 21, 2023 and U.S. Provisional Patent Application No. 63/559,140, entitled, "PORTABLE SHELTER SYSTEMS AND METHODS", filed on Feb. 28, 2024, the disclosure of each which is hereby incorporated herein in its entirety.

INTRODUCTION

[0002] Portable shelters, such as tents, are typically provided without any electrical and/or electronic features.

SUMMARY

[0003] The present description relates generally to a removable (e.g., portable) shelter that electrically and/or communicatively integrates with a vehicle when the removable shelter is mounted to the vehicle. In one or more implementations, the removeable shelter leverages electrical contacts in accessory mounting ports on a roof and/or truck bed of the vehicle. The removeable shelter may also communicate wirelessly (e.g., via Bluetooth communications) with the vehicle. The removable shelter may include any of various integrated electronic components that can be powered by the vehicle (e.g., by a battery of the vehicle), including, but not limited to, external lighting (e.g., entry port lighting, flood lighting, etc.), external proximity sensing, proximity-based external lighting, interior lighting (e.g., including reading lights, overhead lighting, flood lighting, ambient lighting, etc.), air temperature control (e.g., including one or more powered fans and/or ported vehicle HVAC), other temperature control (e.g., heated floor, heated blankets, heated walls, etc.), speakers, charging ports for mobile phones and/or other devices, and/or other features.

[0004] In accordance with aspects of the disclosure, an apparatus is provided that includes a removable shelter configured to be mounted to a vehicle and having at least one electrical connector configured to electrically couple one or more electronic components of the removable shelter to an electrical system of the vehicle when the removable shelter is mounted to the vehicle. The apparatus may also include communications circuitry configured to communicatively couple to vehicle communications circuitry of the vehicle. The communications circuitry of the removable shelter may include wireless communications circuitry.

[0005] The at least one electrical connector may be associated with a mechanical connector for mechanically mounting the removable shelter to the vehicle. The removable shelter may also include an enclosure configured to be occupied by one or more persons, in which at least one of the one or more electronic components is integrally mounted within the enclosure. The one or more electronic components may include at least one exterior light. The at least one exterior light may be configured to project light onto an entrance to the enclosure. The at least one exterior light may be configured to project light onto an access structure for the enclosure. The access structure may include a ladder. The ladder may include a powered ladder operable using power received from the vehicle via the at least one electrical connector.

[0006] The one or more electronic components may include at least one sensor configured to detect an object at or near the entrance to the enclosure. The at least one exterior light may be configured to project light onto an entrance to the enclosure responsive to a detection of the object using the at least one sensor. The at least one sensor may include a LIDAR sensor.

[0007] The apparatus may also include a switch for the at least one exterior light on an exterior surface of the removable shelter. The at least one exterior light may include an entrance light and a flood light. The one or more electronic components may include a powered dock for a flashlight. The one or more electronic components may include a heating component configured to heat at least a portion of the removable shelter. The heating component may include a heating element embedded in a floor of the removable shelter. The one or more electronic components may include a cooling component configured to cool at least a portion of the removable shelter. The cooling component may include a fan. The cooling component may include an air conditioning unit.

[0008] The one or more electronic components may include at least one interior light within an enclosure of the removable shelter. The at least one interior light may include a directional reading light. The at least one interior light may include a flood light embedded within a portion of the enclosure. The one or more electronic components may include a speaker. The one or more electronic components may include a charging port for a portable electronic device. The charging port may include a universal serial bus (USB) port. The one or more electronic components may include a display component for displaying visual content within an enclosure of the removable shelter. The display component may include a projection screen. The projection screen may be configured to allow viewing of the visual content from both of two opposing sides of the projection screen. The display component may also include a projector configured to project the visual content onto the projection screen. The display component may include an active display screen. The display component may be configured to display vehicle information for the vehicle, the vehicle information obtained via wired or wireless communication between the removable shelter and the vehicle. The vehicle information may include one or more of: a battery charge level, a battery discharge rate, a number of miles corresponding to the battery charge level, a change in the battery charge level based on a state of the removable shelter, or a change in the number of miles based on the state of the removable shelter.

[0009] The apparatus may also include a control panel integrally formed within an enclosure of the removable shelter, the control panel including one or more control elements for controlling the one or more electronic components. The one or more electronic components may be operable via a portable electronic device that is communicatively coupled to the removable shelter via communications circuitry of the removable shelter. The one or more electronic components of the removable shelter may be operable via a control panel within the vehicle. One or more electronic features of the vehicle may be operable via a control panel within the removable shelter. The electrical system of the vehicle may include a battery configured to

power one or more wheels of the vehicle. The one or more electronic components may include a center high mounted stop lamp (CHMSL).

[0010] In accordance with other aspects of the disclosure, a method is provided that includes mechanically mounting a removable shelter to a vehicle, where mechanically mounting the removable shelter to the vehicle electrically couples an electrical system of the removable shelter to an electrical system of the vehicle; and operating at least one electronic component of the removable shelter using power provided from the electrical system of the vehicle. The method may also include receiving, by the removable shelter, an electronic communication from the vehicle. Receiving the electronic communication may include receiving the electronic communication wirelessly from the vehicle. Receiving the electronic communication may include receiving the electronic communication via a communications port that is integrated into a mechanical connector for mechanically mounting the removable shelter to the vehicle. The mechanical connector may include an electrical connector for electrically coupling the electrical system of the removable shelter to the electrical system of the vehicle.

[0011] In accordance with other aspects of the disclosure, a frame for a shelter is provided, the frame including a first portion including a window; a second portion coupled to the first portion and configured to form a first part of base for a floor of the shelter; a third portion coupled to the second portion and configured to form a second part of the base for the floor of the shelter; a first hoop coupled to the second portion and the third portion of the frame; and one or more second hoops coupled to the second portion of the frame. The first portion, the second portion, the third portion, the first hoop, and the one or more second hoops may be configured to support one or more fabric bounding features that form an enclosure for the shelter.

[0012] The first portion may include an inner shell, an outer shell, and an air gap between the inner shell and the outer shell, and the first portion may be configured to open to an angle of greater than ninety degrees relative to the second portion. The inner shell may be configured to house a control panel having a fan, and an inlet, where the air gap forms a duct between the inlet and the fan. The inner shell may be configured to support a screen that is extendible over the window. The one or more second hoops may include a door frame for a door for the enclosure, and an outer frame. The door frame may be configured to receive an inner door frame of the door, the door including a plurality of panels coupled together by fabric hinges.

[0013] The inner door frame and the plurality of panels may each include one or more magnets configured to hold the door in any of an open, partially open, or closed position. The door frame may be configured to open to an angle of ninety degrees relative to the second portion of the frame, and the outer frame may be configured to open to an angle of greater than ninety degrees relative to the second portion of the frame. The outer frame may include a plurality of Keder slots configured to receive a plurality of anchors for a plurality of fabric portions of the one or more fabric bounding features. The plurality of Keder slots may include a Keder slot for an anchor for a first end of a fabric bridge between the door frame and the outer frame, and the door frame may include an additional Keder slot configured to receive an anchor for an opposing end of the fabric bridge between the door frame and the outer frame.

[0014] The frame may also include a hydraulic strut that couples the first portion and the second portion; and a mechanism that couples the second portion and the outer frame. The mechanism may include a pulley mechanism or a ratchet mechanism. The frame may also include a plurality of mechanical connectors on the second portion, each of the plurality of mechanical connectors configured to attach to a corresponding crossbar on a roof of a vehicle. Each of the plurality of mechanical connectors may include a pair of opposing clamping members that are configured to move in unison to clamp that mechanical connector to the corresponding crossbar. Each of the plurality of mechanical connectors may include a spring and a paddle, the paddle configured to compress the spring to press the pair of opposing clamping members against the crossbar. The window may include a solid transparent cover.

[0015] In accordance with other aspects of the disclosure, a removable shelter is provided that includes a frame configured to removably mount to a vehicle, the frame including a first portion including a window; a second portion coupled to the first portion and configured to form a first part of base for a floor of the removable shelter; a third portion coupled to the second portion and configured to form a second part of the base for the floor of the removable shelter; a first hoop coupled to the second portion and the third portion of the frame; and one or more second hoops coupled to the second portion of the frame. The first portion, the second portion, the third portion, the first hoop, and the one or more second hoops may be configured to support one or more fabric bounding features that form an enclosure for the removable shelter. The removable shelter may also include the one or more fabric bounding features. At least one of the one or more fabric bounding features may be anchored within at least one respective Keder slot in the first hoop.

[0016] In accordance with other aspects of the disclosure, a system is provided that includes a vehicle and a removable shelter configured to removably mount to the vehicle, the removable shelter including a frame that includes a first portion including a window; a second portion coupled to the first portion and configured to form a first part of base for a floor of the removable shelter; a third portion coupled to the second portion and configured to form a second part of the base for the floor of the removable shelter; a first hoop coupled to the second portion and the third portion of the frame; and one or more second hoops coupled to the second portion of the frame. The first portion, the second portion, the third portion, the first hoop, and the one or more second hoops may be configured to support one or more fabric bounding features that form an enclosure for the removable shelter.

[0017] In accordance with other aspects of the disclosure, a shelter is provided that includes a first portion including a window. The first portion may be coupled to a second portion configured to form a first base of a floor of the shelter, and the second portion may be coupled to a third portion configured to form a second base for the floor. The shelter may also include a first hoop coupled to the second portion and the third portion, and one or more second hoops coupled to the second portion. One or more of the first portion, the second portion, the third portion, the first hoop, and the one or more second hoops may be configured to support one or more fabrics that bind to form an enclosure for the shelter. The first portion may include an inner shell, an outer shell, and an air gap between the inner shell and the

outer shell, and the first portion may be configured to open to an angle of greater than ninety degrees relative to the second portion. An inner shell of the first portion may be configured to house a control panel having a fan, and an inlet. An air gap may form a duct between the inlet and the fan.

[0018] An inner shell of the first portion may be configured to support a screen that is extendible over the window. The one or more second hoops may include a frame for a door for the enclosure, and an outer frame. A frame for a door for the enclosure may be configured to receive an inner door frame of the door, the door including a plurality of panels coupled together by fabric hinges. The inner door frame and the plurality of panels may each include one or more magnets configured to hold the door in any of an open, partially open, or closed position. The frame for the door may be configured to open to an angle of ninety degrees relative to the second portion of the frame, and the outer frame may be configured to open to an angle of greater than ninety degrees relative to the second portion of the frame. The outer frame may include a plurality of Keder slots configured to receive a plurality of anchors for a plurality of fabric portions of the one or more fabrics. The plurality of Keder slots may include a Keder slot for an anchor for a first end of a fabric bridge between the frame and the outer frame, and the frame may include an additional Keder slot configured to receive an anchor for an opposing end of the fabric bridge between the frame and the outer frame.

