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SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
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DATE SIGNED:	10/12/2021
Total Attachments: 19	
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INVENTION ASSIGNMENT

WHEREAS, Craig WALLIN, Hyrum, UT, **Trevin WALLIN**, Mountain Green, UT, and **Brandon WALLIN**, Providence, UT (“Assignors”) are inventors of a soon-to-be pending patent application for an **EQUIPMENT RACK FOR A VEHICLE** (“the Invention”), a copy or copy portion of which is attached hereto as “Exhibit A”, and

WHEREAS, Assignors believe themselves to be the original, first, and/or sole inventors of the Invention disclosed and claimed in Exhibit A; and

WHEREAS, RISE OUTSIDE, LLC, a Utah limited liability company with a place of business at 2255 N 1700 W, Ste 100, Layton, UT 84041 (“Assignee”) desires to confirm its ownership of and/or acquire by formal, recordable assignment any right, title, and interest in and to said Invention, and said patent application in the United States and throughout the world;

NOW, THEREFORE, in consideration of good and valuable consideration rendered by Assignee:

1. Assignment. Assignors hereby grant and assign unto Assignee, any right, title, and interest in the invention, including any and all patent applications based upon it. Assignee also hereby acquires the right, power, and authority to file and prosecute any patent application in its own name. Assignee also maintains the right to bring actions for infringement related to the invention in its own name, specifically including the right to seek damages for any past infringement.

2. General authorization. Assignors authorize and request the Commissioner of Patents and Trademarks of the United States and of all foreign countries to issue any Patent granted for said Invention, whether on an application for said Invention, said Patent Application, or on any subsequently filed provisional, non-provisional, divisional, continuation, continuation-in-part, reissue, or other application, to Assignee, its successors and assigns, as the assignee of their entire interest in said Invention.

3. Representations and warranties. Assignors individually represent and warrant as follows:

- (a) they are Assignee’s employee OR a sole inventor or owner of the Invention;
- (b) they have not sold or transferred the Invention to any third party;
- (c) they have the authority to enter into this agreement;
- (d) they do not believe that the Invention has been taken from any third party without authorization (e.g., a knowing copy of another company’s invention);
- (e) they do not know of any permissions that have to be obtained in order for this assignment to be completed;
- (f) the Invention was not conceived or created in the course and conduct of Assignor’s employment by a separate, third party.

4. Agreement to cooperate. Assignors hereby agree, without further consideration and without expense to Assignee, to sign all lawful papers and to perform all other lawful acts which the Assignee may request in order to make this Assignment fully effective, including the furnishing of all lawful documents as requested by Assignee to further the prosecution of any patent applications relating to the invention, cooperation to the best of Assignor's ability in executing all other lawful documents pertaining to the invention, and producing evidence in any actions or proceedings concerning the invention, including, but not limited to, nullification, reissuance, extension, and infringement proceedings.

5. Forum selection. The Parties agree that any action or lawsuit arising out of or related to this Agreement—including but not limited to any action brought to enforce the terms of this Agreement—shall be brought in the federal or state courts of the State of Utah. The Parties agree that they are subject to the personal jurisdiction of such courts for the purposes of any such lawsuit or action.

6. Prevailing party costs and attorneys' fees. In any action arising out of this Agreement, including but not limited to any action brought to enforce the terms of this Agreement, the prevailing Party shall be entitled to the recovery of reasonable attorneys' fees and reasonably incurred costs and expenses of litigation.

This agreement shall be binding upon any and all heirs and legal representatives of each Assignor.

ASSIGNOR CRAIG WALLIN

Signature: Craig Wallin

Date: 10/14/21

ASSIGNOR TREVIN WALLIN

Signature: _____

Date: _____

ASSIGNOR BRANDON WALLIN

Signature: Brandon Wallin

Date: 10-11-21

SEND COPY TO:

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Director of the United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

4. Agreement to cooperate. Assignors hereby agree, without further consideration and without expense to Assignee, to sign all lawful papers and to perform all other lawful acts which the Assignee may request in order to make this Assignment fully effective, including the furnishing of all lawful documents as requested by Assignee to further the prosecution of any patent applications relating to the invention, cooperation to the best of Assignor's ability in executing all other lawful documents pertaining to the invention, and producing evidence in any actions or proceedings concerning the invention, including, but not limited to, nullification, reissuance, extension, and infringement proceedings.

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ASSIGNOR CRAIG WALLIN

Signature: _____

Date: _____

ASSIGNOR TREVIN WALLIN

Signature: Trevin Wallin

Date: 10/11/21

ASSIGNOR BRANDON WALLIN

Signature: _____

Date: _____

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ABSTRACT

Embodiments of the present invention include an equipment rack for a vehicle, such as a vertical, tire-mount bicycle rack, that is specially adapted for heavier bicycles like e-bicycles, that is significantly more robust than prior vertical bicycle racks by using a high-powered actuator coupled with a base structure that optimizes both leverage and stability through a wide, cradling hinge plate and post member pivot axis that is located aft of the post member when the post member is in a generally vertical position.

**UNITED STATES
UTILITY PATENT APPLICATION
FOR AN
EQUIPMENT RACK FOR A VEHICLE**

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

Rise Outside, LLC a United States business, whose post office address is 2255 N 1700 W Ste 100, Layton, UT 84041 prays that letters patent be granted to it as applicant and assignee of the entire interest for an **EQUIPMENT RACK FOR A VEHICLE**, as set forth in the following specification.

