

MOVABLE PANEL FOR AMUSEMENT PARK ATTRACTION SYSTEM

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to and the benefit of U.S. Provisional Application Serial No. 63/536,658, filed September 5, 2023, entitled “MOVABLE PANEL FOR AMUSEMENT PARK ATTRACTION SYSTEM,” which is hereby incorporated by reference in its entirety for all purposes.

BACKGROUND

[0002] This section is intended to introduce the reader to various aspects of art that may be related to various aspects of the present techniques, which are described and/or claimed below. This discussion is believed to be helpful in providing the reader with background information to facilitate a better understanding of the various aspects of the present disclosure. Accordingly, it should be understood that these statements are to be read in this light, and not as admissions of prior art.

[0003] Throughout amusement parks and other entertainment venues, special effects can be used to help immerse guests in the experience of a ride or attraction. Immersive environments may include three-dimensional (3D) props and set pieces, robotic or mechanical elements, and/or display surfaces that present media. In addition, the immersive environment may include audio effects, smoke effects, and/or motion effects. Thus, immersive environments may include a combination of dynamic and static elements. The special effects may enable the amusement park to provide creative methods of entertaining guests, such as by providing an effect in an unexpected manner.

BRIEF DESCRIPTION

[0004] Certain embodiments commensurate in scope with the originally claimed subject matter are summarized below. These embodiments are not intended to limit the scope of the claimed subject matter, but rather these embodiments are intended only to provide a brief summary of possible forms of the subject matter. Indeed, the subject

matter may encompass a variety of forms that may be similar to or different from the embodiments set forth below.

[0005] In an embodiment, a ride vehicle for an amusement park attraction system includes a plurality of walls cooperatively defining a volume configured to receive a guest into the ride vehicle and a panel assembly with a panel and a wall of the plurality of walls. The wall is configured to contain the panel in a first configuration of the panel assembly, and the panel is configured to move relative to the wall and actuate out of the wall in a second configuration of the panel assembly.

[0006] In an embodiment, a panel assembly for an amusement park attraction system includes an enclosure, a support member positioned at least partially within the enclosure, a panel coupled to the support member, and one or more actuators positioned within the enclosure. The one or more actuators are configured to move the support member relative to the enclosure, thereby moving the panel relative to the enclosure to actuate the panel out of the enclosure.

[0007] In an embodiment, a panel assembly for an amusement park attraction system includes an enclosure defining a space and having a cover configured to extend over the space and a base, a panel configured to be positioned in the space defined by the enclosure, one or more actuators configured to drive movement of the panel relative to the enclosure, and a controller communicatively coupled to the one or more actuators. The controller is configured to instruct the one or more actuators to drive movement of the panel toward the base of the enclosure to transition the panel assembly to a first configuration and instruct the one or more actuators to drive movement of the panel away from the base of the enclosure to transition the panel assembly to a second configuration.

DRAWINGS

[0008] These and other features, aspects, and advantages of the present disclosure will become better understood when the following detailed description is read with reference to the accompanying drawings in which like characters represent like parts throughout the drawings, wherein:

[0009] FIG. 1 is a side perspective view of an embodiment of an amusement park attraction system, in accordance with an aspect of the present disclosure;

[0010] FIG. 2 is a front cross-sectional view of an embodiment of a panel assembly for an amusement park attraction system, in accordance with an aspect of the present disclosure;

[0011] FIG. 3 is a front cross-sectional view of the embodiment of the panel assembly of FIG. 2, in accordance with an aspect of the present disclosure;

[0012] FIG. 4 is a side cross-sectional view of a portion of an embodiment of a panel assembly for an amusement park attraction system, in accordance with an aspect of the present disclosure;

[0013] FIG. 5 is a front cross-sectional view of an embodiment of a panel assembly for an amusement park attraction system, in accordance with an aspect of the present disclosure;

[0014] FIG. 6 is a front cross-sectional view of an embodiment of a panel assembly for an amusement park attraction system, in accordance with an aspect of the present disclosure;

[0015] FIG. 7 is a front cross-sectional view of the embodiment of the panel assembly of FIG. 6, in accordance with an aspect of the present disclosure;

[0016] FIG. 8 is a side cross-sectional view of an embodiment of a panel assembly for an amusement park attraction system, in accordance with an aspect of the present disclosure;

[0017] FIG. 9 is a front cross-sectional view of an embodiment of a panel assembly for an amusement park attraction system, in accordance with an aspect of the present disclosure;

[0018] FIG. 10 is a front cross-sectional view of the embodiment of the panel assembly of FIG. 9, in accordance with an aspect of the present disclosure;

[0019] FIG. 11 is a side cross-sectional view of an embodiment of a panel assembly for an amusement park attraction system, in accordance with an aspect of the present disclosure;

[0020] FIG. 12 is a front cross-sectional view of an embodiment of a panel assembly for an amusement park attraction system, in accordance with an aspect of the present disclosure;

[0021] FIG. 13 is a front cross-sectional view of the embodiment of the panel assembly of FIG. 12, in accordance with an aspect of the present disclosure;

[0022] FIG. 14 is a side cross-sectional view of an embodiment of a panel assembly for an amusement park attraction system, in accordance with an aspect of the present disclosure;

[0023] FIG. 15 is a partially exploded perspective view of an embodiment of a panel assembly for an amusement park attraction system, in accordance with an aspect of the present disclosure;

[0024] FIG. 16 is a partially a partially exploded perspective view of the embodiment of a panel assembly of FIG. 15, in accordance with an aspect of the present disclosure;

[0025] FIG. 17 is a front cross-sectional view of an embodiment of a panel assembly for an amusement park attraction system, in accordance with an aspect of the present disclosure;

[0026] FIG. 18 is a front cross-sectional view of an embodiment of a panel assembly for an amusement park attraction system, in accordance with an aspect of the present disclosure; and

[0027] FIG. 19 is a flowchart of an embodiment of a method for operating a panel assembly of an amusement park attraction system, in accordance with an aspect of the present disclosure.

DETAILED DESCRIPTION

[0028] When introducing elements of various embodiments of the present disclosure, the articles “a,” “an,” and “the” are intended to mean that there are one or more of the elements. The terms “comprising,” “including,” and “having” are intended to be inclusive and mean that there may be additional elements other than the listed elements. Additionally, it should be understood that references to “one embodiment” or “an embodiment” of the present disclosure are not intended to be interpreted as excluding the existence of additional embodiments that also incorporate the recited features.

[0029] One or more specific embodiments of the present disclosure will be described below. In an effort to provide a concise description of these embodiments, all features of an actual implementation may not be described in the specification. It should be appreciated that in the development of any such actual implementation, as in any engineering or design project, numerous implementation-specific decisions must be made to achieve the developers' specific goals, such as compliance with system-related and business-related constraints, which may vary from one implementation to another. Moreover, it should be appreciated that such a development effort might be complex and time consuming, but would nevertheless be a routine undertaking of design, fabrication, and manufacture for those of ordinary skill having the benefit of this disclosure.

[0030] As used herein, the terms “approximately,” “generally,” “substantially,” and so forth, are intended to convey that the property value being described may be within a relatively small range of the property value, as those of ordinary skill would understand. For example, when a property value is described as being “approximately” equal to (or, for example, “substantially similar” to) a given value, this is intended to convey that the property value may be within +/- 5%, within +/- 4%, within +/- 3%, within +/- 2%, within +/- 1%, or even closer, of the given value. Similarly, when a given feature is described as being “substantially parallel” to another feature, “generally perpendicular” to another feature, and so forth, this is intended to convey that the given feature is within +/- 5%, within +/- 4%, within +/- 3%, within +/- 2%, within +/- 1%, or even closer, to having the described nature, such as being parallel to another feature, being perpendicular to another feature, and so forth. Mathematical terms, such as

“parallel” and “perpendicular,” should not be rigidly interpreted in a strict mathematical sense, but should instead be interpreted as one of ordinary skill in the art would interpret such terms. For example, one of ordinary skill in the art would understand that two lines that are substantially parallel to each other are parallel to a substantial degree, but may have minor deviation from exactly parallel.

[0031] Embodiments of the present disclosure are directed to a system of an amusement park. The amusement park may include various attraction systems, such as a ride (e.g., a roller coaster, a water ride, a drop tower), a performance show, a path walkway (e.g., a haunted house walkthrough), and so forth, with features that may entertain guests at the amusement park. Such features may provide a show effect, such as a visual effect, to the guests. As an example, the attraction system may include a ride vehicle in which guests may be positioned, and the ride vehicle may navigate through the attraction system to move the guests and provide entertainment to the guests. The show effect may provide additional entertainment to the guests to supplement the entertainment provided via movement of the ride vehicle.

