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(54) **LOADER PARKING STAND**

(57) A loader for a tractor includes a loader arm, a parking support, and a lock brace. The parking support includes a support pivot end pivotally coupled to the loader arm, a ground engagement end opposite the support pivot end, and a plurality of connection regions disposed between the support pivot end and the ground engagement end. At least one connection region of the plurality of connection regions includes an obstruction. The lock

brace includes a brace pivot end pivotally coupled to the loader arm and an attachment end opposite the brace pivot end. The attachment end is made to removably couple to any of the connection regions. The obstruction obstructs coupling of the attachment end of the lock brace to the respective connection region of the parking support.

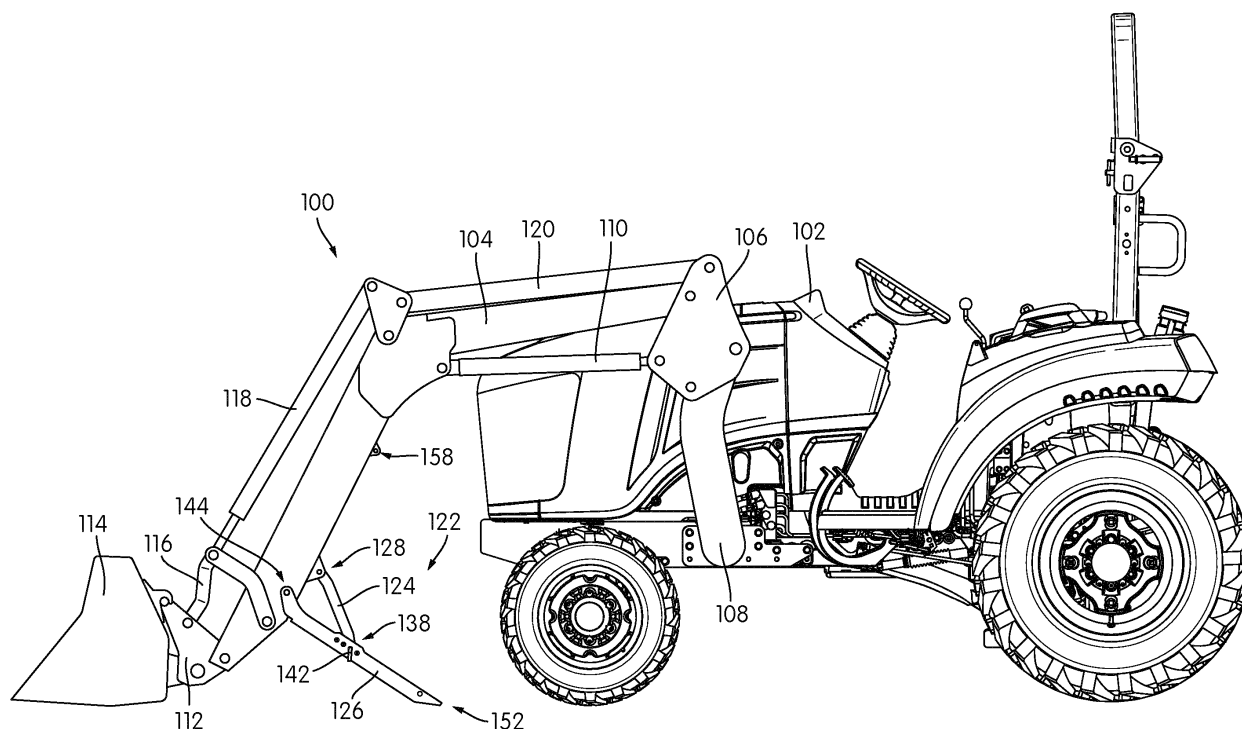


FIG. 2

Description

BACKGROUND

[0001] The present disclosure relates to a parking stand for a loader of a tractor.

[0002] Tractors equipped with front loaders can perform a variety of functions. Because a tractor may not always require the front loader for a given task, the front loader can be mounted on or decoupled from a frame bracket provided on the tractor. The front loader typically includes two arms that extend forward from the tractor and are equipped with an implement, such as a bucket, a hay bale fork, a grapple, a blade, or the like. The arms and the implement are moved with actuators, which are typically hydraulic or electrical.

[0003] Parking stand units connected to the arms of the front loader often include a pivotable parking support that can be placed and locked in a parking position. In the parking position, the front loader can be decoupled from the tractor and be supported on the parking support in such a manner that the arms of the loader are held in an upright coupling and decoupling position when the loader is parked. In this manner, simple maneuvering of the tractor can line up the connection regions between the arms of the loader and the tractor frame to remount the loader at a later time.

[0004] Many parking stand units further include an additional locking brace that extends between the arm and the parking support. The locking brace is pivotally connected to the arm and is releasably connected to the parking support to lock the parking support in position relative to the arm.

[0005] A user operating the tractor in the process of placing the loader in a parking position can inadvertently overload the parking stand units by moving the loader arms too far downwardly. This downward motion beyond a threshold distance causes the front end of the tractor to lift off the ground such that the tractor is supported by the back wheels and the loader instead of the back wheels and front wheels.

[0006] Because of the potential for this condition, typical parking stand units are over-engineered compared to what is necessary for their actual purpose, i.e., operation without the aforementioned overload condition.

[0007] What is needed, therefore, is a parking stand and loader system that is able to avoid the possibility of an overloaded condition.

SUMMARY

[0008] To support the loader, the parking stand includes a parking support moved to a parking position in which the parking support is angled relative to the respective arm of the loader. Depending on the particular type of tractor and the corresponding type of loader connected to the tractor, a parking stand must be able to lock in the parking position at a given angle to properly support

the loader when the tractor is no longer connected to the loader. Instead of making a parking stand of specific dimensions for each particular type of tractor and/or loader, a parking stand of standard dimensions for use with all types of tractors and/or loaders would be preferable. The parking stand must then be capable of locking the parking support in a variety of angles in order to be useful for various types of tractors and/or loaders. This variable angle assembly can include multiple connection regions between the parking support and the lock brace to keep the parking support at the proper angle.

[0009] As stated above, however, it would be preferable to avoid the capability of the user to place the parking stand in an overloaded condition. If the user connects the lock brace to the wrong connection region on the parking support, it becomes relatively easy to accidentally place the parking stand in an overloaded condition. It would be advantageous to prevent a user from being able to make such a mistake by providing a parking stand that is of standard dimensions but easily customizable for a particular tractor and/or loader.

