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Roberts et al.

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(54) **BODY PROP ASSEMBLY**

USPC 414/776, 777, 779, 782, 639, 648, 642,
414/674; 254/88, 114; 108/6, 7, 9, 10;
298/17 B

(71) Applicant: **Global Vacuum Systems**, Navasota,
TX (US)

See application file for complete search history.

(72) Inventors: **Landon Roberts**, Navasota, TX (US);
Leland Carl Sutton, Jr., Navasota, TX
(US)

(56) **References Cited**

U.S. PATENT DOCUMENTS

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 489 days.

296,938 A * 4/1884 Dees
1,264,432 A * 4/1918 Palm B60P 1/34
298/11
2,407,012 A * 9/1946 Hutchinson B60P 1/283
298/22 R

(21) Appl. No.: **15/900,761**

(Continued)

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FOREIGN PATENT DOCUMENTS

(65) **Prior Publication Data**

US 2018/0236831 A1 Aug. 23, 2018

DE 1480147 A1 * 9/1969 B60P 1/283
GB 847163 * 9/1960 B60P 1/283
JP 58183325 * 10/1983 B60P 1/283

Related U.S. Application Data

Primary Examiner — Anne Marie M Boehler

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20, 2017.

(74) *Attorney, Agent, or Firm* — Shannon Warren

(51) **Int. Cl.**

B60D 1/66 (2006.01)
B60P 1/04 (2006.01)
B60P 1/28 (2006.01)
B60P 3/22 (2006.01)
B60D 1/46 (2006.01)
B60D 1/50 (2006.01)
B60S 9/16 (2006.01)

(52) **U.S. Cl.**

CPC **B60D 1/465** (2013.01); **B60D 1/50**
(2013.01); **B60D 1/665** (2013.01); **B60P 1/04**
(2013.01); **B60S 9/16** (2013.01)

(58) **Field of Classification Search**

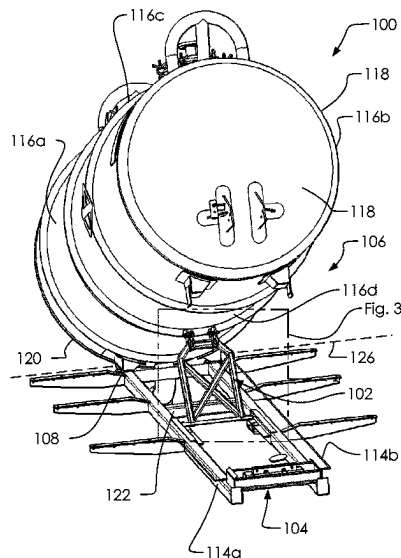
CPC B60S 9/16; B60S 9/18; B60S 9/22; B60P
1/04; B60P 1/283; B60P 3/224; B65D
88/20; B65D 88/128; B65D 88/56; B65D
2251/04; B28C 7/0084

(57)

ABSTRACT

A body prop assembly for supporting portions of a tilting trailer assembly. Said body prop assembly comprising a body prop, a hinge assembly, two sidetracks. Said body prop assembly configured to attach to said tilting trailer assembly between tilting portions and a trailer platform. Said tilting portions selectively rotate with respect to said trailer platform on a tilting hinge. Said tilting hinge defines a tilting axis of said tilting trailer assembly. Said body prop is configured to selectively hold a portion of said tilting portions at an incline. Lower guides are configured to slide through portions of said two sidetracks in order to adjust a lower portion of said body prop assembly. Said body prop comprises an upper portion, a side portions and said lower guides. Said upper portion is substantially parallel with said lower guides.