TITLE OF THE INVENTION

Equipment Rack for a Vehicle

BACKGROUND

[0001] Vertical mount equipment racks for vehicles allow users to carry more by positioning equipment vertically with respect to the vehicle. Vertical bike trailer hitch racks are one type of such vertical mount equipment racks. These racks allow users with a trailer hitch the ability to mount up to six bikes, usually by pivoting backwards for loading, then positioned and/or locked vertically for travel. These designs are relatively new, achieving popularity and widespread adoption only within the last few years. Significantly, the vast majority of these designs are for mounting and carrying conventional mountain and/or road bicycles. Accordingly, the corresponding structures, functionalities, and weight capacities are all premised upon loads of up to 300 pounds.

[0002] Electronic bikes (“e-bikes”) are increasingly popular, with major markets experiencing annual growth of between 10-50% or more, and there are millions of new users each year. E-bike users also want to be able to easily transport their bikes with other vehicles. However, e-bikes present unique challenges to existing rack designs. For example, e-bikes may weigh between 40 and 70 pounds—50% heavier than a conventional mountain bike. At best, the existing structures, functionalities, and weight capacities of vertical bike trailer hitch racks are inadequate to address these unique challenges. At worst, attempting to use existing bicycle designs with e-bikes may pose significant safety hazards through overloading failure, including traffic accidents as such events occur during transport.

[0003] What is needed is a vertical mount equipment rack—such as a vertical bike trailer hitch rack—that is specifically designed for the unique challenges presented by loading, carrying, and unloading e-bikes, and that optimizes rack structure, functionality, and weight capacity in view of the same.

SUMMARY OF THE INVENTION

[0004] In accordance with the above, a new equipment rack for a vehicle is provided that includes a hitch member configured to mount to a vehicle trailer hitch receiver; a hinge plate member attached to the hitch member; and a post member with a first end and a second end, the first end pivotally attached to the hinge plate member, the post member configured to move between generally vertical and generally angled positions. In various embodiments, the equipment

rack is significantly more robust than prior designs through a high-powered actuator coupled with a base structure that optimizes both leverage and stability through a wide, cradling hinge plate and post member pivot axis that is located aft of the post member when the post member is in a generally vertical position.

BRIEF DESCRIPTION OF THE FIGURES

[0005] To further clarify the above and other aspects of the present invention, a more particular description of the invention will be rendered by reference to specific embodiments thereof which are illustrated in the appended drawings. It is appreciated that these drawings depict only typical embodiments of the invention and are therefore not to be considered limiting of its scope. The drawings may not be drawn to scale. The invention will be described and explained with additional specificity and detail through the use of the accompanying drawings in which:

[0006] Figure 1 is a perspective view of one embodiment of an equipment rack for a vehicle.

[0007] Figure 2 is first side view of one embodiment of an equipment rack for a vehicle in a first position.

[0008] Figure 3 is a second side view of one embodiment of an equipment rack for a vehicle in a second position.

[0009] Figure 4 is a partial, exploded view of one embodiment of an equipment rack for a vehicle.

[0010] Figure 5 is a top view of one embodiment of an equipment rack for a vehicle.

[0011] Figure 6 is a bottom view of one embodiment of an equipment rack for a vehicle.

[0012] Figure 7 is a front view of one embodiment of an equipment rack for a vehicle.

[0013] Figure 8 is a back view of one embodiment of an equipment rack for a vehicle.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

[0014] The present invention in its various embodiments, some of which are depicted in the figures herein, is an equipment rack for a vehicle.

[0015] Referring now to Figures 1 through 3, one embodiment of an equipment rack for a vehicle 100—here a vertical, tire-mount bicycle rack—is shown. Equipment rack 100 has a hitch member 101 configured to mount to a vehicle trailer hitch receiver. A relatively wide hinge plate member 102 is attached to the hitch member 101. Preferably, hinge plate member 102 has a width B of between 6 and 14 inches. The illustrated embodiment represents an angled hitch member-

hinge plate configuration adapted for low mount vehicles such as cars, vans, and jeeps. For example, in such embodiments, hitch plate member 102 may be angled and/or positioned above hitch member 101. Other embodiments for high mount vehicles such as trucks may incorporate a straighter hitch member-hinge plate configuration. For example, in these embodiments, hitch plate member 102 may be more lateral to hitch member 101.

[0016] Rack 100 also has a post member 103 with a first end 104 and a second end 105. Post member 103 may be comprised of two or more sub-post members 103a, 103b. Post member 103 and/or post member sub-parts 103a, 103b may be configured to telescopically extend. Post member first end 104 is pivotally attached to the hinge plate member 102. Post member 103 is configured to travel between generally vertical D and generally angled E positions. In the illustrated embodiment, generally angled position E is preferably between 50 and 60 degrees from horizontal.

[0017] Post member 103 is pivotable about an axis A that, in some embodiments, is located aft of the post member 103 when the post member 103 is in the generally vertical position D. Axis A does not intersect the longitudinal axis C of the post member. Hinge plate member 102 forms a cradle for the post member first end 104 that, from a side view, is at least twice as wide as the greatest width of the post member 103. In the illustrated embodiment this cradle is closer to five times the greatest width of the post member 103. The structure of the cradle comprised, in large part, of the hinge plate member 102, forms a stable base for the post member 103 by reducing the potential for forward and backward inertia. Hinge plate member 102 may include other features for regulating, restricting, or stopping travel of the post member 103 such as tab, bolt, and/or pin components 118.