[0010] In one aspect, the disclosure provides a loader for a tractor including a loader arm, a parking support, and a lock brace. The parking support includes a support pivot end pivotally coupled to the loader arm, a ground engagement end opposite the support pivot end, and a plurality of connection regions disposed between the support pivot end and the ground engagement end. At least one connection region of the plurality of connection regions includes an obstruction. The lock brace includes a brace pivot end pivotally coupled to the loader arm and an attachment end opposite the brace pivot end. The attachment end is made to removably couple to any of the connection regions. The obstruction obstructs coupling of the attachment end of the lock brace to the respective connection region of the parking support.

[0011] In another aspect, the disclosure provides a parking stand for connection to a loader arm of a loader. The parking stand includes a parking support and a lock brace. The parking support includes a support pivot end able to pivotally couple to the loader arm, a ground engagement end opposite the support pivot end, and a wall disposed between the support pivot end and the ground engagement end. The wall includes a row of discrete removable sections. The lock brace includes a brace pivot end able to pivotally couple to the loader arm and an attachment end opposite the brace pivot end. The attachment end includes a fastener receiving attachment hole. Removal of a respective removable section leaves a through hole defined in the wall of the parking support. The attachment hole of the lock brace and the through hole of the wall are alignable to receive a fastener there-through.

[0012] In yet another aspect, the disclosure provides a method of assembling a parking stand with a loader arm of a loader. The method includes connecting a parking support to the loader arm at a parking support pivot connection, connecting a lock brace to the loader arm at

a lock brace pivot connection, and removing one of a plurality of removable obstructions of the parking support to create a through hole in the parking support.

[0013] Other aspects of the disclosure will become apparent by consideration of the detailed description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

FIG. 1 is a side elevation view of a tractor and loader equipped with a parking stand in a storage position according to an embodiment of the disclosure.

FIG. 2 is a side elevation view of the tractor, loader, and parking stand of FIG. 1 with the parking stand in a parking position.

FIG. 3 is a detailed perspective view of the tractor, loader, and parking stand of FIG. 1 with the parking stand in the storage position.

FIG. 4 is a detailed perspective view of the loader and parking stand of FIG. 1 with the parking stand in the parking position and the loader detached from the tractor.

FIG. 5 is a detailed perspective view of the loader and parking stand of FIG. 1 with the parking stand components exploded from the loader.

FIG. 6 is a detailed perspective view of a parking support of the parking stand of FIG. 1 with a tool being used to remove an obstruction.

FIG. 7 is a detailed perspective view of the parking support of FIG. 6 with the obstruction removed, leaving behind a through hole defined in the parking support.

FIG. 8 is a detailed perspective view of a parking support of the parking stand of FIG. 1 with a tool being used to remove an obstruction.

DETAILED DESCRIPTION

[0015] Before any embodiments of the disclosure are explained in detail, it is to be understood that the disclosure is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the following drawings. The disclosure is capable of supporting other embodiments and of being practiced or of being carried out in various ways.

[0016] FIGS. 1 and 2 illustrate a loader 100 that can be coupled to a utility vehicle, such as a tractor 102, and operated thereon. The loader 100 includes loader arms 104, which are couplable to the tractor 102 by a mast section 106 and a bracket 108 mounted on the tractor 102. A first actuator (e.g., a first hydraulic cylinder assembly) 110 is connected to the loader arm 104 and the mast section 106 to raise and lower the loader arm 104. An implement attachment bracket 112, which is equipped with an interchangeable implement (e.g., a bucket) 114

is arranged at a distal end of the loader arm 104. The implement attachment bracket 112, and thus also the implement 114, can be pivoted relative to the loader arm 104 by an actuation linkage 116, which can be controlled by a second actuator (e.g., a second hydraulic cylinder assembly) 118. Another linkage 120 is used for parallel guidance of the implement attachment bracket 112 and/or the implement 114 while the loader arm 104 is being raised and lowered.

[0017] As shown in FIGS. 3 and 4, the loader 100 further includes a parking stand 122 disposed on the loader arm 104 and movable between a storage configuration (FIG. 3) and a parking configuration (FIG. 4). The parking stand 122 includes a lock brace 124 and a parking support 126.

[0018] The lock brace 124 is illustrated as a U-shaped channel member and includes a brace pivot end 128 pivotally coupled to the loader arm 104. In the illustrated embodiment, the brace pivot end 128 is pivotally coupled to the loader arm 104 by a pivot pin 130 passing through brace pivot openings 132 defined in the lock brace 124. The pivot pin 130 is illustrated in FIG. 5 including two clips 134, which keep the pivot pin 130 laterally in place relative to the lock brace 124. The pivot pin 130 also passes through corresponding bracket openings 136 of the loader arm 104 to pivotally connect the lock brace 124 to the loader arm 104.

[0019] The lock brace 124 further includes an attachment end 138 opposite the brace pivot end 128. In the illustrated embodiment, the lock brace 124 includes two attachment holes 140 defined therein adjacent the attachment end 138 of the lock brace 124. The lock brace 124 is connectable to the parking support 126 by a retention pin 142 passing through the attachment holes 140 of the lock brace 124. The connection of the lock brace 124 to the parking support 126 will be discussed further below.

[0020] The parking support 126 is illustrated as a generally U-shaped channel member and has a support pivot end 144 pivotally coupled to the loader arm 104. In the illustrated embodiment, the support pivot end 144 is pivotally coupled to the loader arm 104 by a fastener (e.g., a bolt) 146 passing through support pivot openings 148 defined in the parking support 126 as shown in FIG. 5. The fastener 146 also passes through a corresponding arm opening 150 of the loader arm 104 to pivotally connect the parking support 126 to the loader arm 104.

[0021] The parking support 126 includes a ground engagement end 152 opposite the support pivot end 144. In the illustrated embodiment, the ground engagement end 152 includes a foot 154. The parking support 126 further includes a storage opening 156 defined therein adjacent the ground engagement end 152. The loader arm 104 includes a corresponding storage aperture 158 defined therein. When the parking support 126 is in the storage position as shown in FIG. 3, the storage opening 156 of the parking support 126 aligns with the storage aperture 158 of the loader arm 104. A user may insert

the retention pin 142 through both the storage opening 156 of the parking support 126 and the storage aperture 158 of the loader arm 104 to maintain the parking support 126 in the storage position during, for instance, operation of the tractor 102. While the parking support 126 is in the storage position in the illustrated embodiment, the lock brace 124 is disconnected from the parking support 126 and nests in the U-shaped channel of the parking support 126.

