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(57) Abstract: A cart including a load carrier and an adjustable support system including a chassis and one or more arms adjustably coupled to the load carrier at a first end and adjustably coupled to the chassis at a second end, the cart being retractable from an open extended state to a retracted closed state and wherein the adjustable support system is configured to translate the load carrier and continuously maintain an intersection of a line of gravity of the cart with a base-of-support of the cart.

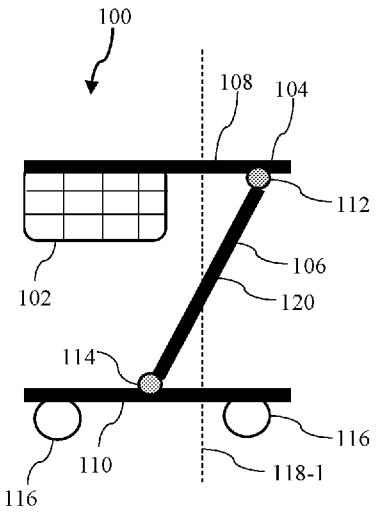

FIG 1A

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ADJUSTABLE CART

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of priority of U.S. Provisional Patent Application No. 63/045,053 titled "ADJUSTABLE CART", filed June 27, 2020, the contents of which are incorporated herein by reference in their entirety.

FIELD OF THE INVENTION

[0002] The present invention, in some embodiments thereof, relates to carts and, more particularly, but not exclusively, to folding carts.

BACKGROUND

[0003] Carts such as shopping carts are commonly used to transport merchandise. Commonly used cart usually comprise a basket coupled to one or more wheels with which the basket is driven by a user from one location to another. Commonly used carts comprise handles with which a user can move the cart from one location to another.

[0004] The foregoing examples of the related art and limitations related therewith are intended to be illustrative and not exclusive. Other limitations of the related art will become apparent to those of skill in the art upon a reading of the specification and a study of the figures.

SUMMARY

[0005] The following embodiments and aspects thereof are described and illustrated in conjunction with systems, tools and methods which are meant to be exemplary and illustrative, not limiting in scope.

[0006] According to an aspect of some embodiments of the invention there is provided a cart, including a load carrier, and an adjustable support system including: a chassis, and at least one arm adjustably coupled to the load carrier at a first end and adjustably coupled to the chassis at a second end, the cart being retractable from an open extended state to a

retracted closed state, and wherein the adjustable support system is configured to translate the load carrier and continuously maintain an intersection of a line of gravity of the cart with a base-of-support of the cart. In some embodiments, the load carrier is slidable along at least a portion of the at least one arm. In some embodiments, the support is adjustable from one open state to another such that when the chassis is placed onto a surface, the line of gravity of the cart continuously intersects the base-of-support of the cart throughout the adjustment.

[0007] According to some embodiments, the arm includes a first portion and a second portion the first portion is adjustably coupled to the chassis at one end and to the chassis at a second end and the second portion is coupled to the load carrier. In some embodiments, the first portion is coupled to the second portion via an upper joint such that the second portion is rotatable about the upper joint in relation to the first portion. In some embodiments, the upper joint includes one or more of a hinge, sliding hinge, a rail or any combination thereof. In some embodiments, the first portion is slidable onto the second portion. In some embodiments, the second portion includes a frame configured to accommodate the first portion of the arm. In some embodiments, the load carrier includes at least one handle and wherein the at least one handle is moveably coupled to the arm.

[0008] According to some embodiments, the load carrier includes at least one handle and wherein the at least one handle is slidable along at least a portion of the length of the arm. In some embodiments, the chassis includes a plurality of independent legs adjustably coupled to the arm. In some embodiments, the chassis is coupled to the arm at a chassis joint, and the chassis joint includes an axis of rotation such that the chassis is adjustable in relation to the arm. In some embodiments, the length of the arm is extendable. In some embodiments, a portion of the load carrier includes a portion configured to accommodate at least a portion of the support at a closed state. In some embodiments,

[0009] According to an aspect of some embodiments of the invention there is provided a cart, including: a load carrier, and an adjustable support system including at least one arm, and a chassis, the at least one arm being adjustably coupled to the load carrier at a first end and adjustably coupled to the chassis at a second end, the cart being retractable from an open extended state to a retracted closed state, the adjustable support system is configured to translate the load carrier in relation to the chassis, and wherein at a closed state, the

support is retracted to fit within a portion of the load carrier. In some embodiments, the load carrier includes a portion configured to accommodate the support at a closed state. In some embodiments, the load carrier is slidable along at least a portion of the arm.

[0010] According to some embodiments, the support is adjustable from one open state to another such that when the chassis is placed onto a surface, the line of gravity of the cart continuously intersects the base-of-support of the cart throughout the adjustment. In some embodiments, the arm includes a first portion and a second portion the first portion is adjustably coupled to the chassis at one end and to the chassis at a second end and the second portion is coupled to the load carrier. In some embodiments, the first portion is coupled to the second portion via an upper joint such that the second portion is rotatable about the upper joint in relation to the first portion. In some embodiments, the upper joint includes one or more of a hinge, sliding hinge, a rail or any combination thereof. In some embodiments, the first portion is slidable onto the second portion. In some embodiments, the second portion includes a frame configured to accommodate the first portion of the arm.

[0011] According to some embodiments, the load carrier is movably coupled to the second portion by at least one handle. In some embodiments, the at least one handle is slidable along at least a portion of the length of the arm. In some embodiments, the chassis includes a plurality of independent legs adjustably coupled to the arm. In some embodiments, the chassis is coupled to the arm at a chassis joint, and the chassis joint includes an axis of rotation such that the chassis is adjustable in relation to the arm. In some embodiments, the length of the arm is extendable.

[0012] According to an aspect of some embodiments of the invention there is provided a method for adjusting a cart from an open state to a closed state, including: placing load carrier of a cart on a surface, the cart including a cart adjustable support system having at least a first and a second portions and a chassis, adjusting the adjustable portions in respect to each other, and lifting the chassis towards the first portion, and positioning at least one of the first portion, the second portion and the chassis adjacent to the load carrier. In some embodiments, the method includes retracting the length of the first and/or second portion. In some embodiments, the method includes rotating the chassis towards the first portion. In some embodiments, the method includes sliding the chassis.

[0013] According to some embodiments, the method includes sliding the first portion onto the second portion. In some embodiments, the method includes aligning the first portion with the second portion.

[0014] According to an aspect of some embodiments of the invention there is provided a method for adjusting a cart from a closed state to an open state, the method includes: opening a portion of a cart being in a closed state and the method includes: a load carrier placed on a surface, and an adjustable support system the method includes at least one of a first portion and a second portions, and a chassis, adjusting the at least one portion at a first end to the chassis, adjusting the at least one portion at a second end to the load carrier, extending the first portion and/or the second portion, and positioning the chassis onto a platform, and lifting the load carrier from the surface.

[0015] According to some embodiments, the method includes extending the length of the first and/or second portion. In some embodiments, the method includes sliding the first portion away from the second portion. In some embodiments, the method includes rotating the first portion away from the second portion such that the chassis is positioned between the second state and the platform. In some embodiments, the method includes sliding and/or rotating the chassis away from the first portion. In some embodiments,

[0016] According to an aspect of some embodiments of the invention there is provided a system for a self-adjusting cart, including: a cart, including: a load carrier, and an adjustable support system including at least one arm, and a chassis, the at least one arm being adjustably coupled to the load carrier at a first end and adjustably coupled to the chassis at a second end, the cart being retractable from an open extended state to a retracted closed state, the adjustable support system is configured to translate the load carrier, at least one motor coupled to the support, and a control unit coupled to the motor, wherein the control unit controls the adjustment of the support via the motor to maintain the line of gravity of the cart intersecting with the base-of-support of the cart.

[0017] According to some embodiments, the system includes one or more of a strain gauge, proximity sensor, optical sensor, pressure sensor and a Global Positioning System. In some embodiments, the one or more motor is coupled to at least one of the first portion, second portion, chassis, and load carrier.

[0018] In addition to the exemplary aspects and embodiments described above, further aspects and embodiments will become apparent by reference to the figures and by study of the following detailed description.

BRIEF DESCRIPTION OF THE FIGURES

[0019] Exemplary embodiments are illustrated in referenced figures. Dimensions of components and features shown in the figures are generally chosen for convenience and clarity of presentation and are not necessarily shown to scale. The figures are listed below.

[0020] Figs. 1A, 1B, 1C, and 1D, are schematic illustrations of an exemplary embodiment of a cart, in accordance with some embodiments of the present invention;

[0021] Figs. 2A and 2B are perspective view and side view simplified illustrations of an embodiment of a cart in accordance with some embodiments of the present invention;

[0022] Figs. 3A, 3B, 3C, 3D, 3E, 3F, 3G, 3H, 3I, 3J, and 3K are side view illustrations of an exemplary embodiments of a cart during retraction of a support of the cart, in accordance with some embodiments of the present invention;

[0023] Reference is made to Figs. 4A, 4B, and 4C, which are side view simplified illustrations of exemplary embodiments of a cart in a closed state, according to some embodiments of the present invention;

[0024] Fig. 5A is a flow chart illustrating a method of retracting a cart from an open state to a closed state, in accordance with some embodiments of the present invention;

[0025] Fig. 5B is a flow chart illustrating a method of opening a cart from a closed state to an open state, in accordance with some embodiments of the present invention;

[0026] Fig. 6 is a simplified illustration of a system of a self-adjusting cart, in accordance with some embodiments of the present invention; and

[0027] Fig. 7A, 7B, and 7C are side view simplified illustrations of exemplary embodiments of a cart, in accordance with some embodiments of the present invention.

DETAILED DESCRIPTION

[0028] According to an aspect of some embodiments of the present invention there is provided a cart. In some embodiments, the cart comprises a load carrier. In some embodiments, the cart comprises an adjustable support system coupled to and supports the load carrier. In some embodiments, the support comprises one or more arms adjustably coupled to the load carrier. In some embodiments, the cart comprises a chassis adjustably coupled to the one or more arms. In some embodiments, the cart is retractable from an open extended state to a retracted closed state. In some embodiments, the adjustable support system is configured to translate the load carrier and continuously maintain an intersection of a line of gravity of the cart with the base-of-support of the cart.

[0029] According to an aspect of some embodiments of the present invention there is provided a cart comprising an adjustable support system. In some embodiments, the adjustable support system is retractable. In some embodiments, the retractable support comprises a first portion and a second portion. In some embodiments, the retractable support is sized and fitted to fit into at least a portion of the load carrier. In some embodiments, the load carrier is sized and fitted to accommodate at least a portion of the retracted support.

[0030] According to an aspect of some embodiments of the present invention there is provided a method for adjusting a cart from an open state to a closed state. In some embodiments, the method comprises placing a load carrier onto a surface. In some embodiments, the cart comprises an adjustable support system comprising a chassis. In some embodiments, the retractable support comprises a first portion and a second portion. In some embodiments, the method comprises lifting the chassis towards the first portion. In some embodiments, the method comprises positioning the first portion adjacent to the second portion.

[0031] According to an aspect of some embodiments of the present invention there is provided a method for adjusting a cart from a closed state to an open state. In some embodiments, the method comprises opening a portion of the cart positioned in a closed state onto a surface, by extending the first portion away from the second portion. In some embodiments, extending the first portion comprises pivotly rotating the first portion in respect to the second portion. In some embodiments, extending the first portion comprises

sliding the first portion in respect to the second portion. In some embodiments, the method comprises positioning the chassis onto a platform. In some embodiments, the method comprises lifting the load carrier from the surface.