[0018] Referring briefly to Figure 4, hinge plate member 102 may be comprised of two or more members 102a, 102b that bound post member 103. The post member pivot system may include a wide-diameter (between one and several inches) bushing assembly 403 disposed and configured to pivot within a bracket 401 attached to the post member 103 and hinge plate members 102a, 102b.

[0019] Referring back to Figures 1 through 3, rack 100 may also have a powered actuator 106 for moving the post member 103 between generally vertical D and generally angled E positions. Powered actuator 106 may have a first end 107 and a second end 108. The first end 107 of the powered actuator 106 is attached to the hinge plate member 102 and the second end 108

of the powered actuator 106 is attached to the post member 103 between first 104 and second 105 ends of the post member 103. In various embodiments, the post member first end 104 and powered actuator first end 107 are attached to the hinge plate member 102 at different locations 109, 110. In preferred embodiments, post member first end 104 is generally positioned between these different locations 109, 110.

[0020] In preferred embodiments, powered actuator 106 is robust, with capacity to move loads of 400, 500, and/or 600 pounds or more between generally vertical D and generally angled E positions. Powered actuator 106 may have a static load capacity of up to 4000 pounds. Powered actuator 106 may be configured to connect to vehicle trailer, electrical, or other powering or controlling connections. Rack 100 may include a momentary and/or other switch 111 to facilitate movement between positions.

[0021] Rack 100 further has bottom 112 and top 113 generally horizontal mounting members. Bottom 112 and top 113 generally horizontal mounting members may further include a plurality of tire baskets 114, 115, 116 for mounting equipment on the rack 100.

[0022] So, configured, the invention includes a vertical mount equipment rack—such as a vertical bike trailer hitch rack—that is specifically designed for the unique challenges presented by loading, carrying, and unloading e-bikes. The rack optimizes rack structure, functionality, and weight capacity by incorporating, in part, a high-powered actuator coupled with a base structure that optimizes both leverage and stability through a wide, cradling hinge plate and post member pivot axis that is located aft of the post member when the post member is in a generally vertical position.