[0022] The parking support 126 also includes a wall, or a connection plate, 160 disposed between the support pivot end 144 and the ground engagement end 152. The connection plate 160 includes a plurality of connection regions 162 defined therein. In the illustrated embodiment, the parking support 126 is originally manufactured with an obstruction 164 at each connection region 162. Each obstruction 164 is positioned to prevent a user from being able to removably couple the attachment end 138 of the lock brace 124 to the respective connection region 162 of the parking support 126.

[0023] As shown in FIGS. 6 and 7, the illustrated embodiment includes obstructions 164 that are integral with the connection plate 160 of the parking support 126. Stated another way, each obstruction 164 is integrally formed as one piece with the connection plate 160. As shown in FIG. 6, the obstructions 164 bridge each respective connection region 162 in a closed state. A continuous portion of the material between the obstruction 164 and the connection plate 160 is relatively narrow and, therefore, weak compared to the remainder of the connection plate 160. Particularly, in the illustrated embodiment, each obstruction 164 is partially surrounded by two diametrically opposed arcuate slots 166 defined in the connection plate 160, forming a stress concentration in the relatively narrow portion of material joining the obstruction 164 and the connection plate 160. In this manner, each obstruction 164 is removable from the parking support 126 by breaking the obstruction 164 away from the parking support 126 at the continuous portion of the material between the obstruction 164 and the connection plate 160.

[0024] In the illustrated embodiment, each obstruction 164 further includes a tool receiving portion in the form of a tool receiving hole 168 defined therein. As shown in FIG. 6, a tool, such as a screwdriver, 170 may be inserted in the tool receiving hole 168. The tool 170 is then used to twist the obstruction 164 relative to the parking support 126 until the continuities between the obstruction 164 and the parking support 126 break, thereby permanently detaching the obstruction 164 from the parking support 126.

[0025] Once a given obstruction 164 has been removed from the connection plate 160 as shown in FIG. 7, the corresponding connection region 162 can be considered to be in an open state. In the open state, the connection region 162 includes a through hole 172 defined in the connection plate 160. As such, the attachment holes 140 of the lock brace 124 can then be aligned with the through hole 172 of the connection plate 160. Once

aligned, the retention pin 142 is positioned in the attachment holes 140 and the through hole 172 to lock the parking stand 122 in the parking position as shown in FIG. 4.

[0026] Although only one connection plate 160 has been described above, the illustrated embodiment includes two parallel connection plates 160 with connection regions 162 disposed on each connection plate 160. The connection regions 162 on one of the two parallel connection plates 160 of the parking support 126 are aligned with the connection regions 162 on the other of the two parallel connection plates 160 to facilitate insertion of the retention pin 142 in the through holes 172 when two corresponding connection regions 162 are in the open state. In this embodiment, the lock brace 124 may also include a passage, or bushing, 174 to make insertion of the retention pin 142 through the attachment holes 140 and the through holes 172 easier for a user. In some embodiments, the passage 174 may be welded to the lock brace 124 such that it defines a single attachment hole 140.

[0027] Other embodiments of the parking stand 122 may include connection regions 162 that have a protrusion or a cavity instead of a through hole 172. In the case of a protrusion, the obstruction 164 may be a structure that at least partially surrounds the connection region 162. In the case of a cavity, the obstruction 164 may be substantially similar to the removable wall section described above.

[0028] In the illustrated embodiment including connection regions 162 that are through holes 172 in the open state, the obstructions 164 may alternatively be a plug, pin, lock, or some other structure that is attached to the connection plate 160. In each embodiment, the obstructions 164 are removable by either irreparably breaking the obstructions 164 or by specialized access with, for example, a key. In this manner, a user may not access a given connection region 162 by mistake.

[0029] As shown in FIG. 8, another illustrated embodiment includes connection regions 262 with respective obstructions 264 each partially surrounded by one arcuate slot 266 defined in the connection plate 260. Some embodiments further include the one arcuate slot 266 extending about a majority of the obstruction 264 such that the obstruction 264 is connected to the connection plate 260 by only a single relatively narrow portion of material. As illustrated in FIG. 8, the single arcuate slot 266 is merged with the tool receiving portion in the form of a tool receiving hole 268. Stated another way, the tool receiving hole 268 is a continuous opening with the arcuate slot 266 in the illustrated embodiment in FIG. 8. This embodiment may reduce the number of cutting steps in producing the parking support 226.

[0030] The present disclosure also relates to a method of assembling a parking stand 122 with a loader arm 104 of a loader 100. When assembling the loader 100, the manufacturer attaches the parking support 126 to the loader arm 104 with a fastener 146 at a parking support pivot connection. The manufacturer also attaches the

lock brace 124 to the loader arm 104 with a pivot pin 130 at a lock brace pivot connection. The parking support pivot connection is positioned closer to the implement attachment bracket 112, or the implement attachment end of the loader arm 104, than the lock brace pivot connection. The manufacturer also decides which connection region 162 is appropriate for the given loader 100 such that an end-user cannot overload the parking stand 122 when properly positioning the implement 114, the loader arms 104, and the tractor 102 to park the loader 100. Once the proper connection region 162 is decided, the manufacturer may irreversibly break away the corresponding obstruction 164, thereby creating a through hole 172 in the connection plate 160. The proper connection region 162 allows the lock brace 124 to connect to the parking support 126 at an angle and position such that the ground engagement end 152 of the parking support 126 is even with or slightly elevated compared to a bottom surface of the implement 114 when the implement 114 is fully tilted back. In this manner, the implement 114 would experience all or a large majority of the loading force if the user accidentally lifts the front wheels of the tractor 102 off the ground by moving the loader arms 104 too far downward.

[0031] With the above described loader 100 and method of assembly thereof, an end-user cannot easily select and utilize an improper connection region 162 that would allow the parking stand 122 to experience an overloaded condition. If an end-user were to forcefully use an improper connection region 162, it would be evident to the manufacturer that the parking stand 122 has been improperly tampered with.

Claims

1. A parking stand for connection to a loader arm of a loader, the parking stand comprising:

a parking support including
 a support pivot end configured to pivotally couple to the loader arm,
 a ground engagement end opposite the support pivot end, and
 a wall disposed between the support pivot end and the ground engagement end, the wall including a row of discrete removable sections;
 and
 a lock brace including
 a brace pivot end configured to pivotally couple to the loader arm, and
 an attachment end opposite the brace pivot end, the attachment end including a fastener receiving attachment hole,
 wherein
 the wall is configured such that removal of a respective removable section leaves a through hole defined in the wall of the parking support,

and
 the attachment hole of the lock brace and the through hole of the wall are configured to align to receive a fastener therethrough.