[0032] With the increase in expectations among guests, improved and more creative attraction features are desirable. For example, providing show effects in new ways may further enhance the experience provided to guests. Therefore, an attraction system that includes improved and creative features may provide guests with greater satisfaction.

[0033] Accordingly, embodiments of the present disclosure are directed to an attraction system that includes a panel assembly with a movable panel. The panel assembly may include an enclosure in which the panel may be positioned. The panel may move to transition into and out of the enclosure. In a first configuration in which the panel may primarily be positioned within the enclosure, the panel may be concealed and therefore may not be visible to guests. However, in a second configuration in which the panel may be positioned out of, actuated out of the enclosure, and/or the panel may primarily extend out of the enclosure, the panel may be visible to guests. Such movement of the panel may present the panel to the guests in a surprising or unexpected manner. For example, the enclosure may be a part of a ride vehicle of the attraction system, such as a door or wall that serves as a barrier to secure guests within the ride vehicle. Extension of the panel out of the door or wall may be unexpected. In an

embodiment, the panel may also include a display (e.g., display screen) configured to provide imagery or other visual effects that may further entertain the guests. Thus, the panel may provide further entertainment to the guests while positioned out of, actuated out of, and/or extended out of the enclosure. In addition to providing entertainment to the guests, movement of the panel may adjust a footprint occupied by the panel assembly. For instance, retraction of the panel into the enclosure may reduce the footprint occupied by the panel assembly, and extension of the panel out of the enclosure may increase the footprint occupied by the panel assembly. Such adjustment of the panel assembly may provide greater functionality of the panel assembly. For example, extension of the panel out of the door or wall of the ride vehicle (e.g., to increase a height of the barrier surrounding guests within the ride vehicle) may provide a sense of increased securement for the guests within the ride vehicle, and retraction of the panel into the door or wall may reduce obstruction of a view of guests and/or provide a more thrilling experience for the guests. Thus, the panel assembly may be moved and operated to provide a desirable guest experience.

[0034] FIG. 1 is a side perspective view of an embodiment of an attraction system 50. In the illustrated embodiment, the attraction system 50 includes a ride vehicle 52 in which guests 54 may be positioned. In an embodiment, the ride vehicle 52 may be configured to move throughout the attraction system 50. For example, the ride vehicle 52 may be configured to travel along a ride path, such as a track, a flume, or an open pathway. Additionally or alternatively, the ride vehicle 52 may move in a different manner, such as about a pivot point. Movement of the ride vehicle 52 may carry the guests 54 to facilitate their entertainment.

[0035] The ride vehicle 52 may include a plurality of walls 56 that cooperatively define a volume 58 in which the guests 54 may be positioned. One of the walls 56A may also be a part of a panel assembly 60 that may provide additional entertainment for the guests 54. For example, the panel assembly 60 may include a panel 62 that may be movable relative to the wall 56A. For instance, the panel 62 may move (e.g., translate) into and out of the wall 56A. In a first configuration (e.g., a retracted configuration) of the panel assembly 60 in which the panel 62 is primarily positioned (e.g., fully contained) within the wall 56A, the wall 56A may conceal the panel 62 from view by the guests 54. In a second configuration (e.g., an extended configuration) of

the panel assembly 60, the panel 62 may actuate out of the wall 56A in which the panel may primarily actuate out of, be positioned out of, and/or extend out of (e.g., be entirely external to) the wall 56A and may therefore be visible to the guests 54. As an example, the panel assembly 60 may be in the first configuration while the guests are positioned external to the ride vehicle 52, and the panel assembly 60 may transition from the first configuration to the second configuration while the guests are positioned within the ride vehicle 52. The transition of the panel assembly 60 from the first configuration to the second configuration may be unexpected to the guests 54 and may therefore provide further entertainment for the guests 54. For example, the appearance of the wall 56A enclosing and concealing the panel 62 may not cause the guests 54 to believe that the panel 62 exists and can extend, actuate, and/or be positioned out of the wall 56A. Thus, the guests 54 may be surprised by the appearance and movement of the panel 62 into view of the guests 54.

[0036] Although the illustrated panel assembly 60 includes the wall 56A positioned in front the guests 54, the panel assembly 60 may include another one of the walls 56, such as a side wall 56B or a back wall 56C, in an additional or alternative embodiment. Furthermore, multiple walls 56 may have a common panel assembly 60. For example, the panel 62 may have an angle or curve to enable the panel 62 to extend or be positioned along or among different walls 56. Indeed, any suitable portion of the ride vehicle 52 may have a movable panel 62. It should also be noted that although each wall 56 has a generally planar or linear configuration in the illustrated embodiment, any of the walls 56 may have a different geometry (e.g., a curve) in an additional or alternative embodiment, and the panel 62 may be configured to be enclosed by the wall 56, and the wall 56 may have a corresponding geometry. Indeed, the wall 56 and the panel 62 may have any suitable configuration that enables enclosure of the panel 62 via the wall 56, as well as movement of the panel 62 out of the wall 56.

[0037] In one embodiment, the panel 62 may provide improved containment (e.g., increased containment) and/or a sense of increased containment of the guests 54 within the ride vehicle 52. For example, in the second configuration, the panel 62 may provide an additional barrier between the volume 58 of the ride vehicle 52 and an external environment surrounding the ride vehicle 52 and may therefore cooperatively define the volume 58 with the walls 56. Thus, the surface area of the ride vehicle 52 enclosing

the guests 54 may be increased. Additionally or alternatively, the panel 62 may provide other show effects to entertain the guests 54. By way of example, the panel 62 may include a display (e.g., a display screen, a light-emitting diode) configured to present imagery (e.g., story-related imagery, scenery-related imagery, augmented reality imagery), output light, or provide any other suitable effect that may entertain the guests 54 while extended out, actuated out, and/or positioned out of the wall 56A. Such effects may supplement the entertainment provided by movement of the ride vehicle 52 to enhance the experience of the guests 54. Furthermore, the panel 62 may be at least partially transparent to enable the guests 54 to see through the panel 62. Thus, the panel 62 may serve as a window or viewer that may enable the guests 54 to see out of the ride vehicle 52 while the panel 62 is extended out, actuated out, and/or positioned out of the wall 56A. As another example, the panel 62 may support various props, such as a show piece, a physical cutout, and so forth, to provide an additional show element that may be visible to the guests 54. Further still, the panel 62 may have a non-continuous profile that may form spaces to enable air flow through the panel 62. By way of example, the panel 62 may include multiple bars spaced apart to form gaps therebetween, the panel 62 may have a meshed configuration, and/or the panel 62 may include any other suitable openings formed therethrough. Such design of the panel 62 may correspond to a theme of the attraction system 50. Indeed, the panel 62 may have any suitable profile or provide any suitable functionality to entertain the guests 54. The panel 62 may be also composed of any suitable material, such as a polymer, a metal, a composite, another suitable material, or any combination thereof to provide sufficient structural rigidity to enable movement into and out of the wall 56A.

[0038] In an embodiment, a controller 64 (e.g., an electronic controller, a programmable control, an automation controller, a cloud computing system, control circuitry) may instruct movement of the panel 62 relative to the wall 56A via an actuator 70. The controller 64 (e.g., control system, control circuitry) may include memory 66 and processor 68 (e.g., processing system, processing circuitry). The memory 66 may include volatile memory, such as random-access memory (RAM), and/or non-volatile memory, such as read-only memory (ROM), optical drives, hard disc drives, solid-state drives, or any other non-transitory computer-readable medium that includes instructions to operate the panel assembly 60. The processor 68 may be configured to execute such instructions. For example, the processor 68 may include one or more

application specific integrated circuits (ASICs), one or more field programmable gate arrays (FPGAs), one or more general purpose processors, or any combination thereof.

[0039] The controller 64 may be communicatively coupled to an actuator 70 (e.g., an electromechanical actuator, a hydraulic actuator, a pneumatic actuator), such as a linear actuator or a rotary actuator, of the panel assembly 60 and may be configured to instruct the actuator 70 to move the panel 62 relative to the wall 56A, such as to move the panel 62 into and/or out of the wall 56A. In an embodiment, the controller 64 may instruct the actuator 70 to move the panel 62 based on data received from a sensor 72 of the attraction system 50. By way of example, the data may indicate an operating parameter of the attraction system 50, such as a position of the ride vehicle 52, a position of the guests 54 (e.g., within the volume 58), a time associated with a ride cycle of the attraction system 50, any other suitable operating parameter, or any combination thereof. Additionally or alternatively, the controller 64 may instruct the actuator 70 to move the panel 62 based on a received user input, such as a user input received from one of the guests 54 and/or from a ride operator. In an embodiment, the panel 62 may be manually moved without operation of the controller 64. In any of these embodiments, the panel 62 may be moved at any suitable time of operation of the attraction system 50, such as while the ride vehicle 52 is in motion.