[0019] The shelter may also include a hydraulic strut that couples the first portion and the second portion; and a mechanism that couples the second portion and the outer frame. The mechanism may include a pulley mechanism or a ratchet mechanism.

[0020] The shelter may also include a plurality of mechanical connectors on the second portion, each of the plurality of mechanical connectors configured to attach to a corresponding crossbar on a roof of a vehicle. Each of the plurality of mechanical connectors may include a pair of opposing clamping members that are configured to move in unison to clamp that mechanical connector to the corresponding crossbar. Each of the plurality of mechanical connectors may include a spring and a paddle, the paddle configured to compress the spring to press the pair of opposing clamping members against the crossbar. The window may include a solid transparent cover.

[0021] In accordance with other aspects of the disclosure, a removable shelter may be provided that includes a frame configured to removably mount to a vehicle. The frame may include a first base portion coupled to a window portion and configured to form at least part of a floor base; a second base portion configured to form at least another part of the floor base; and a support structure coupled to the first base portion and the second base portion. The first base portion, the second base portion, and the support structure are configured to support one or more fabrics that bind to form an enclosure for the removable shelter. The removable shelter may also include the one or more fabrics. At least one of the one or more fabrics may be anchored within at least one respective Keder slot in the support structure.

[0022] In accordance with other aspects of the disclosure, a system may be provided that includes a vehicle and a removable shelter configured to removably mount to the vehicle. The removable shelter may include a frame that includes a first portion including a window. The first portion may be coupled to a second portion configured to form a first base of a floor of the removable shelter, and the second portion may be coupled to a third portion configured to form a second base for the floor. The removable shelter may also include a first hoop coupled to the second portion and the third portion of the frame; and one or more second hoops coupled to the second portion of the frame. At least one of the first portion, the second portion, the third portion, the first hoop, and the one or more second hoops may be configured to support one or more fabrics that bind to form an enclosure for the removable shelter. The removable shelter may also include a first light source on the first hoop, a second light source on the one or more second hoops, and a third light source on the third portion.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] Certain features of the subject technology are set forth in the appended claims. However, for purpose of explanation, several embodiments of the subject technology are set forth in the following figures.

[0024] FIGS. **1**A and **1**B illustrate schematic side views of example implementations of a vehicle having a removable shelter mounted thereto in accordance with one or more implementations.

[0025] FIG. **2** illustrates a cross-sectional view of an example removable shelter in accordance with one or more implementations.

[0026] FIG. **3** illustrates a perspective view of a removable shelter in accordance with one or more implementations.

[0027] FIG. **4** illustrates a bottom view of a removable shelter in accordance with one or more implementations.

[0028] FIG. **5**A illustrates a side view of a removable shelter in a closed position in accordance with one or more implementations.

[0029] FIG. **5**B illustrates a side view of a frame for a removable shelter in accordance with one or more implementations.

[0030] FIG. **6** illustrates a perspective view of the frame of FIG. **5**B in accordance with one or more implementations.

[0031] FIG. **7** illustrates a perspective bottom view of an end of a removable shelter in accordance with one or more implementations.

[0032] FIG. **8** illustrates a perspective bottom view of the end of the removable shelter of FIG. **5**B with a door of the removable shelter in an open configuration in accordance with one or more implementations.

[0033] FIG. **9** illustrates an end view of a screen door for a removable shelter in accordance with one or more implementations.

[0034] FIG. **10** illustrates a cross-sectional view of a part of a portion of a frame of a removable shelter in accordance with one or more implementations.

[0035] FIG. **11** illustrates a cross-sectional view of another part of the portion of the frame of the removable shelter in accordance with one or more implementations.

[0036] FIG. **12** illustrates a control panel in a sidewall of a portion of a frame for a removable shelter in accordance with one or more implementations.

[0037] FIG. **13** illustrates a cross-sectional side view of a portion of a rear hoop of a frame for a removable shelter in accordance with one or more implementations.

[0038] FIG. **14** illustrates a cross-sectional top view of a portion of a frame for a removable shelter in accordance with one or more implementations.

[0039] FIG. **15** illustrates a cross-sectional side view of another portion of a frame for a removable shelter in accordance with one or more implementations.

[0040] FIG. **16** illustrates an end view of a frame for a removable shelter in accordance with one or more implementations.

[0041] FIG. **17** illustrates a perspective view of a mechanical connector for a removable shelter in accordance with one or more implementations.

[0042] FIG. **18** illustrates a top view of a mechanical connector for a removable shelter in accordance with one or more implementations.

[0043] FIG. **19** illustrates a cross-sectional side view of a mechanical connector for a removable shelter in accordance with one or more implementations.

[0044] FIG. **20** illustrates a flow diagram of an example process for operating one more electronic components of a removable shelter in accordance with one or more implementations.

[0045] FIG. **21** illustrates an example computing system with which aspects of this disclosure may implemented.

DETAILED DESCRIPTION

[0046] The detailed description set forth below is intended as a description of various configurations of the subject technology and is not intended to represent the only configurations in which the subject technology can be practiced. The appended drawings are incorporated herein and constitute a part of the detailed description. The detailed description includes specific details for the purpose of providing a thorough understanding of the subject technology. However, the subject technology is not limited to the specific details set forth herein and can be practiced using one or more other implementations. In one or more implementations, structures and components are shown in block diagram form in order to avoid obscuring the concepts of the subject technology.

[0047] Aspects of the subject technology described herein relate to a removable shelter that can be mechanically mounted to, and thereby electrically coupled to, a vehicle, such as an electric vehicle.

[0048] FIG. **1**A is a diagram illustrating an example implementation of an apparatus as described herein. In the example of FIG. **1**A, the apparatus includes a removable shelter **150** that is mounted to (e.g., mechanically mounted to) a moveable apparatus implemented as a vehicle **100**. As shown, the vehicle **100** may include one or more batteries **110**. The battery **110** may be coupled to an electrical system of the vehicle **100**, to receive power for charging of the battery and/or to provide power to one or more electronic components of the vehicle electrical system.

[0049] In one or more implementations, the vehicle **100** may be an electric vehicle having one or more electric motors that drive the wheels **102** of the vehicle using electric power from the battery **110**. In one or more implementations, the vehicle **100** may also, or alternatively, include one or more chemically powered engines, such as a gas-powered engine or a fuel cell powered motor. For example, electric vehicles can be fully electric or partially electric (e.g., hybrid or plug-in hybrid).

[0050] In the example of FIG. **1**A, the vehicle **100** is implemented as a truck (e.g., a pickup truck) having a battery **110**. The battery **110** may include one or more battery modules, which may include one or more battery cells, or may be provided without any battery modules (e.g., in a cell-to-pack configuration).

[0051] As shown, the battery **110** may be include in, or be electrically coupled to, an electrical system that may include a charging port **130**, one or more electrical outlets **132** within the interior cab and/or within the truck bed of the vehicle, and/or one or more electrical contacts **160** that are incorporated into one or more respective mechanical connectors **159**. For example, the mechanical connectors **159** may be disposed on a roof of the vehicle **100** and/or on a surface or a wall of the truck bed of the vehicle **100**. The electrical system of the vehicle may include the battery **110** configured to power one or more wheels **102** of the vehicle **100**.

[0052] In one or more implementations, the electrical system of the vehicle **100** may also include control circuitry **134**. The control circuitry **134** may switchably couple the battery **110** to the charging port **130** (e.g., for charging the battery when the charging port **130** is connected to an external power source, such as an electrical grid or an external battery), to the electrical outlets **132** (e.g., for providing direct-current (DC) or alternating-current (AC) power to the electrical outlets **132**), and/or to the electrical contacts **160** disposed in the mechanical connectors **159** (e.g., for providing power to one or more electronic components of the removable shelter **150**, when the removable shelter **150** is mounted to the vehicle **100**).

[0053] In the example of FIG. **1**A, two mechanical connectors **159** (with electrical contacts **160**) are visible on the roof of the vehicle **100** (e.g., at or near the left side of the vehicle that is visible in FIG. **1**A). In one or more implementations, two additional mechanical connectors **159** (with electrical contacts **160**) may be symmetrically disposed on the roof of the vehicle **100**, such as at or near the right side of the vehicle that is not visible in FIG. **1**A. In such implementations, the removable shelter **150** may include four mechanical connectors **161** (with electrical connectors **166**) that mechanically and electrically couple (e.g., at the same time) with the four mechanical connectors **159** (with electrical contacts **160**) on the roof of the vehicle. In one or more implementations, the mechanical connectors **161** (with electrical connectors **166**) may mechanically and electrically couple (e.g., at the same time) with a roof rack structure (e.g., a crossbar) that mechanically and electrically couples to the mechanical connectors **159** (with electrical contacts **160**) on the roof of the vehicle (e.g., and that routes power from the electrical contacts **160** of the vehicle **100** to the electrical connectors **166** of the removable shelter **150** via electrical components within the roof rack structure). For example, in one or more implementations, mounting the removable shelter **150** to the vehicle **100** may include mounting one or more crossbars to the mechanical connectors **159** on the roof of the vehicle **100**, and mounting the removable shelter **150** to the one or more crossbars (e.g., using the mechanical connectors **161** of the removable shelter **150**).

[0054] As shown in FIG. **1**, in one or more implementations, the vehicle **100** may optionally (e.g., in addition to and/or instead of one or more of the mechanical connectors **159** on the roof of the vehicle) include one or more mechanical connectors **159** (with electrical contacts **160**) on or near a wall of the truck bed of the vehicle. In implementations in which the optional mechanical connector **159** is provided on a wall (or other portion) of a truck bed, the vehicle **100** or

the removable shelter **150** may include an optional mounting structure **162** that mechanically and electrically couples to the mechanical connector **159** (with electrical contacts **160**) on the wall of the truck bed, and includes a mechanical connector **164**, which may also include electrical contacts, that mechanically couples to the removable shelter **150** to support the removable shelter **150** at the roof height of the vehicle). However, this is merely illustrative, and the vehicle **100** may be provided without any mechanical and/or electrical connectors on the wall of the truck bed, without a mounting structure **162**, and/or may include more or fewer mechanical connectors **159** (e.g., including mechanical connectors **159** with electrical contacts **160**) than those shown in FIG. **1**A, each with or without one or more electrical contacts **160** that are electrically couplable to the battery **110**.