18 Claims, 25 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

3,272,558	A *	9/1966	Rathman	B60P 1/20 298/22 D
3,455,475	A *	7/1969	Suteau	B60P 3/2225 414/787
3,730,396	A *	5/1973	Harper	B28C 7/0084 222/166
3,792,814	A *	2/1974	Platz	A01C 23/047 239/149
4,202,434	A *	5/1980	Herron	B65G 41/002 198/316.1
4,218,094	A *	8/1980	Leaver	B60P 1/04 248/351
4,480,871	A *	11/1984	Fox	B60P 1/16 298/17 R
5,267,780	A *	12/1993	Friesen	B60P 1/04 298/17 B
5,405,181	A *	4/1995	Watkins	B60P 1/283 298/17 B
6,745,869	B2 *	6/2004	Garrett	B23D 45/003 182/45

* cited by examiner

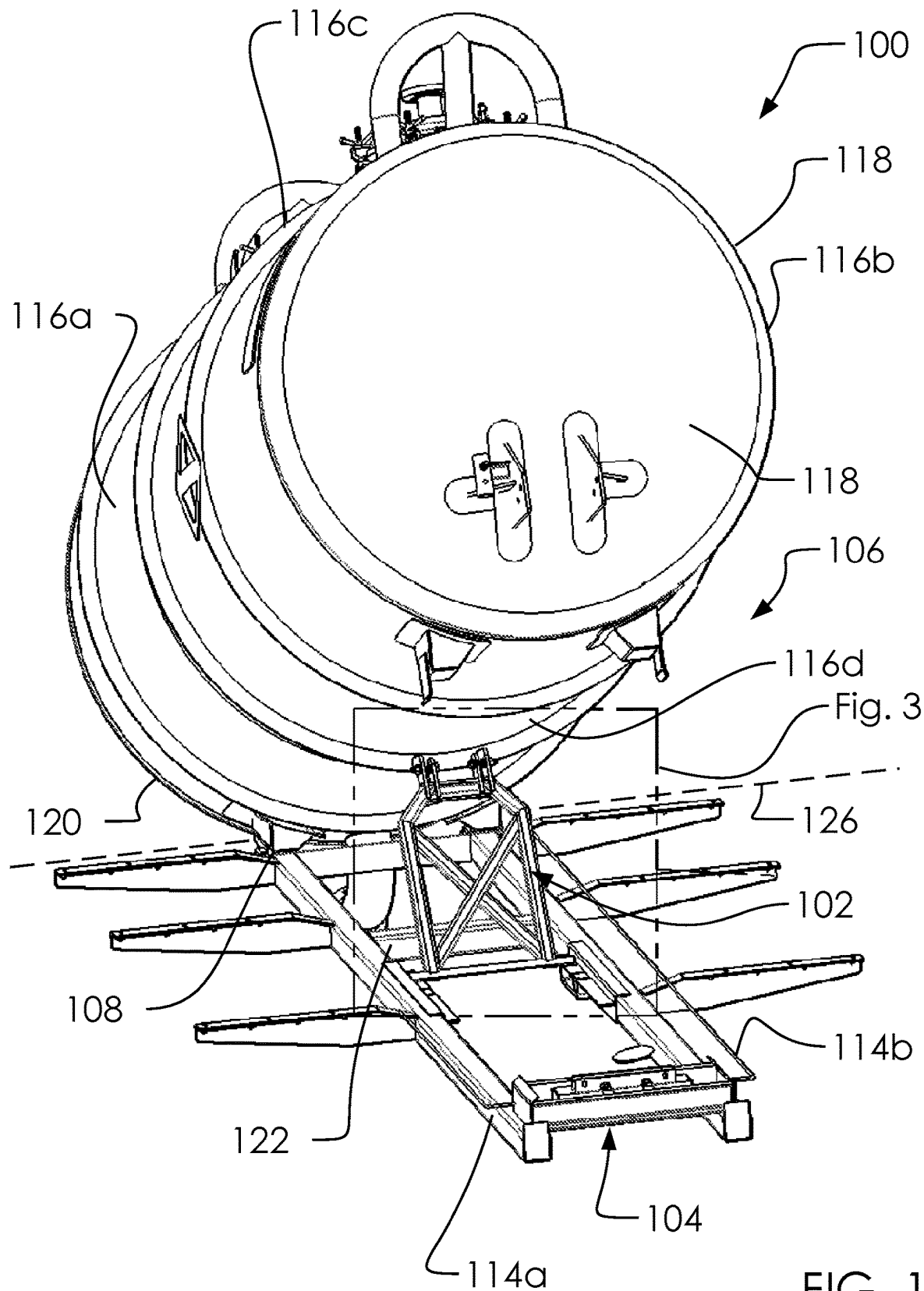


FIG. 1

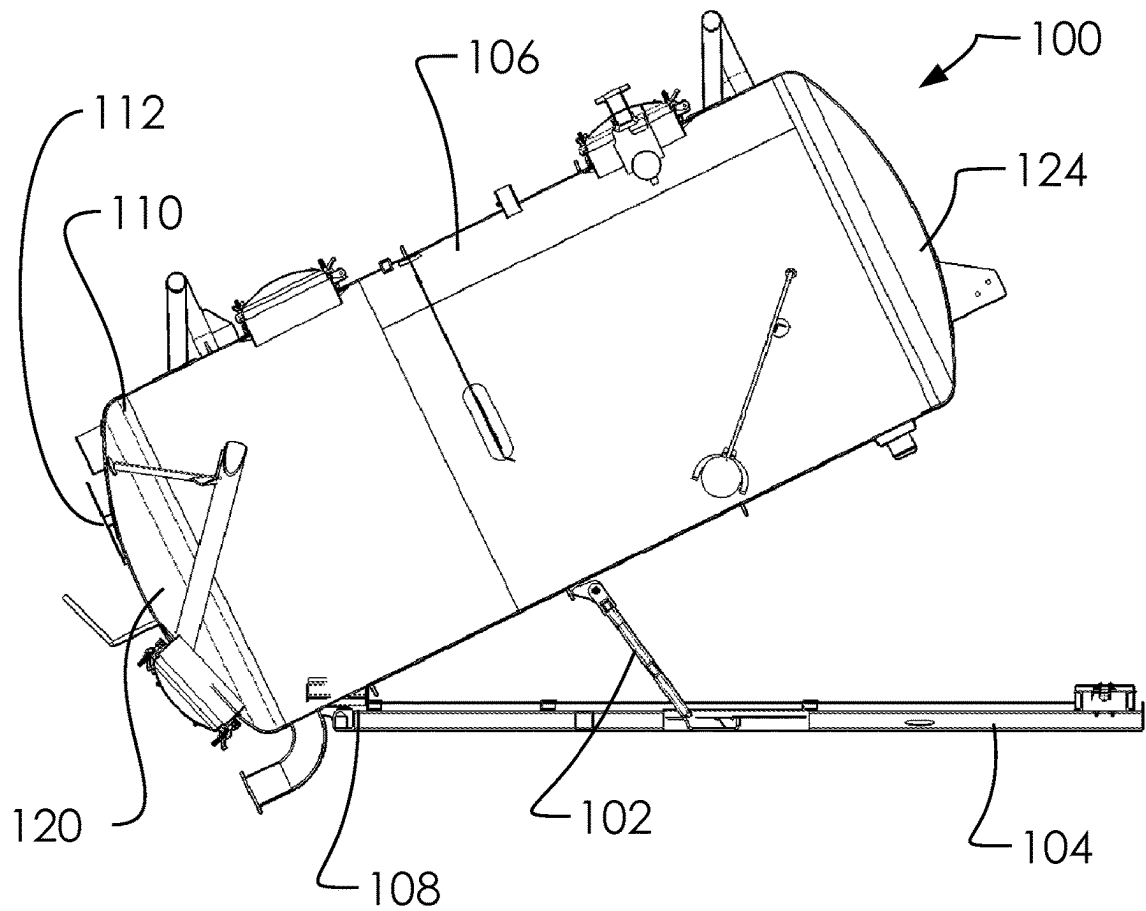