[0023] The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

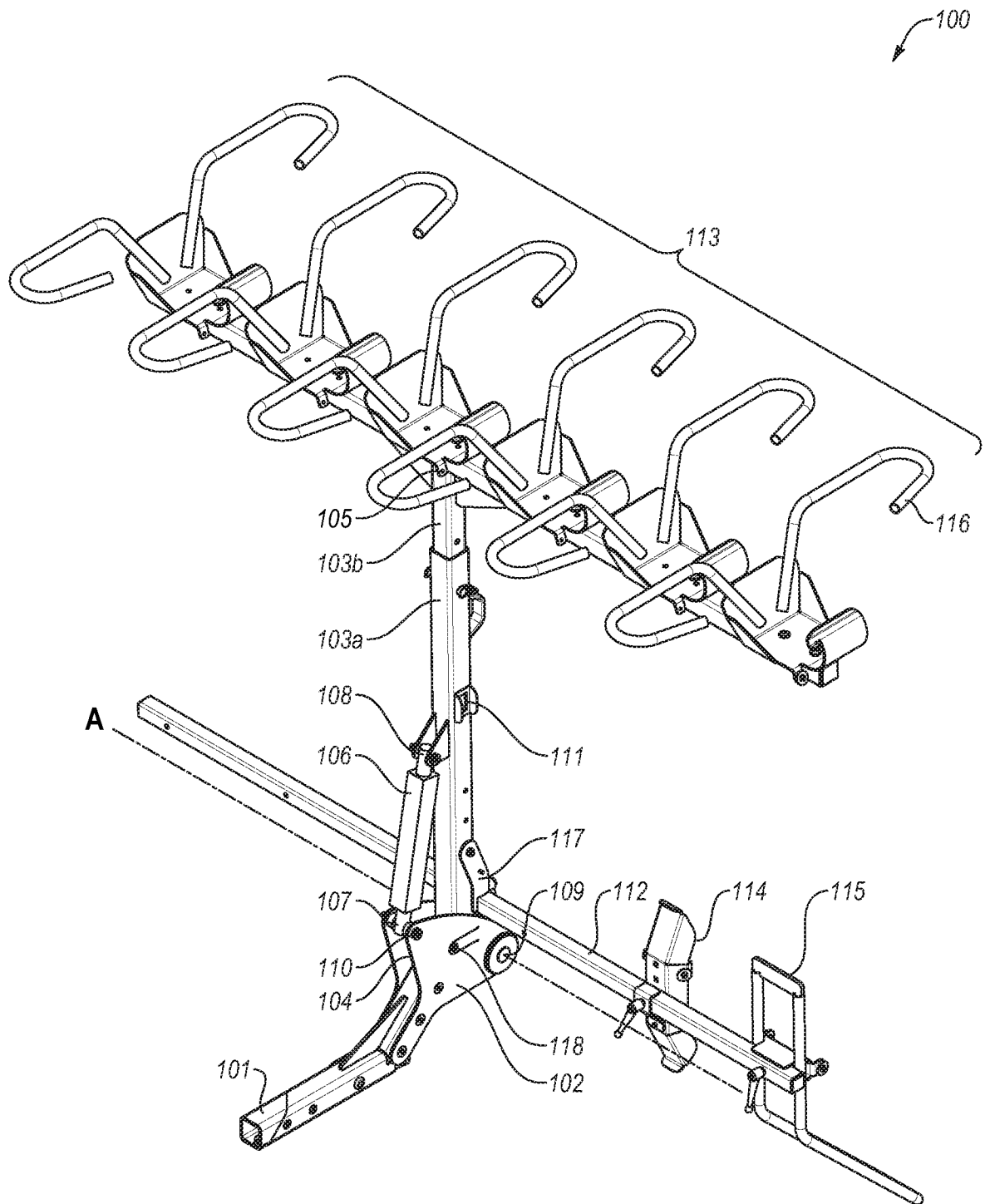
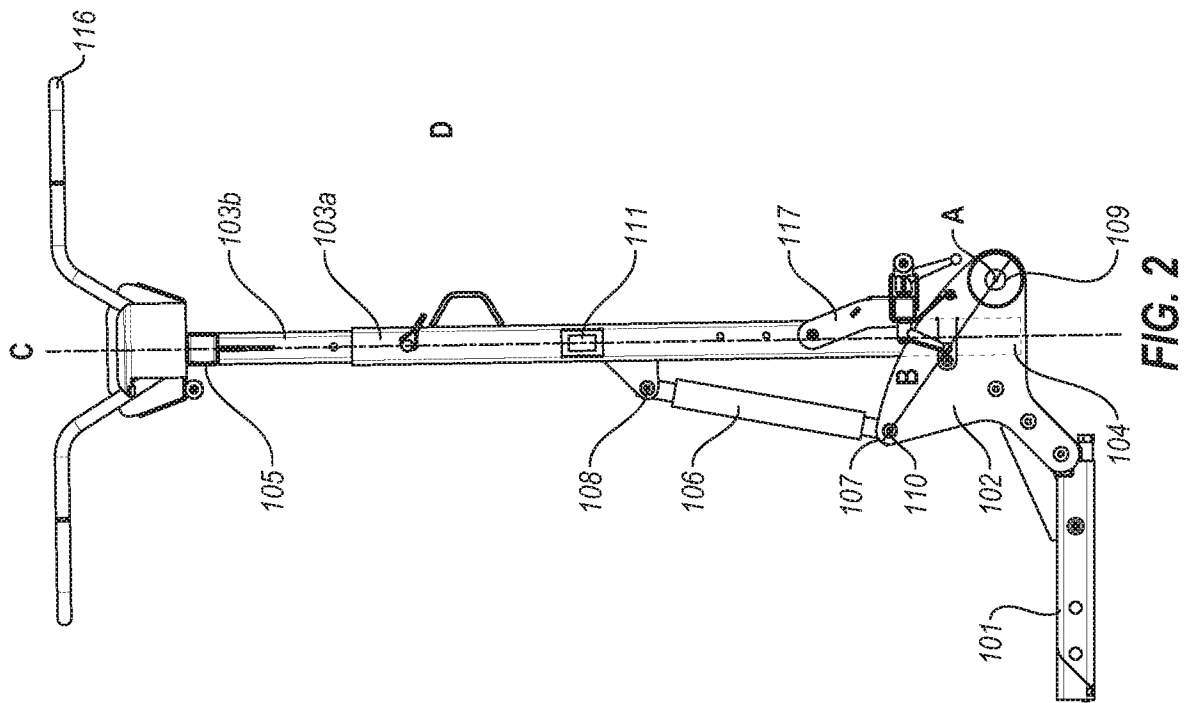
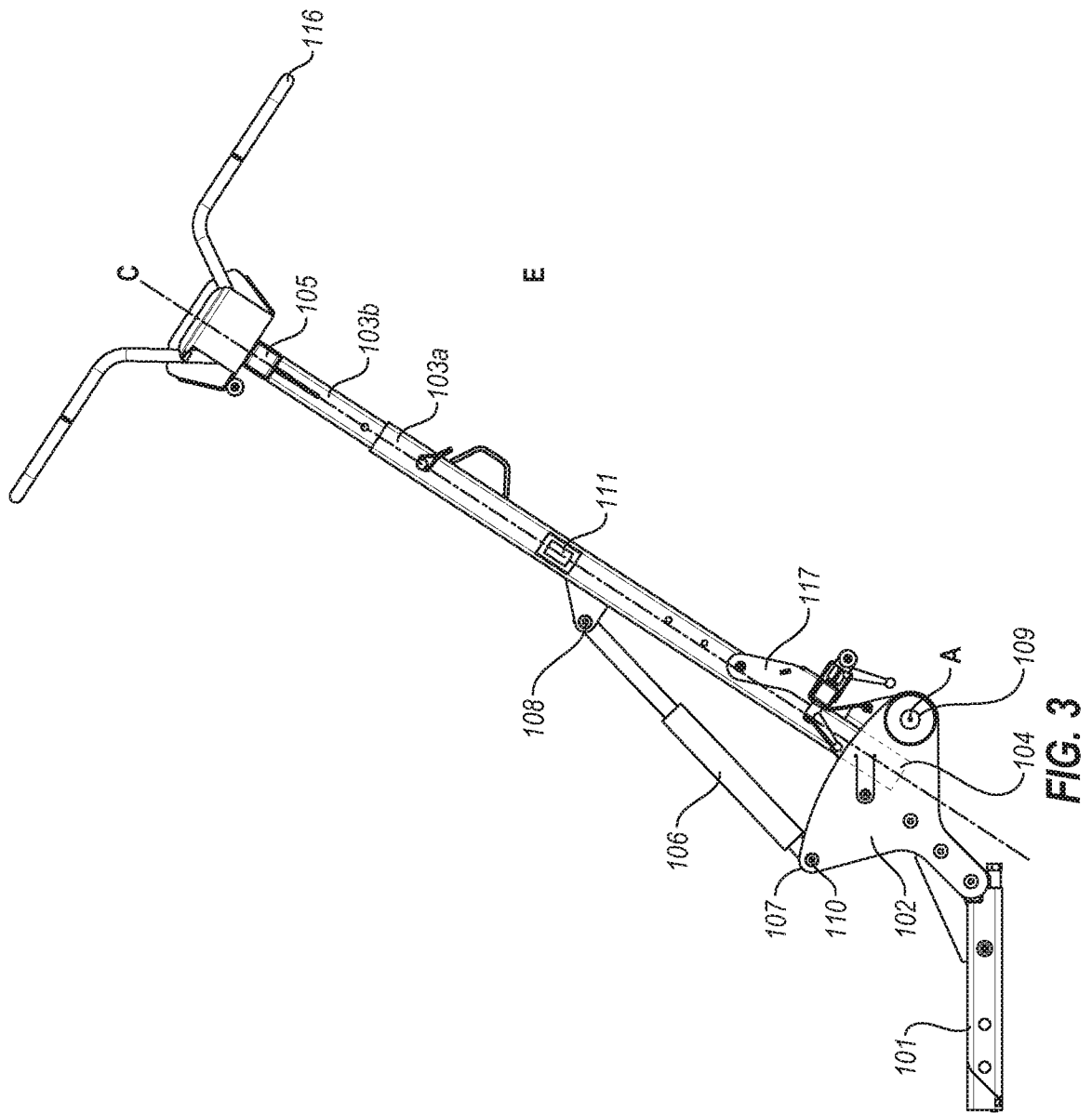