[0040] Although the panel assembly 60 is implemented in the ride vehicle 52 in the illustrated embodiment, it should be noted that the panel assembly 60 and related embodiments discussed herein may be implemented in any other suitable system, such as a gate or fencing system, a stage of a theatrical show, a table or desk (e.g., for a cafeteria, for a cash register), and so forth. Indeed, the benefits of an adjustable panel assembly 60 may be provided for multiple different types of systems.

[0041] FIG. 2 is a front cross-sectional view of an embodiment of the panel assembly 60 for the amusement park attraction system 50. The panel assembly 60 includes the panel 62 and an enclosure 100 (e.g., the wall 56A of FIG. 1). The illustrated panel assembly 60 is in the first configuration in which the panel 62 is primarily positioned within (e.g., fully inserted into) the enclosure 100. In an embodiment, an end portion 102 (e.g., a top edge) of the panel 62 may be positioned external to the enclosure 100 in the first configuration. That is, a portion of the panel 62 may extend out of the enclosure 100 in the first configuration. In an additional or

alternative embodiment, an entirety of the panel 62 may be positioned within the enclosure 100.

[0042] The panel 62 may be coupled to one or more support members 104 (e.g., rails, sliders, bars), and the one or more support members 104 may be coupled (e.g., actuatably coupled) to one or more of the actuators 70 and may extend into and/or through the enclosure 100. For example, the panel assembly 60 may include one or more of the actuators 70, which may be fixedly positioned within the enclosure 100 (e.g., secured to walls of the enclosure 100). Each support member 104 may extend through a respective actuator 70, and the actuators 70 may be coupled to (e.g., actuatably coupled to, support) the one or more support members 104 to support the panel 62. The illustrated panel 62 includes a central portion 106 and side portions 108 that are connected to one another along the end portion 102, but may be offset from one another to accommodate positioning of the actuators 70 and/or of the one or more support members 104 between the central portion 106 and the side portions 108. However, the central portion 106 and the side portions 108 may be contiguous across the actuators 70 and/or across the one or more support members 104 in an additional or alternative embodiment. For example, the adjoining central portion 106 and side portions 108 may include a respective internal space or volume that may accommodate positioning of the actuators 70 and/or of the one or more support members 104 so that a connected face (e.g., a seamless surface) of the combined central portion 106 and side portions 108 can be provided.

[0043] As discussed herein, the controller 64 may be configured to instruct the actuators 70 to drive movement of the panel 62. For example, the controller 64 may instruct the actuators 70 to move the one or more support members 104, such as to translate the one or more support members 104 in directions 114. Movement of the one or more support members 104 in the directions 114 may drive corresponding movement of the panels 62 in the directions 114. In this way, the controller 64 may instruct the actuators 70 to move the panel 62 via the one or more support members 104.

[0044] The panel assembly 60 may also include a plate 110 coupled to the one or more support members 104. For instance, the plate 110 may include one or more flanges 112 that may each be coupled to the one or more support members 104. The plate 110 may facilitate securement of the first configuration and/or of the second

configuration of the panel assembly 60 via one or more couplers (e.g., magnets, clamps, fasteners (e.g., threaded fasteners)). As an example, the panel assembly 60 may include one or more first magnets 116 positioned within the enclosure 100 near (e.g., fixed to) an enclosure base 117 of the enclosure 100. The plate 110 may be composed of a magnetically polarized material, such as a metallic alloy, and the flanges 112 of the plate 110 may be configured to engage with the one or more first magnets 116, which may provide a magnetic force that may hold the plate 110 against the one or more first magnets 116, thereby maintaining the panel assembly 60 in the first configuration. However, operation of the controller 64 to instruct the actuators 70 to move the one or more support members 104 may cause the actuators 70 to provide a sufficient force that overcomes the magnetic force provided by the one or more first magnets 116, thereby disengaging the flanges 112 from the one or more first magnets 116. Thus, the operation of the controller 64 may enable the plate 110 to move away from the one or more first magnets 116 and instruct the panel 62 to position, actuate, and/or extend farther out of the enclosure 100 via the actuator 70. In an additional or alternative embodiment, the one or more first magnets 116 (e.g., electro permanent magnets) may be selectively polarized, such as via a control signal output by the controller 64. As such, the controller 64 may output the control signal to polarize the one or more first magnets 116 and maintain engagement between the plate 110 and the first magnets 116, thereby securing a position of the plate 110 against the one or more first magnets 116, and the controller 64 may interrupt output of the control signal to suspend polarization of the one or more first magnets 116 and to enable the plate to become disengaged from the first magnets 116, thereby facilitating movement of the plate 110 away from the one or more first magnets 116.

[0045] Additionally, the plate 110 may include a center segment 118 coupled to and extending between the flanges 112. The center segment 118 may be coupled to biasing members 120 positioned within the enclosure 100. As an example, the biasing members 120 may include coil springs, gas springs, and the like, configured to facilitate certain movement of the plate 110 relative to the enclosure 100. For instance, the biasing members 120 may facilitate movement of the one or more support members 104 relative to the enclosure 100, as driven by the actuators 70, thereby facilitating movement of the panel 62 relative to the enclosure 100. In this way, the biasing members 120 may

enable efficient and desirable operation of the controller 64 to instruct movement of the panel 62.

[0046] As shown in FIG. 2, the center segment 118 may be positionally offset from extension of the flanges 112 to form a U-shaped or C-shaped configuration or a stepped configuration. In this way, each flange 112 may form a recess 122 (e.g., a step) in conjunction with the center segment 118. As discussed herein, each recess 122 may be configured to receive a respective actuator 70 in the second configuration of the panel assembly 60. Thus, the plate 110 may accommodate positioning of the actuators 70 via the recesses 122 in the second configuration of the panel assembly 60.

[0047] Positioning of different components, such as the actuators 70, the plate 110, the first magnets 116, and the biasing members 120, within the enclosure 100 may conceal such components from view by the guests 54 and provide stability. Concealment of the components may provide for the unexpected movement of the panel 62. Additionally, the enclosure 100 may shield the components from external elements, such as dust and debris, thereby increasing a potential useful lifespan of the components. In an additional or alternative embodiment, one or more of the components may be positioned at a different location external to the enclosure 100, such as below the enclosure 100 (e.g., underneath the volume 58 of the ride vehicle 52 in which guests 54 are positioned) to conceal the components.

[0048] It should be noted that in an additional or alternative embodiment, different components may be used to drive movement of the panel 62. For instance, a pulley system, a counterweight system, a pump, hydraulics, and so forth may be utilized. Furthermore, any other suitable component may be used to secure the configuration of the panel assembly 60 (e.g., to secure the position of the plate 110). As an example, the actuators 70 may output a force to maintain a position of the one or more support members 104. As another example, an additional component, such as a pin, a lock, a latch, and so forth, dedicated to maintaining the configuration of the panel assembly 60 may be utilized.

[0049] FIG. 3 is a front cross-sectional view of an embodiment of the panel assembly 60. For example, in the illustrated embodiment, the panel assembly 60 is in the second configuration in which the panel 62 may be positioned out of, actuate out

of, and/or extend out of the enclosure 100. In the illustrated embodiment, an entirety of the panel 62 may be positioned out of, actuate out of, and/or extend out of the enclosure 100. For example, a first edge 142 (e.g., a bottom edge) of the panel 62 may be spaced apart from a second edge 144 (e.g., a top edge) of the enclosure 100. For instance, the space formed between the first edge 142 of the panel 62 and the second edge 144 of the enclosure 100 may be less than 5 centimeters, between 5 centimeters (2 inches) and 10 centimeters (4 inches), or between 10 centimeters and 18 centimeters (7 inches). However, in an additional or alternative embodiment, a portion of the panel 62 may remain within the enclosure 100 in the second configuration. Moreover, in an embodiment, the panel assembly 60 may be arranged between the first configuration and the second configuration in which the panel 62 may not fully be positioned out of, actuate out of, and/or extend out of the enclosure 100.