FIG. 2A

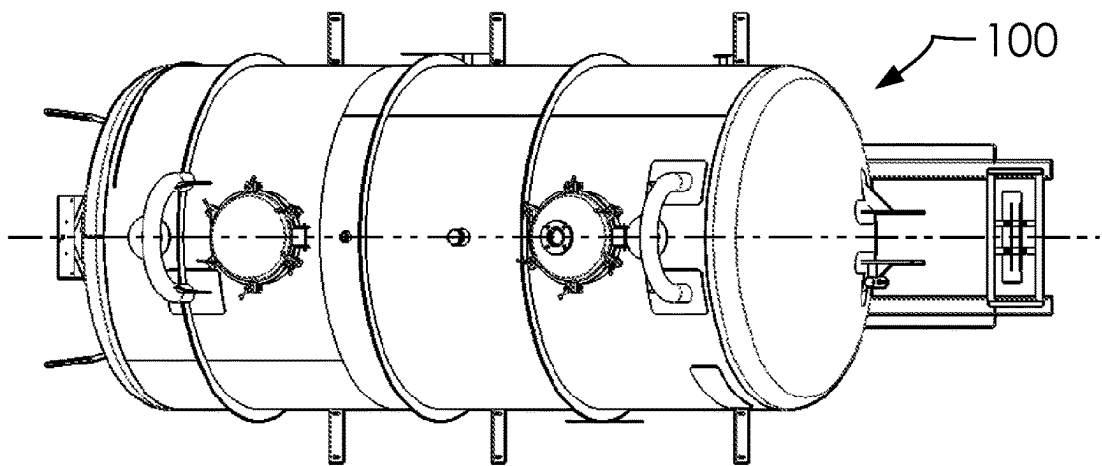


FIG. 2B

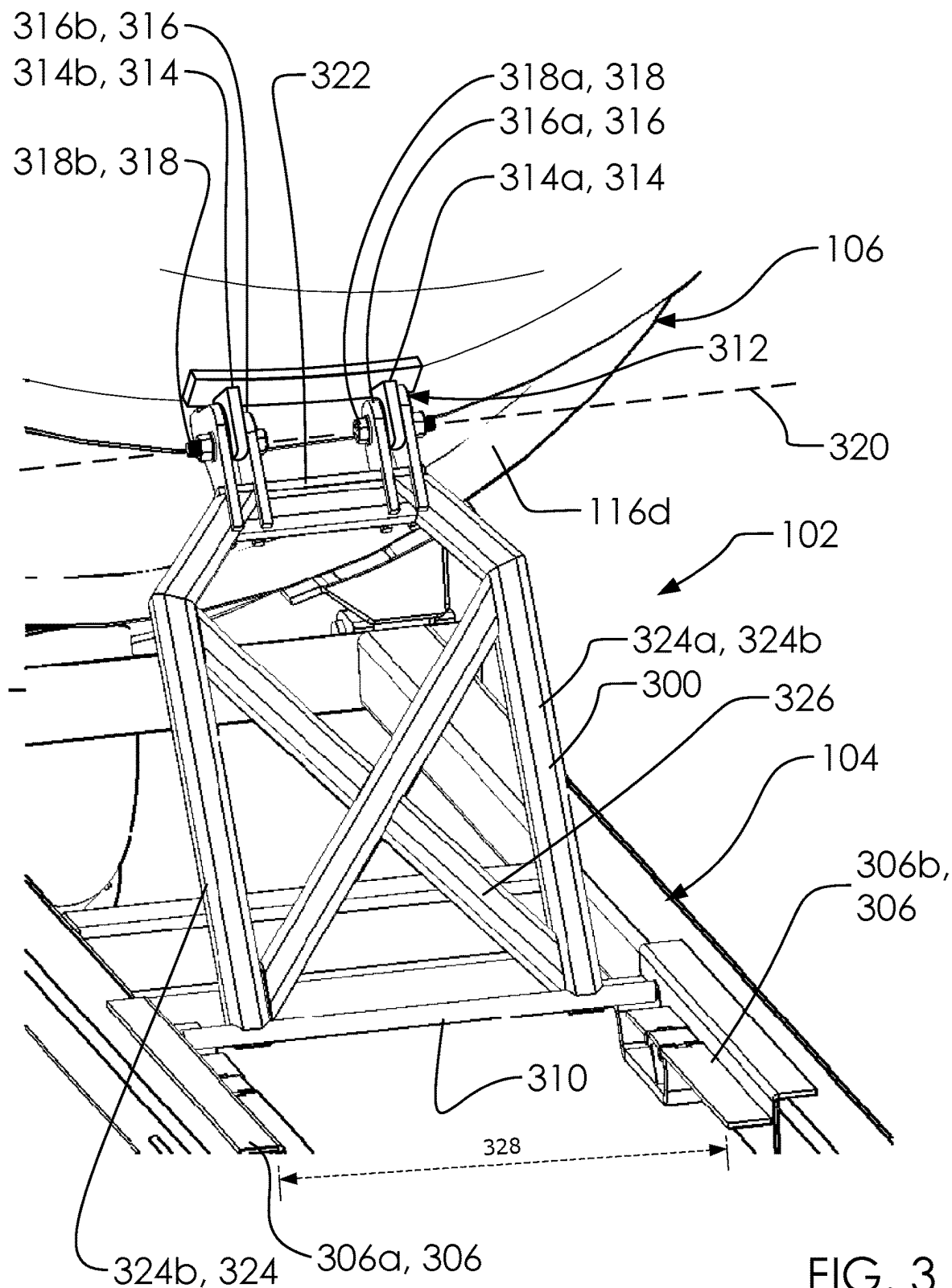
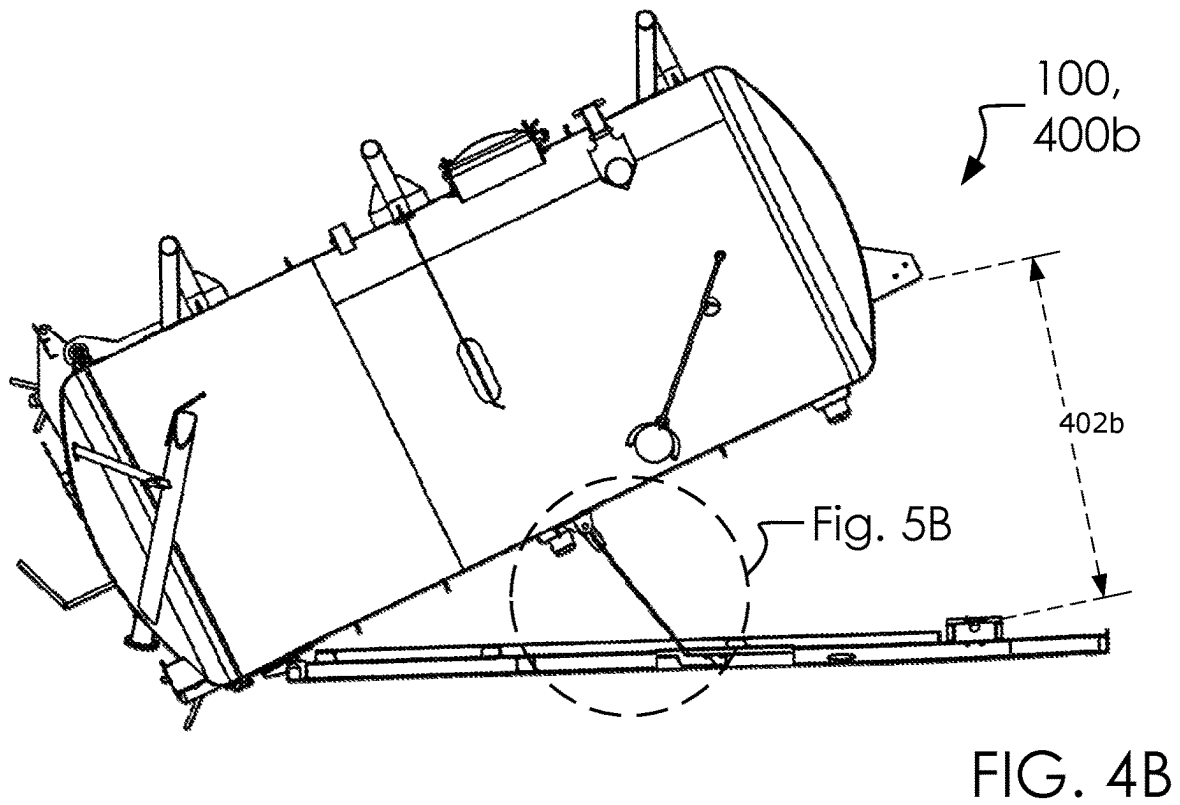