According to an aspect of some embodiments of the present invention there is provided a system of a self-adjusting cart. In some embodiments, the system comprises a cart comprising an adjustable support system. In some embodiments, the system comprises one or more motors coupled to the cart. In some embodiments, the system comprises a control unit coupled to the cart. In some embodiments, the control unit communicates with and controls the motor. In some embodiments, the motor adjusts the support. In some embodiments, the control unit communicates with and controls the motor to adjust the support and maintain intersection of a line of gravity of the cart with the base-of-support of the cart.

Cart

[0032] Reference is made to Figs. 1A, 1B, 1C and 1D, which are schematic illustrations of an exemplary embodiment of a cart in open and closed states, in accordance with some embodiments of the invention. In some embodiments, the cart **100** comprises a load carrier **102**. In some embodiments, the cart comprises an adjustable support system **104**. In some embodiments, the cart **100** and/or load carrier **102** is configured to hold, carry and/or transport objects from one place to another. In some embodiments, the load carrier **102** is configured to hold the objects being carried by the cart **100**. In some embodiments, the support **104** is configured to translate the load carrier **102** from one place to another. In some embodiments, the cart **100** comprises one or more open states, as depicted, for example, by Figs. 1A, 1B, and 1C, and one or more closed states, as depicted, for example, by Fig. 1D.

[0033] In some embodiments, the load carrier **102** is a portion of the cart in which objects can be placed, such as, for example, a bin, a crate, a box, a platform, a basket, a container, a hook and/or any other carrying or supporting element.

[0034] In some embodiments, the support **104** comprises a chassis **110**. In some embodiments, the support **104** comprises one or more arms **120** configured to couple the

load carrier **102** to the chassis **110**. In some embodiments, the location and/or spatial orientation of the load carrier **102** in relation to the chassis **110** is manipulated by the position and/or configuration of the one or more arms **120**.

[0035] In some embodiments, the arm **120** comprises at least a first portion **106** (106-1 and 106-2) and a second portion **108**. In some embodiments, the first portion **106** is adjustably (e.g., pivotly) coupled to the second portion **108** at an upper joint 112 at a first end of the first portion **106**. In some embodiments, the first portion **106** is adjustably (e.g., pivotly) coupled to the chassis **110** at a chassis joint 114 at a second end of the first portion **106**. In some embodiments, the second portion **108** is coupled to the load carrier **102**.

[0036] In some embodiments, portion 106 comprises two or more segments 106-1 and 106-2, at least one of which moveable in respect to the other. In the exemplary embodiment depicted in Fig. 2A, segment 106-1 is configured to slide over and accommodate segment 106-2 thus shortening a length of first portion **106** in a telescope fashion. Alternatively, and optionally and in some embodiments, segment 106-1 comprises a rail configured to slide along segment 106-2 thus shortening a length of first portion **106.** Alternatively, and optionally and in some embodiments, segment 106-1 is hingedly coupled to segment 106-2 and fold in respect to segment 106-2 thus shortening a length of first portion 106.

[0037] In some embodiments, and as described in greater detail elsewhere herein, the load carrier **102** is slidably coupled to the arm **120**. In some embodiments, the load carrier **102** is slidable along at least a portion of the arm **120**. In some embodiments, the load carrier **102** is slidable along the first portion **106**. In some embodiments, the load carrier **102** is slidable along the second portion **108**.

[0038] In some embodiments, the cart **100** comprises a plurality of arms **120**. In some embodiments, the plurality of arms **120** are coupled to the load carrier **102**. In some embodiments, the plurality of arms **120** are coupled to opposite sides of the load carrier **102**. In some embodiments, the plurality of arms **120** are coupled to the chassis **110**. In some embodiments, the plurality of arms **120** are coupled to opposite sides of the chassis **110**. In some embodiments, the arms **120** are positioned parallel to each other. In some embodiments, the upper joints 112 of the plurality of arms **120** are positioned parallel to

each other. In some embodiments, the chassis joints 114 of the plurality of arms **120** are positioned parallel to each other.

[0039] In some embodiments, and as explained in greater detail elsewhere herein, the arm **120** comprises a frame, for example, rectangular frame. In some embodiments, the frame is integral with one or more of the first portion **106** and the second portion **108**.

[0040] In some embodiments, the first portion **106** and/or second portion **108** comprises a rod. In some embodiments, the first portion **106** and/or second portion **108** is rigid or semi-rigid. In some embodiments, the length of the first portion **106** and/or second portion **108** is extendable, for example, telescopically. In some embodiments, the length of the first portion **106** and/or the second portion **108** is between 10-100cm.

[0041] In some embodiments, the upper joint 112comprises a hinge, sliding hinge, a rail or any combination thereof. In some embodiments, the upper joint 112comprises an axis of rotation about which one of the first portion **106** and/or the second portion **108** rotates. In some embodiments, the second portion **108** is rotatable about the upper joint 112in relation to the first portion **106**. In some embodiments, the first portion **106** rotatable about the upper joint 112in relation to the second portion **108**.

[0042] In some embodiments, one of the first portion **106** and/or second portion **108** are slidable onto one another. In some embodiments, the first portion **106** comprises a rail configured to accommodate the second portion **108**. In some embodiments, the second portion **108** comprises a rail configured to accommodate the first portion **106**.

[0043] In some embodiments, the chassis joint 114 comprises a hinge, sliding hinge, rail, or any combination thereof. In some embodiments, the chassis joint 114 comprises an axis of rotation about which at least one of the first portion **106** and/or the chassis **110** rotate. In some embodiments, the first portion **106** is rotatable about the chassis joint 114 in relation to the chassis **110**. In some embodiments, the chassis **110** is rotatable about the chassis joint 114 in relation to the first portion **106** and/or support **104**.

[0044] In some embodiments, one of the first portion **106** and/or chassis **110** are slidable onto one another. In some embodiments, the first portion **106** comprises a rail configured to accommodate the chassis **110**. In some embodiments, the chassis **110** comprises a rail configured to accommodate the first portion **106**. In some embodiments, and as described

in greater detail elsewhere herein, the chassis **110** comprises a plurality of legs which are retractable into the first portion **106**.

[0045] In some embodiments, the configuration of the arm **120** is changeable by one or more of rotation of the first portion **106** about the upper joint 112, rotation of the second portion **108** about the upper joint 112, extension of the first and/or second portion **106/108**, or any combination thereof. In some embodiments, the position of the arm **120** is adjustable in relation to the chassis **110** by rotation of the first portion **106** about the chassis joint 114.

[0046] In some embodiments, the distance between the chassis **110** and the load carrier **102** is adjustable, for example, by extending the length of the first portion **106**, changing the angle between the first portion **106** and the second arm **108**, changing the angle between the first portion **106** and the chassis **110**, or any combination thereof.

[0047] A potential advantage of the cart **100** comprising an upper joint 112and a chassis joint 114 is in that the angle between the first arm **106** and/or the chassis **110** and the angle between the first arm **106** and the second arm **108** are adjustable, such that the special orientation of the load carrier **102** in relation to the case **110** can be maintained fixed.

[0048] A potential advantage of the adjustability of the upper joint 112and the chassis joint 114 is in that the center of mass of the cart can be maintained stationary in relation to the chassis **110** throughout the adjustment of the support **104**.

Chassis

[0049] Reference is made to Figs. 2A and 2B, which are perspective view and side view simplified illustrations of an embodiment of a cart in accordance with some embodiments of the present invention.

[0050] In some embodiments, the chassis **110** is configured to define the base-of-support of the load carrier **102** and/or cart **100** at an open state thereof, for example, by comprising a frame within which the base-of-support of the cart **100** is defined. In some embodiments, the chassis **110** comprises one or more independent legs **122-1/122-2/122-3/122-4** (collectively referred to as legs **122**). In some embodiments, the leg **122** is adjustably

coupled to the arm **120** and/or the first portion **106**. In some embodiments, the chassis **110** comprises one or more wheels **116** coupled to the legs **122**.

[0051] In some embodiments, the legs **122** are rigid or semi-rigid. In some embodiments, the legs **122** comprise one or more rods. In some embodiments, the length of the legs **122** is extendable. In some embodiments, the length and/or width of the chassis is changeable by one or more of changing the position of the legs in relation to one another, changing the distance between one or more legs **122**, and changing the length of one or more legs **122**.

[0052] A potential advantage of the chassis **110** having an adjustable width and/or length is in that the base-of-support of the cart **100** is adjustable to maintain balance of the load carrier **102**.

[0053] In some embodiments, the legs **122** are coupled to each other. In some embodiments, the legs **122** are coupled to the arm **120** at the chassis joints **114-1/114-2** (collectively referred to as chassis joints **114**). In some embodiments, one or more of the legs **122** comprise the shape of a rectangle, an H, a X, E, or the like. In some embodiments, a plurality of legs **122** form a chassis **110** having a shape of a rectangle, an H, E, X, or the like. In some embodiments, the position of one or more of the legs **122** is moveable in relation to another leg **122**. In some embodiments, the legs **122** are independently moveable in relation to one another.

[0054] In some embodiments, each chassis joint **114** couples between one leg **122** and the first portion **106**. In some embodiments, each chassis joint 114 couples between a plurality of legs **122** and the first portion **106**.

[0055] In some embodiments, at an open state of the cart **100**, the legs **122** are positioned such that the area of the chassis **110** covers at least the projection of one or more of the arm **120**, first portion **106**, second portion **108** and/or load carrier **102**.

[0056] In some embodiments, the chassis comprises 3-8 wheels **116**. In some embodiments, each leg comprises at least one wheel **116**. In some embodiments, and as described in greater detail elsewhere herein, the chassis **110** comprises brakes.

[0057] In some embodiments, and as described in greater detail elsewhere herein, the wheels **116** are driven by one or more motors. In some embodiments, and as described in

greater detail elsewhere herein, the position of the legs **122** is adjusted by one or more motors.

[0058] In some embodiments, the length of each leg **122** ranges between 10-100cm. In some embodiments, the length of each leg **122** ranges between 10-60cm. In some embodiments, the length of each leg **122** ranges between 30-50cm.

[0059] In some embodiments, the width of the chassis **110** ranges between 30-150cm. In some embodiments, the width of the chassis **110** ranges between 40-120cm. In some embodiments, the width of the chassis **110** ranges between 60-100cm.

[0060] In some embodiments, the length of the chassis **110** ranges between 30-150cm. In some embodiments, the length of the chassis **110** ranges between 40-120cm. In some embodiments, the length of the chassis **110** ranges between 60-100cm.

Arm

[0061] In some embodiments, the arm **120** is positioned between the chassis **110** and the load carrier **102**. In some embodiments, the second portion **108** of the arm **120** supports the load carrier **102** at one or more point of support **128**. in some embodiments, the point of support **128** comprises a lock and/or joint. In some embodiments, and as described in greater detail elsewhere herein, the point of support **128** comprises a handle **124** which holds the load carrier **102** at a specified position, e.g., a fixed position, a moveable position, and a dynamic position which is changed in order to maintain balance of the cart **100**.

[0062] In some embodiments, the second portion **108** comprises a frame **130**. In some embodiments, the frame **130** is rigid or semi-rigid. In some embodiments, the frame **130** is collapsible, for example, in some embodiments the frame **130** comprises a plurality of foldable portions. In some embodiments, the frame **130** comprises a shape fit to accommodate the load carrier **102**. In some embodiments, the frame **130** comprises a rail **132** in which the load carrier **102** is slidable. In some embodiments, and as described in greater detail elsewhere herein, the load carrier **102** comprises one or more handles **124** which is slidable along the frame **130**, the second portion **108**, and/or at least a portion of the arm **120**.