2. The parking stand of claim 1, wherein the parking support and the lock brace are both positionable in a storage configuration, the parking support is formed as a generally U-shaped channel member, and the lock brace is nested in the parking support in the storage configuration.
3. The parking stand of claim 1 or 2, wherein the lock brace is also a generally U-shaped channel member.
4. The parking stand of claim 1, 2, or 3 wherein each of the removable sections is configured to be broken away from the wall of the parking support.
5. The parking stand of any preceding claim, wherein, upon removal from the wall of the parking support, each of the removable sections is permanently detached therefrom.
6. The parking stand of any preceding claim, wherein each of the removable sections is integrally formed as one piece with the wall.
7. The parking stand of any preceding claim, wherein each of the removable sections is partially surrounded by a slot defined in the wall.
8. The parking stand of claim 7, wherein the slot is arcuate
9. The parking stand of any preceding claim, wherein each of the removable sections includes a tool receiving portion.
10. The parking stand of claim 9, wherein the tool receiving portion of each of the removable sections includes a tool receiving hole defined in the respective removable section.
11. A loader for a tractor, the loader including a loader arm and the parking stand of any of claims 1 to 10 coupled thereto.
12. The loader of claim 11, wherein the loader arm includes a storage aperture defined therein, the parking support further includes a storage opening defined therein, and the storage opening of the parking support aligns with the storage aperture of the loader arm when the parking stand is in a storage position.

13. The loader of claim 12, further comprising
a retention pin occupying the storage opening of the
parking support and the storage aperture of the load-
er arm to hold the parking stand in the storage posi-
tion, and 5
wherein
the attachment hole of the lock brace aligns with the
through hole of the wall when the parking stand is in
the parking position, and
the retention pin occupies the attachment hole of the 10
lock brace and the through hole of the wall to hold
the parking stand in the parking position.
14. A tractor, the tractor including the loader of claim 11
coupled thereto. 15
15. A method of assembling the parking stand with the
loader arm of the loader of claim 11, the method com-
prising: 20
connecting the parking support to the loader arm
at a parking support pivot connection;
connecting the lock brace to the loader arm at
a lock brace pivot connection; and
removing one of the removable sections of the 25
wall, thereby creating the through hole defined
in the wall of the parking support.
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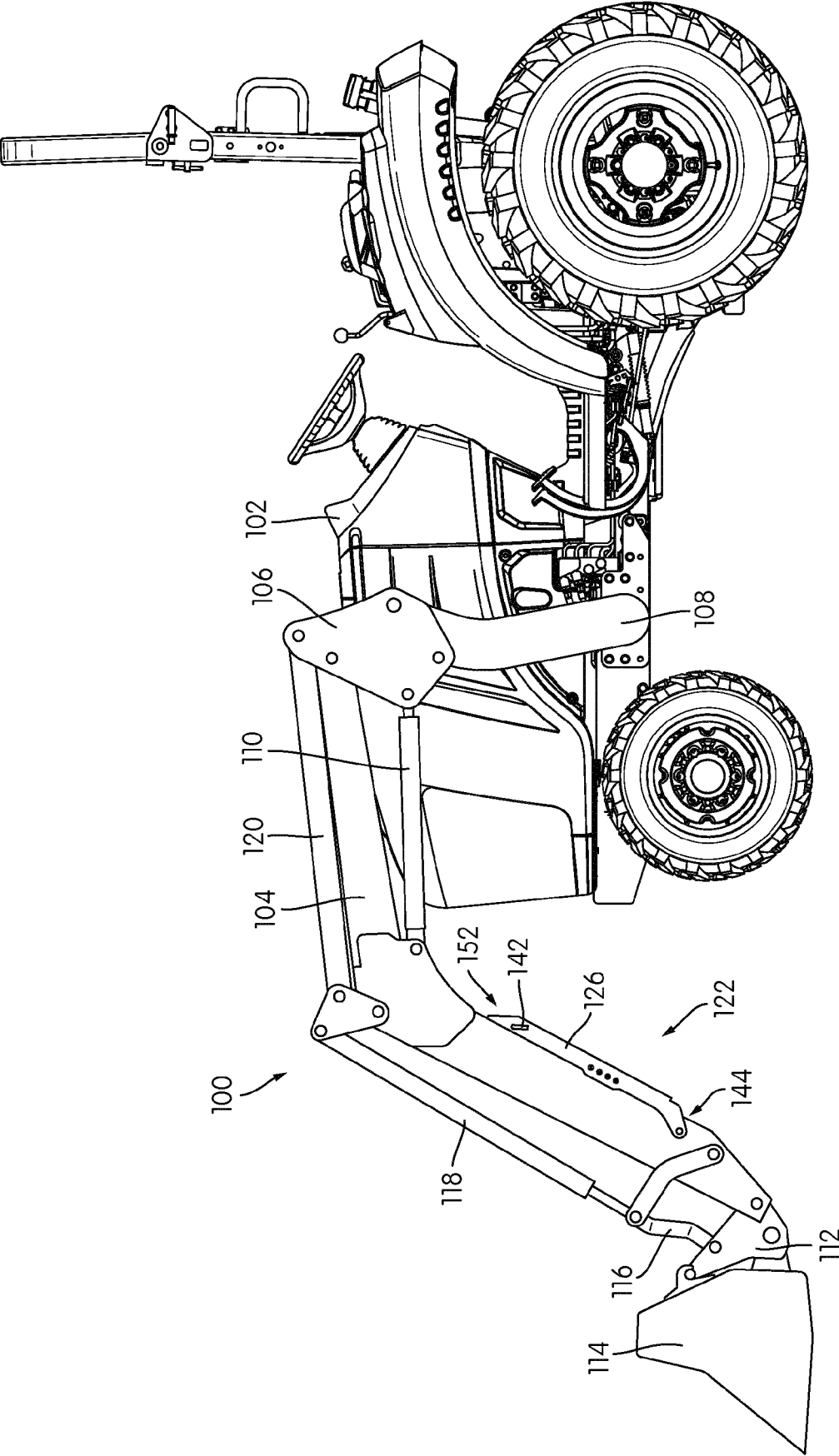