[0050] To transition the panel assembly 60 from the first configuration to the second configuration, the controller 64 may instruct the actuators 70 to drive movement of the one or more support members 104 in a first direction 140 away from the enclosure base 117 of the enclosure 100. Movement of the one or more support members 104 in the first direction 140 may also drive movement of the panel 62 and of the plate 110 in the first direction 140. Thus, the actuators 70 may be positioned in the respective recesses 122 of the plate 110 in the second configuration. In one embodiment, the panel assembly 60 may include one or more second magnets 146, which may be positioned near an opening end portion 148 of the enclosure 100. In the second configuration, the center segment 118 of the plate 110 may be engaged with the one or more second magnets 146 to secure the panel assembly 60 in the second configuration of the panel assembly 60. For example, the one or more second magnets 146 may impart a magnetic force that may hold the plate 110 against the one or more second magnets 146 to maintain the panel assembly 60 in the second configuration. However, operation of the controller 64 to instruct the actuators 70 to move the one or more support members 104 may cause the actuators 70 to provide a sufficient force that overcomes the magnetic force provided by the one or more second magnets 146 to disengage the center segment 118 from the one or more second magnets 146. Thus, the operation of the controller 64 may enable the plate 110 to move in a second direction 150, opposite the first direction 140, away from the one or more second magnets 146 and toward the enclosure base 117 to move the panel 62 into the enclosure 100, thereby transitioning the panel

assembly 60 from the second configuration to the first configuration. The one or more second magnets 146 may be selectively polarized via a control signal output by the controller 64, such as to selectively polarize the one or more second magnets 146 to maintain engagement between the plate 110 and the one or more second magnets 146 (e.g., in the second configuration) and to suspend polarization of the one or more second magnets 146 to enable the plate 110 to disengage from the one or more second magnets 146.

[0051] FIG. 4 is a side cross-sectional view of a portion of an embodiment of the panel assembly 60. For example, in the illustrated embodiment, the panel assembly 60 is in the first configuration, and the side cross-sectional view is taken along section lines A-A of FIG. 2. In the first configuration, a panel base 170 of the panel 62 extends into a space 172 formed within the enclosure 100. Additionally, a frame 174 of the panel 62 may engage with a top portion 176 of the enclosure 100. For example, the frame 174 may rest on the top portion 176 such that an appearance of the panel 62 with respect to the enclosure 100 may not provide any expectation that the panel 62 moves relative to the enclosure 100 (e.g., to extend the panel base 170 out of the enclosure 100). The panel base 170 may be positioned within an opening 178 of the top portion 176 (e.g., centered between a first side 176A of the top portion 176 and a second side 176B of the top portion 176, offset toward one of the first side 176A or second side 176B) and/or be coupled to and/or engaged with one of the first side 176A or second side 176B of the top portion 176.

[0052] In the second configuration, the panel base 170 may be actuated out of the space 172, extend out of the space 172, and/or be visible (e.g., at least partially visible) to the guests 54. Additionally, the plate 110 of the panel 62 may engage with the second magnets 146 in the second configuration. For example, the one or more second magnets 146 may be coupled to the top portion 176 (e.g., a respective second magnet 146 coupled to each of the first side 176A and/or the second side 176B of the top portion 176), and the plate 110 of the panel 62 may extend across each of the one or more second magnets 146 to engage with the one or more second magnets 146, thereby enabling securement of the panel 62 in the second configuration. In an additional or alternative embodiment, the plate 110 of the panel 62 may engage with one of the second magnets 146 and not another.

[0053] FIG. 5 is a front cross-sectional view of an embodiment of the panel assembly 60. In particular, the panel assembly 60 may have multiple panels 62 coupled to one another. For example, a first panel 62A may be coupled to a second panel 62B at a first pivot 200. Each panel 62A, 62B may be configured to be positioned within a respective enclosure 100 and/or configured to extend through and/or into a respective enclosure 100. That is, the first panel 62A may be configured to be positioned within a first enclosure 100A and/or be configured to extend through and/or into a first enclosure 100A, and the second panel 62B may be configured to be positioned within a second enclosure 100B and/or be configured to extend through and/or into a second enclosure 100B. The enclosures 100A, 100B may also be coupled to one another, such as at second pivots 202. The panels 62A, 62B may be configured to rotate relative to one another via the first pivot 200, and the enclosures 100A, 100B may be configured to rotate relative to one another via the second pivots 202, such as about a common rotational axis 204. By way of example, each of the enclosures 100A, 100B may be a respective wall 56 of a ride vehicle 52, and the second enclosure 100B may rotate relative to the first enclosure 100A to open and expose the volume 58 of the ride vehicle 52 to an external environment thereby enabling transition of guests 54 into and out of the ride vehicle 52. Thus, the first enclosure 100A may serve as a door or gate for the ride vehicle 52. For instance, the enclosures 100A, 100B may rotate relative to one another and/or the panels 62A, 62B may rotate relative to one another via a manually applied force. Additionally or alternatively, the enclosures 100A, 100B may rotate relative to one another and/or the panels 62A, 62B may rotate relative to one another via operation of the controller 64 (e.g., by instructing an actuator to drive rotation of the enclosures 100A, 100B relative to one another and/or of the panels 62A, 62B relative to one another).

[0054] The first panel 62A may also move relative to the first enclosure 100A, and the second panel 62B may move relative to the second enclosure 100B, thereby adjusting extension of the enclosures 100A, 100B out of the respective enclosures 100A, 100B. By way of example, the first panel 62A may be coupled to a first support member 104A, and a first actuator 70A may be configured to drive movement of the first support member 104A. The second panel 62B may be coupled to a second support member 104B, and a second actuator 70B may be configured to drive movement of the second support member 104B. The controller 64 may be communicatively coupled to

each of the actuators 70A, 70B. Thus, the controller 64 may instruct the actuators 70A, 70B to drive respective movement (e.g., translation) of the one or more support member 104A, 104B, thereby driving movement of the panels 62A, 62B. For instance, the panel 62A, 62B may move in conjunction with one another because of the coupling at the first pivot 200. As such, the effect provided by movement of the panels 62A, 62B may be effectuated for multiple enclosures 100A, 100B that are coupled to one another.

[0055] Additionally, a first plate 110A may be coupled to the first support member 104A, and a second plate 110B may be coupled to the second support member 104B. The first plate 110A and the second plate 110B may be configured to engage with respective first magnets 116 (e.g., first magnets 116A, 116B) to maintain positioning of the panels 62A, 62B within the respective enclosures 100A, 100B (e.g., in the first configuration). The first plate 110A and the second plate 110B may also be configured to engage with respective second magnets 146 to maintain positioning of the panels 62A, 62B out of the respective enclosures 100A, 100B (e.g., in the second configuration). Thus, desirable positioning of each of the panels 62A, 62B may be achieved.

[0056] FIG. 6 is a front cross-sectional view of an embodiment of the panel assembly 60. For example, in the illustrated embodiment, the panel assembly is in a first configuration. In the first configuration, the panel 62 may be positioned within the enclosure 100. For example, the frame 174 of the panel 62 may be coupled to and/or engaged with the top portion 176 of the enclosure 100 in the first configuration. The panel 62 of the illustrated panel assembly 60 is coupled to a guide 600. For example, the guide 600 may be coupled to a lateral end 230 of the panel 62. In an embodiment, the guide 600 may be configured to be positioned within, extend through, extend within, and/or extend into an additional enclosure 232, which may be dedicated to enclosing the guide 600. Thus, the additional enclosure 232 may conceal the guide 600 and reduce the appearance and expectation that the panel 62 is able to move out of the enclosure 100. The panel 62 may be positioned within, extend through, extend within, and/or extend at least partially into the enclosure 100 to couple to the guide 600.

[0057] Additionally, the panel 62 may be coupled to the plate 110, the plate 110 is coupled to one or more actuators 70, and the actuators 70 are coupled to the enclosure base 117 in the illustrated embodiment. The controller 64 may be communicatively

coupled to the actuators 70 and may instruct the actuators 70 to drive movement of the plate 110, thereby driving movement of the panel 62 coupled to the plate 110. The guide 600 may remain fixed during movement of the panel 62, and the panel 62 may move along the guide 600 in the directions 114. The arrangement of the guide 600 at the lateral end 230 of the panel 62 and the positioning of the actuators 70 between the plate 110 and the enclosure base 117 may enable the panel 62 to have a continuous profile. That is, the panel 62 may not have offsetting portions to accommodate positioning of the guide 600 and/or of the actuators 70. Such arrangement of the guide 600 and positioning of the actuators 70 may also enable the plate 110 to have a linear configuration instead of a U-shaped or C-shaped configuration. That is, the plate 110 may not have recesses to receive the actuators 70 (e.g., in the second configuration). In an additional or alternative embodiment, the actuators 70 may be directly attached to the panel 62, and the panel assembly 60 may not include the plate 110.