[0063] In some embodiments, the frame comprises a bumper **134** set to limit the movement of the load carrier **102** in one or more directions. In some embodiments, the bumper **134** is shock absorbing. In some embodiments, the bumper **134** is positioned to intersect the line of movement of the load carrier **102**. In some embodiments, the frame **130** and/or bumper **134** is positioned such that there is a distance between an edge of the load carrier **102** (i.e., edge **138**) and an outermost edge of the frame **103** (i.e., outermost edge **140**), such that an incoming obstruction is obstructed by the frame **130** before reaching the load carrier **102**.

[0064] In some embodiments, the frame **130** comprises a length and/or width are equal to or larger than the length and/or width of the load carrier **102**. In some embodiments, the dimensions of the frame **130** are equal to or larger than the dimensions of the load carrier **102** such that the load carrier **102** is moveable within the frame **130**. In some embodiments, the load carrier **102** is slidable along the width and/or length of the frame **130**.

[0065] In some embodiments, the first portion **106** comprises one or more projections **126**. For example, in the exemplary embodiment depicted by Fig. 2B, the cart **100** comprises a plurality of projections **126-1/126-2/126-3** (collectively referred to as projections **126**). In some embodiments, the first portion **106** comprises a plurality of projections **126** of which at least two are maintained parallel to one another. In some embodiments, the cart **100** comprises a plurality of projections **126** of which at least two are maintained parallel to each other throughout an adjustment of the cart **100** from one state to another.

[0066] In some embodiments, the first portion **106** of the arm **120** and/or the one or more projection **126** is coupled to the frame **130** at one or more conjunctions **142**. In some embodiments, the one or more projection **126** is coupled to the chassis **110** on one end and to the frame **130** at a second end. In some embodiments the length of the projection **126** is extendable, for example, telescopically.

[0067] In some embodiments, the conjunctions **142** comprise one or more upper joints 112. In some embodiments, the upper joint **112** comprises an axis of rotation between one end of one or more projection **126** and the frame **130** and/or conjunction **142**. In some embodiments, the upper joint **112** and/or conjunction **142** is slidable within frame **130**. In

some embodiments, the projection **126** and/or first portion **106** is slidable within the frame **130**.

[0068] In some embodiments, the projection **126** is coupled to the leg **122** of the chassis **110**. In some embodiments, each projection **126** is coupled to one leg **122** such that at a closed state, the leg **122** folds onto the projection **126**.

Closed and Open States of the Cart

[0069] In some embodiments, at one or more of the open states, when the support **104** of the cart **100** is positioned on a surface, the support **104** comprises the base-of-support of the load carrier **102** and/or cart **100**. In some embodiments, at one or more of the open states, the support **104** is set to maintain the spatial location and/or orientation of the load carrier **102** fixed. In some embodiments, the support **104** is adjustable from one or more open state to another while maintaining the spatial location and/or orientation of the load carrier **102** fixed. In some embodiments, the support **104** is adjustable from one or more open state to one or more closed state while maintaining the spatial location and/or orientation of the load carrier **102** fixed.

[0070] In some embodiments, the support **104** is adjustable from one open state to another such that when the chassis **110** is placed onto a surface, the line of gravity **118** of the cart **100** continuously intersects the base-of-support of the cart **100** throughout the adjustment.

[0071] In some embodiments, at a closed state, the load carrier **102** is set onto a surface, such as, for example, a trunk of a car. In some embodiments, at a closed state of the cart **100**, the support **104** comprises a retracted state. In some embodiments at the closed state of the cart **100**, the support **104** is folded, bent, collapsed, packed, and/or the like. In some embodiments, and as explained in greater detail elsewhere herein, the retracted support **104** fits into a portion of the load carrier **102**.

Movable Load carrier

[0072] In some embodiments, the load carrier **102** is rigid, semi-rigid, or flexible. In some embodiments, the load carrier **102** is collapsible and/or foldable. In some embodiments, the cart **100** comprises one or more handles **124** configured to couple between the load carrier **102** and the second portion **108**. In some embodiments, the load carrier **102** comprises the

handle **124**. In some embodiments, the handle **124** is movably coupled to the arm **120**. In some embodiments, the handle **124** is slidably coupled to the arm **120**. In some embodiments, the handle **124** is slidable along at least a portion of the length of the arm **120**.

[0073] In some embodiments, the length of the load carrier **102** is 0.5-1.5m. In some embodiments, the length of the load carrier **102** is 0.5-1m. In some embodiments, the length of the load carrier **102** is 0.7-1m.

[0074] In some embodiments, the width of the load carrier **102** is 0.2-1.5m. In some embodiments, the width of the load carrier **102** is 0.2-0.75m. In some embodiments, the width of the load carrier **102** is 0.2-0.6m.

[0075] In some embodiments, the depth of the load carrier **102** is 0.2-1.5m. In some embodiments, the depth of the load carrier **102** is 0.2-0.8m. In some embodiments, the depth of the load carrier **102** is 0.2-0.65m.

[0076] In some embodiments, the one or more handle **124** is a portion of the load carrier which is configured to accommodate the second portion **108**. In some embodiments, the second portion **108** comprises the one or more handle **124** onto which the load carrier **102** is coupled. In some embodiments, the handle **124** comprises a slot and/or track in which the second portion **108** fits at an open and/or closed state of the cart. In some embodiments, the handle **124** comprises a slot and/or track in which the support **104** fits at a closed state of the cart.

[0077] For example, in some embodiments the handle **124** is one or more of a hoop, hook, clasp, or the like, which are slidable along the length of the second portion **108** and couplable to the load carrier **102**.

[0078] In some embodiments, the handles **124** are slidable along the second portion **108**. In some embodiments, the handles are lockable onto the second portion **108**. In some embodiments, and as described in greater detail elsewhere herein, the position of the load carrier **102** in relation to the second portion **108** is controlled by one or more motors.

[0079] In some embodiments, the spatial location and/or of the load carrier**102** is changeable in relation to the chassis **110** and/or the second portion **108** by one or more of

sliding the load carrier along the length of the second portion **108**, changing the angle between the first portion **106** and the second portion **108**, changing the angle between the second portion **108** and the chassis **110**, and changing the distance between the second portion **108** and the chassis **110**.

[0080] In some embodiments, the spatial location and/or orientation of the load carrier **102** is maintained fixed throughout the adjustment of the spatial location and/or of the load carrier**102** in relation to the second portion **108** and/or the chassis **110**.

[0081] In some embodiments, the spatial location and/or of the load carrier 102 is changeable in relation to the chassis **110** and or the second portion **108** which maintaining the line of gravity (as depicted by lines **118-1/118-2/118-3** in Figs. 1A, 1B, and 1C respectively) of the cart **100** stationary. In some embodiments, the spatial location and/or orientation of the load carrier 102 is changeable in relation to the chassis **110** and or the second portion **108** which maintaining the line of gravity of the cart **100** within a range of locations which intersect with the base-of-support of the cart **100**. In some embodiments, the spatial location and/or of the load carrier 102 is changeable in relation to the chassis **110** and or the second portion **108** which maintaining the line of gravity of the cart **100** within a range of locations which intersect with the chassis **110**.

[0082] For example, in Fig. 1A the cart **100** is at an open state wherein the line of gravity **118-1** of the cart **100** intersects the first portion **106** and the chassis **110**. The cart **100** can be adjusted from the open state depicted by Fig. 1A to any one or more open states, for example as depicted by Fig. 1B and 1C, wherein the line of gravity **118-2** and **118-3**, respectively, intersects with the chassis **110** at a location between the load carrier **102** and the first portion **106**.

[0083] In some embodiments, the cart **100** maintains its center of gravity **118** by shifting the position of any one of the load carrier **102**, the first portion **106**, and the second portion **108**, in relation to the chassis **110**. In some embodiments, the cart **100** maintains its center of gravity **118** by shifting the positions of the one or more legs **122** of the chassis **110** in relation to one another. In some embodiments, and as described in greater detail elsewhere herein, the cart **100** comprises one or more sensors which determine the position of the line of gravity **118** of the cart **100**.

[0084] A potential advantage of the cart **100** maintaining the center of gravity **118** which intersects with the chassis **110** is in that the load carrier **102** is maintained balanced by the support **104** during and after positioning of the cart **100** at an open state from a closed state and/or another open state. In some embodiments, the line of gravity **118** of the cart **100** is shiftable during the adjustment of the cart **100** from one state to another.

Retraction of the Support

[0085] Reference is made to Figs. 3A, 3B, 3C, 3D, 3E, 3F, 3G, 3H, 3I, 3J, and 3K, which are side view illustrations of an exemplary embodiments of a cart during retraction of a support of the cart, in accordance with some embodiments of the present invention.

[0086] In some embodiments, the support **104/204** is retractable to a closed state of the cart such as depicted by Fig. 1D and Fig. 3K.

[0087] In some embodiments, and as described in greater detail elsewhere herein, the cart **100** is self-adjusting. In some embodiments, the cart **100** comprises one or more motors coupled to one or more of the legs **122**, chassis joint 114, first portion **106**, second portion **108**, load carrier **102**, handles **124**, upper joint 112, and/or other portions of the cart **100**. In some embodiments, the motors shift the position of any one or more of the legs **122**, chassis joint 114, first portion **106**, second portion **108**, load carrier **102**, handles **124**, upper joint 112, and/or other portions of the cart **100** during the retraction of the support **104**.

[0088] Figs. 3A-3K show a sequence of an exemplary sequence of adjustments of the cart **100** position from an open state to a closed state. Fig. 3A shows the cart **100** at an open state wherein the support **104** holds the load carrier **102**. In some embodiments, such as depicted by Fig. 3C-3D, the cart **100** positions the load carrier **102** onto a platform prior to the retraction of the support **104**. In some embodiments, once the load carrier **102** is positioned onto a platform, the support **104** is adjusted such that the cart **100** is in a closed state.

[0089] For example, in the exemplary illustrations in Figs. 3E-3K, the line of gravity **118** of the cart **100** is shifted towards the load carrier **102**. In some embodiments, the weight of the cart **100** is shifted from the chassis **110** to the load carrier **102**.

[0090] In some embodiments, such as depicted by Figs. 3F and 3G, the legs **122** each rotate about the chassis joint **114**. In some embodiments, at a closed or-semi-closed state of the cart **100**, the legs **122** are positioned parallel to the first portion **106**. In some embodiments, such as depicted by Fig. 3I, the first portion **106** rotates about the upper joint 112. In some embodiments, at a closed or-semi-closed state of the cart **100**, the first portion **106** is positioned parallel to the second portion **108**.

[0091] In some embodiments, at a closed or semi-closed state of the cart **100**, such as depicted by Figs. 3J-3K, the load carrier **102** and/or handle **124** accommodate one or more of the leg **122**, first portion **106**, and second portion **108**.

[0092] Reference is made to Figs. 4A, 4B, and 4C, which are side view simplified illustrations of exemplary embodiments of a cart in a closed state, according to some embodiments of the present invention. In some embodiments, the retracted support **104** comprises one or more of the legs **122** and first portion **106** positioned within the second portion **108**. In some embodiments, at a closed the cart **100**, one or more of the legs **122** and first portion **106** are positioned at angle in relation to the second portion **108**. In some embodiments, at a closed or semi-closed state of the cart **100**, one or more of the legs **122** and first portion **106** are set around a portion of the load carrier **102**.

