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(54) **TRUCK BED MOUNTED BICYCLE RACK**

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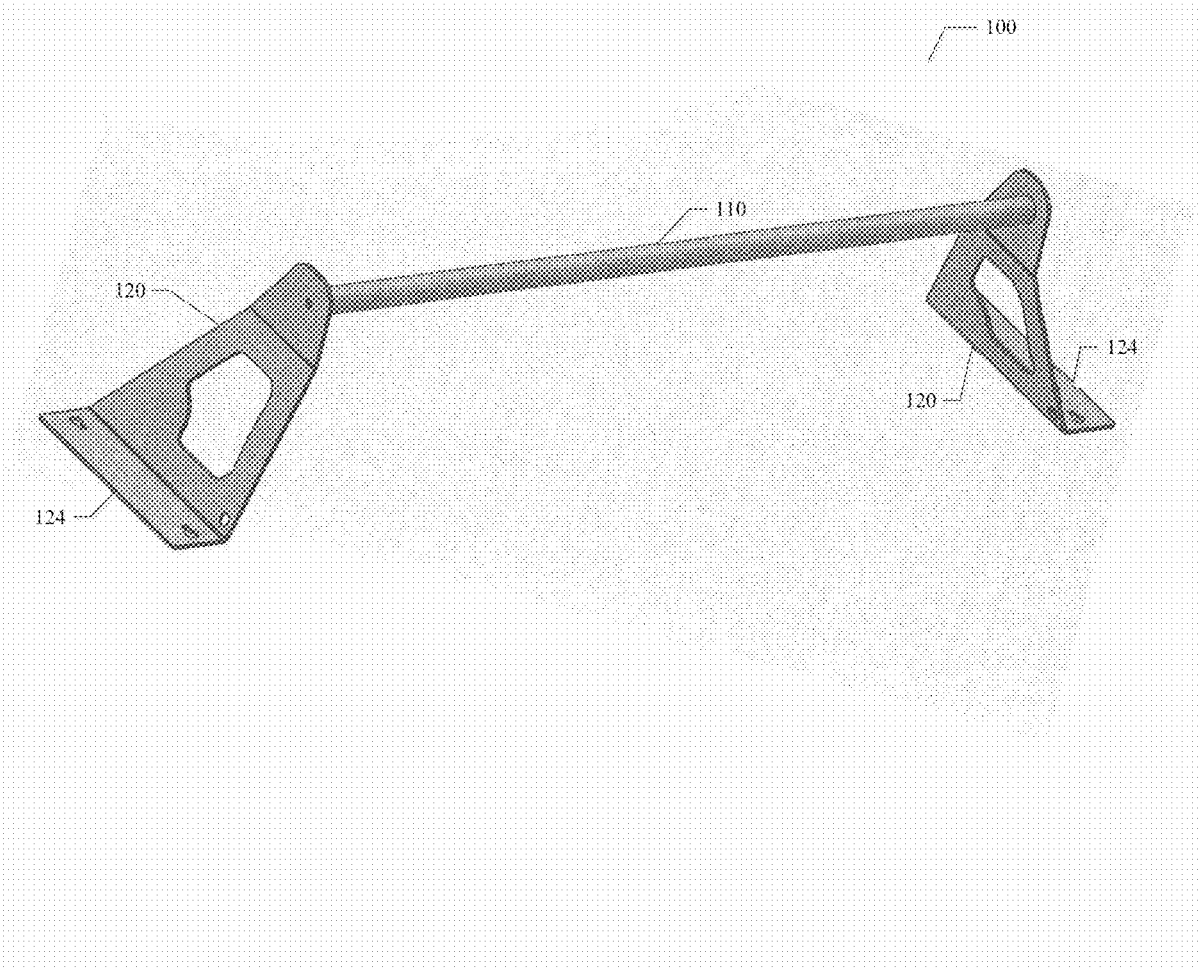
(57) **ABSTRACT**

A truck bed mounted bicycle rack is disclosed. An example embodiment includes: a truck bed mounted bicycle rack comprising: a cross bar; and a plurality of side wing mounting brackets, a side wing mounting bracket attached to each end of the cross bar, the plurality of side wing mounting brackets each including a flange for mounting the side wing mounting brackets to rails of a truck cargo bed.