[0058] FIG. 7 is a front cross-sectional view of the embodiment of the panel assembly 60 of FIG. 6. For example, in the illustrated embodiment, the panel assembly is in a second configuration. In the second configuration, the panel 62 may be positioned out of, be actuated out of, and/or extend out of the enclosure 100. For example, the controller 64 may instruct the actuators 70 to drive movement of the plate 110 away from the enclosure base 117 to transition the panel assembly 60 from the first configuration to the second configuration. In the second configuration, the plate 110 may be coupled to and/or engaged with the top portion 176 of the enclosure 100. Thus, the plate 110 may remain within the enclosure 100.

[0059] FIG. 8 is a side cross-sectional view of an embodiment of the panel assembly 60. For example, in the illustrated embodiment, the panel assembly is in the second configuration, and the side cross-sectional view is taken along section lines A-A of FIG. 7. In the illustrated second configuration, the plate 110 is positioned within the space 172 of the enclosure 100 and couples to and/or engages with (e.g., abuts against) the top portion 176 of the enclosure 100. For example, the top portion 176 may include a lip 260 that extends over the space 172, and the plate 110 may abut against the lips 260 in the second configuration. Thus, the lips 260 may block further movement of the plate 110 out of the enclosure 100 to avoid undesirable positioning of the panel assembly 60 (e.g., extension of the plate 110 out of the enclosure 100). In some

embodiments, additional components, such as magnets, may be used to maintain engagement between the plate 110 and the lips 260, thereby maintaining the panel assembly 60 in the second configuration.

[0060] FIG. 9 is a front cross-sectional view of an embodiment of the panel assembly 60. For example, in the illustrated embodiment, the panel assembly is in a first configuration. In the first configuration, an entirety of the panel 62 is positioned within the enclosure 100, and one or more guides 278 to which the panel 62 is coupled are positioned within and/or extend within the enclosure 100. Additionally, the plate 110 may be positioned external to the enclosure 100, such as in a compartment 280 separate from the enclosure 100. For example, the compartment 280 may be positioned underneath the enclosure 100 (e.g., underneath a floor of a ride vehicle 52 having the panel assembly 60) in the first configuration. For this reason, the one or more guides 278 may be positioned within, extend through, extend within, and/or extend into the compartment 280 in the first configuration to connect to the plate 110. The actuator 70 may also be disposed in the compartment 280 instead of in the enclosure 100. Moreover, the actuator 70 and the plate 110 may be coupled to one another via a linkage 282, which may also be contained within the compartment 280 in the first configuration. The illustrated linkage 282 includes scissor segments, but the linkage 282 may include any other suitable mechanism, such as telescoping segments, a bellows, a bladder, a strut, and so forth. The positioning of the plate 110, the linkage 282, and the actuator 70 in the compartment 280, instead of in the enclosure 100, may reduce an amount of space occupied by one or more components of the panel assembly 60 in the enclosure 100 when the one or more guides 278 and the panel 62 are in the first configuration. As such, a larger sized panel 62 may be implemented and positioned in the enclosure 100.

[0061] The actuator 70 may adjust the linkage 282 to drive movement of the panel 62. For example, the controller 64 may instruct the actuator 70 to extend and to retract the linkage 282 relative to the enclosure 100, thereby driving movement of the panel 62 relative to the enclosure 100. The one or more guides 278 may remain fixed and may enable desirable movement of the panel 62, such as to move in the directions 114.

[0062] FIG. 10 is a front cross-sectional view of the embodiment of the panel assembly 60 of FIG. 9. For example, in the illustrated embodiment, the panel assembly

is in a second configuration. In the second configuration, the linkage 282 is extended via the actuator 70 to drive the panel 62 to extend out of or actuate out of the enclosure 100. For example, the actuator 70 may extend the linkage 282 at least partially into the enclosure 100. Such operation of the actuator 70 may push the panel 62 along the one or more guides 278, away from the enclosure base 117, and out of the enclosure 100. In an embodiment, the plate 110 may couple to and/or engage with the covers 176 of the enclosure 100 in the second configuration.

[0063] FIG. 11 is a side cross-sectional view of an embodiment of the panel assembly 60. For example, in the illustrated embodiment, the panel assembly is in the second configuration, and the side cross-sectional view is taken along section lines A-A of FIG. 10. In the second configuration, a cover 292 of the enclosure 100 is positioned to expose the space 172 of the enclosure 100, thereby enabling the panel 62 to be positioned out of, actuate out of, and/or extend out of the enclosure 100. By way of example, in the first configuration, the cover 292 may extend over or be positioned over the space 172 (e.g., and the panel 62) to block exposure of the space 172 (e.g., to fully contain and conceal the panel 62 within the enclosure 100). As such, the cover 292 may reduce the appearance and expectation that the panel 62 is able to move out of the enclosure 100. Movement of the panel 62 in the first direction 140 (e.g., effectuated by operation of the actuator 70) may cause the panel 62 to contact the cover 292 and to drive the cover 292 to rotate in a first rotational direction 283 about a hinge 284, thereby rotating the cover 292 away from the space 172 to expose the space 172 and enable the panel 62 to actuate out of or extend out of the space 172. Additionally, in an embodiment, the cover 292 may rotate in a second rotational direction 286, opposite the first rotational direction 283, to extend over the space 172 when the panel 62 is contained within the enclosure 100 (e.g., when the panel 62 is not positioned out of or does not extend out of the enclosure 100). For instance, a biasing member (e.g., spring) may urge rotation of the cover 292 in the second rotational direction 286.

[0064] In one embodiment, lips 288 of enclosure walls 290 may block movement of the plate 110 out of the enclosure 100. That is, the plate 110 may couple to and/or engage with (e.g., abut) the lips 288 in the second configuration and block further movement of the plate 110 and of the panel 62 in the first direction 140. Thus, the lips

288 may enable desirable positioning of the panel 62 and/or of the plate 110 in the second configuration.

[0065] FIG. 12 is a front cross-sectional view of an embodiment of the panel assembly 60. For example, in the illustrated embodiment, the panel assembly is in a first configuration. In the illustrated embodiment, the panel 62 has an irregular shape, but the panel 62 may have any other suitable shape, such as a triangular shape, a circular shape, a rectangular shape, a hexagonal shape, and so forth, in an additional or alternative embodiment. Additionally, in the first configuration, the panel 62 may be coupled to a pivot 310 and may be positioned within the enclosure 100. The controller 64 may be configured to instruct the actuator 70 to rotate the panel 62 about the pivot 310 relative to the enclosure 100. For example, the controller 64 may instruct the actuator 70 to rotate the panel 62 in a first rotational direction 312 about the pivot 310 to move the panel 62 away from the enclosure base 117 and actuate out of or extend out of the enclosure 100, and the controller 64 may instruct the actuator 70 to rotate the panel 62 in a second rotational direction 314, opposite the first rotational direction 312, about the pivot 310 to move the panel 62 toward the enclosure base 117 and retract into the enclosure 100. Additionally or alternatively, the panel 62 may move in the first rotational direction 312 and/or in the second rotational direction 314 via an externally applied force, such as a manual force applied by a user and/or a gravitational force.

[0066] FIG. 13 is a front cross-sectional view of the embodiment of the panel assembly 60 of FIG. 12. For example, in the illustrated embodiment, the panel assembly is in a second configuration. In the second configuration, the panel 62 is at least partially positioned, at least partially extends, and/or at least partially actuates out of the enclosure 100. For instance, the controller 64 may instruct the actuator 70 to rotate the panel 62 in the first rotational direction 312 to transition the panel assembly 60 from the first configuration to the second configuration. The pivot 310 may remain within the enclosure 100 in the second configuration.

[0067] FIG. 14 is a side cross-sectional view of an embodiment of the panel assembly 60. For example, in the illustrated embodiment, the panel assembly is in a second configuration, and the side cross-sectional view is taken along section lines A-A of FIG. 13. In the second configuration, a first cover portion 344A of the enclosure 100 may be moved to expose the space 172 of the enclosure 100 to enable the panel 62

to extend or actuate out of the enclosure 100. For example, in the first configuration, the first cover portion 344A may extend over the space 172, such as to couple to and/or engage (e.g., abut against) a second cover portion 344B, to block exposure of the space 172 and enable the enclosure 100 to fully conceal and contain the panel 62. The first cover portion 344A may move (e.g., slide, translate) along a corresponding enclosure wall 290 in a first direction 340 to move away from the second cover portion 344B, thereby exposing the space 172 and enabling the panel 62 to extend or actuate out of the space 172. The first cover portion 344A may also be configured to move along the corresponding enclosure wall 290 in a second direction 342, opposite the first direction 340, toward the second cover portion 344B to extend over the space 172. For example, a biasing member (e.g., spring) may urge movement of the first cover portion 344A in the second direction 342. Additionally or alternatively, the second cover portion 344B may be configured to move along its corresponding enclosure wall 290 to expose the space 172 or to block exposure of the space 172. Indeed, each of the first and second cover portions 344A, 344B may move relative to one another to enable the panel 62 to extend or actuate out of the space 172 and/or to block extension of the panel 62 out of the space 172.