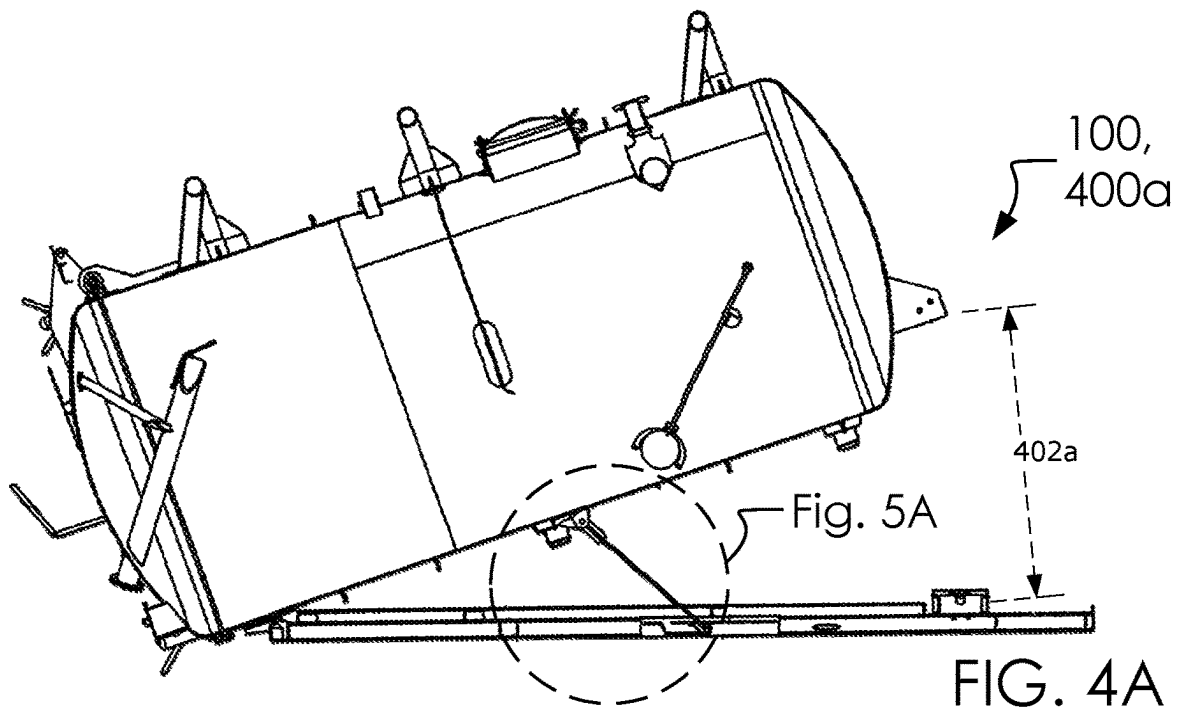
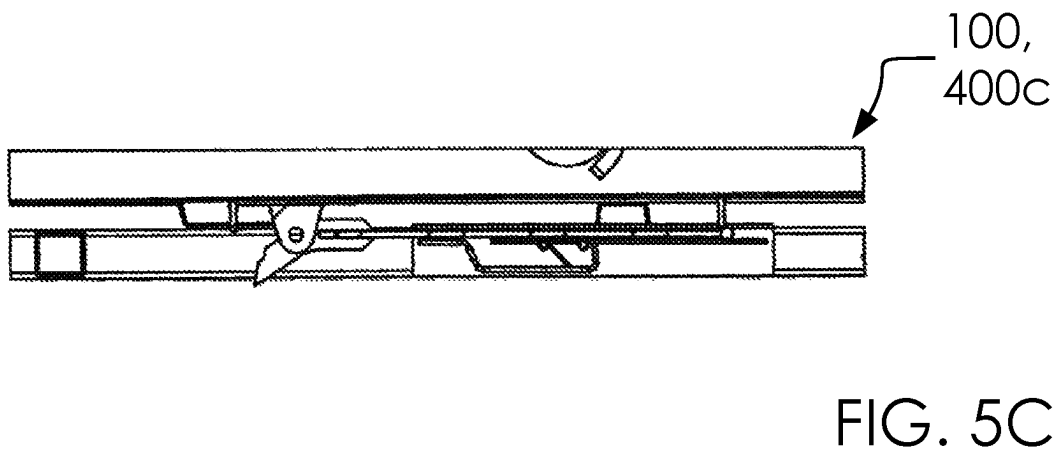
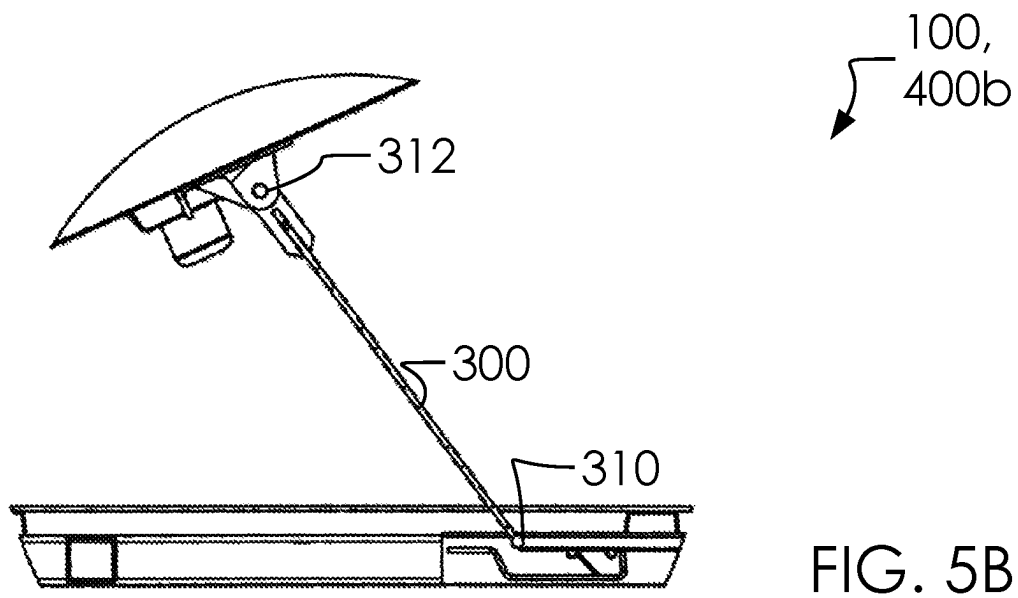
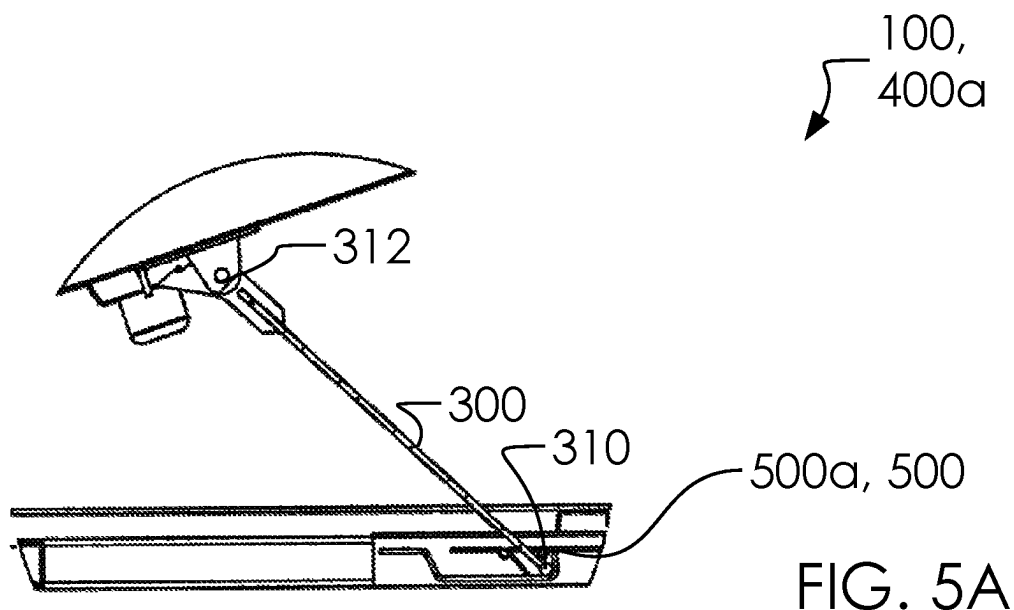