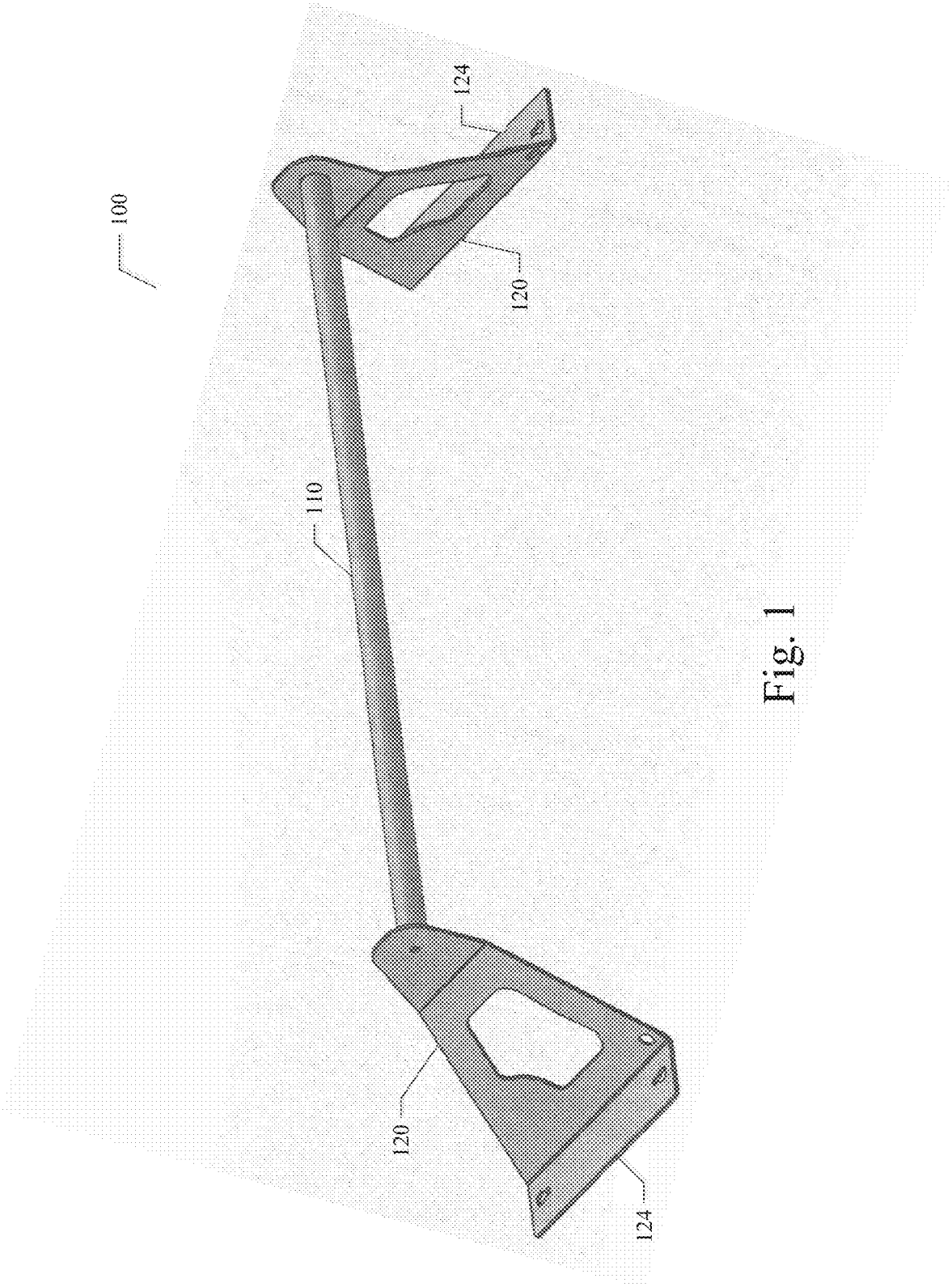


Fig. 1

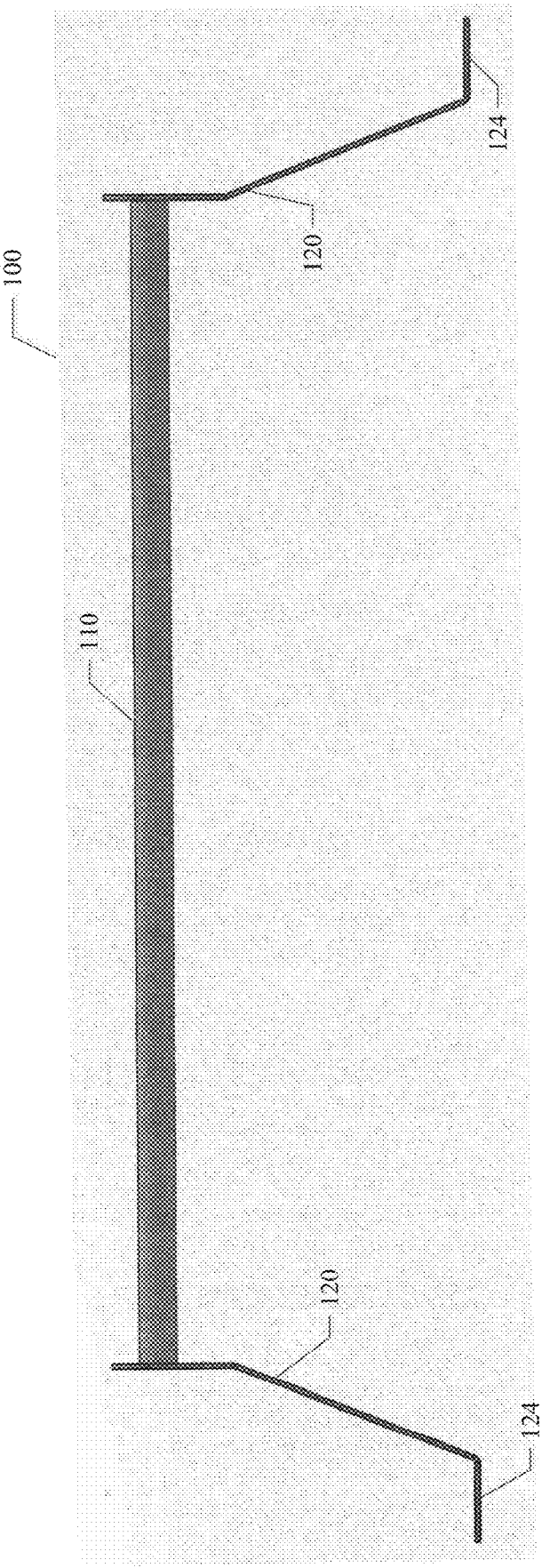


Fig. 2

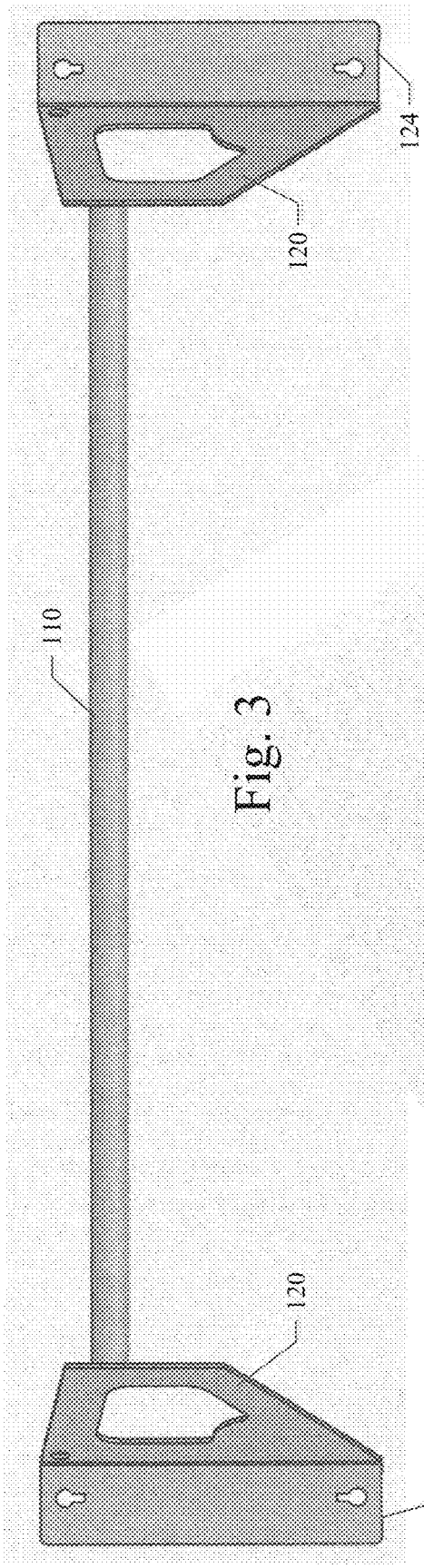


Fig. 3

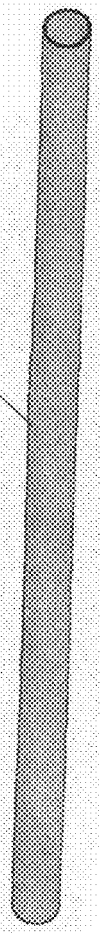


Fig. 4

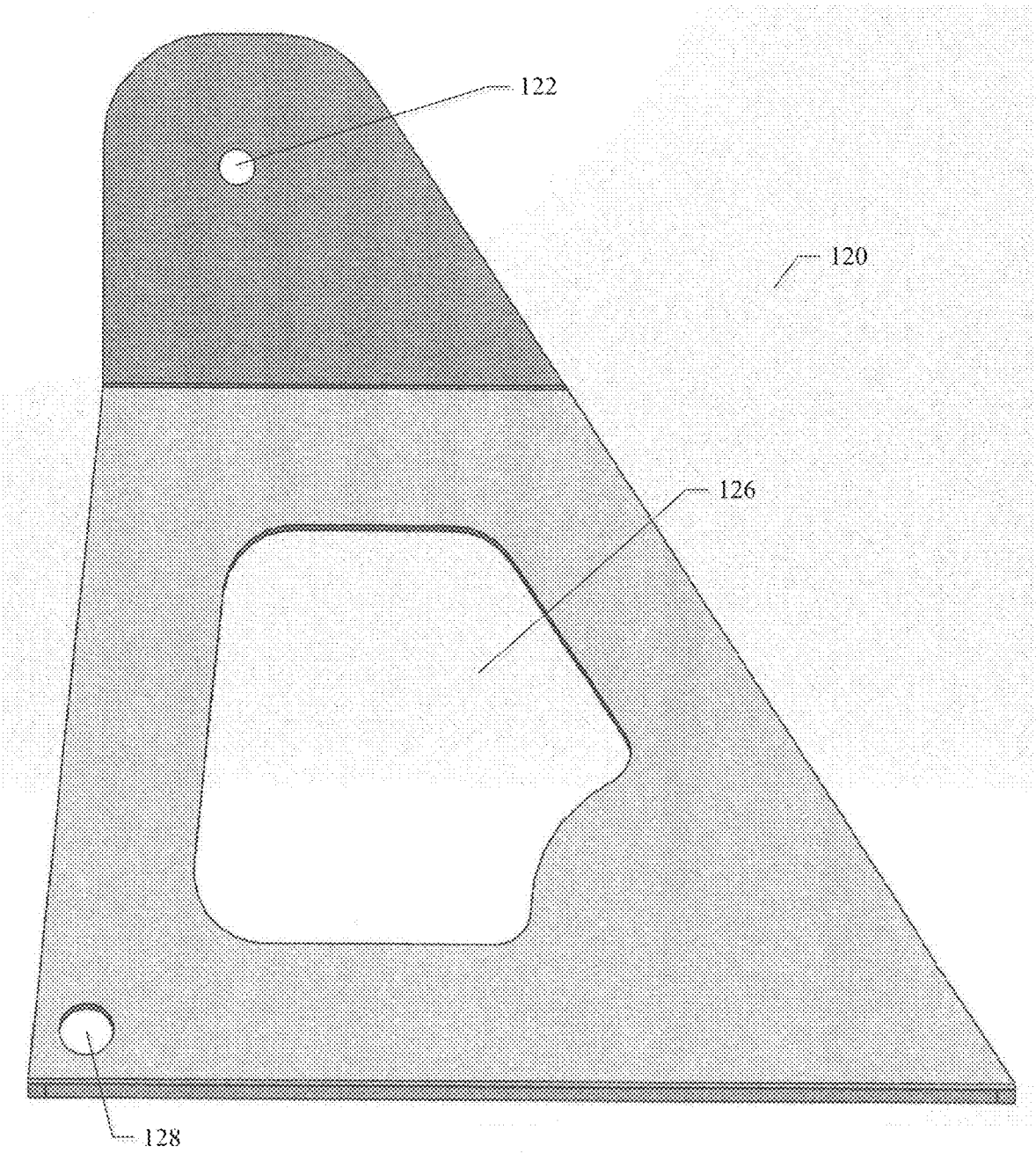


Fig. 5

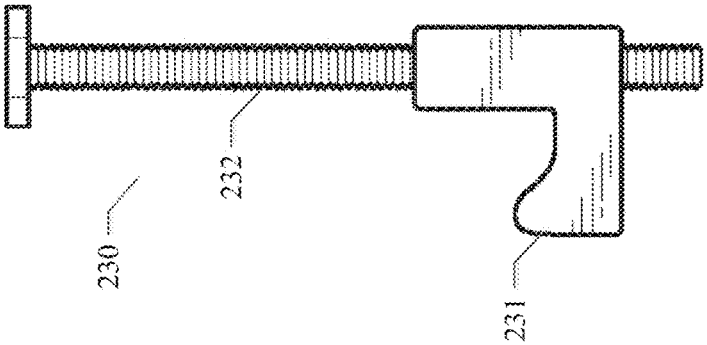


Fig. 6C

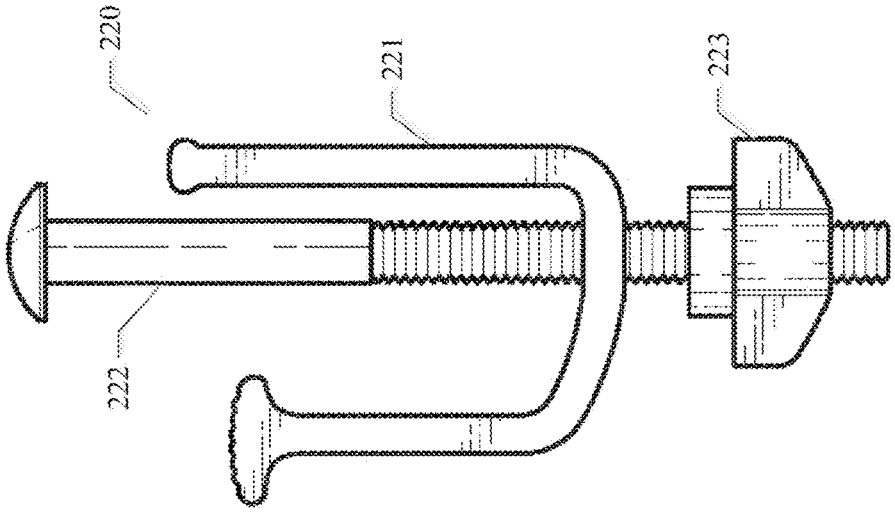


Fig. 6B

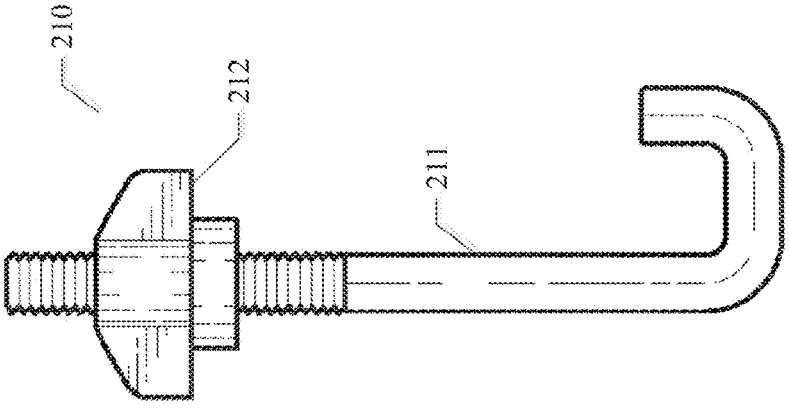


Fig. 6A

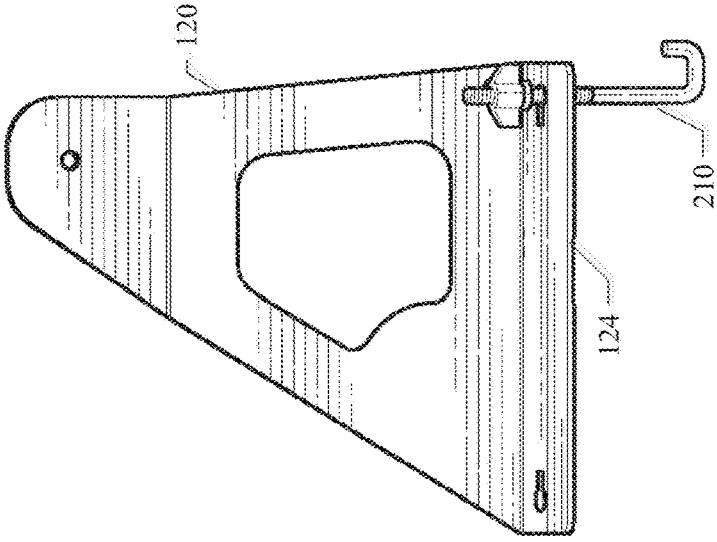


Fig. 7A

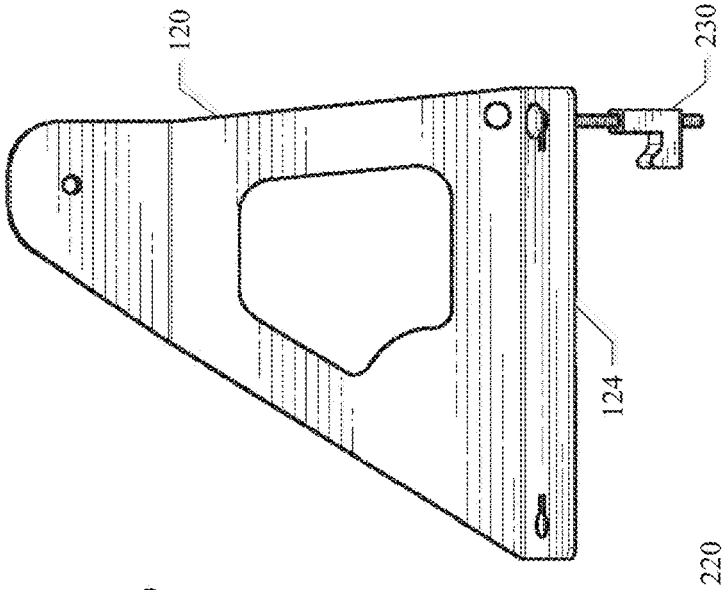


Fig. 7C

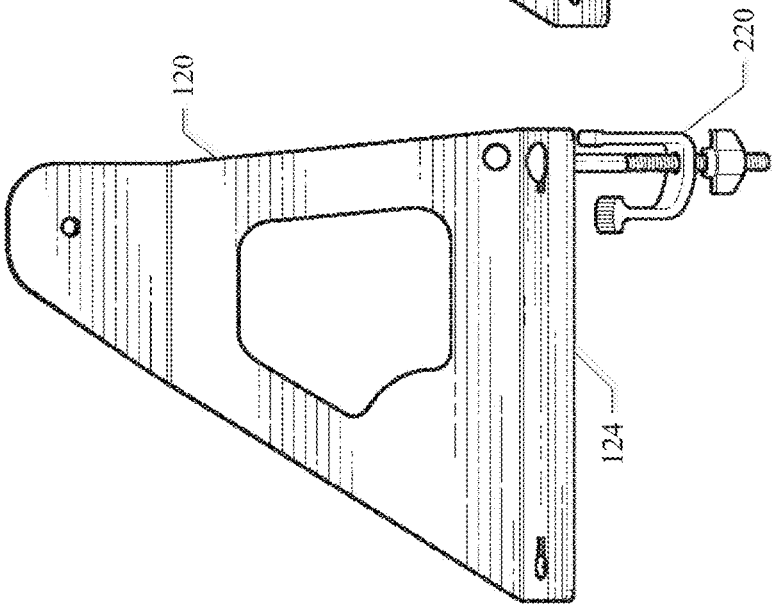


Fig. 7B

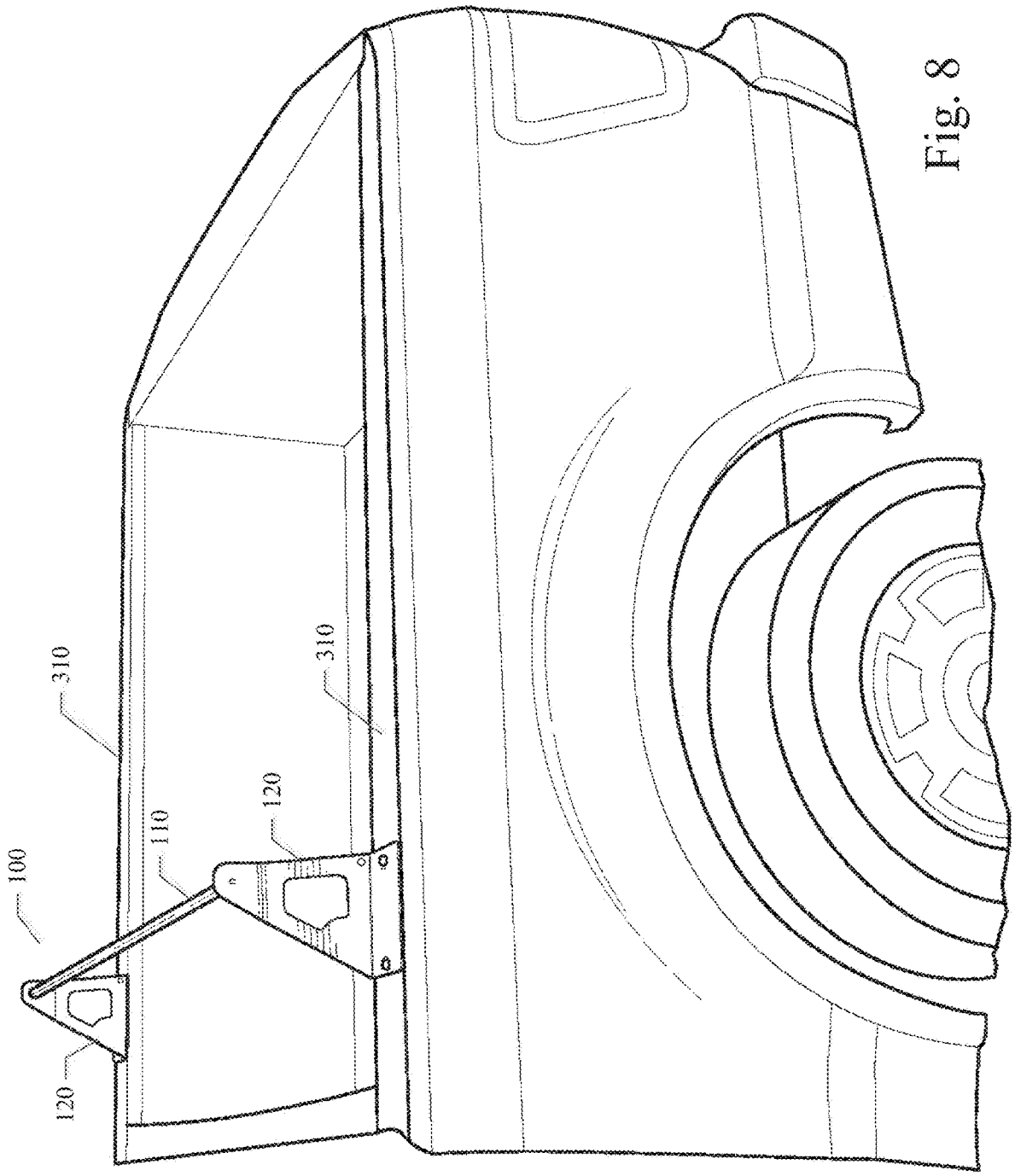


Fig. 8

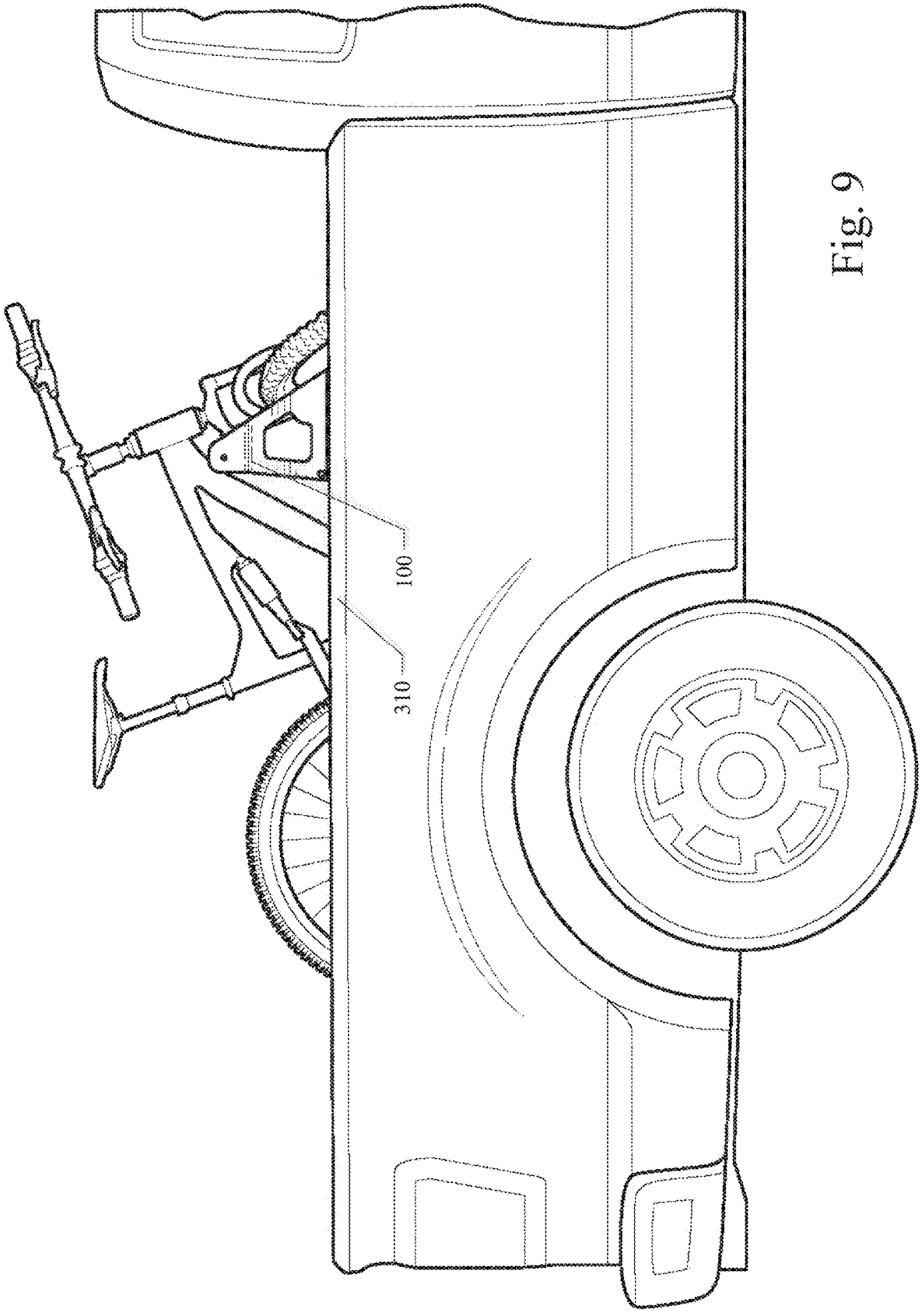


Fig. 9

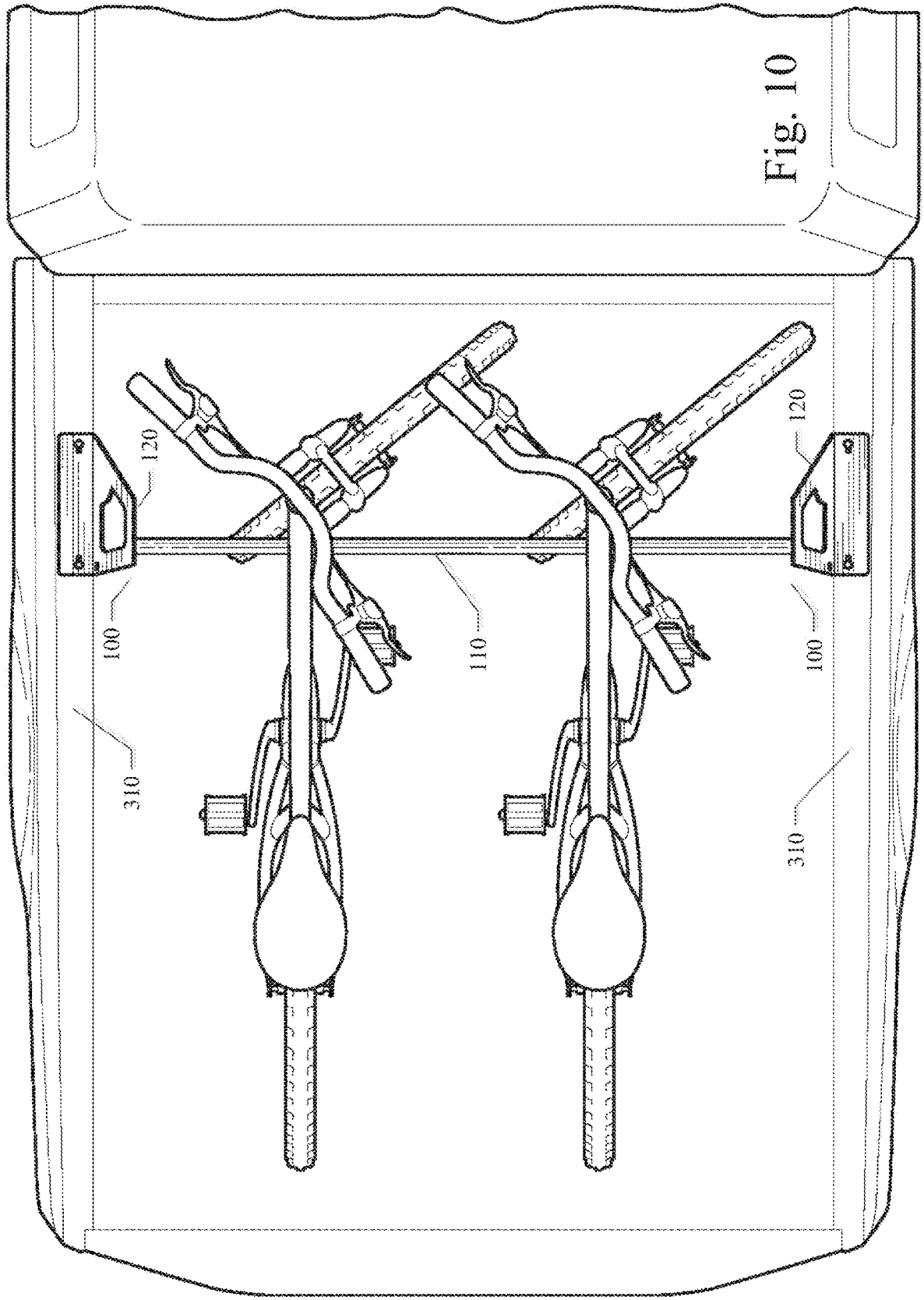


Fig. 10

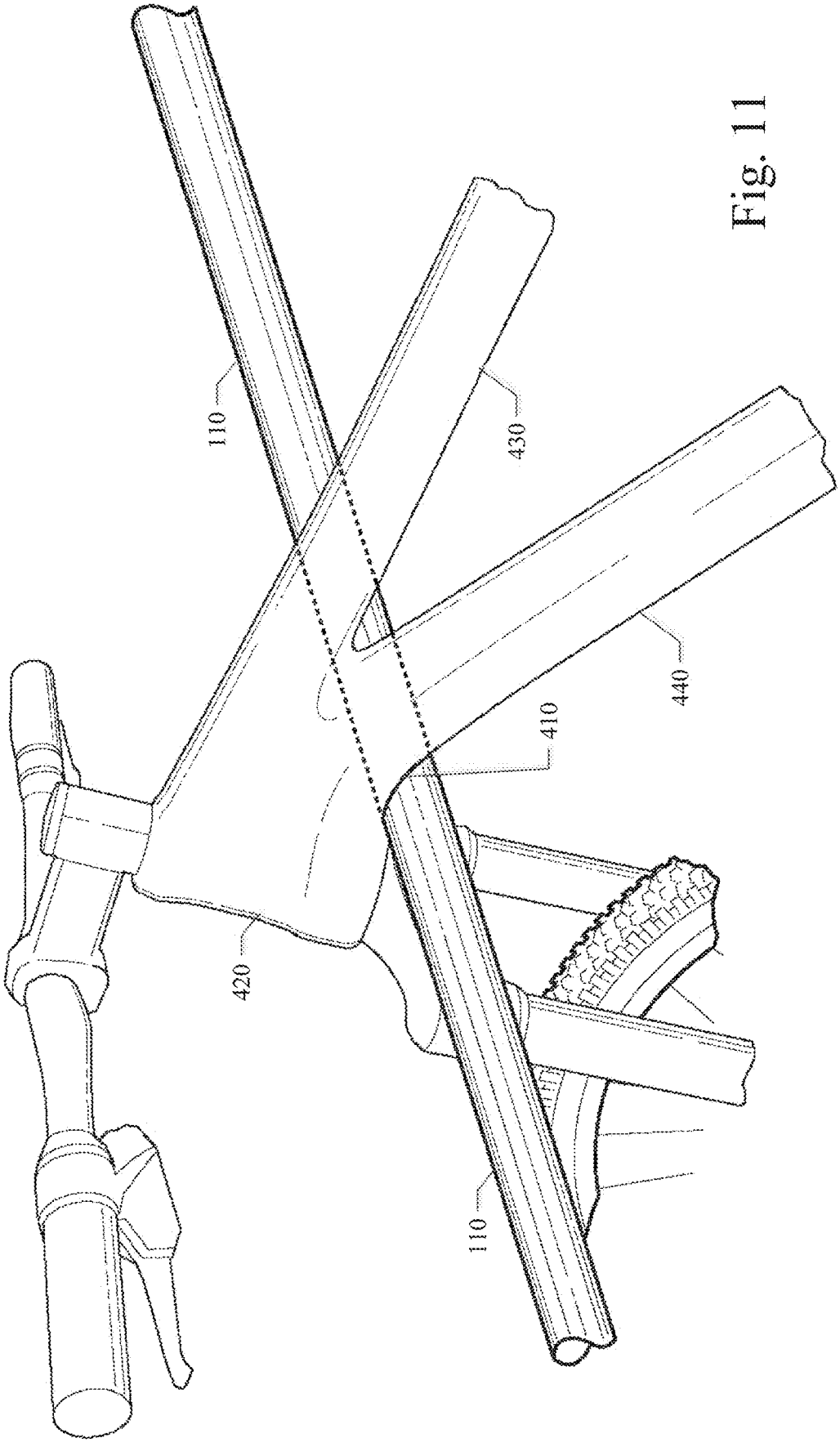


Fig. 11

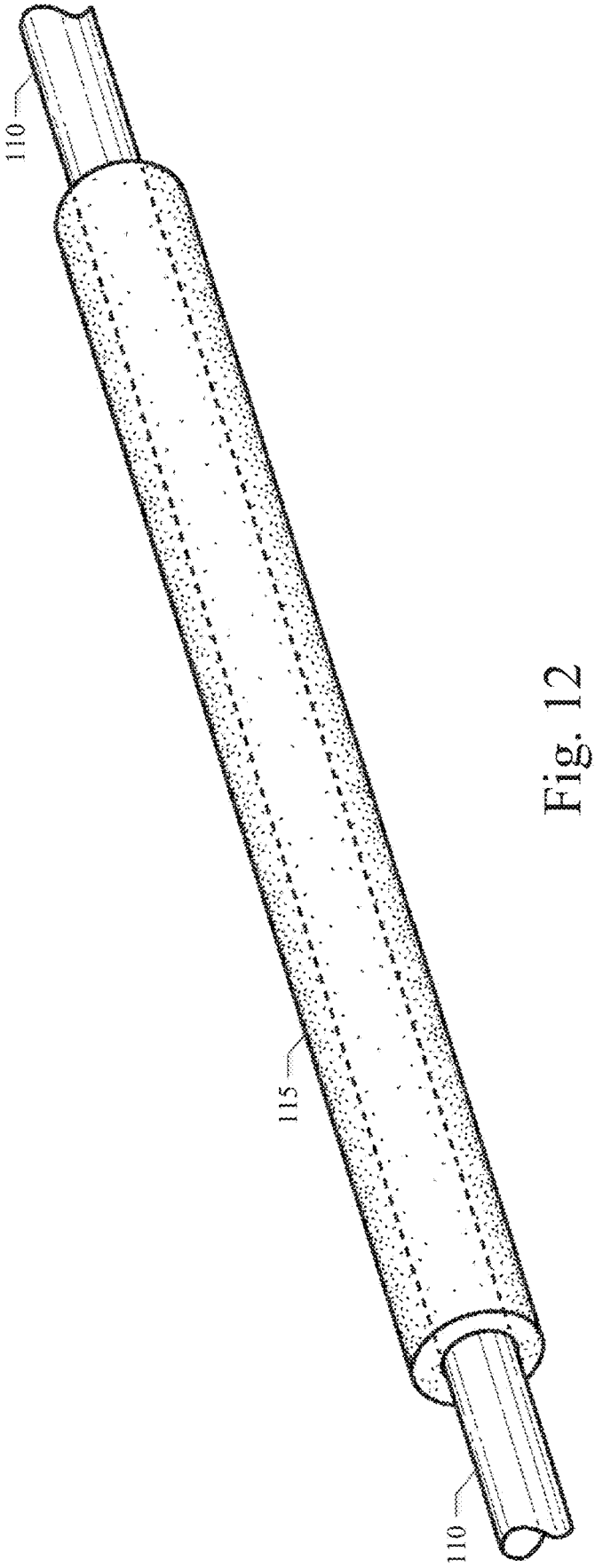


Fig. 12

TRUCK BED MOUNTED BICYCLE RACK

TECHNICAL FIELD

[0001] The disclosed subject matter relates to the field of bicycle racks and, in particular, to truck bed mounted bicycle racks.

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[0002]

BACKGROUND

[0003] Pickup trucks or trucks with an open rear cargo bed can be useful for transporting one or more bicycles. However, conventional bicycle rack systems often require a user to disassemble the bicycle to attach the bike to the rack. For example many conventional systems require the user to remove the front wheel of the bike. Other conventional bicycle rack systems use complicated hardware mechanisms attached to the trailer hitch