[0093] In some embodiments, such as depicted by Figs. 4A, 4B, and 4C, the support **104** supports at least a portion of the weight of the cart **100** at a closed state. In some embodiments, the closed state of the cart comprises sliding a portion of the support over the load carrier **102**. In some embodiments, the closed state of the cart **100** comprises sliding a portion of the support **104** past the load carrier **102** such that at least a portion of the support **104** is positioned on either side of the load carrier **102**.

[0094] A potential advantage of having a portion of the support **104** angled in relation to the second portion **108** at a closed state of the cart **100** is in that the spatial location and/or orientation of the load carrier**102** is then fixed at the location onto which it was set.

[0095] A potential advantage of having a portion of the support **104** angled in relation to the second portion **108** at a closed state of the cart **100** is in that the support **104** creates a barrier between the load carrier **102** and the surrounding environment.

Method

[0096] Reference is made to Fig. 5A, which is a flow chart illustrating a method of retracting a cart from an open state to a closed state, in accordance with some embodiments of the present invention.

[0097] In some embodiments, the method comprises at **502** placing a load carrier **102** onto a surface (e.g., surface **202** depicted by Figs. 3A-3K). In some embodiments, the method comprises at **504** adjusting adjustable portions of the cart support system in respect to each other and at **506** lifting the chassis **110** towards the first portion **106**. In some embodiments, the method comprises at **508** positioning the chassis 110 and one or more adjustable portions (e.g., first portion **106)** adjacent to the load carrier. In some embodiments, the method further includes positioning the chassis 110 and one or more adjustable portions (e.g., first portion **106)** adjacent to the second portion **108**.

[0098] In some embodiments, the method comprises retracting the length of the first and/or second portion **106/108**. In some embodiments, the method comprises rotating the chassis **110** towards the first portion **106**. In some embodiments, the method comprises sliding the chassis **110** onto the first portion **106**. In some embodiments, the method comprises sliding the first portion **106** onto the second portion **108**. In some embodiments, the method comprises aligning the first portion **160** with the second portion **108**.

[0099] In some embodiments, the method comprises shifting the weight of the cart **100** from the chassis **110** to the load carrier **102**. In some embodiments, the method comprises retracting the support **104**. In some embodiments, the method comprises one or more of folding, sliding, and rotating one or more legs **122** to a position parallel to the first portion **106**. In some embodiments, the method comprises rotating one or more legs **122** about chassis joint 114. In some embodiments, the method comprises sliding one or more legs **122** onto the first portion **106** and/or projection **126**.

[00100] In some embodiments, the method comprises rotating the first portion **106** about the upper joint 112. In some embodiments, the method comprises sliding the first portion **106** along the length of a portion of the second portion **108**. In some embodiments, the method comprising retracting the length of one or more of the first portion **106**, the second portion **108**, and/or the leg **122**.

[00101] In some embodiments, the method comprises sliding the second portion **108** within the handles **124** of the load carrier **102**.

[00102] Reference is made to Fig. 5B, which is a flow chart illustrating a method of opening a cart from a closed state to an open state, in accordance with some embodiments of the present invention.

[00103] In some embodiments, the method comprises opening a portion of the cart **100** positioned in a closed state onto a surface, by, at **510** adjusting adjustable portions of the cart support system in respect to the chassis and at **512** in respect to each other. In some embodiments, the adjusting at **510** comprises e.g., extending the first portion **106** away from the second portion **108**. In some embodiments, the method comprises extending one or more portions of the cart support system at **514** and at **516**, in some embodiments, the method comprises positioning the chassis **110** onto a platform. In some embodiments, at **518** the method comprises lifting the load carrier **102** from the surface.

[00104] In some embodiments, the method comprises extending the length of the first and/or second portion **106/108**. In some embodiments, the method comprises sliding the first portion **106** away from the second portion **108**. In some embodiments, the method comprises rotating the first portion **106** away from the second portion **108** such that the chassis **110** is positioned between the second portion **108** and a platform onto which the cart **100** is being opened. In some embodiments, the method comprises sliding and/or rotating the chassis **110** away from the first portion **106**.

[00105] In some embodiments, the method comprises sliding the first portion **106** along the second portion **108**. In some embodiments, the method comprises extending the length of one or more of the first portion **106** and/or the second portion **108**. In some embodiments, the method comprises rotating the second portion **108** about the upper joint 112. In some embodiments, the method comprises unfolding the second portion **108** from the first portion **106**.

[00106] In some embodiments, the method comprises sliding the legs **122** away from the first portion **106**. In some embodiments, the method comprises rotating the leg **122** about the chassis joint 114.

Self-Adjusting System

[00107] Reference is made to Fig. 6, which is a simplified illustration of a system of a self-adjusting cart, in accordance with some embodiments of the present invention. In some embodiments, there is provided a system of a self-adjusting cart. In some embodiments, the system **600** comprises a cart **100** and at least one motor **608** coupled to the cart **100**. In some embodiments, the system **600** comprises a control unit **602**. In some embodiments, the system **600** comprises one or more sensors **604** configured to send data to the control unit **602**. In some embodiments, the system **600** comprises a user interface module **606** coupled to the cart **100** and/or the control unit **602**.

[00108] In some embodiments, the sensor **604**, user interface module **606**, and/or motor **608** are coupled to the control unit **602** via one or more of cable, Bluetooth, Wi-Fi, and the like.

[00109] In some embodiments, the control unit **602** receives data from the one or more sensors. In some embodiments, the control unit **602** controls the one or more motors **608**. In some embodiments, the one or more motors **608** are coupled to at least a portion of the support **104**. In some embodiments, the one or more motors **608** are coupled to any one or more of the first portion **106**, second portion **108**, chassis joint 114, upper joint 112, chassis **110**, legs **122**, load carrier **102**, frame **130**, rail **132**, wheels **116**, projection **126** and handles **124**.

[00110] In some embodiments, the control unit controls the position of the support **104** and/or load carrier **102** via one or more motors **608**. In some embodiments, the control unit adjusts the load carrier **102** and/or the support **104** via one or more motors **608**. In some embodiments, the control unit **602** maintains the cart **100** balanced such that the spatial location and/or orientation of the load carrier **102** is maintained fixed.

[00111] In some embodiments, the motor **608** drives the wheels **116**. In some embodiments, the control unit controls the transportation of the cart **100** by one or more of controlling the speed of travel and/or the location to which the wheels are driven by the motor **608**.

[00112] In some embodiments, the system comprises one or more sensors **604** such as, for example, pressure sensor, load carrier sensor, strain gauge, line of gravity sensor, proximity

sensor, Global Positioning System, optical sensor, and the like. In some embodiments, the one or more sensor **604** is coupled to any one or more of the first portion **106**, second portion **108**, chassis joint 114, upper joint 112, chassis **110**, legs **122**, load carrier **102**, frame **130**, rail **132**, projection **126** and handles **124**.

[00113] In some embodiments, the user interface module **606** sends data to the control unit **602** comprising parameters inputted by a user, for example, the speed of travel of the cart **100**, the height of the platform onto which the cart **100** is positioned in a closed state, the distance of the platform onto which an open cart **100** is adjusted onto to a closed state, and the desired state, spatial location and/or orientation of the load carrier **102**.

Load carrier Embodiments

[00114] Reference is made to Fig. 7A, 7B, and 7C are side view simplified illustrations of exemplary embodiments of a cart, in accordance with some embodiments of the present invention.

[00115] In some embodiments, such as depicted by Figs. 7A the cart **700** comprises a plurality of load carriers **702** positioned along the second portion **108**. In some embodiments, the load carriers **702** are slidable along the support **104** and/or second portion **108**. In some embodiments, the distances between two consecutive load carriers **702** are adjustable. In some embodiments, a one or more load carriers **702** are removable.

[00116] A potential advantage of the cart **700** having a plurality of load carriers **702** which are moveable along the second portion **108** is in that the weight distribution of the load carriers **702** can be manipulated such that the cart **700** is maintained balanced. In some embodiments, the positions of the load carriers **702** (i.e. distance between the load carriers **702**, position of the load carriers **702** along the second portion **108**) are adjusted from one open state of the cart **700** to another open state.

[00117] In some embodiments, such as depicted by Fig. 7B, the cart **750** comprises a plurality of load carriers **704** which are moveable along the support **104** such that the one load carrier is positioned partially or directly above a second load carrier **704**. In some embodiments, the load carriers **704** and the support **104** are coupled to each other by a handle **706**. In some embodiments, the handle **706** is integral to the load carrier **704** and/or

to the support **104**. In some embodiments, the load carriers **704** are moveable along the support **104**.

[00118] A potential advantage of the load carriers **704** being moveable along the length of the support **104** is in that the cart **750** includes more compartments which increase the amount of merchandise that the cart **750** can support. In some embodiments, the cumulative dimensions of the load carriers **704** are not limited by the dimensions of the second portion **108** of the support **104**.

[00119] In some embodiments, such as depicted by Fig. 7C, the cart **780** comprises one or more load carrier holders **710**, such as, e.g., hooks, configured to hold one or more load carriers and/or bags. In some embodiments, the load carrier holders **710** are structured to accommodate bags such as shopping bags and plastic bags.

[00120] A potential advantage of the cart **780** comprising load carrier holders **710** instead of comprising load carriers is in that the cart **780** can accommodate many types of load carriers. Additionally, the support **104** and load carrier holder **710** of the cart **780** can retract into a closed state without load carriers.

[00121] In some embodiments, the load carrier holders comprise sensors such as, for example, strain gauges which measure the force exerted onto each load carrier holder **710**. In some embodiments, the distance between each load carrier holder **710** and/or the position of the load carrier holder **710** in relation to the second portion **108** is adjustable.

[00122] Throughout this application, various embodiments of this invention may be presented in a range format. It should be understood that the description in range format is merely for convenience and brevity and should not be construed as an inflexible limitation on the scope of the invention. Accordingly, the description of a range should be considered to have specifically disclosed all the possible subranges as well as individual numerical values within that range. For example, description of a range such as from 1 to 6 should be considered to have specifically disclosed subranges such as from 1 to 3, from 1 to 4, from 1 to 5, from 2 to 4, from 2 to 6, from 3 to 6 etc., as well as individual numbers within that range, for example, 1, 2, 3, 4, 5, and 6. This applies regardless of the breadth of the range.

[00123] Whenever a numerical range is indicated herein, it is meant to include any cited numeral (fractional or integral) within the indicated range. The phrases “ranging/ranges

between" a first indicate number and a second indicate number and "ranging/ranges from" a first indicate number "to" a second indicate number are used herein interchangeably and are meant to include the first and second indicated numbers and all the fractional and integral numerals therebetween.

[00124] In the description and claims of the application, each of the words "comprise" "include" and "have", and forms thereof, are not necessarily limited to members in a list with which the words may be associated. In addition, where there are inconsistencies between this application and any document incorporated by reference, it is hereby intended that the present application controls.

[00125] The descriptions of the various embodiments of the present invention have been presented for purposes of illustration but are not intended to be exhaustive or limited to the embodiments disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art without departing from the scope and spirit of the described embodiments. The terminology used herein was chosen to best explain the principles of the embodiments, the practical application or technical improvement over technologies found in the marketplace, or to enable others of ordinary skill in the art to understand the embodiments disclosed herein.

WHAT IS CLAIMED IS:

1. A cart, comprising:

a load carrier; and

an adjustable support system comprising:

a chassis; and

at least one arm adjustably coupled to said load carrier at a first end and adjustably coupled to said chassis at a second end;

said cart being retractable from an open extended state to a retracted closed state; and wherein said adjustable support system is configured to translate said load carrier and continuously maintain an intersection of a line of gravity of said cart with a base-of-support of said cart.