[0055] As shown in FIG. **1**A, a removable shelter **150** may be to be mounted to a vehicle **100** and may have at least one electrical connector **166** configured to electrically couple to at least one corresponding electrical contact **160** on the vehicle (e.g., directly or via a roof rack structure), to electrically couple one or more electronic components of the removable shelter to an electrical system of the vehicle **100** when the removable shelter is mounted to the vehicle. The removable shelter **150** may include a frame **152** and bounding features **154** (e.g., fabric walls) that are mounted to the frame **152**. The frame **152** may be formed from various materials, including metal portions, plastic portions, and/or other portions. In one or more implementations, cork may be used in during a pre-preg lay-up process to reduce the weight and increase the stiffness of various shell portions of the frame **152** and/or portions of the bounding features **154**. As shown, the removable shelter **150** may also include communications circuitry **178** configured to communicatively couple to vehicle communications circuitry **180** of the vehicle **100**. For example, the communications circuitry **178** of the removable shelter **150** may include wireless communications circuitry (e.g., WiFi circuitry, Bluetooth circuitry, and/or other wireless communications circuitry). As another example, the communications circuitry **178** may include communications circuitry for communicating with the vehicle communications circuitry **180** via a physical communications port disposed in the mechanical connector **161** (e.g., coupled to a corresponding vehicle physical communications port in the mechanical connector **159**).

[0056] As shown, the at least one electrical connector **166** of the removable shelter **150** may be integrated into a mechanical connector **161** for mechanically mounting the removable shelter **150** to the mechanical connector **159** of the vehicle **100**. In one or more other implementations, the electrical connector **166** may be associated with the mechanical connector **161** without integrating the electrical connector **166** into the mechanical connector **161** (e.g., by placing the electrical connector **166** near the mechanical connector **161** such that connecting a mechanical connector **161** to a mechanical connector **159** on the vehicle **100** causes electrical contact between the associated, nearby, electrical connector **166** of the removable shelter **150** with an associated electrical contact **160** on the vehicle **100** (e.g., an electrical contact **160** that is nearby the mechanical connector **159** on the vehicle **100**).

[0057] As shown in FIG. **1**A, in one or more implementations, the electronic components of the removable shelter **150** may include one or more exterior lights, such as an exterior light **174** that is configured to project light onto an entrance **156** of the removable shelter **150** and/or onto an access feature **158**, such as a ladder, for the removable shelter **150**. In the example of FIG. **1**A, the entrance **156** is shown as being located on a side of the removable shelter **150** (e.g., a side of the removable shelter **150** that is mounted above the doors **193** of the vehicle **100**. In one or more implementations, the ladder may be a powered ladder that is operable using power received from the vehicle (e.g., from the battery **110**) via the electrical connector **166** and the electrical contact **160**. As shown in FIG. **1**A, the electronic components of the removable shelter **150** may also include one or more sensors, such as a sensor **168**, configured to detect an object (e.g., a person or an animal) at or near the entrance **156** to the removable shelter **150**. In one or more implementations, the exterior light **174** is configured to project light onto an entrance **156** and/or the access feature **158** responsive to a detection of the object using the sensor **168**. As examples, the sensor **168** may include a LIDAR sensor, a radar sensor, an imaging sensor, and/or any other type of proximity and/or motion sensor. As shown in FIG. **1**A, the removable shelter **150** may also include one or more exterior switches, such as a switch **170** for the exterior light **174** and/or one or more other exterior lights on an exterior surface of the removable shelter **150**.

[0058] For example, as shown in FIG. **1**A, the exterior lights of the removable shelter **150** may also, or alternatively, include one or more flood lights **176**. For example, the flood lights **176** may be configured to project light onto a bottom exterior surface of the removable shelter **150** and/or other the vehicle and/or the ground surrounding the vehicle. In one or more implementations, the flood lights **176** and/or the exterior light **174** may be switchable between various colors, including, as examples, a white color or a red color (e.g., for stargazing or reduced light pollution, and/or to reduce attraction of insects). As shown in FIG. **1**A, the removable shelter **150** may also include a powered dock **172** for a flashlight. For example, the powered dock **172** may securely hold a flashlight inserted therein, and may include electrical contacts for charging a battery of the flashlight using the power received from the vehicle **100**.

[0059] As shown in FIG. **1**A, the vehicle **100** may include a control panel **182** (e.g., a touchscreen control panel). The control panel **182** of the vehicle **100** may provide controls for operating various components and/or features of the vehicle **100** (e.g., climate control, audio control, etc.). In one or more implementations, the control panel **182** of the vehicle **100** may also be used for authorizing power to the removable shelter **150** and/or for controlling one or more of the electronic components of the removable shelter **150**.

[0060] In the example of FIG. **1**A, the removable shelter **150** is mounted to a vehicle **100** implemented as a pickup truck. However, in one or more other use cases, the removable shelter **150** may be mounted to another type of vehicle. For example, FIG. **1**B illustrates another use case in which the vehicle **100** including the battery **110**, the charging port **130**, the electrical outlets **132**, the control circuitry **134**, the vehicle communications circuitry **180**, the control panel **182**, and the mechanical connectors **159** with the electrical contacts **160** is implemented as a sport utility vehicle (SUV), such as an electric sport utility vehicle. In the example of FIG. **1**B, the vehicle **100** may include a cargo storage area in at least a rear portion of the vehicle that is enclosed within the vehicle **100** (e.g., behind a row of seats within a cabin of

the vehicle). As shown, in this example, the vehicle **100** may include two mechanical connectors **159** with the electrical contacts **160** located on a left side of the roof of the SUV. One or more (e.g., two) additional mechanical connectors **159** with electrical contacts **160** may also be provided (e.g., symmetrically with the two mechanical connectors **159** with the electrical contacts **160** on the left side of the roof of the vehicle) on a right side of the roof of the vehicle. In other implementations, the vehicle **100** may implemented as another type of electric truck, an electric delivery van, an electric automobile, an electric car, an electric motorcycle, an electric scooter, an electric passenger vehicle, an electric passenger or commercial truck, a hybrid vehicle, or other vehicles such as sea or air transport vehicles, planes, helicopters, submarines, boats, or drones, and/or any other movable apparatus having a battery **110** (e.g., that powers the propulsion or drive components of the moveable apparatus) and to which a removable shelter **150** can be mechanically, electrically, and/or communicatively coupled.

[0061] FIG. **2** illustrates a cross-sectional perspective view of a portion of the removable shelter **150**, in accordance with one or more implementations. In the example of FIG. **2**, the entrance (e.g., front wall and/or door) of the removable shelter are removed so that portions of the interior of the removable shelter **150** can be seen. As shown in FIG. **2**, in one or more implementations, the removable shelter **150** may include an enclosure **215** configured to be occupied by one or more persons (e.g., for sitting, laying, sleeping, lounging, reading, etc.). As illustrated in FIG. **2**, one or more of the electronic components of the removable shelter **150** may be integrally mounted within the enclosure **215** (e.g., within the walls and/or fabric that form the enclosure **215**).

[0062] As shown in FIG. **2**, the electronic components of the removable shelter **150** that may be powered by the vehicle **100** may include one or more thermal components **212**. For example, the thermal components **212** may include a heating component configured to heat at least a portion of the removable shelter **150**. In the example of FIG. **2**, the thermal component **212** is implemented as a heating element (e.g., a heating coil) that is embedded in a floor **200** of the removable shelter. In one or more other implementations, the thermal component **212** may be implemented as a heater with a heating element and a fan that moves air over the heating element, a heat pump, or any other heating component. In one or more implementations, the thermal component **212** may also, or alternatively, include one or more cooling components (e.g., water-cooled or fluid-cooled channels in the floor of the removable shelter). As shown in FIG. **2**, the electronic components of the removable shelter **150** that may be powered by the vehicle **100** may include a cooling component **210** configured to cool at least a portion of the removable shelter **150**. In the example of FIG. **2**, the cooling component **210** is implemented as a fan mounted in a sidewall (e.g., within the fabric of the sidewall) of the enclosure **215**. In one or more other implementations, the cooling component **210** may be implemented as an air conditioning unit, a heat pump, and/or a component that allows for conditioned air generated by the vehicle to be piped into the enclosure **215**. In one or more implementations, the cooling component **210** may include and/or be coupled to one or more airflow pathways (e.g., ducting) that are incorporated into the frame **152**, the bounding features **154**, the floor **200**, and/or other structures of the removable shelter **150**, such as for circulating external air throughout the shelter (e.g., external air blown or pulled into the one or more airflow pathways by a fan, and/or cooled by a heat pump or other cooling system of the removable shelter).

[0063] As shown in FIG. **2**, the electronic components of the removable shelter **150** that may be powered by the vehicle **100** may include one or more one interior lights within the enclosure **215** of the removable shelter **150**. For example, the interior lights may include one or more task lights, such as (e.g., directional) reading lights **201**, and/or one or more flood lights **203** embedded within a portion (e.g., a ceiling) of the enclosure **215** (e.g., for generally lighting the interior space within the enclosure **215**). As shown in FIG. **2**, the electronic components of the removable shelter **150** that may be powered by the vehicle **100** may include one or more speakers **208**. As shown in FIG. **2**, the electronic components of the removable shelter **150** that may be powered by the vehicle **100** may include one or more charging ports **205** for a portable electronic device (e.g., a smartphone, a tablet, a smartwatch, a laptop computer, or the like). For example, the charging port **205** may be implemented as a universal serial bus (USB, or USB-c) port, a lightning port, or any other type of charging port, or an inductive charging surface.