of the vehicle or attached to the tailgate of the truck. These devices typically require extensive set-up time and eliminate the ability of the truck driver to effectively use the tailgate or tow hitch assembly of the truck. Thus, there is a need for an improved apparatus for supporting a bicycle in the cargo bed of a pickup truck.

SUMMARY

[0004] A truck bed mounted bicycle rack is disclosed. In various example embodiments, a universal bicycle rack for the cargo bed of a pickup truck allows a user to load and unload a bicycle quickly and easily with no disassembly of the bike required. The truck bed mounted bicycle rack of an example embodiment also allows a user to mount and un-mount the rack quickly in the bed of the truck. As a result, the user spends less time getting ready to go ride and more time enjoying riding the bicycle.

[0005] In an example embodiment, the truck bed mounted bicycle rack comprises a cross bar to which side wing mounting brackets are connected on each end of the cross bar. The truck bed mounted bicycle rack of the example embodiment is configured to transversely mount to the rails of the cargo bed of a truck using one of several alternative configurations of truck bed rail mounting brackets. Once the truck bed mounted bicycle rack is removably mounted to the rails of the truck cargo bed, the truck bed mounted bicycle rack allows the user to place a bicycle on the cross bar of the bicycle rack with the junction point of the bicycle being in contact with the cross bar of the rack. The junction point of the bicycle corresponds to the point where the head tube, top tube, and down tube join at the top portion of the bicycle. The junction point of the bicycle can also correspond to the point where the front forks of the bicycle attach to the bicycle frame. In this configuration with the bike placed on the cross bar of the bicycle rack at the junction point of the bike, the bike thereby straddles and securely rests on the cross bar of the bicycle rack in transverse fashion without the need to remove the front wheel of the bike. As a result, the truck bed mounted bicycle rack of an example embodiment allows the user to load and unload the bicycle quickly and easily with no disassembly of the bike required. The truck bed mounted bicycle rack of an example embodiment also allows the user to mount and un-mount the rack quickly in the bed of the truck. Because the truck bed mounted bicycle rack of an example embodiment does not use or block the tailgate of the truck as some conventional bike racks do, the truck bed mounted bicycle rack of an example embodiment enables full use of the truck tailgate and tow hitch assembly. Some conventional bike rack designs use the tow hitch assembly of the truck or use a pad that hangs over the tailgate, which prevents the use of the tailgate and also produces a high probability of scratching or damaging the outside of the truck tailgate.