[0068] FIG. 15 is a partially exploded perspective view of an embodiment of the panel assembly 60. For example, in the illustrated embodiment, the panel assembly 60 is in a first configuration. In the illustrated embodiment, an entirety of the panel 62 and one or more guides 414 are positioned within the enclosure 100. Additionally, the plate 110 (e.g., panel holder) may be coupled to and/or engaged with the panel 62 and the one or more guides 414. Moreover, the plate 110 along with the one or more guides 414 may be configured to direct movement of the panel 62 in the directions 114. For example, the plate 110 is positioned underneath the panel 62 and includes one or more plate extensions 400 protruding from the plate 110, each plate extension 400 configured to engage with a respective guide 414. In addition, each guide 414 may include a respective guide cavity 402 disposed within a side of the respective guide 414 that is configured to face the plate 110 in installation of the panel assembly 60. In particular, a geometry (e.g., shape) of the guide cavity 402 may correspond with a geometry of the respective plate extension 400 with a volume of the guide cavity 402 being greater than a volume of the respective plate extension 400 such that, in operation, the respective plate extension 400 may be positioned within or extend within and slide along the guide

cavity 402 in the directions 114. Thus, the one or more guides 414 may maintain stability of the panel 62 and may enable flexible and controllable positioning of the panel 62 via a corresponding position of the plate 110 along a height 404 of the one or more guides 414. In certain embodiments, the one or more guides 414 and/or the plate 110 may be magnetic and/or controllably polarized (e.g., via the controller 64). In such embodiments, the polarization may facilitate smooth (e.g., decreased friction) movements of the plate 110 (e.g. plate extensions 400) within and relative to the one or more guides 414 (e.g., guide cavities 402).

[0069] Additionally, the panel 62 is coupled to the plate 110 and the plate 110 is configured to engage with one or more actuators 70. In the illustrated embodiment, the one or more actuators 70 is an electromagnetic actuator 70. Furthermore, the controller 64 may be communicatively coupled to the electromagnetic actuator 70 and may instruct the electromagnetic actuator 70 to adjust a magnetic field of the electromagnetic actuator 70, thus driving movement of the plate 110 and thereby driving movement of the panel 62 coupled to the plate 110. The one or more guides 414 and/or the electromagnetic actuator 70 may remain fixed during movement of the panel 62, and the panel 62 may move along the one or more guides 414 in the directions 114. The arrangement of the one or more guides 414 at respective lateral ends 406 of the panel 62 and the positioning of the electromagnetic actuator 70 between the plate 110 and the enclosure base 117 may enable the panel 62 to have a continuous profile. That is, the panel 62 may not have offsetting portions to accommodate positioning of the one or more guides 414 and/or of the electromagnetic actuator 70. Such arrangement of the one or more guides 414 and positioning of the electromagnetic actuator 70 may also enable the plate 110 to have a linear configuration instead of a U-shaped or C-shaped configuration. The plate 110 may not have recesses to receive the electromagnetic actuator 70 (e.g., in the first configuration). In an additional or alternative embodiment, the electromagnetic actuator 70 may engage directly with the panel 62 (e.g., the panel 62 may include the panel extensions similar to that of the plate extensions 400), and the panel assembly 60 may not include the plate 110.

[0070] FIG. 16 is a partially exploded perspective view the embodiment of the panel assembly 60 of FIG. 15. For example, in the illustrated embodiment, the panel assembly 60 is in a second configuration. In the second configuration, the panel 62

may be positioned out of, actuate out of, or extend out of the enclosure 100. For example, the controller 64 may instruct the electromagnetic actuator 70 to adjust the magnetic field to drive movement of the plate 110 away from the enclosure base 117 and thus transition the panel assembly 60 from the first configuration to the second configuration. In addition, the panel assembly 60 may include one or more biasing elements 410 configured to couple to and support at least a portion of the plate 110 and thus support at least a portion of the panel 62. In particular, in certain embodiments, the biasing elements 410 may be coupled to the electromagnetic actuator 70 and extend between the electromagnetic actuator 70 and the plate 110. While in additional or alternative embodiments, the biasing elements 410 may be coupled to the enclosure base 117 and extend between the enclosure base 117 and the plate 110. As an example, the biasing members 410 may include coil springs, gas springs, and the like, configured to facilitate certain movement of the plate 110 relative to the enclosure 100. For instance, the biasing members 410 may facilitate movement of the plate 110 (e.g., the plate extensions 400) within the one or more guides 414 (e.g., the guide cavities 402) relative to the enclosure 100, as driven by the electromagnetic actuator 70, and thereby facilitate movement of the panel 62 relative to the enclosure 100. In this way, the biasing members 410 may enable efficient and desirable operation of the controller 64 to instruct movement of the panel 62.

[0071] Although the electromagnetic actuator 70 is positioned within the enclosure 100 in the illustrated embodiment, it should be noted that the electromagnetic actuator 70 may be positioned external to the enclosure 100, such as in a compartment 412 separate from the enclosure 100. For example, the compartment 412 may be positioned underneath the enclosure 100 (e.g., underneath a floor of a ride vehicle 52 having the panel assembly 60). In addition, in certain embodiments, at least a portion of the one or more guides 414 may also be positioned within the compartment 412. In these embodiments, at least a portion of the plate 110 may additionally be positioned within, extend through and/or into the compartment 412. The positioning of the electromagnetic actuator 70, and at least a portion of the one or more guides 414 and/or the plate 110 in the compartment 412, instead of in the enclosure 100, may reduce an amount of space occupied by one or more components of the panel assembly 60 in the enclosure 100 when the one or more guides 414 and the panel 62 are in the first

configuration. As such, a larger sized panel 62 may be implemented and positioned within the enclosure 100.

[0072] FIGS. 17 is a front cross-sectional view of an embodiment of the panel assembly 60. In particular, in the illustrated embodiment, the panel assembly 60 includes a locking assembly 420 (e.g., locking system, locking implement) configured to hold (e.g., lock) the panel 62 in a desired position (e.g., the first and/or second configurations). In some embodiments, the panel assembly 60 may include one or more biasing elements 422 (e.g., springs) configured to bias the panel 62 (e.g., via the plate 110 coupled to the panel 62) by applying a force to the panel 62 and/or the plate 110. In some embodiments, the one or more biasing elements 422 may apply a force to the panel 62 in the second direction 150. In other words, the biasing elements 422 may bias the panel 62 and/or the plate 110 towards the disclosed first configuration (e.g., a retracted configuration), such that the panel 62 is primarily enclosed within the enclosure 100 and therefore not visible (e.g., concealed) to the guests 54. In other embodiments, the biasing elements 422 may apply a force to the panel 62 and/or the plate 110 in the first direction 140, such that the panel 62 and/or the plate 110 is biased towards the disclosed second configuration (e.g., an extended configuration), such that the panel 62 is primarily positioned out of, actuated out of, or extended out of (e.g., be entirely or partially external to) the enclosure 100 and may therefore be visible to the guests 54. In addition, the locking assembly 420 may lock (e.g., hold) the panel 62 and/or plate 110 in a desired position and/or prevent movement of the panel 62 and/or plate 110 due to the force of the biasing elements 422 (e.g., oppose the force applied by the biasing elements 422), a weight or force due to gravity of the panel 62 (e.g., and the plate 110), or a combination thereof. In some embodiments, the controller 64 may instruct the one or more biasing elements 422, an actuator (not shown), and/or the locking assembly 420 to controllably adjust or to drive movement of the plate 110 away from the enclosure base 117 and/or toward the enclosure base 117, and thus transition the panel assembly 60 from the first configuration toward the second configuration, and from the second configuration toward the first configuration.