FIG. 1





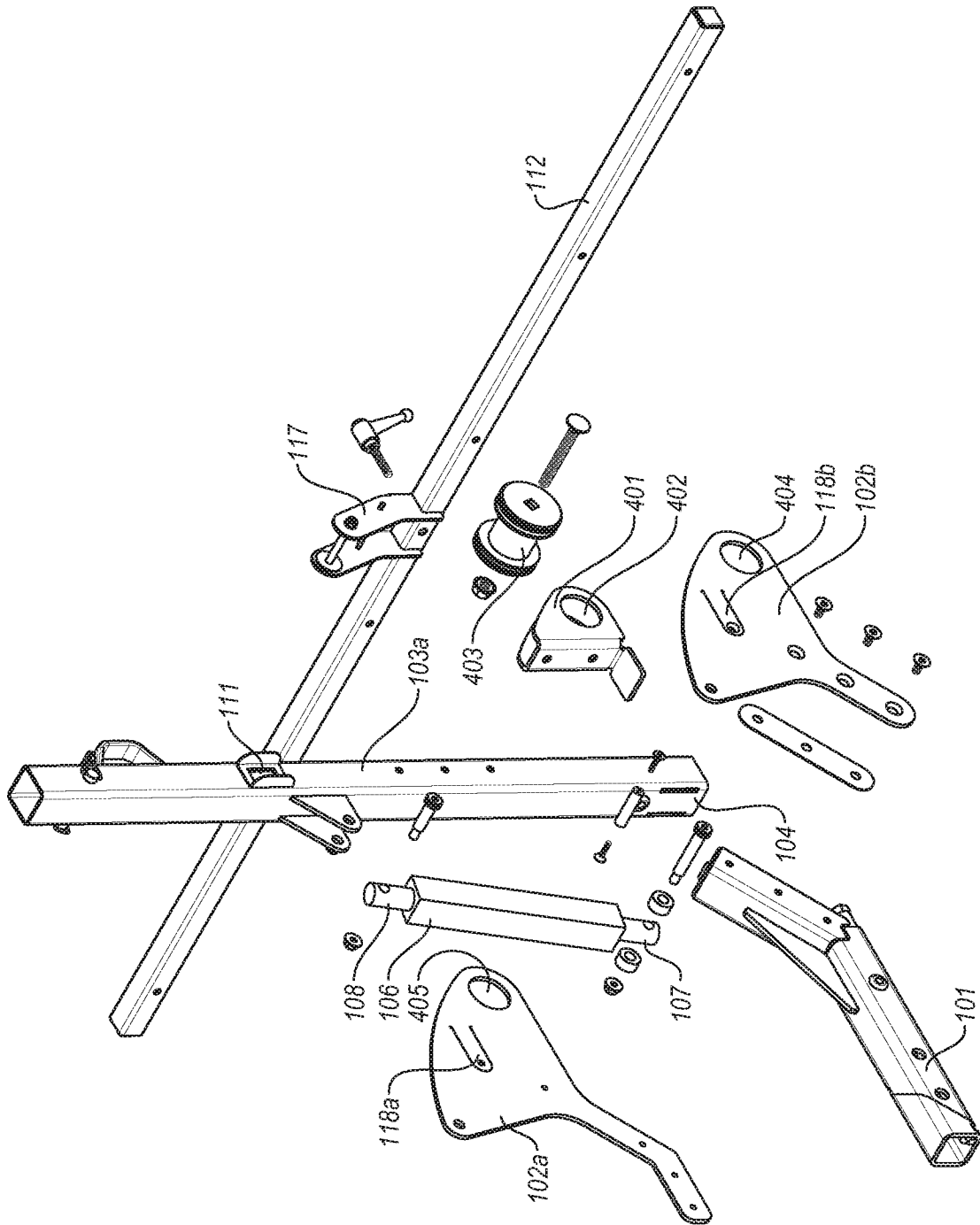


FIG. 4

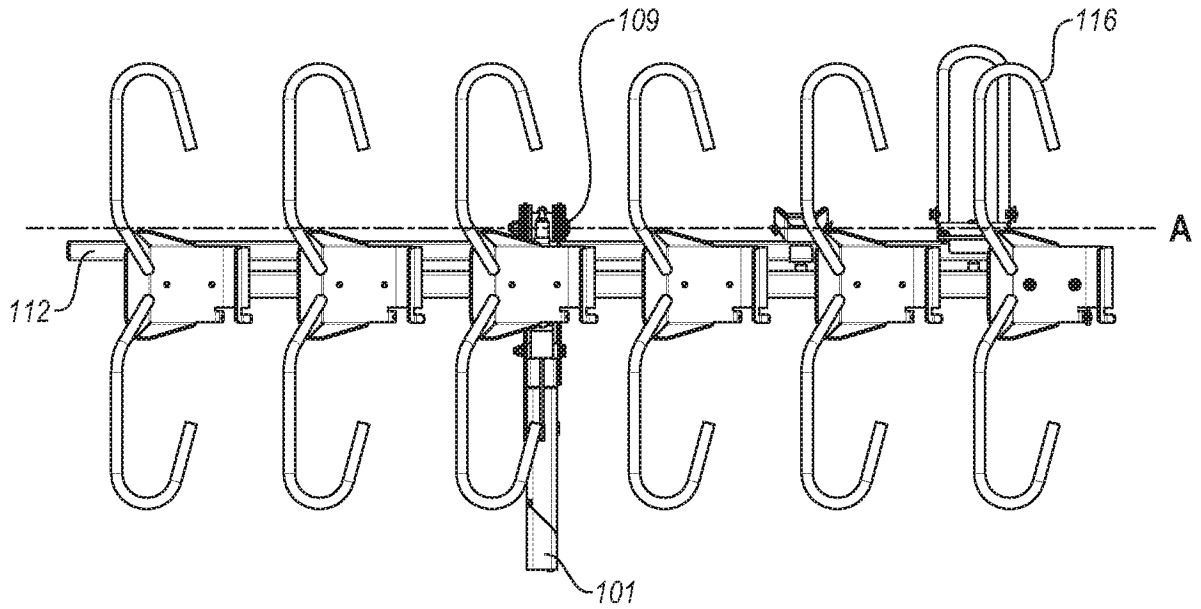