FIG. 1

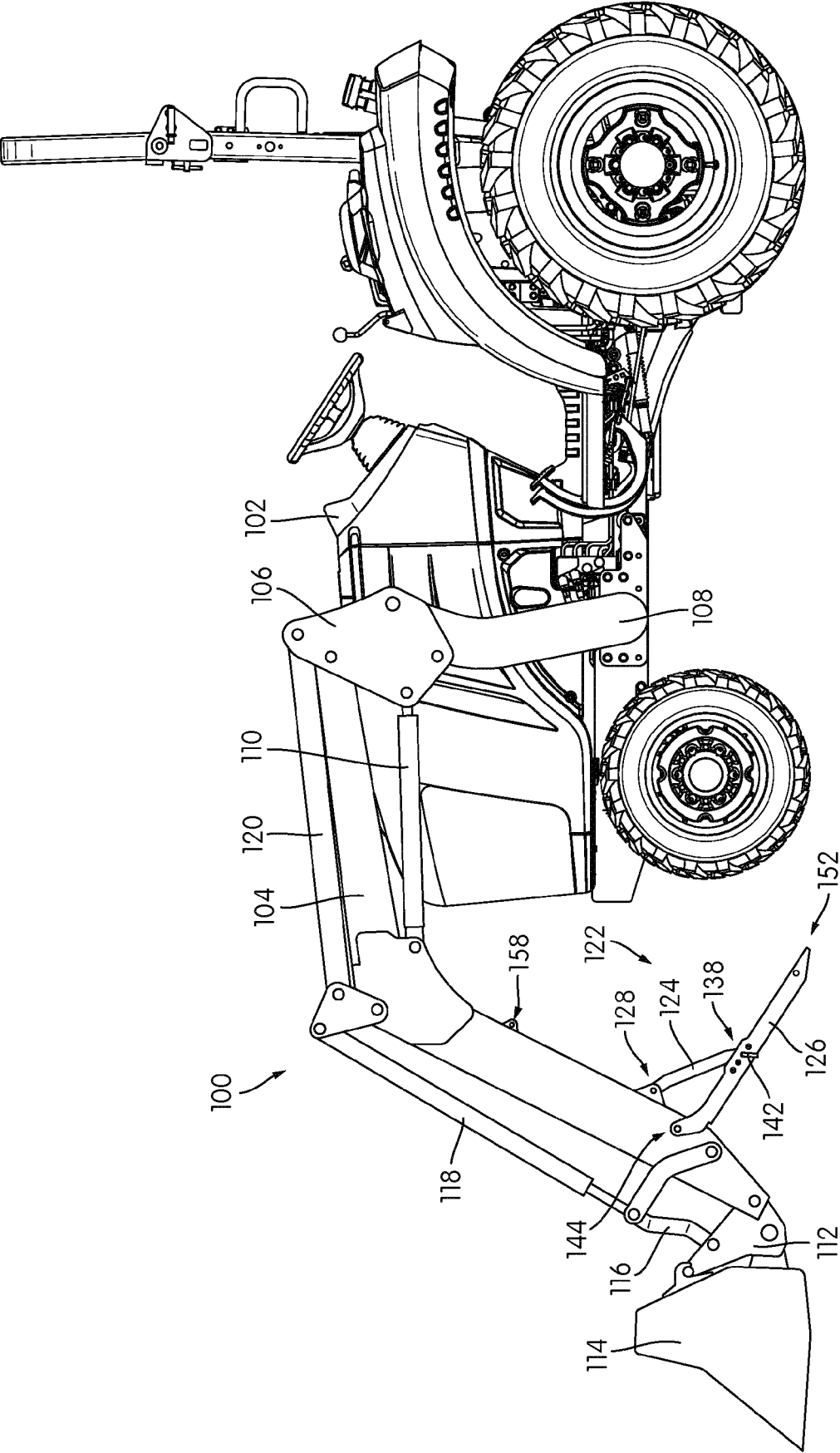


FIG. 2

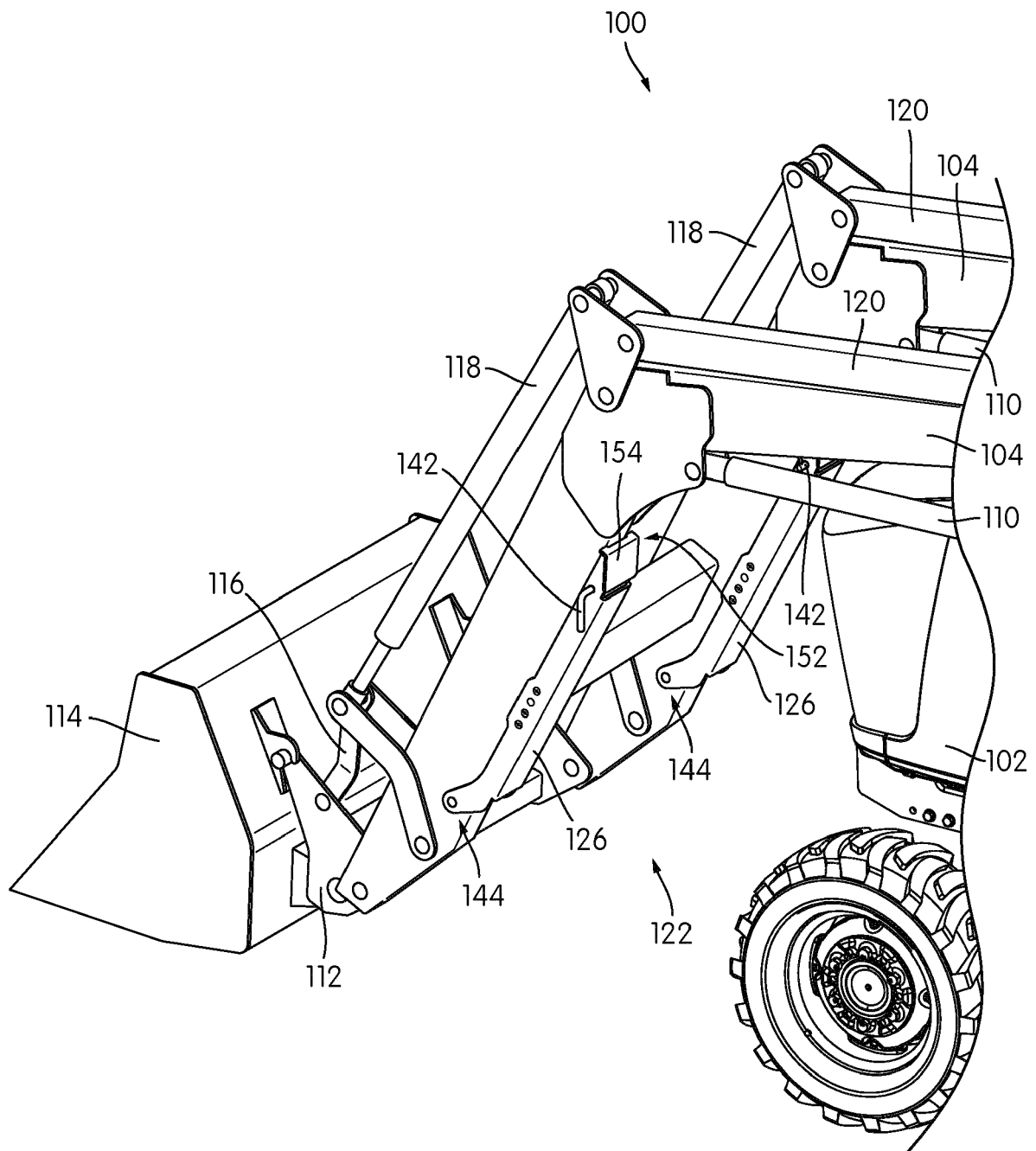


FIG. 3

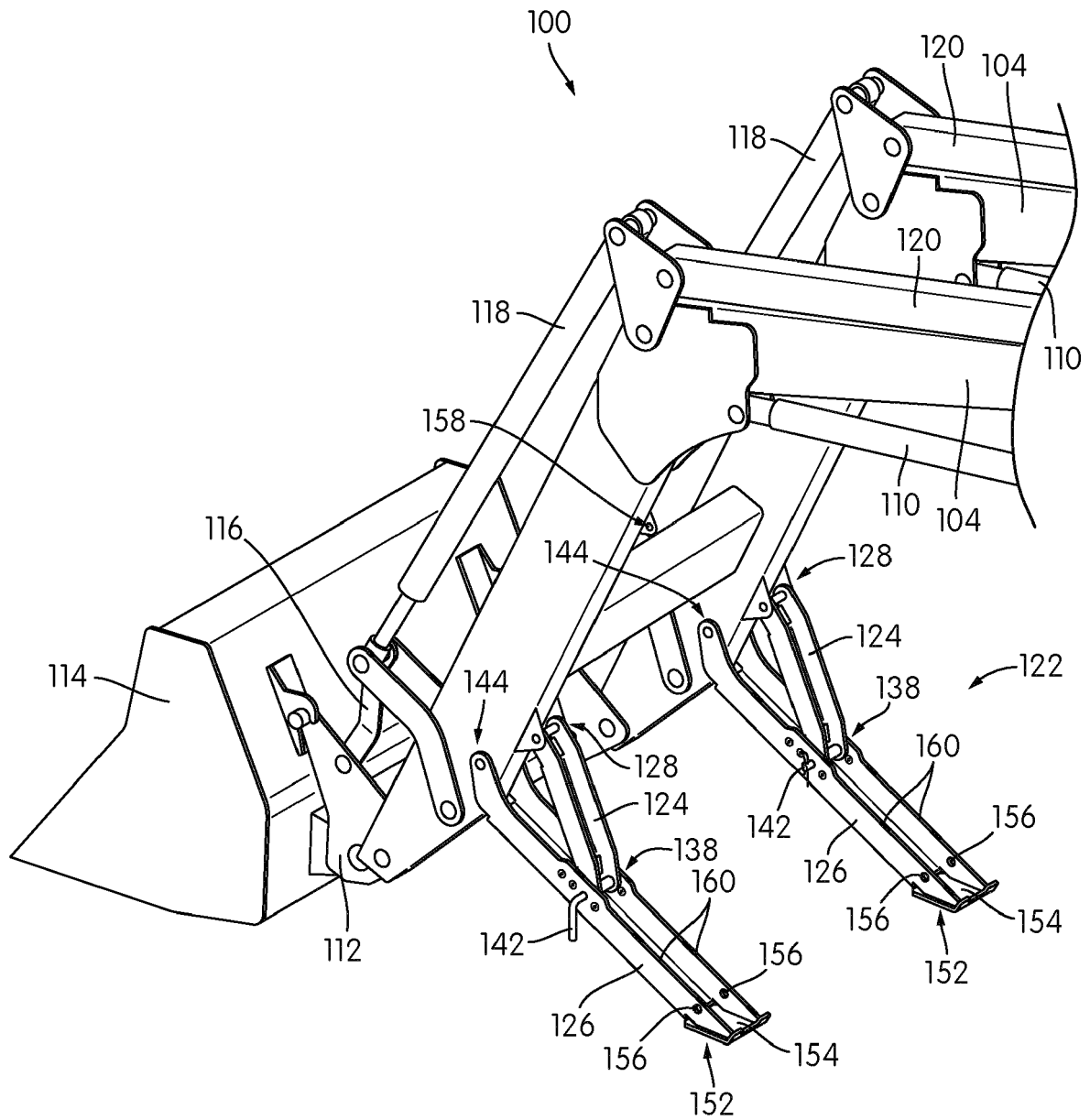


FIG. 4