[0073] The locking assembly 420 of FIG. 17 may comprise one or more locking components 424 (e.g., pawl components, ratchet components, positioning components, interfacing components). In some embodiments, the one or more locking components

may be configured to freely rotate in a first rotational direction 426 and to lock (e.g., not rotate) when a force is applied to cause rotation of the one or more locking components 424 a second rotational direction 428 opposite of the first rotational direction 426. The one or more locking components 424 may engage with one or more teeth 430 disposed along at least one of the lateral sides 432 of the plate 110. In certain embodiments, the one or more teeth 430 may be disposed along lateral sides of the panel 62, and the plate 110 may be omitted from the design. Furthermore, in some embodiments, the one or more biasing elements 422 may bias the plate 110 (e.g., thus the panel 62 coupled to the plate 110) toward the first direction 140 to extend, actuate, and/or position the panel 62 exterior to the enclosure 100. The one or more biasing elements 422 may be configured to apply a force to the plate 110 in the first direction 140 and thus cause the panel 62 to actuate towards the second configuration. As the panel 62 approaches a desired position (e.g., such as the second configuration) the force applied by the one or more biasing elements 422 in the first direction 140 may decrease and a weight of the panel 62 and/or the plate 110 (e.g., due to gravitational force) may be greater than the force applied by the one or more biasing elements 422. The panel 62 and/or plate 110 may then apply a force in the second direction 150 and cause the one or more locking components 424 to hold (e.g., lock) the plate 110, and thus the panel 62, in the desired position.

[0074] The one or more locking components 424 may hold the plate 110 in the desired position by interfacing with the one or more teeth 430 and opposing rotational movement of the one or more locking components 424 in the second rotational direction 428 caused by the weight of the panel 62 and/or the plate 110. In addition, to actuate the panel 62 from the second configuration toward the first configuration, the one or more locking component 424 may be controllably released (e.g., via the controller 64) such that the one or more locking components 424 may rotate freely in the second rotational direction 428 and enable the plate 110 to be moved in the second direction 150 towards the base 117 of the enclosure 100. In some embodiments, an actuator (not shown) may cause the plate 110 (e.g., and thus the panel 62) to move in the second direction 150, by applying a force in the second direction 150 that is greater than the force applied by the one or more biasing elements 422 in the first direction 140. Specifically, in certain embodiments, the weight of the panel 62 and/or the plate 110 plus the force applied by the actuator is greater than the force applied by the biasing

elements 422. It should be appreciated that the locking assembly 420 may engage (e.g., caused to engage via the controller 64) with the one or more teeth 430 and lock, hold, or cause positioning of the plate 110 and thus the panel 62 at any desired position within a range of positions from the first configuration (e.g., an entirety of the panel 62 retracted into the enclosure 100) to the second configuration (e.g., the panel 62 fully extended, actuated, and/or positioned outside of the enclosure 100) regardless of any force acting on the plate 110 and/or the panel 62 (e.g., such as force applied by the one or more biasing elements 422 and/or an actuator (not shown)).

[0075] Additionally, in some embodiments, the panel assembly 60 of FIG. 17 may include one or more guides 440 and one or more guide followers 442 configured to facilitate stability of the panel 62 and/or the plate 110 during movement and/or to ensure desired positioning of the panel 62 during operation. In certain embodiments, the panel assembly 60 may additionally or alternatively include a damper 438, as illustrated in FIG. 18, configured to decrease an abruptness of the force applied by the one or more biasing elements 422 (e.g., slow the initial force applied by the one or more biasing elements 422).

[0076] It should be appreciated that although the panel assembly 60 of FIG. 17 includes the one or more biasing elements 422 configured to apply a force on the plate 110 and thus the panel 62 in the first direction 140, in certain embodiments, the one or more biasing elements 422 may be configured to apply a force on the plate 110 and thus the panel 62 in the second direction 150 towards the base 117 of the enclosure 100. For example, the biasing elements 422 may hold the plate 110 and thus the panel 62 in the first configuration. Furthermore, to transition the panel 62 from the first configuration toward the second configuration, an actuator (not shown) may cause (e.g., via the controller 64) the plate 110 (e.g., and thus the panel 62) to actuate or extend in the first direction 140. The actuator may apply a force to the plate 110 that is greater than the force of the one or more biasing elements 422 in the second direction 150. When the panel 62 is in a desired position (e.g., such as the second configuration) the actuator may cease applying the force in the first direction 140, and the one or more biasing elements 422 may continue to apply the force in the second direction 150. The one or more locking components 424 may lock the plate 110, and thus the panel 62, in the desired position by interfacing with the one or more teeth 430. To transition the panel

62 from the second configuration toward the first configuration, the one or more locking components 424 may be controllably released (e.g., via the controller 64) such that the one or more locking components 424 may rotate freely in the second rotational direction 428 and enable the plate 110 to be moved in the second direction 150 towards the base 117 of the enclosure 100 via the force applied by the one or more biasing elements 422.

[0077] FIGS. 18 is a front cross-sectional view of an embodiment of the panel assembly 60. In particular, in the illustrated embodiment, the panel assembly 60 includes one or more interfacing elements 500 (e.g., locking components, positioning components) configured to freely rotate in a first rotational direction 502 and to lock (e.g., not rotate) when a force is applied to cause rotation of the one or more interfacing elements 500 the second rotational direction 504 opposite of the first rotational direction 502. In some embodiments, each of the one or more interfacing components may include an actuatable ratchet assembly configured to be locked (e.g., controllably locked) in a desired position. In the illustrated embodiment, the one or more interfacing elements 500 may directly interface with the plate 110 that is coupled to and beneath the panel 62. In particular, the plate 110 may include one or more extensions 434 at lateral ends 436 of the plate 110, and the one or more interfacing elements 500 may engage with the extensions 434. In addition, the panel assembly 60 may include the one or more biasing elements 422, an actuator (not shown), or both which may bias and/or actuate (e.g., via the controller 64) the plate 110 (e.g., thus the panel 62 coupled to the plate 110) towards the first direction 140 to position, actuate, and/or extend the panel 62 exterior to the enclosure 100. In other words, the one or more biasing elements 422, the actuator, or both may be configured to bias or actuate the plate 110 and thus the panel 62 towards the second configuration. Furthermore, the one or more interfacing elements 500 may rotate in the first rotational direction 502 when the plate 110 is moved in the first direction 140 (e.g., via engagement of the extensions 434 with the one or more interfacing elements 500).

[0078] As the panel 62 approaches a desired position (e.g., such as the second configuration) the force applied by the one or more biasing elements 422, the actuator, or both in the first direction 140 may decrease and a weight of the panel 62 and/or the plate 110 (e.g., due to gravitational force) may be greater than the force applied by the one or more biasing elements 422, the actuator, or both. The panel 62 and/or plate 110

may then apply a force in the second direction 150, and the one or more interfacing elements 500 may hold (e.g., lock) the plate 110, and thus the panel 62, in the desired position. The one or more interfacing elements 500 may hold the plate 110 in the desired position by interfacing with the extensions 434 of the plate 110 and opposing rotational movement of the one or more interfacing elements 500 (e.g., via one or more ratchet assemblies) in the second rotational direction 504 caused by the weight of the panel 62 and/or the plate 110. In addition, to transition the panel 62 from the second configuration toward the first configuration, the one or more interfacing elements 500 may be controllably released (e.g., release the one or more ratchet assemblies, via the controller 64) such that the one or more interfacing elements 500 may rotate freely in the second rotational direction 504 and enable the plate 110 to be moved in the second direction 150 towards the base 117 of the enclosure 100. In some embodiments, an actuator (not shown) may cause (e.g., via the controller 64) the plate 110 (e.g., and thus the panel 62) to move in the second direction 150, by applying a force in the second direction 150 that is greater than the force applied by the one or more biasing elements 422 in the first direction 140. Specifically, in certain embodiments, the weight of the panel 62 and/or the plate 110 plus the force applied by the actuator is greater than the force applied by the one or more biasing elements 422.

[0079] In some embodiments, the panel assembly 60 of FIG. 18 may include the one or more guides 440 and the one or more guide followers 442 configured to facilitate stability of the panel 62 and/or the plate 110 during movement and/or to ensure desired positioning of the panel 62 during operation. In certain embodiments, the panel assembly 60 may additionally or alternatively include a damper 438 configured to decrease an abruptness of the force applied by the one or more biasing elements 422 (e.g., slow the initial force applied by the one or more biasing elements 422).