FIG. 5

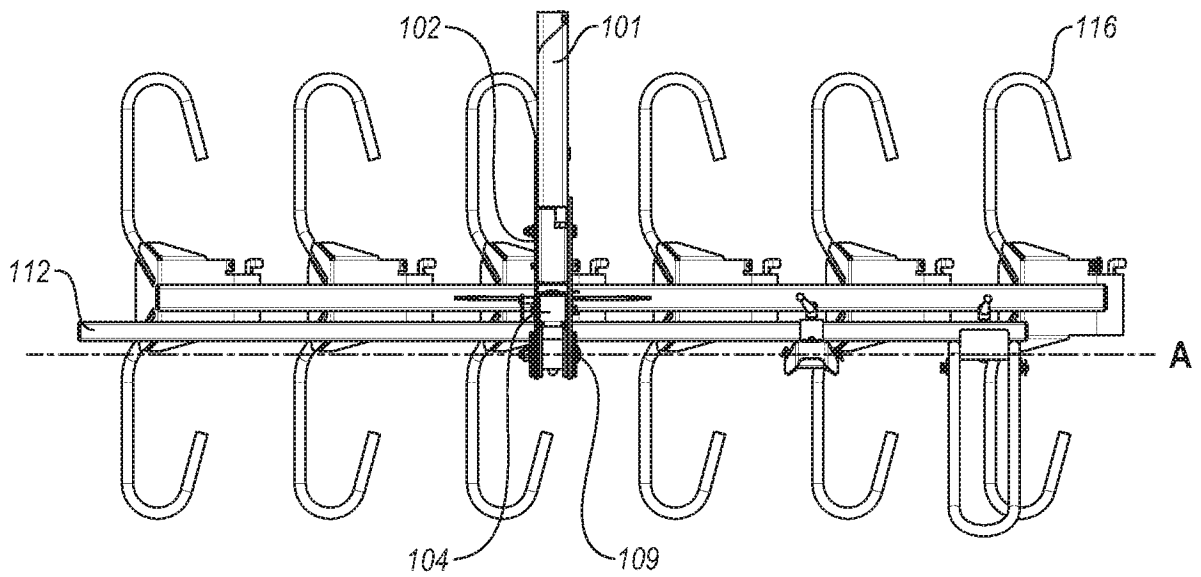


FIG. 6

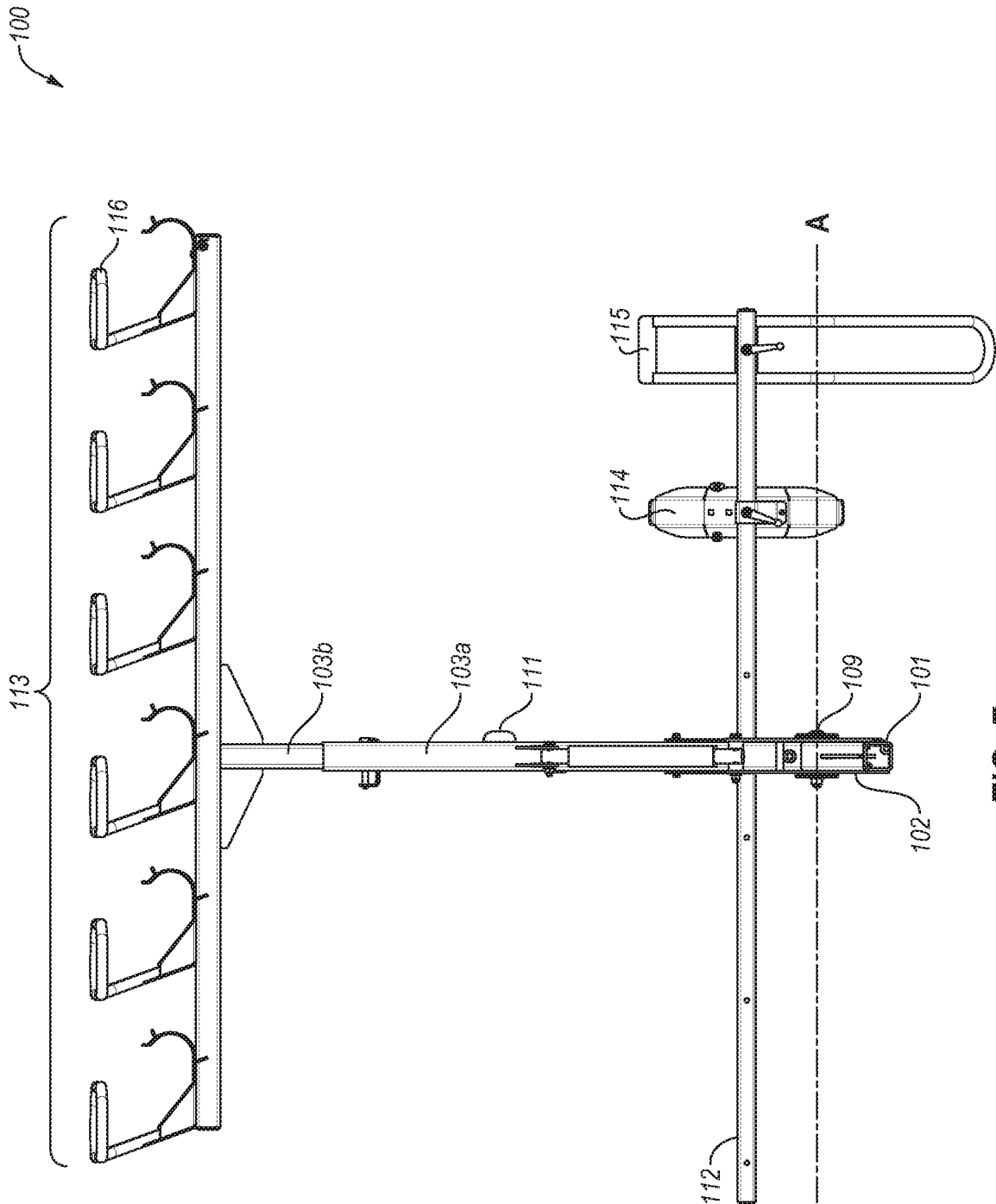