[0064] In one or more implementations, the removable shelter **150** may include a display component **214** for displaying visual content within the enclosure **215** of the removable shelter **150** (e.g., for watching movies or other video content, and/or for viewing status information for the vehicle and/or the removable shelter). For example, the display component may include a projection screen on a wall **202** of the enclosure **215**. The projection screen may be configured to allow viewing of the visual content from one or both of two opposing sides of the projection screen. In one or more implementations, the display component **214** may also include a projector (not shown) configured to project the visual content onto the projection screen. In one or more implementations, the display component **214** may include an active display screen, such as a touchscreen or a non-interactive screen. In one or more implementations, the display component **214** may be configured to display vehicle information for the vehicle **100**, the vehicle information obtained via wired or wireless communication between the removable shelter **150** and the vehicle **100**. As examples, the vehicle information may include one or more of: a battery charge level, a battery discharge rate, a number of miles corresponding to the battery charge level, a change in the battery charge level based on a state of the removable shelter, or a change in the number of miles based on the state of the removable shelter. As shown in FIG. **2**, the electronic components of the removable shelter **150** that may be powered by the vehicle **100** may include a center high mounted stop lamp (CHMSL) **240**. The removable shelter **150** may be foldable or collapsible, to allow the removable shelter **150**, in a folded or collapsed configuration, to remain mounted to the vehicle **100** while the vehicle **100** is in motion (e.g., and while maintaining a powered connection for the CHMSL **240**.

[0065] As shown in FIG. **2**, the removable shelter **150** may include a control panel **204** integrally formed within the enclosure **215** of the removable shelter **150**. As shown, the control panel may include one or more control elements **206** (e.g., buttons, switches, dials, touch-sensitive elements, or the like) for controlling respective electronic components of the removable shelter **150**. In one or more implementations,

one or more of the electronic components of the removable shelter **150** may also, or alternatively, be operable via a portable electronic device (e.g., a smartphone, a tablet, a smartwatch, a laptop computer, or the like) that is communicatively coupled to the removable shelter via communications circuitry of the removable shelter **150** (e.g., using an application installed on the portable electronic device). In one or more implementations, one or more of the electronic components of the removable shelter **150** may also, or alternatively, be operable via the control panel **182** within the vehicle **100**. In one or more implementations, one or more electronic features of the vehicle **100** (e.g., lights, audio, information access) may be operable via the control panel **204** within the removable shelter **150**.

[0066] In one or more implementations, the floor **200** of the removable shelter **150** may also include powered components (e.g., for lifting a portion of the floor **200** to provide a backrest or other seating feature).

[0067] In the examples of FIGS. **1**A and **1**B, the entrance **156** of the removable shelter **150** is shown as being located on a side of the removable shelter **150** (e.g., a side of the removable shelter **150** that is mounted above the doors **193** of the vehicle **100**). In one or more other implementations, the entrance **156** of the removable shelter **150** may be located elsewhere on the removable shelter **150**. For example, the entrance **156** may be located at a front or a rear of the removable shelter **150** in one or more implementations.

[0068] FIG. **3** illustrates an example in which the removable shelter **150** includes a window **300** along the side of the removable shelter **150** (e.g., a side of the removable shelter **150** that is configured to be mounted above the doors **193** of the vehicle **100**). The window **300** may be formed by an opening in the bounding features **154** (e.g., in the fabric walls **307**, such as in a main fabric wall) of the removable shelter **150**. The opening for the window **300** may be covered by a mesh fabric that allows air and light to pass through, while preventing insects and/or debris from passing into the enclosure **215** formed by the bounding features **154**. For example, the window **300** may have a fabric cover that can be zipped to close the window **300** or unzipped to open the window **300**.

[0069] As shown in FIG. **3**, the removable shelter **150** may also include a window **302** at an end (e.g., a front end) of the enclosure **215**. In one or more implementations, the window **302** may include a transparent cover **303**. For example, the transparent cover **303** may be formed from glass, transparent rigid plastic, plexiglass, or a transparent flexible plastic. As shown, the transparent cover may be mounted in an opening in a portion **304** of the frame **152** of the removable shelter **150**. In the example of FIG. **3**, the access feature **158** (e.g., the ladder) can be seen at an end (e.g., a rear end) of the removable shelter **150** that is opposite the end of the removable shelter **150** at which the window **302** is mounted. FIG. **3** also shows how the removable shelter **150** may be provided with an outer layer **306** (e.g., a canopy such as a rainfly and/or sun shield). For example, the outer layer **306** may be foldable and/or removable from the removable shelter **150** so that the outer layer **306** can be deployed and/or retracted as desired. The outer layer **306** may be positioned away from the fabric wall **307**, as shown in FIG. **3**, by a strut **308***a* and a strut **308***b*, each of which may be position in a respective port. Also, a user may actuate the struts **308***a* and **308***b* while positioned in the removable shelter **150** or while outside of the removable shelter **150**. Moreover, based on the struts **308***a* and **308***b*, the outer layer **306** may be positioned at an angle (within a range of angles) relative to the fabric wall **307**.

[0070] FIG. **4** illustrates a bottom view of the removable shelter **150** in the configuration of FIG. **3**. As shown in FIG. **4**, the frame **152** of the removable shelter **150** may include the portion **304**, a portion **400**, and a portion **402**. For example, the portion **402** (e.g., and the bounding features **154**) may be configured to fold into a case formed by the portion **304** and the portion **400** for stowage of the removable shelter **150** (e.g., when the removable shelter **150** is not in use, and/or during driving of a vehicle to which the removable shelter **150** is attached). In the example of FIG. **4**, the removable shelter **150** includes four mechanical connectors **161** (e.g., clamps) on the bottom of the portion **400** of the frame **152**. As discussed in further detail hereinafter (see, e.g., FIGS. **17-19**), the four mechanical connectors **161** of FIG. **4** may be configured to mount to one or more roof structures, such as one or more fixed or removable crossbars mounted to the roof of a vehicle. In one or more implementations, the mechanical connectors **161** of FIG. **4** may be provided with or without electrical contacts (e.g., electrical connectors **166**) for receiving power (e.g., from the battery **110** via the crossbars) from the vehicle **100**.

[0071] FIG. **5**A illustrates a side view of a removable shelter **150** a closed position in accordance with one or more implementations. As shown, the portion **304** couples with the portion **400** to carry several components (e.g., within the portion **304**) of the removable shelter **150**. The removable shelter **150** may further include a latch **401**. When actuated (e.g., by a user), the latch **401** allows the portion **304** to rotate away from the portion **400**, thereby allowing the removable shelter **150** to deploy.

[0072] FIG. **5**B illustrates a side view of the frame **152** of the removable shelter **150**. In the example of FIG. **5**B, the frame **152** includes the portion **304**, the portion **400**, the portion **402**, a mid hoop **500**, and a rear hoop **503**. As shown, the rear hoop **503** may include a door frame **502**, and an outer frame **504**. As shown, the portion **304** may be mounted to the portion **400** (e.g., by a hinge), and may open to an angle of more than ninety degrees (e.g., as much as or more than one hundred five degrees) with respect to the portion **400** (e.g., to allow an occupant of the removable shelter **150** a view downward toward the ground when the removable shelter **150** is mounted to the roof of a vehicle). For example, the portion **304** may be secured to the portion **400** by a strut **508** (e.g., a hydraulic strut such as a gas strut, and/or an electric powered strut or actuator) that allows the portion **304** to be closed onto the portion **400**, and limits the opening angle of the portion **304** (e.g., with respect to the portion **400**) to an angle of more than ninety degrees, as shown. In one or more implementations, the portion **400** and the portion **402** of the frame may form a foundation or base for the floor **200** of the enclosure **215**. As shown, the outer frame **504** may be mounted to the portion **402** and/or the door frame **502**, such that, in an open/extended configuration, the outer frame **504** opens to an angle of more than ninety degrees (e.g., one hundred five degrees) and is outward of the door frame. Further, the access feature **158** may be coupled with the portion **402**. As a result, when a user pulls the access feature **158**, the portion **402** may be moved (e.g., rotated) to the position shown in FIG. **5**B. When the access feature **158** takes the form of a ladder, the access feature **158**

may include a telescoping ladder. In this regard, the access feature **158** may transition with a smaller footprint, thus allowing the access feature **158** to be stowed within the portion **304**.

[0073] As discussed in further detail hereinafter (see, e.g., FIGS. **6-9**), a door for the removable shelter **150** may be mounted to the door frame **502** (e.g., at an end, such as a rear end, of the removable shelter **150**). As discussed in further detail hereinafter (see, e.g., FIGS. **13-16**), the bounding features (e.g., fabric walls **307**) of the removable shelter may be mounted to and/or pass over the mid hoop **500**, the door frame **502**, and/or the outer frame **504**.

[0074] The rear hoop **503** can be actuated using a variety of mechanisms, such as a mechanism **506**. As examples, the mechanism **506** may be implemented as a pulley mechanism or a ratchet mechanism. For example, a pulley mechanism may be provided that enables the rear hoop **503** to be deployed in the same motion of the removable shelter **150** being deployed (e.g., by opening the portion **304** of the frame **152** from the portion **400**, and/or rotating the portion **402** away from the portion **400**), such as by connecting the rotation of the rear hoop **503** to the mid hoop **500**. In one or more other implementations, the mechanism **506** may be implemented as a ratchet mechanism. For example, the ratchet mechanism may include two ratchets, one extending from each side of the portion **402** to each side (e.g., arm) of the outer frame **504**. When the ratchet is engaged, it can be used to tension the fabric of the bounding features **154** that form the enclosure **215**. When released, the entire rear hoop **503** can be folded down.

[0075] The frame **152**, including its components, may carry several light sources. For example, the mid hoop **500** may carry a light source **507***a*. When illuminated, the light source **507***a* may provide light in one or both directions along the Z-axis (of Cartesian coordinates). Also, the door frame **502** may carry a light source **507***b* designed to provide light near an entryway of the removable shelter **150**. Further, the portion **402** may carry a light source **507***c* designed to provide light to the access feature **158**.

[0076] FIG. **6** illustrates a perspective view of the frame **152** of FIG. **5**B. As shown in FIG. **6**, the rear hoop **503** (e.g., including the door frame **502** and the outer frame **504**) may be connected to the frame **152** (e.g., to the portion **402** of the frame **152**) by a long hinge **603** that extends along the width of the platform created by the portion **402**. The frame **152** may include two mechanisms **506**, such as two arms, one on either side of the rear hoop **503**. These arms of the mechanisms **506** may house the ratchet mechanism described herein, and may also support the rear hoop **503** in the deployed position shown in FIGS. **5** and **6**. For example, each arm of each mechanism **506** may include an upper arm portion **609** and a lower arm portion **607**. The upper arm portion **609** may contain a ratchet outer, and the lower arm portion **607** may contain a pawl.