2. The cart according to claim 1, wherein said load carrier is slidable along at least a portion of said at least one arm.

3. The cart according to any one of claims 1-2, wherein said support is adjustable from one open state to another such that when said chassis is placed onto a surface, said line of gravity of said cart continuously intersects said base-of-support of said cart throughout said adjustment.

4. The cart according to any one of claims 1-3, where said arm comprises a first portion and a second portion, wherein said first portion is adjustably coupled to said chassis at one end and to said chassis at a second end and said second portion is coupled to said load carrier.

5. The cart according to claim 4, wherein said first portion is coupled to said second portion via an upper joint such that said second portion is rotatable about said upper joint in relation to said first portion.

6. The cart according to claim 5, wherein said upper joint comprises one or more of a hinge, sliding hinge, a rail or any combination thereof.

7. The cart according to any one of claims 4-6, wherein said first portion is slidable onto said second portion.

8. The cart according to any one of claims 4-7, wherein said second portion comprises a frame configured to accommodate said first portion of said arm.

9. The cart according to any one of claims 1-7, wherein said load carrier comprises at least one handle and wherein said at least one handle is moveably coupled to said arm.

10. The cart according to claim 9, wherein said load carrier comprises at least one handle and wherein said at least one handle is slidable along at least a portion of the length of said arm.

11. The cart according to any one of claims 1-10, wherein said chassis comprises a plurality of independent legs adjustably coupled to said arm.

12. The cart according to any one of claims 1-11, wherein said chassis is coupled to said arm at a chassis joint, and said chassis joint comprises an axis of rotation such that said chassis is adjustable in relation to said arm.

13. The cart according to any one of claims 1-12, wherein the length of said arm is extendable.

14. The cart according to any one of claims 1-13, wherein a portion of said load carrier comprises a portion configured to accommodate at least a portion of said support at a closed state.

15. A cart, comprising:

a load carrier; and

an adjustable support system comprising

at least one arm; and

a chassis;

said at least one arm being adjustably coupled to said load carrier at a first end and adjustably coupled to said chassis at a second end;

said cart being retractable from an open extended state to a retracted closed state;

said adjustable support system is configured to translate said load carrier in relation to said chassis; and

wherein at a closed state, said support is retracted to fit within a portion of said load carrier.

16. The cart according to claim 15, wherein said load carrier comprises a portion configured to accommodate said support at a closed state.

17. The cart according to any one of claims 15-16, wherein said load carrier is slidable along at least a portion of said arm.

18. The cart according to any one of claims 15-17, wherein said support is adjustable from one open state to another such that when said chassis is placed onto a surface, said line of gravity of said cart continuously intersects said base-of-support of said cart throughout said adjustment.

19. The cart according to any one of claims 15-18, where said arm comprises a first portion and a second portion, wherein said first portion is adjustably coupled to said chassis at one end and to said chassis at a second end and said second portion is coupled to said load carrier.

20. The cart according to claim 19, wherein said first portion is coupled to said second portion via an upper joint such that said second portion is rotatable about said upper joint in relation to said first portion.

21. The cart according to claim 20, wherein said upper joint comprises one or more of a hinge, sliding hinge, a rail or any combination thereof.

22. The cart according to any one of claims 19-21, wherein said first portion is slidable onto said second portion.

23. The cart according to any one of claims 19-22, wherein said second portion comprises a frame configured to accommodate said first portion of said arm.

24. The cart according to any one of claims 15-23, wherein said load carrier is movably coupled to said second portion by at least one handle.

25. The cart according to claim 24, wherein said at least one handle is slidable along at least a portion of the length of said arm.

26. The cart according to any one of claims 15-25, wherein said chassis comprises a plurality of independent legs adjustably coupled to said arm.

27. The cart according to any one of claims 15-26, wherein said chassis is coupled to said arm at a chassis joint, and said chassis joint comprises an axis of rotation such that said chassis is adjustable in relation to said arm.

28. The cart according to any one of claims 15-27, wherein the length of said arm is extendable.

29. A method for adjusting a cart from an open state to a closed state, comprising:

placing load carrier of a cart on a surface, said cart comprising a cart adjustable support system having at least a first and a second portions and a chassis;

adjusting the adjustable portions in respect to each other; and

lifting said chassis towards said first portion; and

positioning at least one of said first portion, said second portion and said chassis adjacent to said load carrier.

30. The method according to claim 29, comprising retracting the length of the first and/or second portion.

31. The method according to any one of claims 29-30, comprising rotating said chassis towards said first portion.

32. The method according to any one of claims 29-31, comprising sliding said chassis onto said first portion.

33. The method according to any one of claims 29-32, comprising sliding said first portion onto said second portion.

34. The method according to any one of claims 29-33, comprising aligning said first portion with said second portion.

35. A method for adjusting a cart from a closed state to an open state, comprising:

opening a portion of a cart being in a closed state and comprising:

a load carrier placed on a surface; and

an adjustable support system comprising

at least one of a first portion and a second portions; and

a chassis;

adjusting said at least one portion at a first end to said chassis;

adjusting said at least one portion at a second end to said load carrier;

extending said first portion and/or said second portion; and

positioning said chassis onto a platform; and

lifting said load carrier from said surface.

36. The method according to claim 35, comprising extending the length of the first and/or second portion.

37. The method according to any one of claims 35-36, comprising sliding said first portion away from said second portion.

38. The method according to any one of claims 35-37, comprising rotating the first portion away from the second portion such that said chassis is positioned between said second state and said platform.

39. The method according to any one of claims 35-38, comprising sliding and/or rotating said chassis away from said first portion.

40. A system for a self-adjusting cart, comprising:

a cart, comprising:

a load carrier; and

an adjustable support system comprising

at least one arm; and

a chassis;

said at least one arm being adjustably coupled to said load carrier at a first end and adjustably coupled to said chassis at a second end;

said cart being retractable from an open extended state to a retracted closed state;

wherein said adjustable support system is configured to translate said load carrier;

at least one motor coupled to said support; and

a control unit coupled to said motor;

wherein said control unit controls the adjustment of said support via said motor to maintain the line of gravity of the cart intersecting with the base-of-support of said cart.

41. The system according to claim 40, wherein said system comprises one or more of a strain gauge, proximity sensor, optical sensor, pressure sensor and a Global Positioning System.

42. The system according to any one of claims 40-41, wherein said one or more motor is coupled to at least one of the first portion, second portion, chassis, and load carrier.

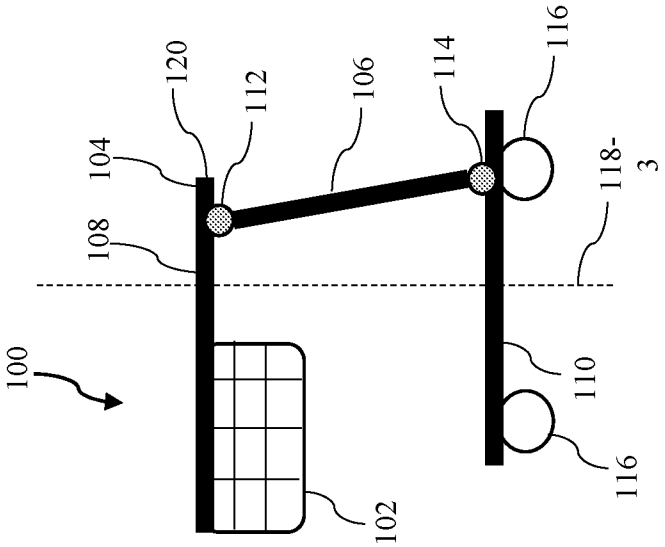


FIG 1C

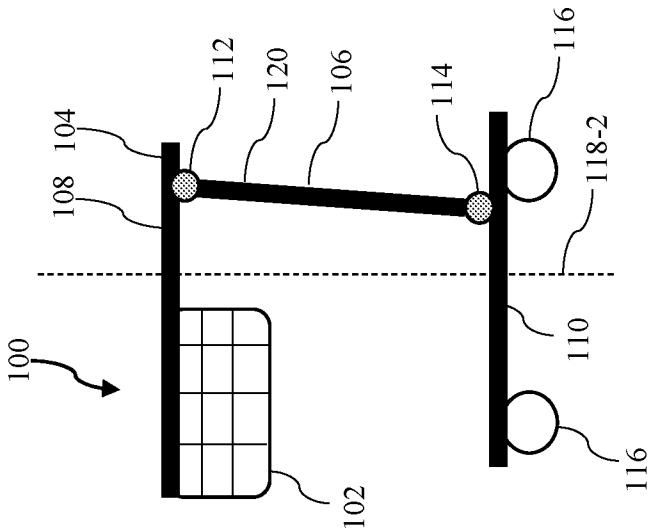


FIG 1B

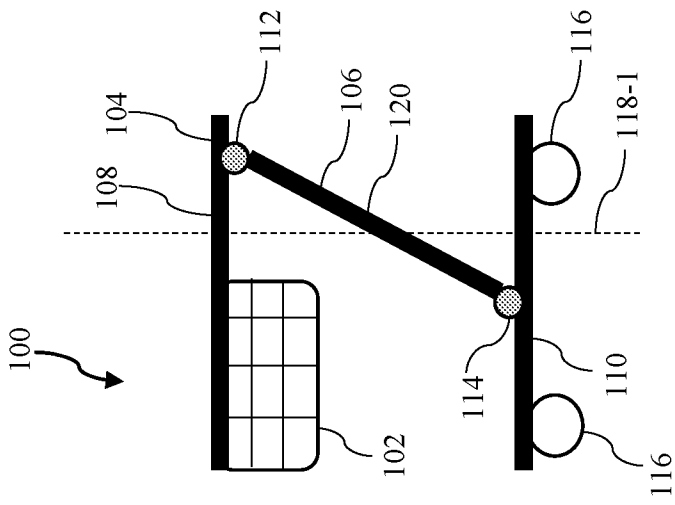
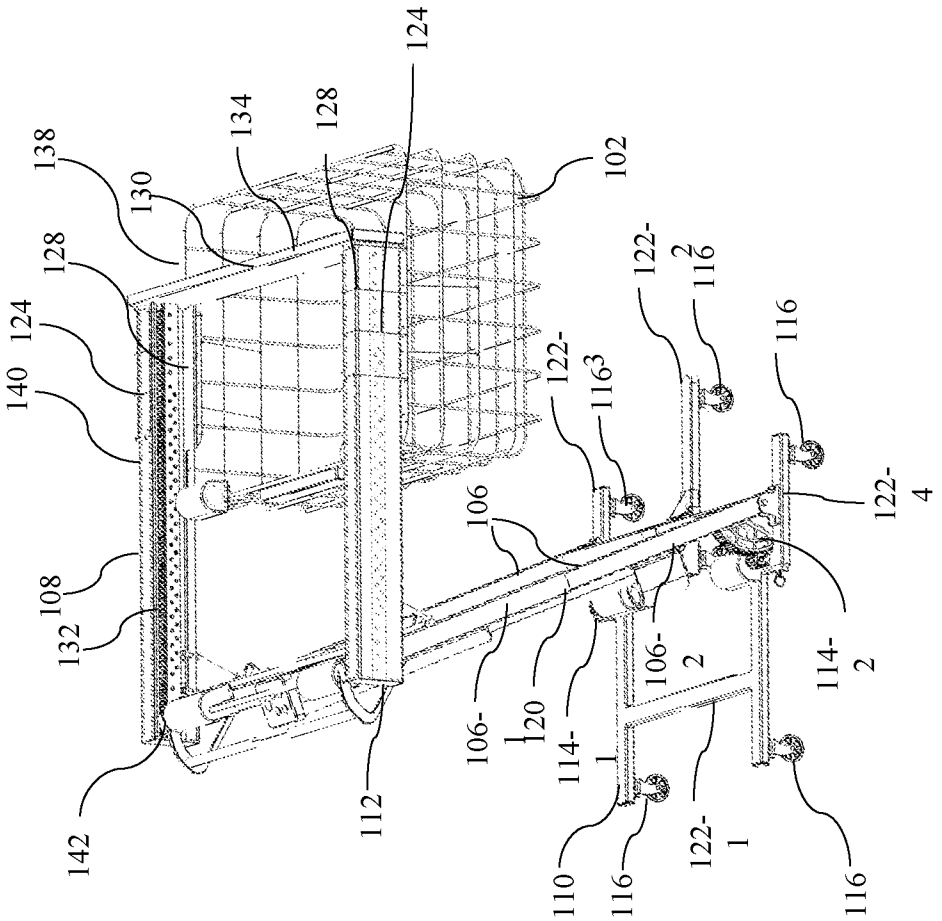