[0080] It should be appreciated that although the panel assembly 60 of FIG. 18 includes the one or more biasing elements 422 configured to apply a force on the plate 110 and thus the panel 62 in the first direction 140, in certain embodiments, the one or more biasing elements 422 may be configured to apply a force on the plate 110 and thus the panel 62 in the second direction 150 towards the base 117 of the enclosure 100. For example, the biasing elements 422 may hold the plate 110 and thus the panel 62 in the first configuration. Furthermore, to transition the panel 62 from the first configuration

toward the second configuration, an actuator (not shown) may cause (e.g., via the controller 64) the plate 110 (e.g., and thus the panel 62) to actuate or extend in the first direction 140. The actuator may apply a force to the plate 110 that is greater than the force of the one or more biasing elements 422 in the second direction 150. When the panel 62 is in a desired position (e.g., such as the second configuration) the actuator may cease applying the force in the first direction 140, and the one or more biasing elements 422 may continue to apply the force in the second direction 150. The one or more interfacing elements 500 may oppose rotational movement of the one or more interfacing elements 500 in the second rotational direction 504 caused by the force of the one or more biasing elements 422 in the second direction 150. To transition the panel 62 from the second configuration toward the first configuration, the one or more interfacing elements 500 may be controllably released (e.g., via the controller 64) such that the one or more interfacing elements 500 may rotate freely in the second rotational direction 504 and enable the plate 110 to be moved in the second direction 150 towards the base 117 of the enclosure 100 via the force applied by the one or more biasing elements 422.

[0081] FIG. 19 is a flowchart of an embodiment of a method 370 for operating a panel assembly. The method 370 may be performed by a single component or system, such as by a controller (e.g., processor). In an additional or alternative embodiment, multiple components or systems may perform the operations for the method 370. It should also be noted that additional operations may be performed for the method 370. Moreover, certain operations of the depicted method 370 may be removed, modified, and/or performed in a different order.

[0082] At block 372, a first indication to position, extend, and/or actuate a panel out of an enclosure may be received. The first indication may include sensor data, which may indicate a position of the ride vehicle, a position of guests (e.g., within the ride vehicle), a time associated with a ride cycle of the attraction system, any other suitable operating parameter, or any combination thereof. Additionally or alternatively, the first indication may include a user input, which may directly request for the panel to be positioned, extended, and/or actuated out of the enclosure.

[0083] At block 374, an actuator may be instructed to position, extend, and/or actuate the panel out of the enclosure based on the first indication. In particular, the

controller may instruct, generate instructions, and/or transmit instructions to cause the actuator to position, actuate, and/or extend the panel out of the enclosure in response to receiving the first indication. In an embodiment, the actuator may translate the panel out of the enclosure, such as by driving movement of a guide to which the panel is coupled, driving movement of a plate to which the panel is coupled, adjusting a linkage to which the panel is coupled, and so forth. In an additional or alternative embodiment, the actuator may rotate the panel out of the enclosure, such as about a pivot. Movement of the panel out of the enclosure may be unexpected to guests and may therefore provide an effect to entertain the guests.

[0084] At block 376, a second indication to position, extend, and/or actuate the panel into the enclosure may be received, such as via sensor data and/or a user input. At block 378, the actuator may be instructed to position, extend, and/or actuate the panel (e.g., via rotation, via translation) into the enclosure based on the second indication. In particular, the controller may instruct, generate instructions, and/or transmit instructions to cause the actuator to position, extend, and/or actuate the panel into the enclosure in response to receiving the second indication. Movement of the panel into the enclosure may conceal the panel from the guests. For example, the appearance of the panel assembly with the panel contained in the enclosure may not indicate that the panel is able to move relative to the enclosure. As such, movement of the panel may be more unexpectedly provided.

[0085] While only certain features of the disclosure have been illustrated and described herein, many modifications and changes will occur to those skilled in the art. It is, therefore, to be understood that the appended claims are intended to cover all such modifications and changes as fall within the true spirit of the disclosure.

[0086] The techniques presented and claimed herein are referenced and applied to material objects and concrete examples of a practical nature that demonstrably improve the present technical field and, as such, are not abstract, intangible or purely theoretical. Further, if any claims appended to the end of this specification contain one or more elements designated as “means for (perform)ing (a function)...” or “step for (perform)ing (a function)...”, it is intended that such elements are to be interpreted under 35 U.S.C. 112(f). However, for any claims containing elements designated in

any other manner, it is intended that such elements are not to be interpreted under 35 U.S.C. 112(f).

CLAIMS

1. A ride vehicle for an amusement park attraction system, the ride vehicle comprising:

a plurality of walls cooperatively defining a volume configured to receive a guest into the ride vehicle; and

a panel assembly comprising a panel and a wall of the plurality of walls, wherein the wall is configured to contain the panel in a first configuration of the panel assembly, and the panel is configured to move relative to the wall and actuate out of the wall in a second configuration of the panel assembly.

2. The ride vehicle of claim 1, comprising one or more actuators and a controller communicatively coupled to the one or more actuators, wherein the controller is configured to instruct the one or more actuators to adjust the panel relative to the wall to transition the panel assembly between the first configuration and the second configuration.

3. The ride vehicle of claim 2, wherein the controller is configured to instruct the one or more actuators to rotate the panel about a pivot to move the panel relative to the wall.

4. The ride vehicle of claim 2, comprising a linkage coupled to the one or more actuators and to the panel, and wherein the one or more actuators are configured to actuate the linkage to move the panel relative to the wall.

5. The ride vehicle of claim 2, wherein the one or more actuators are disposed external to the wall.

6. The ride vehicle of claim 1, wherein the panel comprises a first panel and the wall comprises a first wall, the panel assembly comprises a second panel and a second wall of the plurality of walls, the second wall is configured to contain the second panel in the first configuration of the panel assembly, the second panel is configured to actuate out of the second wall in the second configuration of the panel assembly.

7. The ride vehicle of claim 1, comprising a guide, wherein the panel is coupled to the guide and is configured to move along the guide to actuate out of the wall in the second configuration of the panel assembly.

8. A panel assembly for an amusement park attraction system, the panel assembly comprising:

an enclosure;

a support member positioned at least partially within the enclosure;

a panel coupled to the support member; and

one or more actuators positioned within the enclosure, wherein the one or more actuators are configured to move the support member relative to the enclosure, thereby moving the panel relative to the enclosure to actuate the panel out of the enclosure.

9. The panel assembly of claim 8, wherein the enclosure comprises a base, and one or more actuators are configured to move the support member away from the base to actuate the panel out of the enclosure.

10. The panel assembly of claim 9, comprising a first coupler coupled to the base and comprising a plate coupled to the support member, wherein the plate is configured to engage with the first coupler.

11. The panel assembly of claim 10, wherein the plate is configured to engage with the first coupler in a first configuration of the panel assembly, the enclosure comprises a cover and a second coupler, the one or more actuators are configured to move the support member and the panel away from the base to transition the panel assembly from the first configuration to a second configuration, and the plate is configured to engage with the second coupler in the second configuration of the panel assembly.

12. The panel assembly of claim 9, comprising a biasing member coupled to the base.

13. The panel assembly of claim 8, wherein the one or more actuators are configured to actuate the support member at least partially out of the enclosure to actuate the panel out of the enclosure.

14. A panel assembly for an amusement park attraction system, the panel assembly comprising:

an enclosure defining a space, wherein the enclosure comprises a cover configured to extend over the space, and the enclosure comprises a base;

a panel configured to be positioned in the space defined by the enclosure;

one or more actuators configured to drive movement of the panel relative to the enclosure; and

a controller communicatively coupled to the one or more actuators, wherein the controller is configured to:

instruct the one or more actuators to drive movement of the panel toward the base of the enclosure to transition the panel assembly to a first configuration; and

instruct the one or more actuators to drive movement of the panel away from the base of the enclosure to transition the panel assembly to a second configuration.

15. The panel assembly of claim 14, comprising a plate, wherein the panel is coupled to a plate, the one or more actuators are configured to drive a movement of the plate relative to the enclosure to drive the movement of the panel relative to the enclosure.

16. The panel assembly of claim 15, wherein the controller is configured to instruct the one or more actuators to drive the movement of the plate toward the one or more actuators to drive the movement of the panel away from the base.

17. The panel assembly of claim 14, wherein the enclosure comprises a wall defining the space, the cover is coupled to the wall, the cover is configured to move relative to the wall to expose the space, and the controller is configured to instruct the

one or more actuators to drive the movement of the panel away from the base and out of the enclosure via the space exposed by the cover to transition the panel assembly to the second configuration.

18. The panel assembly of claim 17, wherein the cover is configured to rotate relative to the wall about a hinge or to translate along the wall to expose the space.

19. The panel assembly of claim 14, wherein the panel comprises a frame, and the frame is configured to engage with the cover in the first configuration of the panel assembly.

20. The panel assembly of claim 14, wherein the controller is configured to instruct the one or more actuators to rotate the panel relative to the enclosure to transition the panel assembly between the first configuration and the second configuration.