[0077] In one or more implementations of the mechanism **506**, in an "on" position of the ratchet, the ratchet clicks as a user further tensions the tent (e.g., by pulling the outer frame **504**) towards the one hundred five degree angle shown in FIGS. **5** and **6**. In these implementations, the ratchet mechanism prevents the rear hoop **503** from falling backwards. In an "off" position of the ratchet, the rear hoop **503** can move freely and the rear hoop **503** can be released into a closed position (e.g., with the rear hoop **503**, the mid hoop **500**, and the portion **402** folded into and contained by the portion **400** and the portion **304**). In the "off" position, the ratchet may allow the rear hoop to collapse and prevent it from swinging out. In one or more implementations, the ratchet may be switched between the "on" and "off" positions, such as by a user operating a switching mechanism. In one or more other implementations of the mechanism **506**, the mechanism **506** may automatically re-engage the ratchet to the "on" position responsive a push down motion or at a certain force when the rear hoop is lifted by the user. In this way, a step for a user may be removed for re-deploying the removable shelter **150**, as the switch of the ratchet to "on" can be performed as part of the deployment action by the user, in order to tension the tent/removable shelter after it has been closed.

[0078] In the example of FIG. **6**, a screen **602** is deployed over, and interior to, the window **302**. The screen **602** may be a privacy screen that prevents viewing into the enclosure **215**, a light shade that prevents light from outside the enclosure **215** from passing into the enclosure **215**, and/or may function as a display component **214**, such as a projection screen (e.g., for a projector **604**, which may be mounted to the mid hoop **500**, such as by a ball joint, in one or more implementations). The screen **602** may allow for front and rear projection, enabling the user to watch projected content (e.g., a movie or other content), projected onto the screen **602**, from the inside or outside of the removable shelter **150**. In one or more implementations, wiring may be run through the mid hoop **500** to power lights within the enclosure **215** and/or to power the projector **604**. In the example of FIG. **6**, and as discussed in further detail hereinafter (see, e.g., FIGS. **11** and **12**), the control panel **204** may be mounted in a sidewall of the portion **304** of the frame **152**.

[0079] In the perspective view of FIG. **6**, a door **600** for the removable shelter **150** is shown mounted to the door frame **502**. As discussed herein, the rear hoop **503** may consist of two separate hoops (e.g., the door frame **502** and the outer frame **504**). For example, each of the door frame **502** and the outer frame **504** may be constructed of metal (e.g., aluminum) extrusions and machined corners. As shown, the outer frame **504** may be the outermost hoop of the removable shelter **150**, and may extend to an angle (e.g., relative to the portion **402** of the frame **152**) of greater than ninety degrees (e.g., to an angle of one hundred five degrees). The outer frame **504** may serve to tension the fabric of the enclosure **215**, and may provide an attachment for the outer layer **306** (e.g., a canopy such as a rainfly). The door frame **502** may be mounted to the portion **402** of the frame **152** at an angle of ninety degrees to the floor, and configured to support the door **600** (e.g., a semi-rigid door). As described in further detail hereinafter (see, e.g., FIGS. **13-15**), the mid hoop **500**, the door frame **502**, and/or the outer frame **504** (e.g., aluminum extrusions of the mid hoop **500**, the door frame **502**, and/or the outer frame **504**) may include internal Keder slots for fabric attachment.

[0080] FIG. **7** illustrates a perspective end view of the removable shelter **150** of FIG. **3**. As shown in FIG. **7**, the door frame **502** (e.g., a door hoop) and outer frame (e.g., a rainfly hoop) may be connected by a fabric bridge **702** (e.g., using internal Keder slots). In one or more implementations, the door frame **502** may be connected to fabric of the enclosure **215** (e.g., a tent skin), such as using Keder slots, keeping the door frame **502** at ninety degrees.

[0081] As illustrated in FIG. **7**, the door **600** may be a semi-rigid magnetic door. For example, the door **600** may be free of zippers that are commonly used in tent doors. For example, the door **600** may be made with three overall parts: an inner door frame **705**, a pair of door panels **703**, and a mesh screen. For example, the inner door frame **705** may be formed from a sandwich of fabric and plastic (e.g., polypropylene) corrugate, with magnets **704** on the opening edge thereof. The inner door frame **705** may create an opening for the door **600**, and may be supported by the door frame **502** (e.g., a metal extrusion frame) of the frame **152** (e.g., a metal extrusion frame). As shown, each of the two door panels **703** may include multiple (e.g., four) leaves **700**. As shown, the leaves **700** may be connected to each other by a fabric hinge **711** between each pair of the leaves **700**.

[0082] In this example, the outermost leaves **700** of each of the door panels **703** may be attached to the inner door frame **705**. In one or more implementations, the leaves **700** may be formed from a sandwich of fabric and plastic (e.g., polypropylene) corrugate with magnets **706** at the edge of the leaf **700**. In this way, the door **600** may be configured to be stable in the closed configuration of FIG. **7**, an open configuration as shown in FIG. **8**, and/or in any of various partially open configurations. For example, the door **600** may keep itself in a particular configuration (e.g., open, partially open, or closed) using the magnets **704** that are sewn on the edge of the inner door frame **705** and the magnets **706** in the edge of the door panel leaves **700**. Also, as shown in FIG. **8**, at least some of the leaves **700** may fold onto other leaves in the open configuration.

[0083] As shown in FIG. **9**, on the inside of the inner door frame **705**, a screen door **900** may be provided. For example, the screen door **900** may be formed from a layer of mesh fabric that is mounted to the inner door frame **705**. In this way, the door **600** can remain open or partially open, and the screen door **900** may remain closed to prevent insects or debris from entering into the enclosure **215**. In one or more implementations, the screen door **900** may include two panels **903** that each include magnets **904** that attract each other to hold the screen door **900** closed when the magnets **904** of the two panels **903** meet at an interface **902**. In one or more implementations, the panels **903** may be rolled up and stored (e.g., in an elastic holder) to hold the screen door **900** in an open position. For example, the screen **602** can be pulled down to cover the entire window **302**, or can be released and/or retracted, and hidden in between the inner shell **1000** and the outer shell **1002**. As shown in FIG. **10**, a cutout in the inner shell **1000** may allow for the screen **602** to be accessed.

[0084] FIG. **10** illustrates a cross-sectional view of a part (e.g., a top section) of the portion **304** of the frame **152**. As shown in FIG. **10**, the portion **304** may be formed from an inner shell **1000** and an outer shell **1002** that form a channel **1003** (e.g., an air gap) therebetween. As shown in FIG. **10**, a base **1004** of the screen **602** may be mounted in the inner shell **1000** and may extend into the channel **1003**. In this way, the screen **602** can be rolled and stored in the channel **1003**, without occupying space within the enclosure **215**. Also shown in FIG. **10** is a portion of the transparent cover **303** mounted to the portion **304** of the frame **152** at the location of a bonding flange **1006** between the inner shell **1000** and the outer shell **1002**.

[0085] FIG. **11** illustrates a cross-sectional view of another part (e.g., a sidewall section) of the portion **304** of the frame **152**. In the example of FIG. **11**, a portion of the control panel **204** can be seen, mounted in a sidewall **1104** of the portion **304**, the sidewall **1104** formed by a portion of the inner shell **1000**. For example, the removable shelter **150** may include a fan **1106** mounted in between the inner shell **1000** and the outer shell **1002** of the portion **304** (e.g., a hard shell formed by the inner shell **1000** and the outer shell **1002**) of the frame **152**. In the example of FIG. **11**, the fan **1106** is integrated with the control panel **204**. However, in other implementations, the fan **1106** may be separated from (and controlled by) the control panel **204**. As shown in FIG. **11**, an inlet **1108** for the fan **1106** may also be disposed in the portion **304**. In the example of FIG. **11**, the inlet **1108** is disposed in the inner shell **1000** of the portion **304** of the frame **152**. As shown, the inner shell **1000** may include a first portion **1100** on a first side of a Keder slot **1103** in the inner shell **1000**, and a second portion **1102** on a second side of the Keder slot **1103**.

[0086] When the bounding features **154** (e.g., fabric walls **307**) of the enclosure **215** are mounted to the frame **152** (e.g., with at least one portion of the bounding features **154** mounted in the Keder slot **1103**), the portion **1100** of the inner shell **1000** may form a sidewall **1104** of the enclosure **215** that is interior to the enclosure **215**. In this configuration, the portion **1102** of the inner shell **1000** may be located externally to the enclosure **215**. In this arrangement, inlet **1108** may be exposed to external (e.g., "fresh") air from outside the enclosure **215**. In this arrangement, the channel **1003** between the inner shell **1000** and the outer shell **1002** may act as a duct between the inlet **1108** and the fan **1106**. By providing the inlet **1108** on the inner shell **1000** and outside the fabric of the enclosure **215**, air can be drawn into the enclosure **215** by the fan **1106** from the outside, without the inlet **1108** being visible on the exterior of the outer shell **1002**. The location of the inlet **1108** in the inner shell **1000** may also allow air to be drawn in while preventing water ingress through the inlet **1108** (e.g., by providing the inlet **1108** on a portion of the inner shell **1000** that is protected from rainfall onto the outer shell **1002**). In one or more implementations, the fan **1106** may be a bi-directional fan that can also blow air from inside the enclosure **215** out to the external environment via the inlet **1108**.

[0087] FIG. **12** illustrates an example implementation of the control panel **204** mounted in the sidewall **1104** formed by the portion **1100** of the inner shell **1000** that is interior to the fabric **1203** (e.g., a portion of the bounding features **154**, such as a portion of the fabric wall(s) **307**) that defines the enclosure **215**. In this example, the control panel **204** incorporates the reading light **201**, one or more charging ports **205** (e.g., USB, USB-c, and/or other charging ports), and a vent **1200** for the fan **1106**. As shown, the control element **206** of the control panel **204** may include a button **1204** (or other control element) for turning on or off, and/or brightening or dimming, the reading light **201**, a button **1202** (or other control element) for turning on or off other internal and/or external lights (e.g., the exterior light **174**, the flood lights **176**, and/or the flood light **203**) of the removable shelter **150**, a button **1206** (or other control element) for controlling the access features **158** (e.g., for lighting, retracting, and/or extending a ladder), a button **1201** (or other control element) for controlling (e.g., turning on or off) the fan **1106**, and/or a button **1209** (or other control element) for controlling a thermal component **212**. In the example of FIG. **12**, a single control panel **204** is shown. In one or more

implementations, the removable shelter **150** may include multiple control panels **204**, each with the features shown in FIG. **12**, such as for multiple respective zones of the removable shelter **150** (e.g., one control panel **204** on each of two opposing sidewalls of the inner shell **1000** to provide dual zone controls for two occupants of the removable shelter **150**). In one or more implementations, an application can be provided on a mobile device of a user, and/or on the control panel **182** of the vehicle **100**, to perform any or all of the control operations that can be provided by the control panel **204** of the removable shelter **150**. Also, in one or more implementations, the control panel **204** is in communication with the vehicle **100**, including a heating unit and a cooling unit of the vehicle **100**. In this regard, a user interacting with the control panel **204** may cause the vehicle **100** to provide heated air or cooled air using the heating unit or the cooling unit, respectively, of the vehicle **100**.