FIG 1A


124
134
128
138
130
102
128
122-2
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124
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122-3
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116
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106-2
114-2
106-1
120
114-1
112
142
110
116
122-1
116

FIG 2A

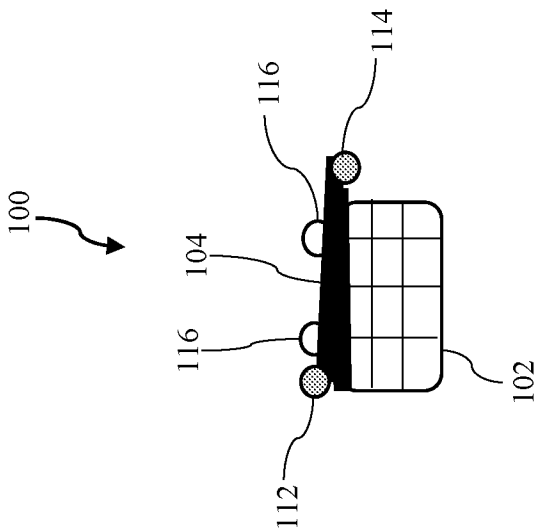
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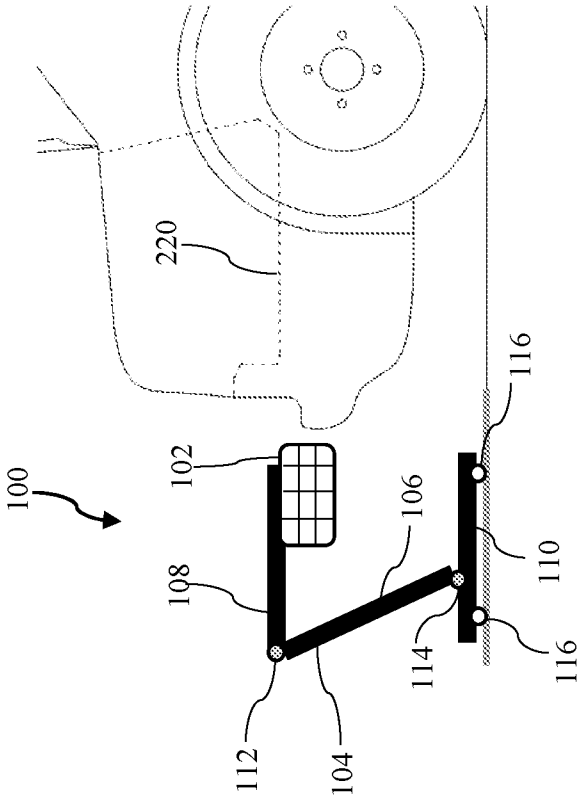
FIG 1D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110
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114
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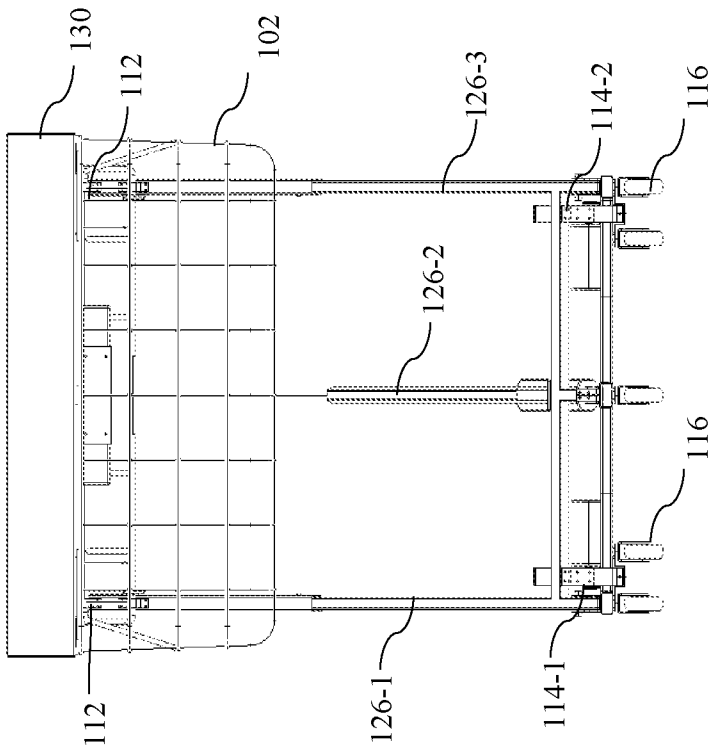
112
104

FIG 3A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126-2
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112
126-1
114-1

FIG 2B

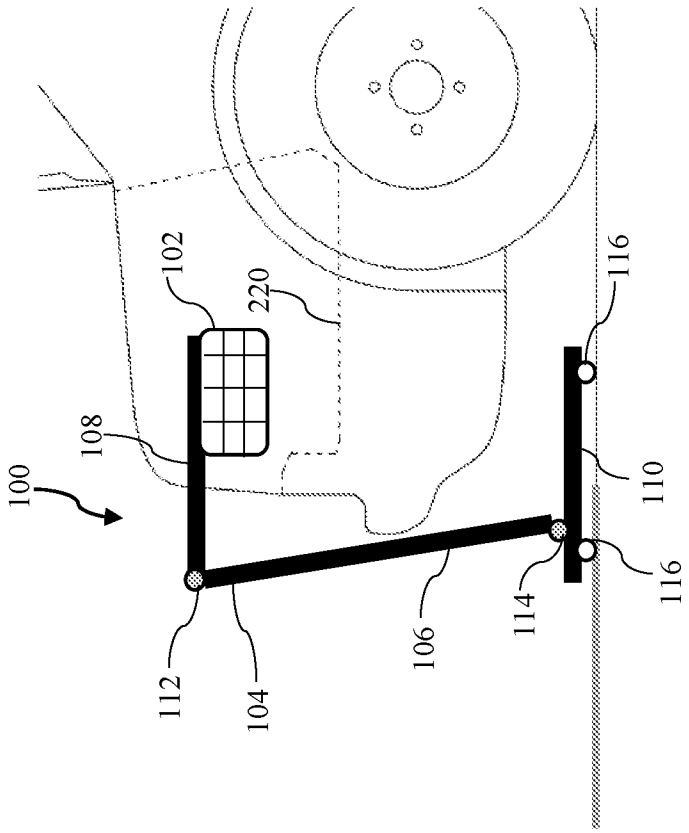
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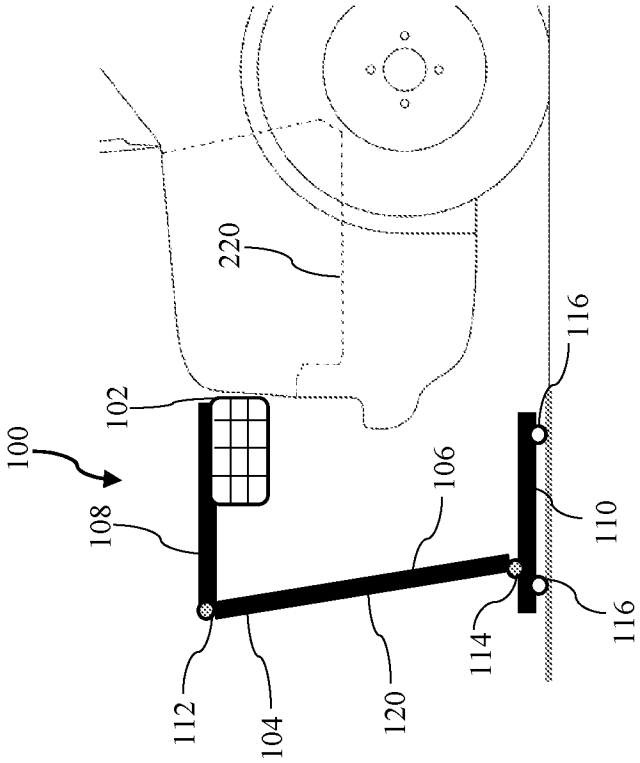
FIG 3C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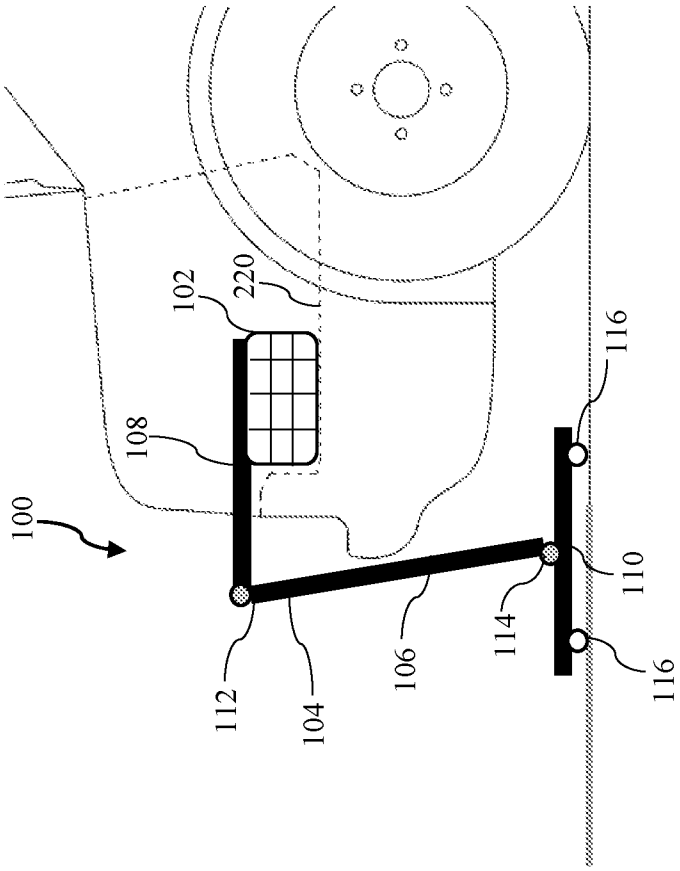
116