[0006] There is currently no bicycle rack that allows a user to simply set a bike on a rack in the cargo bed of a truck without first removing the front wheel of the bike or otherwise disassembling a portion of the bike or attaching a mounting bracket to the bike. The conventional bike racks require a user to remove the front wheel of the bike and mount the forks of the bike to the rack with the removed front wheel placed somewhere in the cargo bed or passenger cab of the truck. In an alternative example embodiment, the bicycle rack can be mounted to the floor of the cargo bed of the truck instead of being mounted to the rails of the truck bed. The various example embodiments are described in more detail below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] Embodiments are illustrated by way of example and not limitation in the figures of the accompanying drawings, in which:

[0008] FIG. **1** illustrates a perspective view of the truck bed mounted bicycle rack of an example embodiment;

[0009] FIG. **2** illustrates a front or rear view of a truck bed mounted bicycle rack of an example embodiment;

[0010] FIG. **3** illustrates a top view of a truck bed mounted bicycle rack of an example embodiment;

[0011] FIG. **4** illustrates the cross bar portion of the truck bed mounted bicycle rack of an example embodiment;

[0012] FIG. **5** illustrates the side wing mounting bracket portion of the truck bed mounted bicycle rack of an example embodiment;

[0013] FIGS. **6**A through **6**C illustrate various alternative configurations of the truck bed rail mounting brackets used for mounting the truck bed mounted bicycle rack of an example embodiment to the cargo bed rails of a truck;

[0014] FIGS. **7**A through **7**C illustrate various alternative configurations of the truck bed rail mounting brackets attached to the side wing mounting bracket of the truck bed mounted bicycle rack, which are used for mounting the truck bed mounted bicycle rack of an example embodiment to the cargo bed rails of a truck;

[0015] FIG. **8** illustrates a perspective view of the truck bed mounted bicycle rack of an example embodiment as attached to the cargo bed rails of a truck;

[0016] FIG. **9** illustrates a side view of the truck bed mounted bicycle rack of an example embodiment as attached to the cargo bed rails of a truck with a bicycle positioned on the cross bar portion of the truck bed mounted bicycle rack;

[0017] FIG. **10** illustrates a top view of the truck bed mounted bicycle rack of an example embodiment as attached to the cargo bed rails of a truck with two bicycles positioned on the cross bar portion of the truck bed mounted bicycle rack;

[0018] FIG. **11** illustrates a perspective view of the cross bar portion of the truck bed mounted bicycle rack with a bicycle transversely positioned on the cross bar at the junction point of the bicycle; and

[0019] FIG. **12** illustrates a perspective view of the cross bar portion of the truck bed mounted bicycle rack with a cushioning element or cross bar cushion wrapped around or enveloping the cross bar.