FIG. 7

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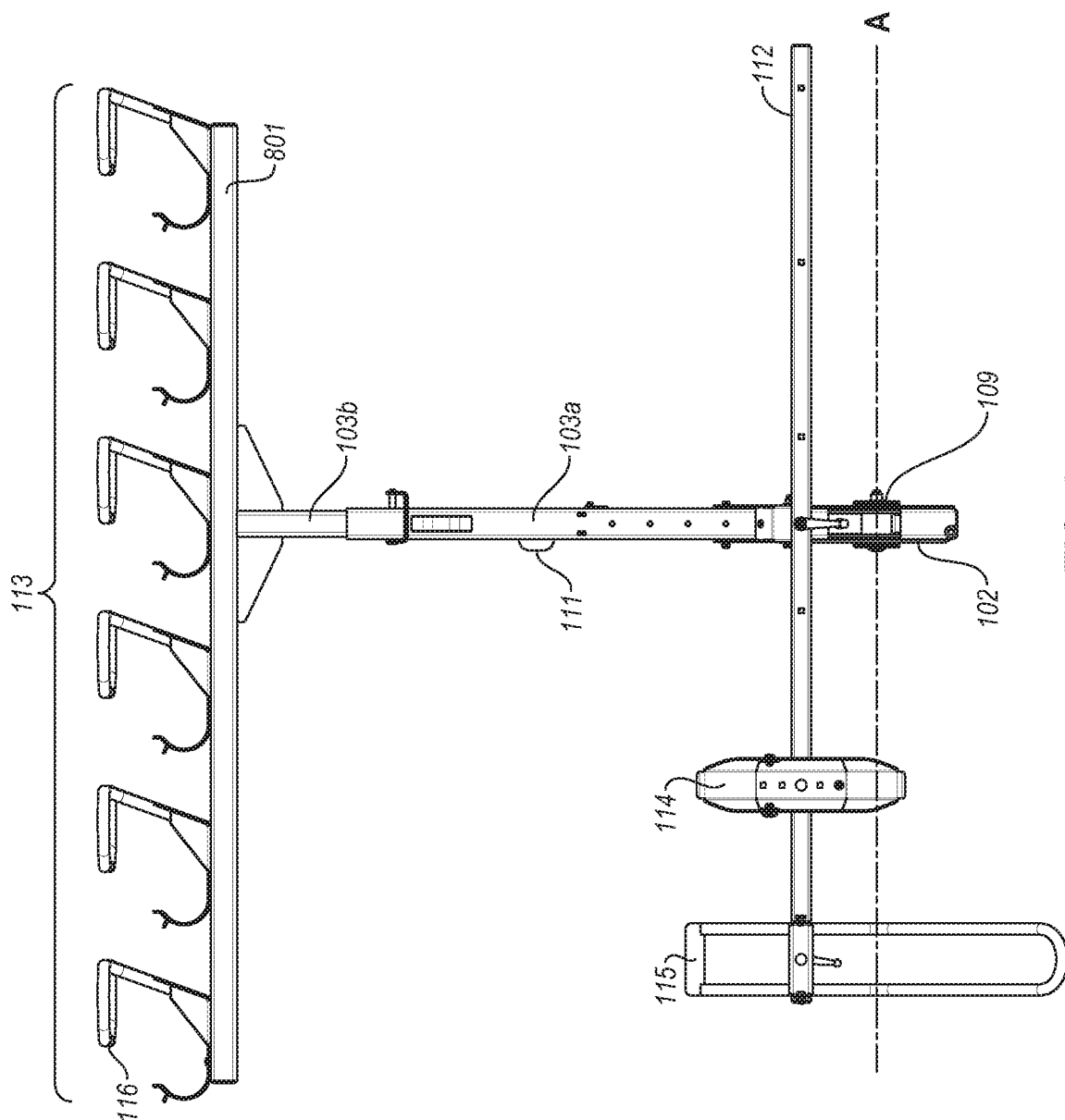