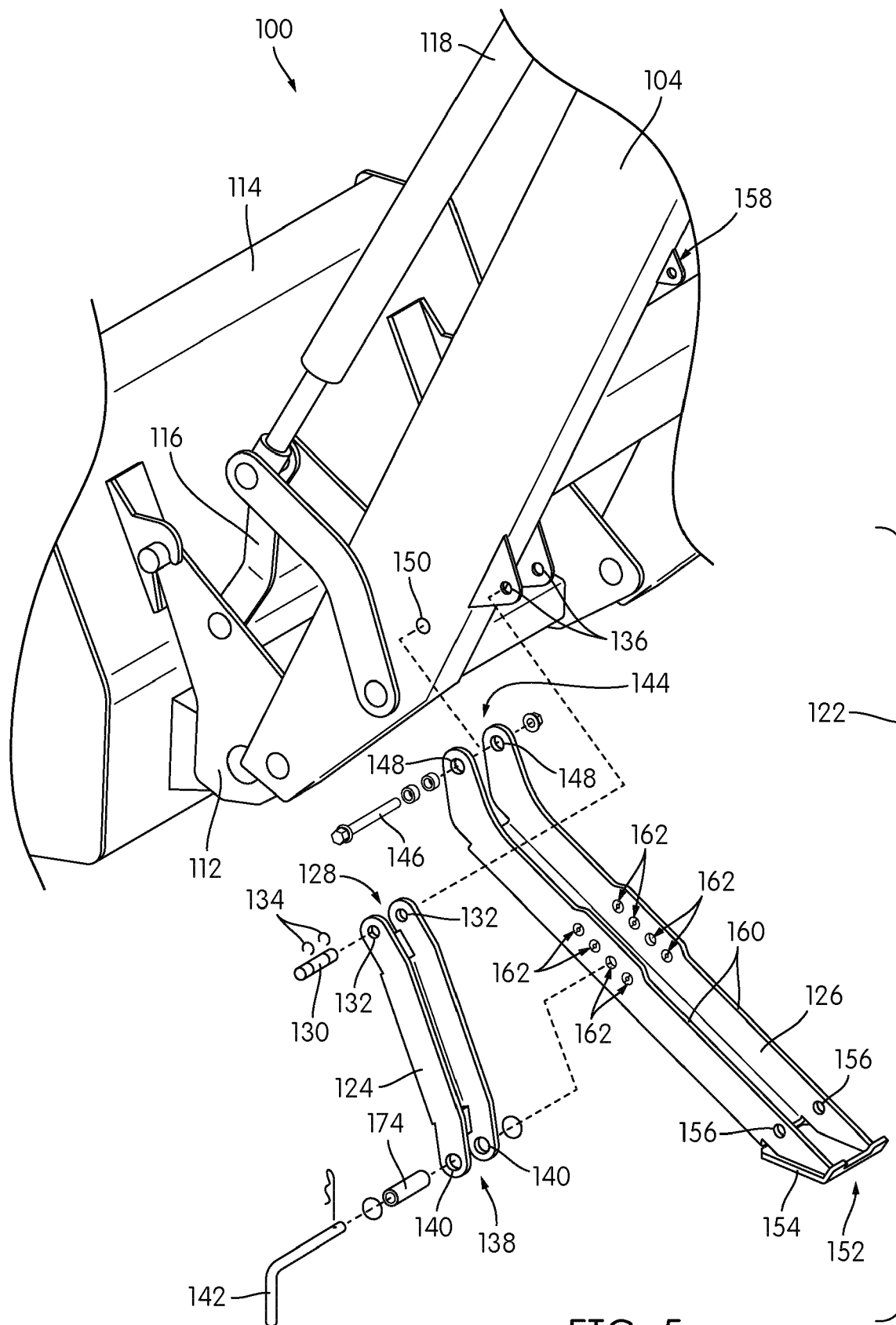


FIG. 5

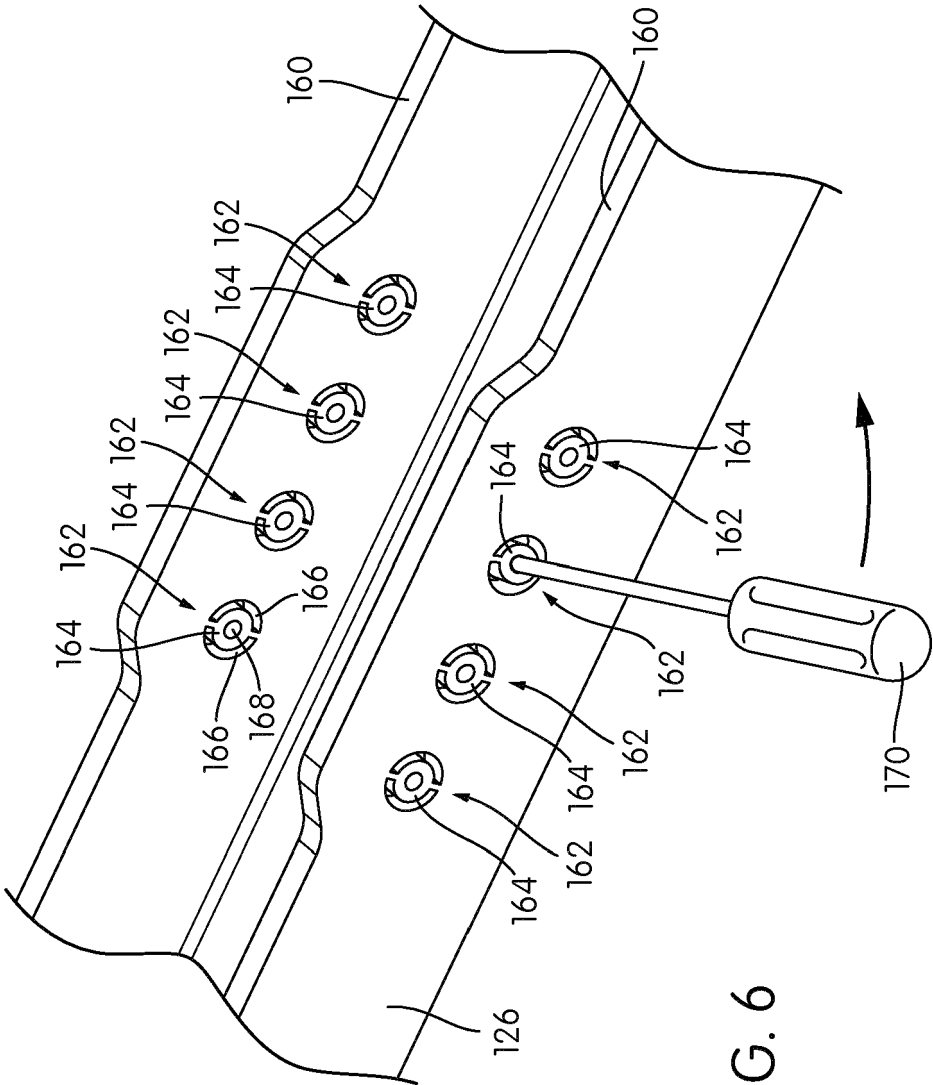


FIG. 6

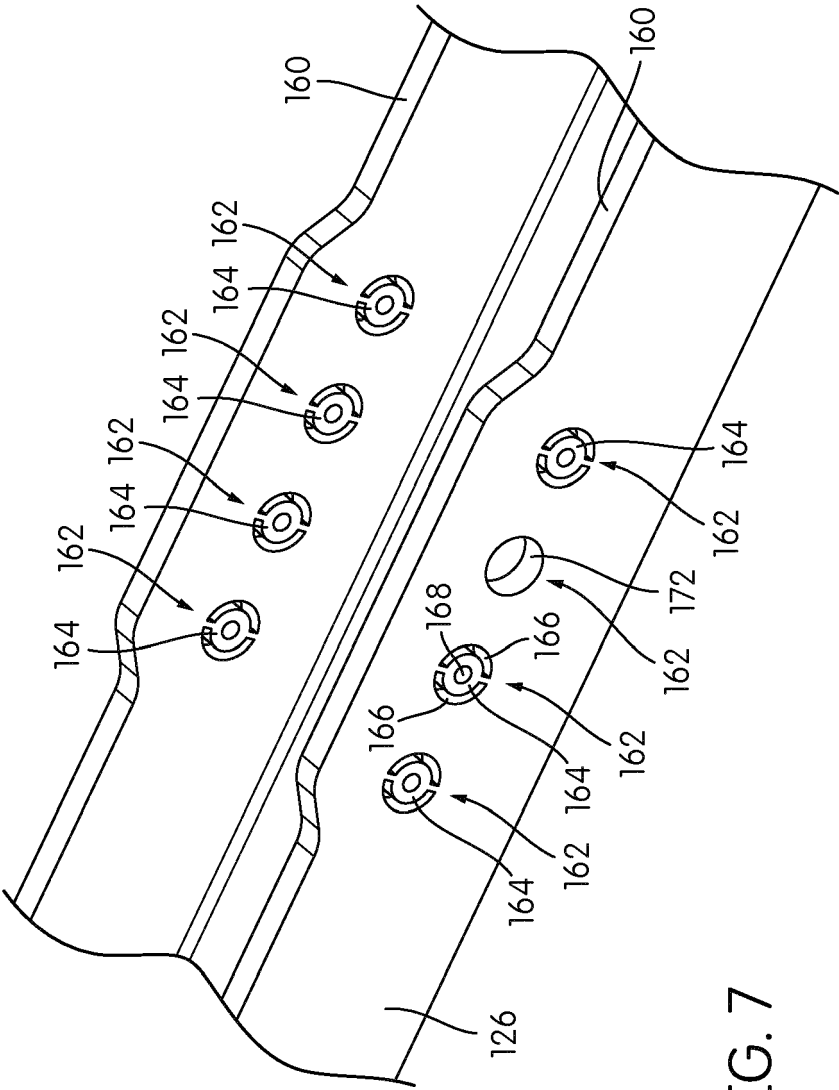