[0088] FIGS. **13-16** illustrate various features of the coupling between the bounding features **154** (e.g., fabric walls **307**, fabric **1203**, fabric bridge **702**, and/or outer layer **306**) and the frame **152** of the removable shelter **150**. For example, FIG. **13** illustrates a cross-sectional side view of a portion of the rear hoop **503**, showing how the outer frame **504** may include multiple Keder slots, such as Keder slots **1301**, **1303**, and **1305**. For example, the Keder slot **1301** may receive an anchor **1302** for the fabric bridge **702** that extends between the outer frame **504** and the door frame **502**. As shown, the door frame **502** may include a Keder slot **1307** configured to receive an anchor **1300** for the other end of the fabric bridge **702**.

[0089] The Keder slot **1303** may be configured to receive an anchor **1304** for a main fabric **1308** of the enclosure **215** (e.g., a fabric layer, such as a portion of the fabric walls **307**, that forms the interior roof and/or walls of the enclosure **215**). For example, the main fabric **1308** may extend over the door frame **502** and the mid hoop **500** to the portion **304** (e.g., and may be attached or anchored, at the opposite end, to the portion **304**) of the frame **152**. The Keder slot **1305** may be configured to receive an anchor **1306** for the outer layer **306** (e.g., the canopy or rainfly). The outer layer **306** may also extend, externally to the main fabric **1308**, over the door frame **502** and the mid hoop **500** to the portion **304** (e.g., and may by attached or anchored at the opposite end to the portion **304**) of the frame **152**. FIG. **13** also illustrates the location of the inner door frame **705** on the door frame **502**.

[0090] One or more of the multiple Keder slots in the outer frame **504** and/or the door frame **502** may extend around several portions (e.g., the entire hoop) thereof to create a seamless connection between the fabric and frame parts. For example, FIG. **14** illustrates a cross-sectional top view of a portion of the frame **152**. As shown in FIG. **14**, the anchor **1304** for the main fabric **1308** may extend (within the Keder slot **1303**) along the side arm of the outer frame **504** as well as the top of the outer frame **504**. As shown, the anchor **1302** for the fabric bridge **702** may extend (within the Keder slot **1301**) along the side arm of the outer frame **504** (e.g., interior to the location of the anchor **1304**) as well as the top of the outer frame **504**. FIG. **14** also shows how the anchor **1300** for the fabric bridge **702** may extend (within the Keder slot **1307**) along the side arm of the door frame **502**.

[0091] FIG. **15** illustrates a cross-sectional side view of a lower portion of the rear hoop **503** at the connection to the portion **402** of the frame **152**. FIG. **15** shows how portions of the anchors **1302** and **1304**, for the fabric bridge **702** and the main fabric **1308**, respectively, may also run along the bottom of the outer frame **504**. As shown, a portion of the anchor **1300** of the fabric bridge **702** may run along the bottom of the door frame **502**. As shown, the portion **402** may include a Keder slot **1600** that is configured to receive an anchor **1601** for an opposing end of a bottom portion of the main fabric **1308**. As shown, the bottom portion of the main fabric **1308** may be loose when the rear hoop **503** is in the deployed or open position (e.g., to allow freedom of the outer frame **504** to fold onto the portion **402** when the removable shelter **150** is folded into a closed configuration).

[0092] FIG. **16** illustrates an end view of the frame **152**, showing the long hinge **603** that hingedly connects outer frame **504** to the portion **402** of the frame. FIG. **16** also shows how two mechanisms **506** may be provided on either side of the outer frame **504**.

[0093] FIGS. **17-19** illustrate various aspects of the mechanical connectors **161** of the removable shelter **150**. For example, FIG. **17** illustrates a bottom perspective view of a mechanical connector **161** in accordance with one or more implementations. As shown, the mechanical connector **161** may include a base **1700** that is configured to be attached (e.g., using fasteners **1704**, such as bolts or screws) to the portion **400** of the frame **152** of the removable shelter **150**. In one or more implementations, a pair of clamping members **1702** may extend from the base **1700**. As indicated by the arrows in the figure, the clamping members **1702** may move toward each other to close or shrink a gap **1701** therebetween, to clamp the mechanical connector **161** to a crossbar mounted to a roof of the vehicle **100**. For example, the surfaces **1706** of the clamping members **1702** may press against the outer surface of a crossbar to secure the removable shelter **150** to the crossbar. In one or more implementations, the surfaces **1706** may be provided with electrical contacts **1707** (e.g., one or more pogo pins) for electrically coupling an electrical system of the removable shelter **150** to power from the battery **110** of the vehicle **100** (e.g., via coupling to one or more electrical contacts on a crossbar on the roof of the vehicle **100**). While FIG. **17** shows one of the surfaces **1706** having electrical contacts **1707**, an additional surface of the surfaces **1706** may include similar electrical contacts. In one or more other implementations, one or more cables may be provided through (or separately from) the mechanical connectors **161** to electrically couple the electrical system of the removable shelter **150** to power from the battery **110** of the vehicle **100**. For example, one or both of the clamping members **1702** may have an opening that houses an electrical connector that connects to an electrical connector on or within a crossbar on the roof of the vehicle **100**, in one or more implementations. Further, in one or more implementations, the mechanical connector **161** may provide, via the electrical contacts **1707** or another electrical component, a predetermined electrical resistance value. In this regard, when the removable shelter **150** is connected to the vehicle **100** via the mechanical connector **161**, the mechanical connector may provide an electrical resistance value (e.g., the predetermined electrical resistance value) to the vehicle **100**, and the vehicle **100** can identify the presence of the removable shelter **150** based on the electrical resistance value.

[0094] In one or more implementations, the clamping members **1702** may be configured to move in unison to clamp together. For example, FIG. **18** illustrates a top view

of a mechanical connector **161** in which a gear **1804** is provided between an actuating member **1800** for a first one of the clamping members **1702** and an actuating member **1802** for a second one of the clamping members **1702**. In this way, the gear **1804** couples motion of either of the clamping members **1702** to an opposite motion of the other of the clamping members **1702**. The clamping members may be moved to clamp or release the mechanical connector **161** mechanically (e.g., by a user pushing the clamping members together) or electronically, in various implementations.

[0095] FIG. **19** illustrates a cross-sectional side view of a mechanical connector **161** in an implementation in which a paddle **1900** is provided for clamping and releasing the clamping members **1702**. In the example, of FIG. **19**, when the paddle **1900** is depressed, it pulls both clamping members **1702** inwards towards each other (e.g., and towards a crossbar **1915** on the roof of the vehicle **100**). Once the clamping members **1702** contact the crossbar, a remaining portion of a motion of the paddle **1900** may compress a spring **1904** (e.g., a die spring), creating a clamping force on the bars. For example, moving the paddle **1900** toward the closed configuration shown in FIG. **19** may cause a rocker **1906** to follow a path **1908** that guides a portion of the rocker up into an opening **1910** and then laterally to compress the spring **1904**. The paddle **1900** may be over-centered so that it snaps into the closed configuration shown in FIG. **19**. In one or more implementations, the mechanical connector **161** may be provided with a locking mechanism to allow the removable shelter **150** to be locked to a vehicle.

[0096] As illustrated by FIGS. **3-19**, in one or more implementations, a frame **152** may be provided for a shelter (e.g., removable shelter **150**). The frame may include a first portion (e.g., portion **304**) including a window (e.g., window **302**); a second portion (e.g., portion **400**) coupled to the first portion and configured to form a first part of base (e.g., a first base) for a floor **200** (e.g., a floor base) of the shelter; a third portion (e.g., portion **402**) coupled to the second portion and configured to form a second part of the base (as a second base) for the floor **200** of the shelter; a first hoop (e.g., mid hoop **500**) coupled to the second portion and the third portion of the frame; and one or more second hoops (e.g., rear hoop **503**) coupled to the second portion of the frame. The first portion, the second portion, the third portion, the first hoop, and the one or more second hoops may be configured to support one or more fabric bounding features (e.g., bounding features **154**, including main fabric **1308**, fabric bridge **702**, fabric walls **307**, fabric **1203**, and/or outer layer **306**) that form an enclosure **215** for the shelter. The first portion may include an inner shell **1000**, an outer shell **1002**, and an air gap (e.g., channel **1003**) between the inner shell and the outer shell. The first portion may be configured to open to an angle of greater than ninety degrees relative to the second portion. The window may include a solid transparent cover (e.g., a glass or plexiglass cover).

[0097] The inner shell **1000** may be configured to house a control panel **204** having a fan **1106**, and an inlet **1108**. The air gap may form a duct between the inlet **1108** and the fan **1106**. The inner shell **1000** may be configured to support a screen **602** that is extendible over the window **302**. The one or more second hoops may include a door frame **502** for a door **600** for the enclosure, and an outer frame **504**. The door frame **502** may be configured to receive an inner door frame **705** of the door **600**, the door **600** include multiple panels (e.g., multiple leaves **700**) coupled together by fabric hinges **711**. The inner door frame **705** and the multiple panels may each include one or more magnets (e.g., magnets **704** and **706**) configured to hold the door **600** in any of an open, partially open, or closed position.