DETAILED DESCRIPTION

[0020] In the following detailed description, reference is made to the accompanying drawings that form a part hereof, and in which are shown, by way of illustration, specific embodiments in which the disclosed subject matter can be practiced. It is understood that other embodiments may be utilized and structural changes may be made without departing from the scope of the disclosed subject matter.

[0021] In various example embodiments disclosed and illustrated herein, a truck bed mounted bicycle rack **100** is described. In an example embodiment, the truck bed mounted bicycle rack **100** comprises a cross bar **110** to which side wing mounting brackets **120** are connected on each end of the cross bar **110**. The truck bed mounted bicycle rack **100** of the example embodiment is configured to transversely mount to the rails of the cargo bed of a truck using one of several alternative configurations of truck bed rail mounting brackets **210**, **220**, and **230**. Additional details of various example embodiments are provided below and in the accompanying drawings.

[0022] FIG. **1** illustrates a perspective view of the truck bed mounted bicycle rack **100** of an example embodiment. FIG. **2** illustrates a front or rear view of a truck bed mounted bicycle rack **100** of an example embodiment. FIG. **3** illustrates a top view of a truck bed mounted bicycle rack **100** of an example embodiment. FIG. **4** illustrates the cross bar **110** portion of the truck bed mounted bicycle rack **100** of an example embodiment. In the example embodiment, the truck bed mounted bicycle rack **100** shown in FIGS. **1** through **4** comprises a cross bar **110** to which side wing mounting brackets **120** can be connected on each end of the cross bar **110**. The cross bar **110** and side wing mounting brackets **120** can be fabricated from any material strong enough to hold and support one or more bicycles, such materials including metal, steel, stainless steel, aluminum, plastics, composite materials, fiberglass, wood, hardened rubber, or combinations of the same. The purpose of the cross bar **110** is to allow one or more bicycles to rest on and be supported by the cross bar **110** in a variety of different ways, such as on the bicycle head tube, down tube, or forks. In an example embodiment, the truck bed mounted bicycle rack **100** allows the user to place a bicycle on the cross bar **110** of the bicycle rack **100** with the junction point **410** (see FIG. **11**) of the bicycle being in contact with the cross bar **110** of the rack **100**. The junction point **410** of the bicycle corresponds to the point where the head tube, top tube, and down tube join at the top portion of the bicycle. The junction point **410** of the bicycle can also correspond to the point where the front forks of the bicycle attach to the bicycle frame. In this configuration with the bike placed on the cross bar **110** of the bicycle rack **100** at the junction point **410** of the bike, the bike thereby straddles and securely rests on the cross bar **110** of the bicycle rack **100** in transverse fashion without the need to remove the front wheel of the bike. Additionally, the bicycle rack **100** allows the front wheel of the bike to have free range and to be pointed in any direction at any angle.

[0023] In various alternative embodiments, the cross bar **110** can be fabricated as a cylindrical tube or a solid rod with a diameter of one half inch up to 12 inches. In other alternative embodiments, the cross bar **110** can be fabricated in a variety of crosscut shapes, such as round, square, rectangular, triangular, hexagonal, oval, or the like. The cross bar **110** can be fixedly attached to the side wing mounting bracket **120** at each end of the cross bar **110** with welds, rivets, adhesives, machining, or the like. Alternatively, the cross bar **110** can be removably attached to the side wing mounting bracket **120** at each end of the cross bar **110** with nuts and bolts, screws, slide mounts, or the like. In another embodiment, the cross bar **110** can be fabricated with a telescoping expansion joint, which can be used to lengthen or shorten the lateral dimension of the cross bar **110** to accommodate truck cargo beds of varying sizes.

[0024] Referring to FIG. **5**, an example embodiment illustrates the side wing mounting bracket **120** portion of the truck bed mounted bicycle rack **100**. In various example embodiments, the side wing mounting bracket **120** can be fabricated as a wing-shaped plate with bends to provide strength for the rack **100**. A hole **122** can be provided in the side wing mounting bracket **120** for connecting the cross bar **110** to the side wing mounting bracket **120** as described above. The side wing mounting bracket **120** can include a flange **124** (see FIGS. **1** through **3**) to connect the side wing mounting bracket **120** to the bed rails of a truck with holes provided in the flange **124**. The side wing mounting bracket **120** can be perforated with additional holes **126** to reduce the overall weight of the rack **100** while still maintaining strength. The side wing mounting bracket **120** can be perforated with another hole **128** to enable a lock or chain to securely connect the bicycles on the rack **100** to the side wing mounting bracket **120**. The wing-shaped portion of the side wing mounting bracket **120** provides the appearance of a streamlined, sporty, and sleek bicycle rack. The side wing mounting bracket **120** can be removably attached to the cargo bed rails of a truck via flanges **124** in a variety of ways described in more detail in connection with FIGS. **6**A, **6**B, **6**C, **7**A, **7**B, and **7**C described in detail below.

[0025] The truck bed mounted bicycle rack **100** of the example embodiment is configured to transversely mount to the rails of the cargo bed of a truck using one of several alternative configurations of truck bed rail mounting brackets **210**, **220**, and **230** as shown in FIGS. **6**A, **6**B, **6**C, **7**A, **7**B, and **7**C. FIGS. **6**A through **6**C illustrate various alternative configurations of the truck bed rail mounting brackets **210**, **220**, and **230** used for mounting the truck bed mounted bicycle rack **100** of an example embodiment to the cargo bed rails **310** of a truck. FIGS. **7**A through **7**C illustrate various alternative configurations of the truck bed rail mounting brackets **210**, **220**, and **230** attached to the side wing mounting bracket **120** of the truck bed mounted bicycle rack **100**, which are used for mounting the truck bed mounted bicycle rack **100** of an example embodiment to the cargo bed rails **310** of a truck.

[0026] Referring now to FIGS. **6**A and **7**A, a truck bed rail mounting bracket first alternative configuration **210** is

shown. The truck bed rail mounting bracket first alternative configuration **210** includes a large J-shaped hook bolt **211** and a knob **212**. The J-shaped hook bolt **211** is configured to capture the underside of the truck bed rail **310** and penetrate a hole in the flange **124** of the side wing mounting bracket **120**. The knob **212**, threaded on the bolt **211**, can be used to tighten the side wing mounting bracket **120**, and thus the rack **100**, to the truck bed rail **310**.

[0027] Referring now to FIGS. **6**B and **7**B, a truck bed rail mounting bracket second alternative configuration **220** is shown. The truck bed rail mounting bracket second alternative configuration **220** includes a U-shaped portion **221**, threaded on a carriage bolt **222**, and a knob **223** also threaded on the carriage bolt **222**. The U-shaped portion **221** is configured to capture the underside of the truck bed rail **310**. The carriage bolt **222** is configured to penetrate a hole in the flange **124** of the side wing mounting bracket **120**. The knob **223**, threaded on the carriage bolt **222**, can be used to tighten the side wing mounting bracket **120**, and thus the rack **100**, to the truck bed rail **310**.

[0028] Referring now to FIGS. **6**C and **7**C, a truck bed rail mounting bracket third alternative configuration **230** is shown. The truck bed rail mounting bracket third alternative configuration **230** includes a J-shaped portion **231** threaded on a hex bolt **232**. The J-shaped portion **231** is configured to capture the underside of the truck bed rail **310**. The hex bolt **232** is configured to penetrate a hole in the flange **124** of the side wing mounting bracket **120**. The hex bolt **232** can be used to tighten the J-shaped portion **231** to the underside of the truck bed rail **310**, thereby removably attaching the side wing mounting bracket **120**, and thus the rack **100**, to the truck bed rail **310**.