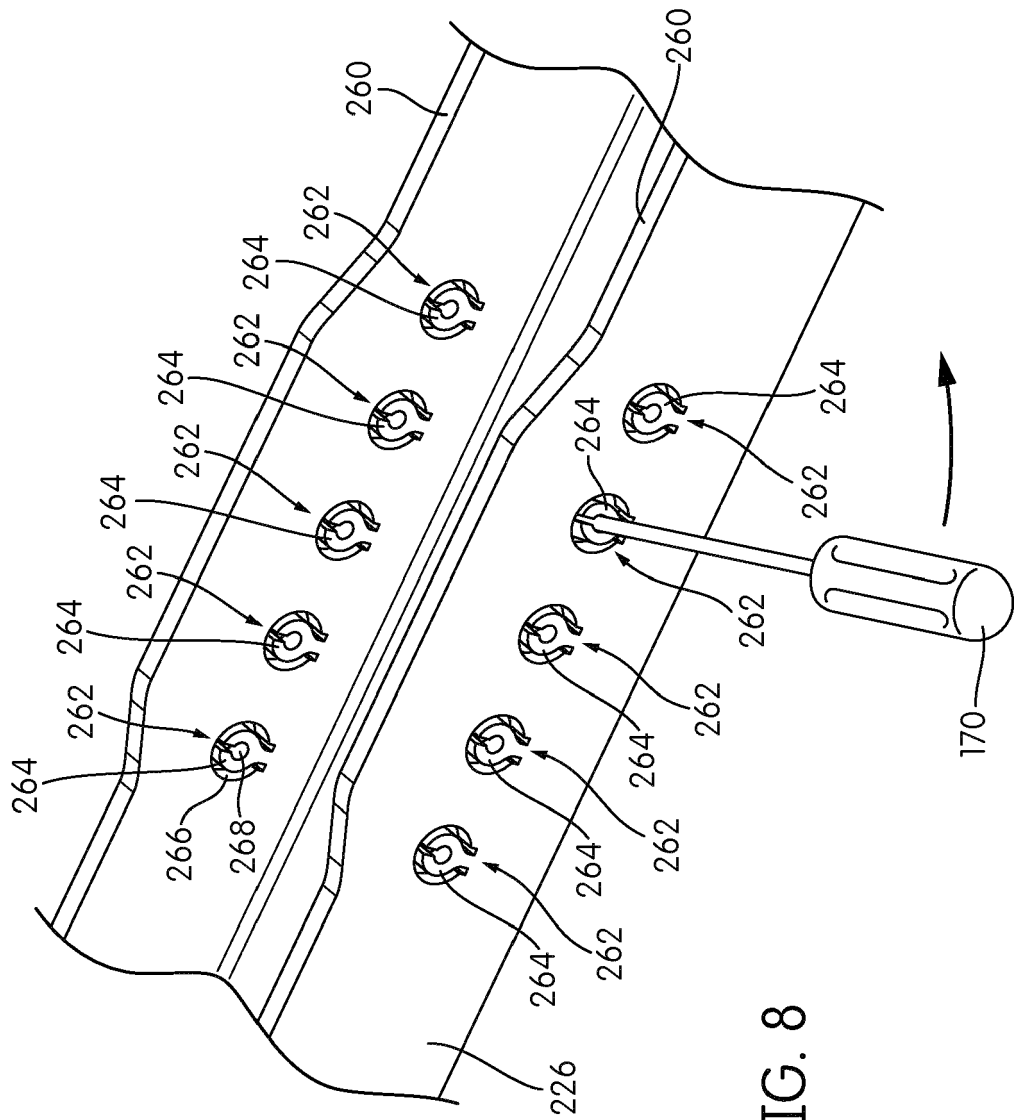


FIG. 7





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Application Number
EP 20 17 3557

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 31 August 2020	Examiner Ferrien, Yann
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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