[0098] The door frame **502** may be configured to open to an angle of ninety degrees relative to the second portion of the frame, and the outer frame **504** may be configured to open to an angle of greater than ninety degrees relative to the second portion of the frame. The outer frame **504** may include multiple Keder slots (e.g., Keder slots **1301**, **1303**, and **1305**) configured to receive a multiple anchors (e.g., anchors **1302**, **1304**, and **1306**) for a multiple fabric portions (e.g., including main fabric **1308**, fabric bridge **702**, and/or outer layer **306**) of the one or more fabric bounding features (e.g., bounding features **154**). The multiple Keder slots may include a Keder slot **1301** for an anchor **1302** for a first end of a fabric bridge **702** between the door frame **502** and the outer frame **504**, and the door frame **502** may include an additional Keder slot **1307** configured to receive an anchor **1300** for an opposing end of the fabric bridge **702** between the door frame **502** and the outer frame **504**.

[0099] In one or more implementations, the frame **152** may also include a strut **508** that couples the first portion and the second portion; and a mechanism **506** that couples the second portion and the outer frame. The mechanism **506** may be implemented as a pulley mechanism. The mechanism **506** may be implemented as a ratchet mechanism. In one or more implementations, the frame **152** may also include multiple mechanical connectors **161** on the second portion, each of the multiple mechanical connectors **161** configured to attach to a corresponding crossbar **1915** on a roof of a vehicle (e.g., vehicle **100**). Each of the multiple mechanical connectors **161** may include a pair of opposing clamping members **1702** that are configured to move in unison to clamp the mechanical connector **161** to the corresponding crossbar **1915**. Each of the multiple mechanical connectors may include a spring **1904** and a paddle **1900**, the paddle **1900** configured to compress the spring **1904** to press the pair of opposing clamping members against the crossbar **1915**. In one or more implementations, the shelter may also include a first light source (e.g., light source **507***a*) on (e.g., carried by or mounted to) the first hoop, a second light source (e.g., a light source **507***b*) on (e.g., carried by or mounted to) the one or more second hoops, and a third light source (e.g., light source **507***c*) on (e.g., carried by or mounted to) the third portion.

[0100] As illustrated by FIGS. **3-19**, in one or more implementations, a removable shelter **150** may include a frame **152** configured to removably mount to a vehicle **100**. The frame may include a first base portion (e.g., portion **400**) coupled to a window portion (e.g., portion **304**) and configured to form at least part of a floor base (e.g., a floor base, such as floor **200**, which may be formed from the portion **400** and the portion **402** of the frame **152** when the frame is in a deployed configuration). The frame may also include a second base portion (e.g., portion **402**) configured to form at least another part of the floor base (e.g., floor **200**). The frame may also include a support structure (e.g., hoop **500**, such as a closed or continuous hoop or a hoop with one or more discontinuities or gaps along the hoop structure) coupled to the first base portion and the second base portion. The first base portion, the second base portion, and the support structure may be configured to support one or more fabrics (e.g., bounding features **154**, which may include

fabric walls **307**) that bind to form an enclosure **215** for the removable shelter. The removable shelter may also include the one or more fabrics. At least one of the one or more fabrics may be anchored within at least one respective Keder slot in the first hoop.

[0101] FIG. **20** illustrates a flow diagram of an example process **2000** that may be performed for operating one or more electronic components of a removable shelter, in accordance with implementations of the subject technology. For explanatory purposes, the process **2000** is primarily described herein with reference to the removable shelter **150** of FIGS. **1A-19**. However, the process **2000** is not limited to the removable shelter **150** of FIGS. **1A-19**, and one or more blocks (or operations) of the process **2000** may be performed by one or more other components of other suitable apparatuses, moveable apparatuses, devices, and/or systems. Further for explanatory purposes, some of the blocks of the process **2000** are described herein as occurring in serial, or linearly. However, multiple blocks of the process **2000** may occur in parallel. In addition, the blocks of the process **2000** need not be performed in the order shown and/or one or more blocks of the process **2000** need not be performed and/or can be replaced by other operations.

[0102] As illustrated in FIG. **20**, at block **2002**, a removable shelter (e.g., removable shelter **150**) may be mechanically mounted (e.g., via mechanical connectors **159** and **161**) to a vehicle (e.g., vehicle **100**). Mechanically mounting the removable shelter to the vehicle may electrically couple an electrical system of the removable shelter to an electrical system of the vehicle (e.g., including a vehicle battery, such as battery **110**). In one or more other implementations, the electrical system of the removable shelter may be coupled to the electrical system of the vehicle separately from the mechanical mounting.

[0103] At block **2004**, at least one electronic component (e.g., sensor **168**, powered dock **172**, exterior light **174**, flood lights **176**, reading light **201** such as a directional reading light, flood light **203**, control panel **204**, speaker **208**, thermal component **212**, cooling component **210**, etc.) of the removable shelter may be operated using power provided from the electrical system of the vehicle (e.g., from the battery **110**). In one or more implementations, the process **2000** may also include receiving, by the removable shelter, an electronic communication from the vehicle (e.g., via communications circuitry **178** of the removable shelter, and/or via vehicle communications circuitry **180** of the vehicle). For example, the electronic communication may include vehicle status information, adjusted according to the presence, the weight, and/or the operational state of the removable shelter. In one or more implementations, receiving the electronic communication may include receiving the electronic communication wirelessly from the vehicle. In one or more other implementations, receiving the electronic communication may include receiving the electronic communication via a communications port that is integrated into a mechanical connector **161** for mechanically mounting the removable shelter to the vehicle. For example, the mechanical connector may also include an electrical connector **166** for electrically coupling the electrical system of the removable shelter to the electrical system of the vehicle.

[0104] FIG. **21** illustrates an example computing system **2100** with which aspects of the subject technology may be implemented in accordance with one or more implementations. The computing system **2100** can be, and/or can be a part of, any computing device or apparatus for generating the features and processes described above, including but not limited to control circuitry for a vehicle, control circuitry for a removable shelter, and the like. The computing system **2100** may include various types of computer readable media and interfaces for various other types of computer readable media. The computing system **2100** includes a permanent storage device **2102**, a system memory **2104** (and/or buffer), an input device interface **2106**, an output device interface **2108**, a bus **2110**, a ROM **2112**, one or more processing unit(s) **2114**, one or more network interface(s) **2116**, and/or subsets and variations thereof.

[0105] The bus **2110** collectively represents all system, peripheral, and chipset buses that communicatively connect the numerous internal devices of the computing system **2100**. In one or more implementations, the bus **2110** communicatively connects the one or more processing unit(s) **2114** with the ROM **2112**, the system memory **2104**, and the permanent storage device **2102**. From these various memory units, the one or more processing unit(s) **2114** retrieves instructions to execute and data to process in order to execute the processes of the subject disclosure. The one or more processing unit(s) **2114** can be a single processor or a multi-core processor in different implementations.

[0106] The ROM **2112** stores static data and instructions that are needed by the one or more processing unit(s) **2114** and other modules of the computing system **2100**. The permanent storage device **2102**, on the other hand, may be a read-and-write memory device. The permanent storage device **2102** may be a non-volatile memory unit that stores instructions and data even when the computing system **2100** is off. In one or more implementations, a mass-storage device (such as a magnetic or optical disk and its corresponding disk drive) may be used as the permanent storage device **2102**.

[0107] In one or more implementations, a removable storage device (such as a flash drive) may be used as the permanent storage device **2102**. Like the permanent storage device **2102**, the system memory **2104** may be a read-and-write memory device. However, unlike the permanent storage device **2102**, the system memory **2104** may be a volatile read-and-write memory, such as random-access memory. The system memory **2104** may store any of the instructions and data that one or more processing unit(s) **2114** may need at runtime. In one or more implementations, the processes of the subject disclosure are stored in the system memory **2104**, the permanent storage device **2102**, and/or the ROM **2112**. From these various memory units, the one or more processing unit(s) **2114** retrieves instructions to execute and data to process in order to execute the processes of one or more implementations.

[0108] The bus **2110** also connects to the input and output device interfaces **2106** and **2108**. The input device interface **2106** enables a user to communicate information and select commands to the computing system **2100**. Input devices that may be used with the input device interface **2106** may include, for example, alphanumeric keyboards and pointing devices (also called "cursor control devices"). The output device interface **2108** may enable, for example, the display of images generated by computing system **2100**. Output devices that may be used with the output device interface **2108** may include, for example, printers and display devices, such as a liquid crystal display (LCD), a light emitting diode (LED) display, an organic light emitting diode (OLED)

display, a flexible display, a flat panel display, a solid state display, a projector, or any other device for outputting information.

[0109] One or more implementations may include devices that function as both input and output devices, such as a touchscreen. In these implementations, feedback provided to the user can be any form of sensory feedback, such as visual feedback, auditory feedback, or tactile feedback; and input from the user can be received in any form, including acoustic, speech, or tactile input.

[0110] Finally, as shown in FIG. **21**, the bus **2110** also couples the computing system **2100** to one or more networks and/or to one or more network nodes through the one or more network interface(s) **2116**. In this manner, the computing system **2100** can be a part of a network of devices (such as a LAN, a wide area network ("WAN"), or an Intranet, or a network of networks, such as the Internet). Any or all components of the computing system **2100** can be used in conjunction with the subject disclosure.

[0111] Implementations within the scope of the present disclosure can be partially or entirely realized using a tangible computer-readable storage medium (or multiple tangible computer-readable storage media of one or more types) encoding one or more instructions. The tangible computer-readable storage medium also can be non-transitory in nature.

[0112] The computer-readable storage medium can be any storage medium that can be read, written, or otherwise accessed by a general purpose or special purpose computing device, including any processing electronics and/or processing circuitry capable of executing instructions. For example, without limitation, the computer-readable medium can include any volatile semiconductor memory, such as RAM, DRAM, SRAM, T-RAM, Z-RAM, and TTRAM. The computer-readable medium also can include any non-volatile semiconductor memory, such as ROM, PROM, EPROM, EEPROM, NVRAM, flash, nvSRAM, FeRAM, FeTRAM, MRAM, PRAM, CBRAM, SONOS, RRAM, NRAM, race-track memory, FJG, and Millipede memory.

[0113] Further, the computer-readable storage medium can include any non-semiconductor memory, such as optical disk storage, magnetic disk storage, magnetic tape, other magnetic storage devices, or any other medium capable of storing one or more instructions. In one or more implementations, the tangible computer-readable storage medium can be directly coupled to a computing device, while in other implementations, the tangible computer-readable storage medium can be indirectly coupled to a computing device, e.g., via one or more wired connections, one or more wireless connections, or any combination thereof.