FIG. 8

CLAIMS

I claim:

1. A rack for a vehicle comprising:
a hitch member configured to mount to a vehicle trailer hitch receiver;
a hinge plate member attached to the hitch member; and
a post member with a first end and a second end, the first end pivotally attached to the hinge plate member, the post member configured to move between generally vertical and generally angled positions.
2. The rack for a vehicle of claim 1, the post member pivotable at its first end about an axis that does not intersect a longitudinal axis of the post member.
3. The rack for a vehicle of claim 1, the post member pivotable about an axis located aft of the post member when the post member is in the generally vertical position.
4. The rack for a vehicle of claim 1, the hinge plate member having a width of between 6 and 14 inches.
5. The rack for a vehicle of claim 1, wherein the hinge plate member forms a cradle for the post member first end that is at least twice as wide as the greatest width of the post member.
6. The rack for a vehicle of claim 1, wherein the post member is configured to telescopically extend.
7. The rack for a vehicle of claim 1, wherein the rack is a vertical, tire-mount bike rack.
8. The rack for a vehicle of claim 1, further having a total weight capacity of at least 400 pounds.
9. A rack for a vehicle comprising:
a hitch member configured to mount to a vehicle trailer hitch receiver;
a hinge plate member attached to the hitch member;
a post member with a first end and a second end, the first end pivotally attached to the hinge plate member; and
a powered actuator for moving the post member between generally vertical and generally angled positions, the powered actuator having a first end and a second end, the first end of the powered actuator attached to the hinge plate member and the second end of the powered actuator attached to the post member between first and second ends of the post member.

10. The rack for a vehicle of claim 9, the post member pivotable at its first end about an axis that does not intersect a longitudinal axis of the post member.
11. The rack for a vehicle of claim 9, the post member pivotable about an axis located aft of the post member when the post member is in the generally vertical position.
12. The rack for a vehicle of claim 9, the post member first end pivotally attached to the hinge plate member at a first hinge plate member location and the powered actuator first end attached to the hinge plate member at a second hinge plate member location.
13. The rack for a vehicle of claim 12, the post member first end generally located between the first and second hinge plate member locations.
14. The rack for a vehicle of claim 12, the distance between first and second hinge plate member locations between 6 and 14 inches.
15. The rack for a vehicle of claim 9, the hinge plate member having a width of between 6 and 14 inches.
16. The rack for a vehicle of claim 9, wherein the hinge plate member forms a cradle for the post member first end that is at least twice as wide as the greatest width of the post member.
17. The rack for a vehicle of claim 9, wherein the post member is configured to telescopically extend.
18. The rack for a vehicle of claim 9, further comprising a momentary switch for moving the post member between generally vertical and generally angled positions.
19. The rack for a vehicle of claim 9, the powered actuator configured to connect to vehicle trailer connections.
20. The rack for vehicle of claim 9, wherein the rack is a vertical, tire-mount bike rack.
21. The rack for vehicle of claim 9, the powered actuator further configured to move the post member between generally vertical and generally angled positions when the post member is loaded with at least 400 pounds of weight.
22. A vertical, tire-mount bike rack for a vehicle comprising:
 - a hitch member configured to mount to a vehicle trailer hitch receiver;
 - a hinge plate member attached to the hitch member;
 - a post member with a first end and a second end, the first end pivotally attached to the

hinge plate member at a first hinge plate member location, the post member pivotable at its first end about an axis that does not intersect a longitudinal axis of the post member;

a powered actuator for moving the post member between generally vertical and generally angled positions, the powered actuator having a first end and a second end, the first end of the powered actuator attached to the hinge plate member at a second hinge plate member location and the second end of the powered actuator attached to the post member between first and second ends of the post member;

wherein the distance between first and second hinge plate member locations is between 6 and 14 inches.

23. The rack for a vehicle of claim 22, wherein the hinge plate member forms a cradle for the post member first end that is at least twice as wide as the greatest width of the post member.