FIG 3B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100
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104
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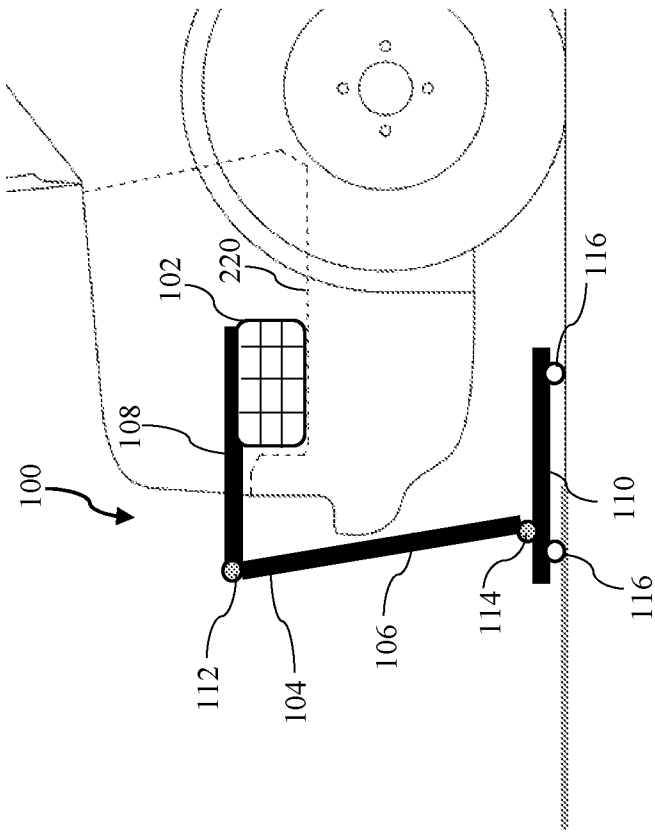
116

FIG 3E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108
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110
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112
104
106
116

FIG 3D

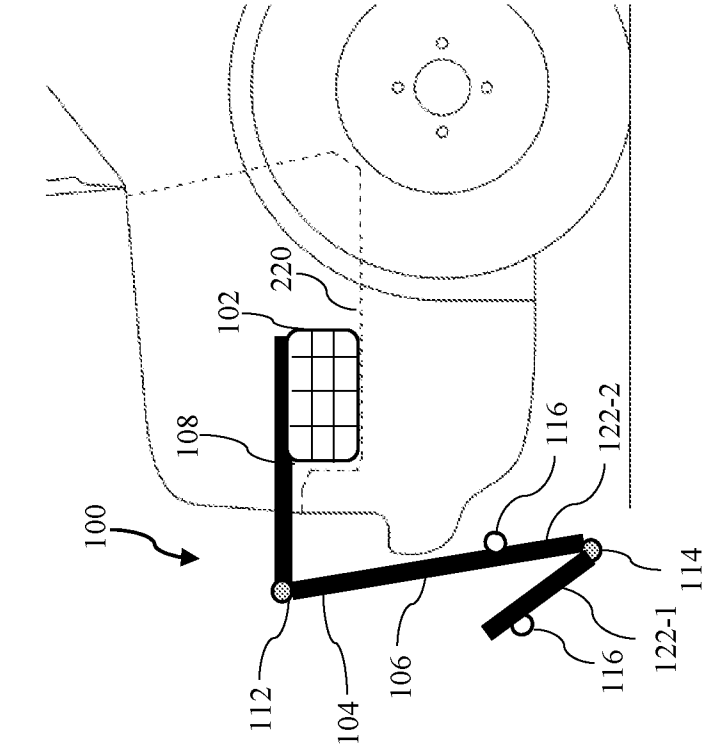
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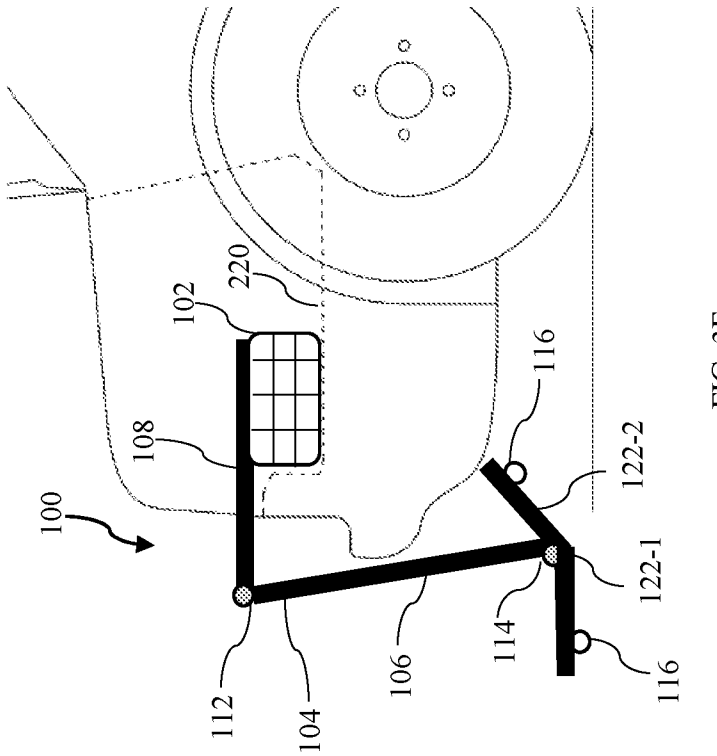
FIG 3G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122-1
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116
112
104

FIG 3F

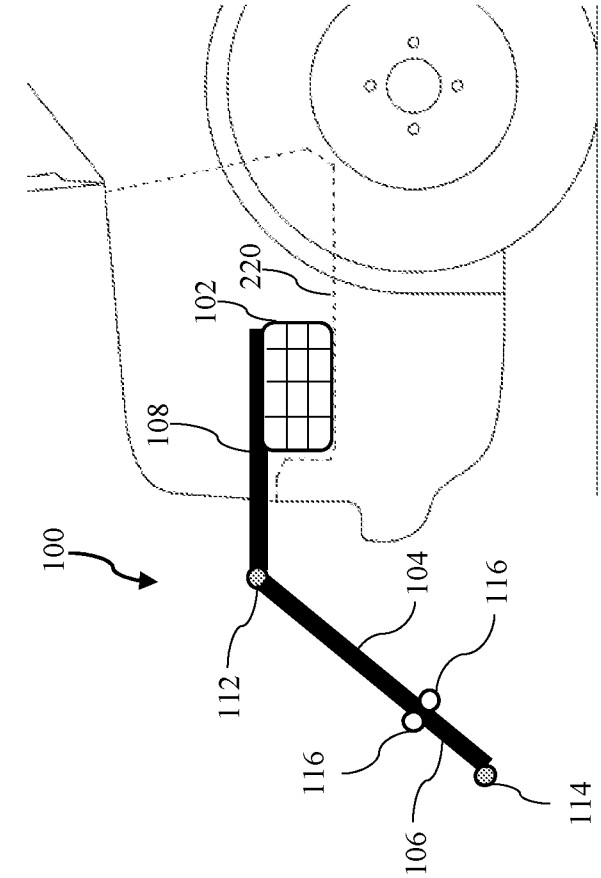
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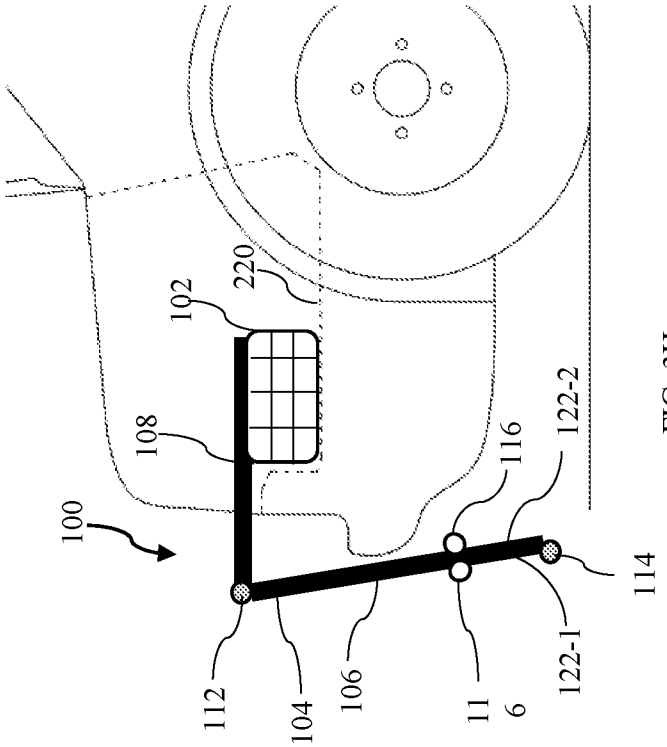
FIG 3I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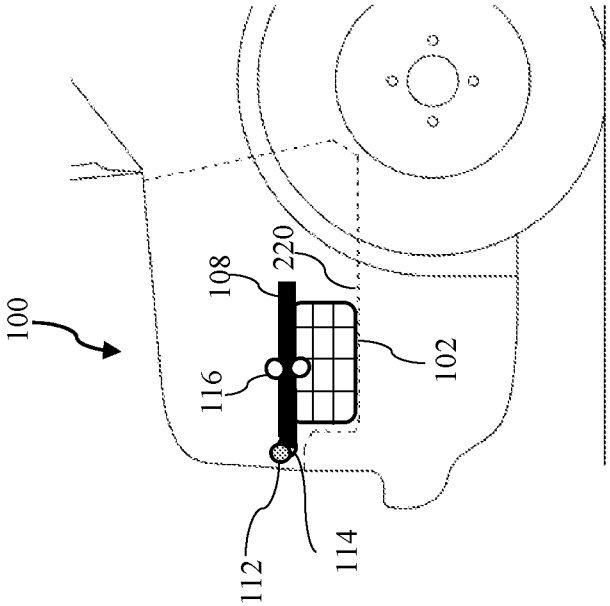
6
122-1

FIG 3H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108
220
102
116
112
114