[0114] Instructions can be directly executable or can be used to develop executable instructions. For example, instructions can be realized as executable or non-executable machine code or as instructions in a high-level language that can be compiled to produce executable or non-executable machine code. Further, instructions also can be realized as or can include data. Computer-executable instructions also can be organized in any format, including routines, subroutines, programs, data structures, objects, modules, applications, applets, functions, etc. As recognized by those of skill in the art, details including, but not limited to, the number, structure, sequence, and organization of instructions can vary significantly without varying the underlying logic, function, processing, and output.

[0115] While the above discussion primarily refers to microprocessor or multi-core processors that execute software, one or more implementations are performed by one or more integrated circuits, such as ASICs or FPGAs. In one or more implementations, such integrated circuits execute instructions that are stored on the circuit itself.

[0116] Those of skill in the art would appreciate that the various illustrative blocks, modules, elements, components, methods, and algorithms described herein may be implemented as electronic hardware, computer software, or combinations of both. To illustrate this interchangeability of hardware and software, various illustrative blocks, modules, elements, components, methods, and algorithms have been described above generally in terms of their functionality. Whether such functionality is implemented as hardware or software depends upon the particular application and design constraints imposed on the overall system. Skilled artisans may implement the described functionality in varying ways for each particular application. Various components and blocks may be arranged differently (e.g., arranged in a different order, or partitioned in a different way) all without departing from the scope of the subject technology.

[0117] It is understood that any specific order or hierarchy of blocks in the processes disclosed is an illustration of example approaches. Based upon design preferences, it is understood that the specific order or hierarchy of blocks in the processes may be rearranged, or that all illustrated blocks be performed. Any of the blocks may be performed simultaneously. In one or more implementations, multitasking and parallel processing may be advantageous. Moreover, the separation of various system components in the implementations described above should not be understood as requiring such separation in all implementations, and it should be understood that the described program components (e.g., computer program products) and systems can generally be integrated together in a single software product or packaged into multiple software products.

[0118] As used herein, the phrase "at least one of" preceding a series of items, with the term "and" or "or" to separate any of the items, modifies the list as a whole, rather than each member of the list (i.e., each item). The phrase "at least one of" does not require selection of at least one of each item listed; rather, the phrase allows a meaning that includes at least one of any one of the items, and/or at least one of any combination of the items, and/or at least one of each of the items. By way of example, the phrases "at least one of A, B, and C" or "at least one of A, B, or C" each refer to only A, only B, or only C; any combination of A, B, and C; and/or at least one of each of A, B, and C.

[0119] The predicate words "configured to", "operable to", and "programmed to" do not imply any particular tangible or intangible modification of a subject, but, rather, are intended to be used interchangeably. In one or more implementations, a processor configured to monitor and control an operation or a component may also mean the processor being programmed to monitor and control the operation or the processor being operable to monitor and control the operation. Likewise, a processor configured to execute code can be construed as a processor programmed to execute code or operable to execute code.

[0120] Phrases such as an aspect, the aspect, another aspect, some aspects, one or more aspects, an implementation, the implementation, another implementation, some implementations, one or more implementations, an embodi-

ment, the embodiment, another embodiment, some implementations, one or more implementations, a configuration, the configuration, another configuration, some configurations, one or more configurations, the subject technology, the disclosure, the present disclosure, other variations thereof and alike are for convenience and do not imply that a disclosure relating to such phrase(s) is essential to the subject technology or that such disclosure applies to all configurations of the subject technology. A disclosure relating to such phrase(s) may apply to all configurations, or one or more configurations. A disclosure relating to such phrase (s) may provide one or more examples. A phrase such as an aspect or some aspects may refer to one or more aspects and vice versa, and this applies similarly to other foregoing phrases.

[0121] The word "exemplary" is used herein to mean "serving as an example, instance, or illustration". Any embodiment described herein as "exemplary" or as an "example" is not necessarily to be construed as preferred or advantageous over other implementations. Furthermore, to the extent that the term "include", "have", or the like is used in the description or the claims, such term is intended to be inclusive in a manner similar to the term "comprise" as "comprise" is interpreted when employed as a transitional word in a claim.

[0122] All structural and functional equivalents to the elements of the various aspects described throughout this disclosure that are known or later come to be known to those of ordinary skill in the art are expressly incorporated herein by reference and are intended to be encompassed by the claims. Moreover, nothing disclosed herein is intended to be dedicated to the public regardless of whether such disclosure is explicitly recited in the claims. No claim element is to be construed under the provisions of 35 U.S.C. § 112(f) unless the element is expressly recited using the phrase "means for" or, in the case of a method claim, the element is recited using the phrase "step for".

[0123] The previous description is provided to enable any person skilled in the art to practice the various aspects described herein. Various modifications to these aspects will be readily apparent to those skilled in the art, and the generic principles defined herein may be applied to other aspects. Thus, the claims are not intended to be limited to the aspects shown herein, but are to be accorded the full scope consistent with the language claims, wherein reference to an element in the singular is not intended to mean "one and only one" unless specifically so stated, but rather "one or more". Unless specifically stated otherwise, the term "some" refers to one or more. Pronouns in the masculine (e.g., his) include the feminine and neuter gender (e.g., her and its) and vice versa. Headings and subheadings, if any, are used for convenience only and do not limit the subject disclosure.

[0124] The title, background, brief description of the drawings, abstract, and drawings are hereby incorporated into the disclosure and are provided as illustrative examples of the disclosure, not as restrictive descriptions. It is submitted with the understanding that they will not be used to limit the scope or meaning of the claims. In addition, in the detailed description, it can be seen that the description provides illustrative examples and the various features are grouped together in various implementations for the purpose of streamlining the disclosure. The method of disclosure is not to be interpreted as reflecting an intention that the claimed subject matter requires more features than are expressly recited in each claim. Rather, as the claims reflect, inventive subject matter lies in less than all features of a single disclosed configuration or operation. The claims are hereby incorporated into the detailed description, with each claim standing on its own as a separately claimed subject matter.

[0125] The claims are not intended to be limited to the aspects described herein, but are to be accorded the full scope consistent with the language of the claims and to encompass all legal equivalents. Notwithstanding, none of the claims are intended to embrace subject matter that fails to satisfy the requirements of the applicable patent law, nor should they be interpreted in such a way.

What is claimed is:

1. A shelter, comprising:

a first portion comprising a window, wherein the first portion is coupled to a second portion configured to form a first base of a floor of the shelter, and wherein the second portion is coupled to a third portion configured to form a second base for the floor;

a first hoop coupled to the second portion and the third portion; and

one or more second hoops coupled to the second portion, wherein one or more of the first portion, the second portion, the third portion, the first hoop, and the one or more second hoops are configured to support one or more fabrics that bind to form an enclosure for the shelter.

2. The shelter of claim **1**, wherein the first portion comprises an inner shell, an outer shell, and an air gap between the inner shell and the outer shell, and wherein the first portion is configured to open to an angle of greater than ninety degrees relative to the second portion.

3. The shelter of claim **1**, wherein an inner shell of the first portion is configured to house a control panel having a fan, and an inlet, wherein an air gap forms a duct between the inlet and the fan.

4. The shelter of claim **1**, wherein an inner shell of the first portion is configured to support a screen that is extendible over the window.

5. The shelter of claim **1**, wherein the one or more second hoops comprise a frame for a door for the enclosure, and an outer frame.

6. The shelter of claim **1**, wherein a frame for a door for the enclosure is configured to receive an inner door frame of the door, the door comprising a plurality of panels coupled together by fabric hinges.

7. The shelter of claim **6**, wherein the inner door frame and the plurality of panels each include one or more magnets configured to hold the door in any of an open, partially open, or closed position.

8. The shelter of claim **5**, wherein the frame for the door is configured to open to an angle of ninety degrees relative to the second portion of the frame, and the outer frame is configured to open to an angle of greater than ninety degrees relative to the second portion of the frame.

9. The shelter of claim **8**, wherein the outer frame comprises a plurality of Keder slots configured to receive a plurality of anchors for a plurality of fabric portions of the one or more fabrics.

10. The shelter of claim **9**, wherein the plurality of Keder slots include a Keder slot for an anchor for a first end of a fabric bridge between the frame and the outer frame, and wherein the frame comprises an additional Keder slot con-

figured to receive an anchor for an opposing end of the fabric bridge between the frame and the outer frame.

11. The shelter of claim **8**, further comprising:

a hydraulic strut that couples the first portion and the second portion; and

a mechanism that couples the second portion and the outer frame.

12. The shelter of claim **11**, wherein the mechanism comprises a pulley mechanism or a ratchet mechanism.

13. The shelter of claim **1**, further comprising a plurality of mechanical connectors on the second portion, each of the plurality of mechanical connectors configured to attach to a corresponding crossbar on a roof of a vehicle.

14. The shelter of claim **13**, wherein each of the plurality of mechanical connectors comprises a pair of opposing clamping members that are configured to move in unison to clamp that mechanical connector to the corresponding crossbar.

15. The shelter of claim **14**, wherein each of the plurality of mechanical connectors comprises a spring and a paddle, the paddle configured to compress the spring to press the pair of opposing clamping members against the crossbar.

16. The shelter of claim **1**, wherein the window comprises a solid transparent cover.

17. A removable shelter, comprising:

a frame configured to removably mount to a vehicle, the frame comprising:

a first base portion coupled to a window portion and configured to form at least part of a floor base;

a second base portion configured to form at least another part of the floor base; and

a support structure coupled to the first base portion and the second base portion,

wherein the first base portion, the second base portion, and the support structure are configured to support one or more fabrics that bind to form an enclosure for the removable shelter.

18. The removable shelter of claim **17**, further comprising the one or more fabrics, wherein at least one of the one or more fabrics is anchored within at least one respective Keder slot in the support structure.

19. A system, comprising:

a vehicle; and

a removable shelter configured to removably mount to the vehicle, the removable shelter comprising:

a frame, comprising:

a first portion comprising a window, wherein the first portion is coupled to a second portion configured to form a first base of a floor of the removable shelter, and wherein the second portion is coupled to a third portion configured to form a second base for the floor;

a first hoop coupled to the second portion and the third portion of the frame; and

one or more second hoops coupled to the second portion of the frame,

wherein the at least one of the first portion, the second portion, the third portion, the first hoop, and the one or more second hoops are configured to support one or more fabrics that bind to form an enclosure for the removable shelter.

20. The system of claim **19**, wherein the removable shelter further comprises a first light source on the first hoop, a second light source on the one or more second hoops, and a third light source on the third portion.

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