[0029] FIG. **8** illustrates a perspective view of the truck bed mounted bicycle rack **100** of an example embodiment as attached to the cargo bed rails **310** of a truck. Any of the truck bed rail mounting bracket configurations as described above can be used for the installation. The truck bed mounted bicycle rack **100** is thereby removably installed in the cargo bed of the truck without interfering or blocking the tailgate or tow hitch assembly of the truck. The truck bed mounted bicycle rack **100** can be installed at any desired position in the truck bed.

[0030] FIG. **9** illustrates a side view of the truck bed mounted bicycle rack **100** of an example embodiment as attached to the cargo bed rails **310** of a truck with a bicycle positioned on the cross bar **110** portion of the truck bed mounted bicycle rack **100**.

[0031] FIG. **10** illustrates a top view of the truck bed mounted bicycle rack **100** of an example embodiment as attached to the cargo bed rails **310** of a truck via side wing mounting brackets **120** with two bicycles positioned on the cross bar **110** portion of the truck bed mounted bicycle rack **110**.

[0032] FIG. **11** illustrates a perspective view of the cross bar **110** portion of the truck bed mounted bicycle rack **100** with a bicycle transversely positioned on the cross bar **110** at the junction point of the bicycle **410**. Once the truck bed mounted bicycle rack **100** is removably mounted to the rails **310** of the truck cargo bed, the truck bed mounted bicycle rack **100** allows the user to place a bicycle on the cross bar **110** of the bicycle rack **100** with the junction point **410** of the bicycle being in contact with the cross bar **110** of the rack as shown in FIG. **11**. The junction point **410** of the bicycle corresponds to the point where the head tube **420**, top tube **430**, and down tube **440** join at the top portion of the bicycle. The junction point **410** of the bicycle can also correspond to the point where the front forks of the bicycle attach to the bicycle frame. In this configuration with the bike placed on the cross bar **110** of the bicycle rack **100** at the junction point **410** of the bike, the bike thereby straddles and securely rests on the cross bar **110** of the bicycle rack **100** in transverse fashion without the need to remove the front wheel of the bike. As a result, the truck bed mounted bicycle rack **100** of an example embodiment allows the user to load and unload the bicycle quickly and easily with no disassembly of the bike required. The truck bed mounted bicycle rack **100** of an example embodiment also allows the user to mount and un-mount the rack **100** quickly in the bed of the truck. In an alternative example embodiment, the bicycle rack **100** can be mounted to the floor of the cargo bed of the truck instead of being mounted to the rails **310** of the truck bed.

[0033] FIG. **12** illustrates a perspective view of the cross bar **110** portion of the truck bed mounted bicycle rack **100** with a cushioning element or cross bar cushion **115** wrapped around or enveloping the cross bar **110**. The cross bar cushion **115** is provided in an example embodiment to cushion and protect the surfaces of the bicycle from damage as the bicycle rests on the cross bar **110**. In various example embodiments, the cross bar cushion **115** can be fabricated from standard foam materials, plastic, rubber, cloth, or other soft and pliable materials. The cross bar cushion **115** can be fabricated with a lateral slit or cut to enable the cross bar cushion **115** to be removable from the cross bar **110**.

[0034] Thus, a truck bed mounted bicycle rack is disclosed. Because the truck bed mounted bicycle rack of an example embodiment does not use or block the tailgate of the truck as some conventional bike racks do, the truck bed mounted bicycle rack of an example embodiment enables full use of the truck tailgate and tow hitch assembly. There is currently no bicycle rack that allows a user to simply set a bike on a rack in the cargo bed of a truck without first removing the front wheel of the bike or otherwise disassembling a portion of the bike or attaching a mounting bracket to the bike. The conventional bike racks require a user to remove the front wheel of the bike and mount the forks of the bike to the rack with the removed front wheel placed somewhere in the cargo bed or passenger cab of the truck. In an alternative example embodiment, the bicycle rack can be mounted to the floor of the cargo bed of the truck instead of being mounted to the rails of the truck bed.

[0035] The illustrations of embodiments described herein are intended to provide a general understanding of the structure of various embodiments, and they are not intended to serve as a complete description of all the elements and features of components and systems that might make use of the structures described herein. Many other embodiments will be apparent to those of ordinary skill in the art upon reviewing the description provided herein. Other embodiments may be utilized and derived, such that structural and logical substitutions and changes may be made without departing from the scope of this disclosure. The figures herein are merely representational and may not be drawn to scale. Certain proportions thereof may be exaggerated, while others may be minimized. Accordingly, the specification and drawings are to be regarded in an illustrative rather than a restrictive sense.

[0036] The description herein may include terms, such as "up", "down", "upper", "lower", "first", "second", etc. that

are used only for descriptive purposes and not to be construed as limiting. The elements, materials, geometries, dimensions, and sequence of operations may all be varied for particular applications. Parts of some embodiments may be included in, or substituted for, those of other embodiments. While the foregoing examples of dimensions and ranges are considered typical, the various embodiments are not limited to such dimensions or ranges.

[0037] The Abstract is provided to allow the reader to quickly ascertain the nature and gist of the technical disclosure. The Abstract is submitted with the understanding that it will not be used to interpret or limit the scope or meaning of the claims. In the foregoing Detailed Description, various features are grouped together in a single embodiment for the purpose of streamlining the disclosure. This method of disclosure is not to be interpreted as reflecting an intention that the claimed embodiments have more features than are expressly recited in each claim. Thus, the following claims are hereby incorporated into the Detailed Description, with each claim standing on its own as a separate embodiment.

[0038] As described herein, a truck bed mounted bicycle rack is disclosed. Although the disclosed subject matter has been described with reference to several example embodiments, it may be understood that the words that have been used are words of description and illustration, rather than words of limitation. Changes may be made within the purview of the appended claims, as presently stated and as amended, without departing from the scope and spirit of the disclosed subject matter in all its aspects. Although the disclosed subject matter has been described with reference to particular means, materials, and embodiments, the disclosed subject matter is not intended to be limited to the particulars disclosed; rather, the subject matter extends to all functionally equivalent structures, methods, and uses such as are within the scope of the appended claims.

What is claimed is:

1. A truck bed mounted bicycle rack comprising:

a cross bar; and

a plurality of side wing mounting brackets, a side wing mounting bracket attached to each end of the cross bar, the plurality of side wing mounting brackets each including a flange for mounting the side wing mounting brackets to rails of a truck cargo bed.

2. The truck bed mounted bicycle rack of claim **1** including a plurality of truck bed rail mounting brackets, a truck bed rail mounting bracket attached to each of the side wing mounting brackets, the plurality of truck bed rail mounting brackets including a portion to capture an underside of the rails of the truck cargo bed.

3. The truck bed mounted bicycle rack of claim **1** wherein the cross bar and plurality of side wing mounting brackets are fabricated from a material from the group consisting of: metal, steel, stainless steel, aluminum, plastics, composite materials, fiberglass, wood, hardened rubber, and combinations of the same.

4. The truck bed mounted bicycle rack of claim **1** wherein the plurality of side wing mounting brackets include wing-shaped plates with bends to provide strength.

5. The truck bed mounted bicycle rack of claim **1** wherein the cross bar is configured to enable a user to place a bicycle on the cross bar at a junction point of the bicycle, the bicycle thereby straddling and securely resting on the cross bar in transverse fashion without a need to remove a front wheel of the bicycle.

6. The truck bed mounted bicycle rack of claim **2** wherein the plurality of truck bed rail mounting brackets include a J-shaped hook bolt and a knob.

7. The truck bed mounted bicycle rack of claim **2** wherein the plurality of truck bed rail mounting brackets include a U-shaped portion, threaded on a carriage bolt, and a knob.

8. The truck bed mounted bicycle rack of claim **2** wherein the plurality of truck bed rail mounting brackets include a J-shaped portion threaded on a hex bolt.

9. The truck bed mounted bicycle rack of claim **1** wherein the cross bar is fabricated in a crosscut shape from the group consisting of: round, square, rectangular, triangular, hexagonal, and oval.

10. The truck bed mounted bicycle rack of claim **1** wherein the cross bar includes a cross bar cushion.

* * * * *