FIG 3K

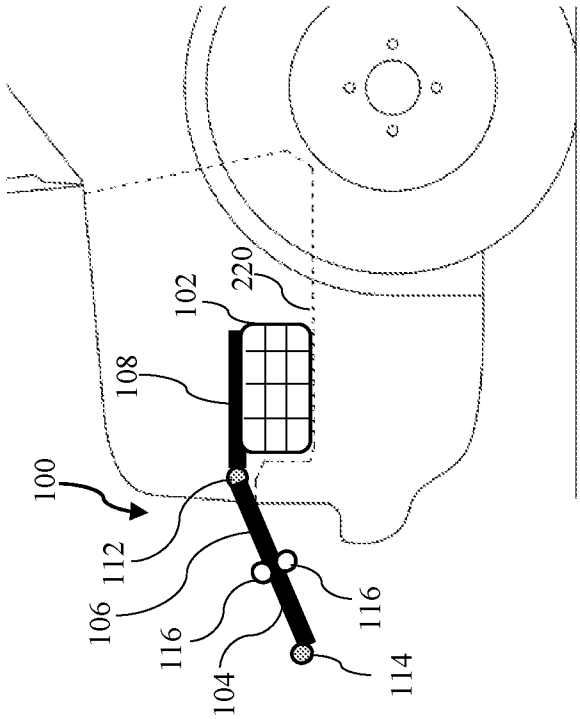

102
220
108
100
112
106
116
104
116
114

FIG 3J

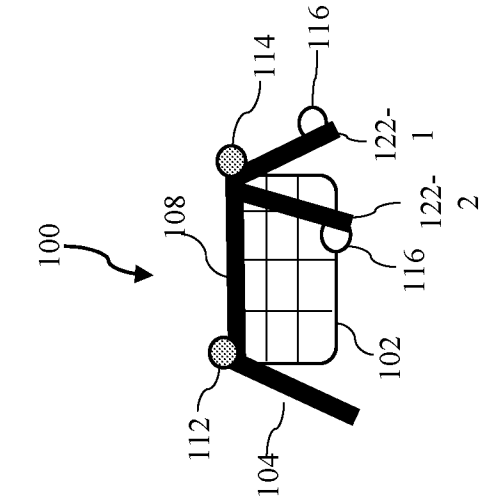


FIG 4C

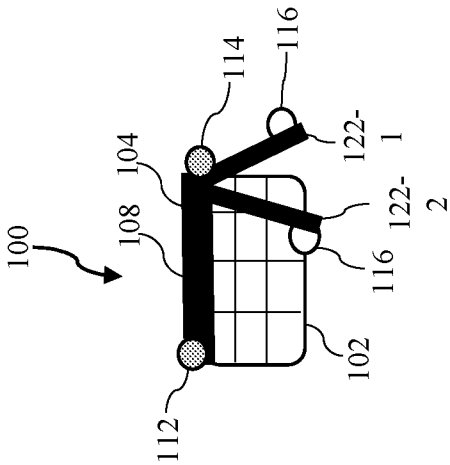


FIG 4B

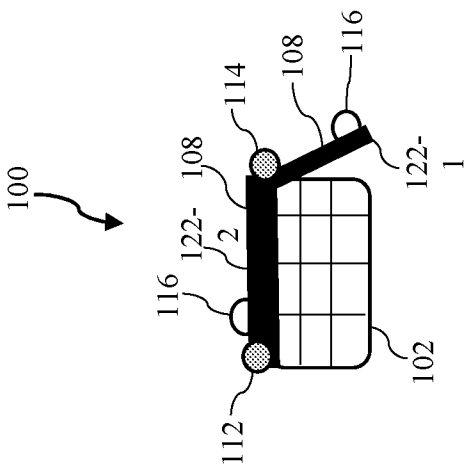


FIG 4A

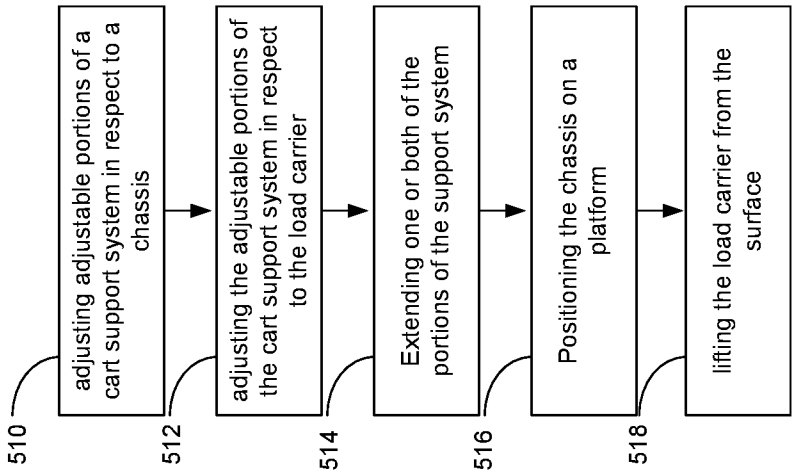

adjusting adjustable portions of a cart support system in respect to a chassis
adjusting the adjustable portions of the cart support system in respect to the load carrier
Extending one or both of the portions of the support system
Positioning the chassis on a platform
lifting the load carrier from the surface
510
512
514
516
518

FIG. 5B

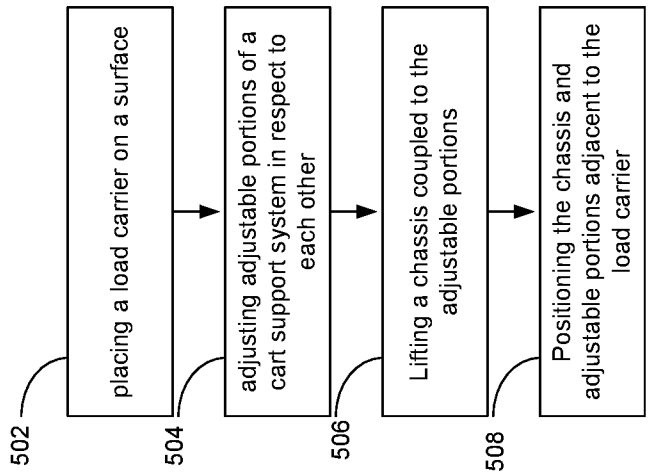

placing a load carrier on a surface
adjusting adjustable portions of a cart support system in respect to each other
Lifting a chassis coupled to the adjustable portions
Positioning the chassis and adjustable portions adjacent to the load carrier
502
504
506
508

FIG. 5A

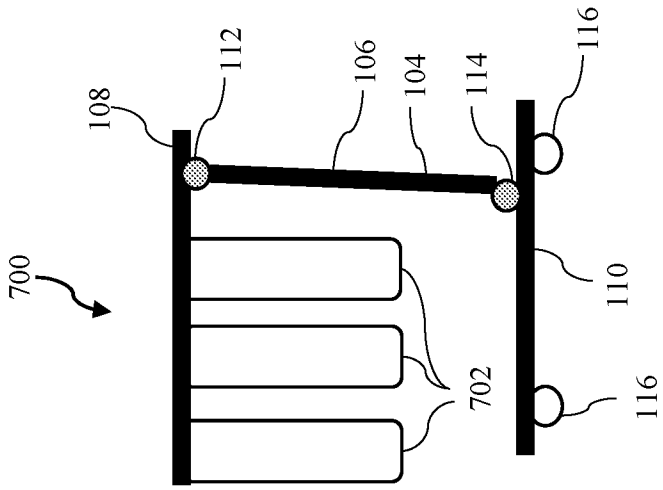

700
108
112
106
104
114
116
110
116
702

FIG 7A

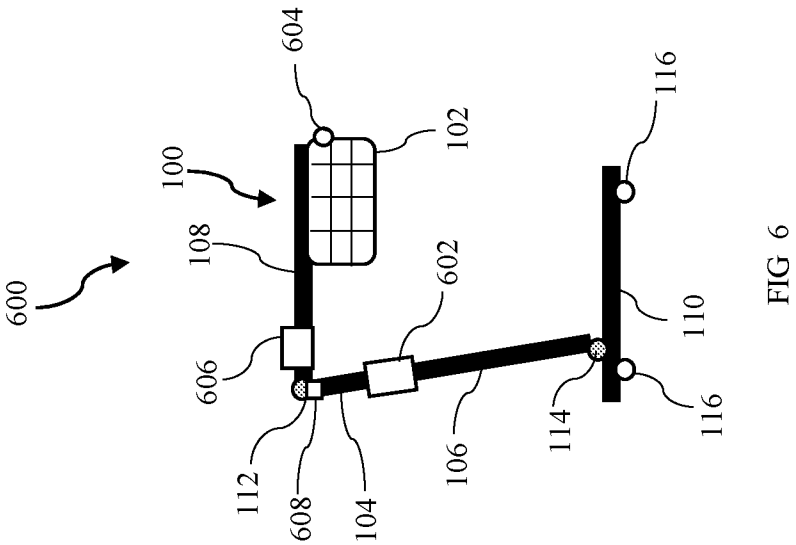
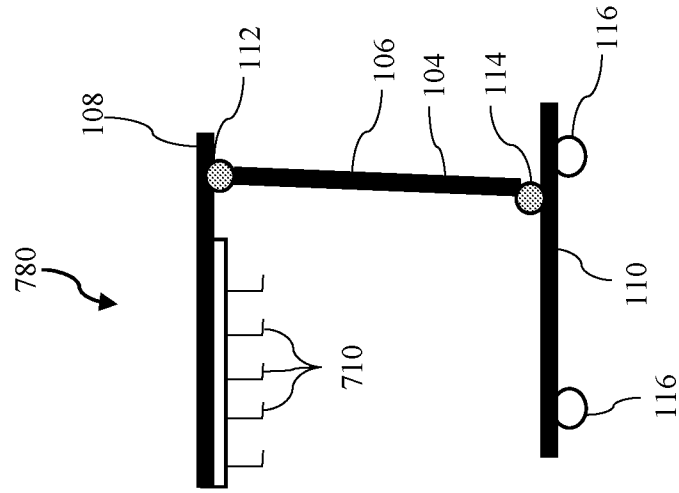

600
100
604
102
108
602
606
112
608
104
106
114
116
110
116

FIG 6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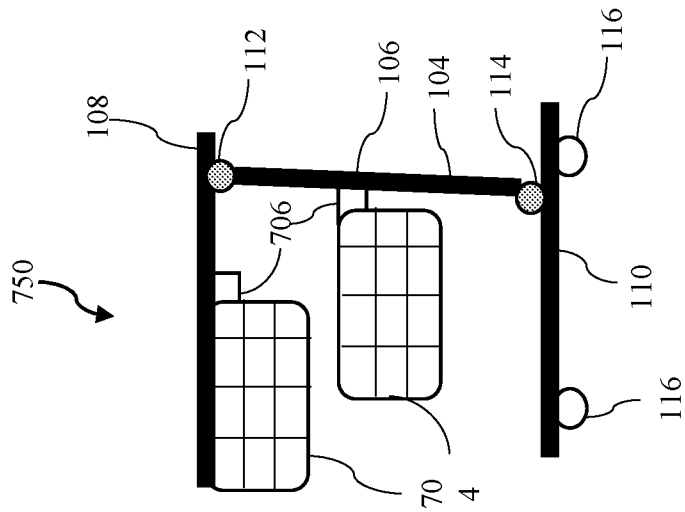
112
106
104
114
116
710
110
116

FIG 7C


750
108
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106
104
114
116
706
110
116
70
4

FIG 7B

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL2021/050785

A. CLASSIFICATION OF SUBJECT MATTER
IPC (20210101) B62B 3/02, B62B 5/00
CPC (20130101) B62B 3/027, B62B 5/0003
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC (20210101) B62B 3/02, B62B 5/00
CPC (20130101) B62B 3/027, B62B 5/0003

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Databases consulted: Derwent Innovation, Similari (AI-based)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 8075016 B2 SILBERBERG BRIAN 13 Dec 2011 (2011/12/13) the entire document	1-42
X	US 8083253 B1 BUTLER JILL 27 Dec 2011 (2011/12/27) the entire document	1,7,9,10,22,24,25, 28,29,32-35,37,40-42
X	US 2011156375 A1 GAL ALEXANDER 30 Jun 2011 (2011/06/30) the entire document	1,7,9,10,13,22,24, 25,28-30,32-42
X	US 9573610 B1 CHATURVEDI PANKAJ 21 Feb 2017 (2017/02/21) the entire document	15,22,24,25,28,29, 32-35,37

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
13 Sep 2021	13 Sep 2021

Name and mailing address of the ISA:
Israel Patent Office
Technology Park, Bldg.5, Malcha, Jerusalem, 9695101, Israel
Email address: pctoffice@justice.gov.il

Authorized officer
NARGASI Ayelet

Telephone No. 972-73-3927212

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL2021/050785

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 9211899 B2 BEAUCHAMP BRENDA JO 15 Dec 2015 (2015/12/15) the entire document	29,32-35,37

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/IL2021/050785

Patent document cited search report	Publication date	Patent family member(s)	Publication Date
US 8075016 B2	13 Dec 2011	US 2008093827 A1	24 Apr 2008
		US 8075016 B2	13 Dec 2011
US 8083253 B1	27 Dec 2011	US 8083253 B1	27 Dec 2011
US 2011156375 A1	30 Jun 2011	US 2011156375 A1	30 Jun 2011
US 9573610 B1	21 Feb 2017	US 9573610 B1	21 Feb 2017
US 9211899 B2	15 Dec 2015	US 2014369801 A1	18 Dec 2014
		US 9211899 B2	15 Dec 2015
		WO 2013191700 A1	27 Dec 2013