FIG. 3





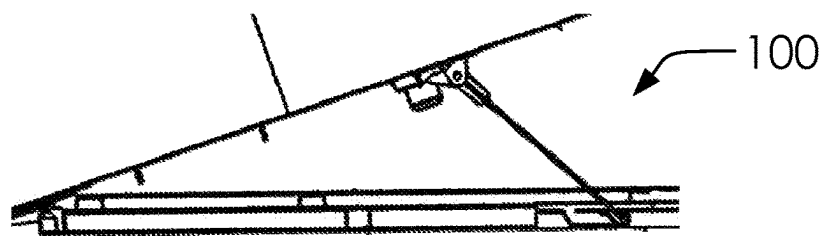


FIG. 6A

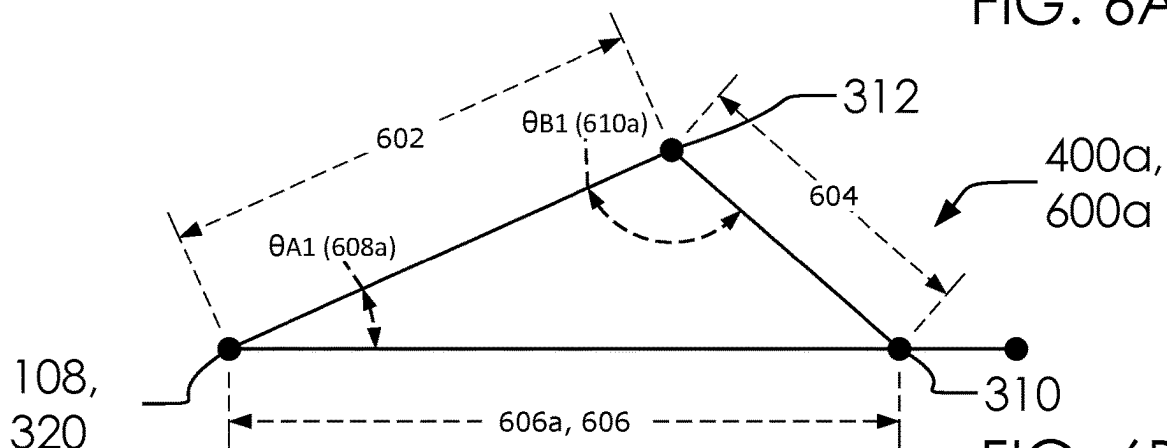


FIG. 6B

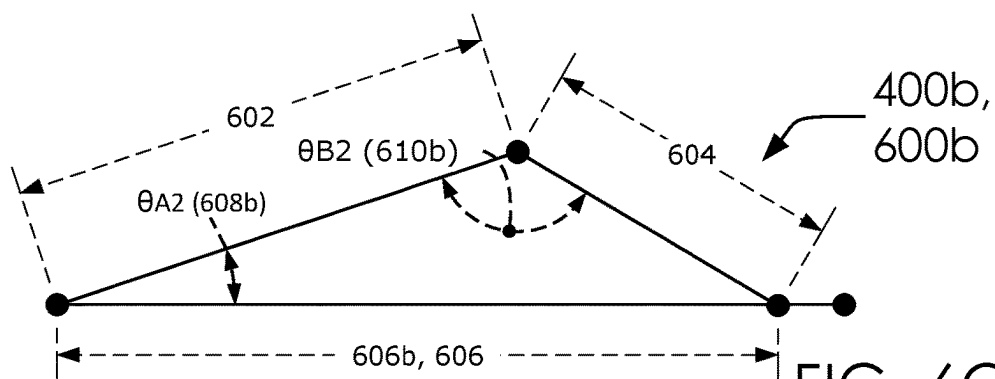


FIG. 6C

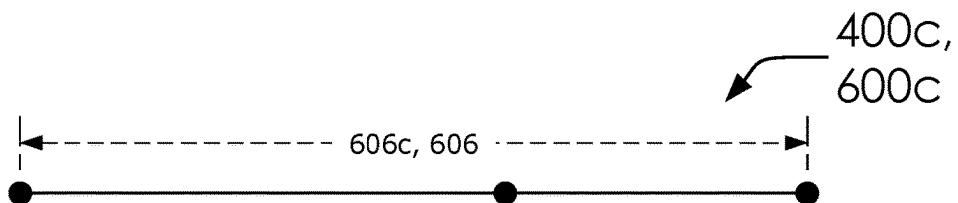
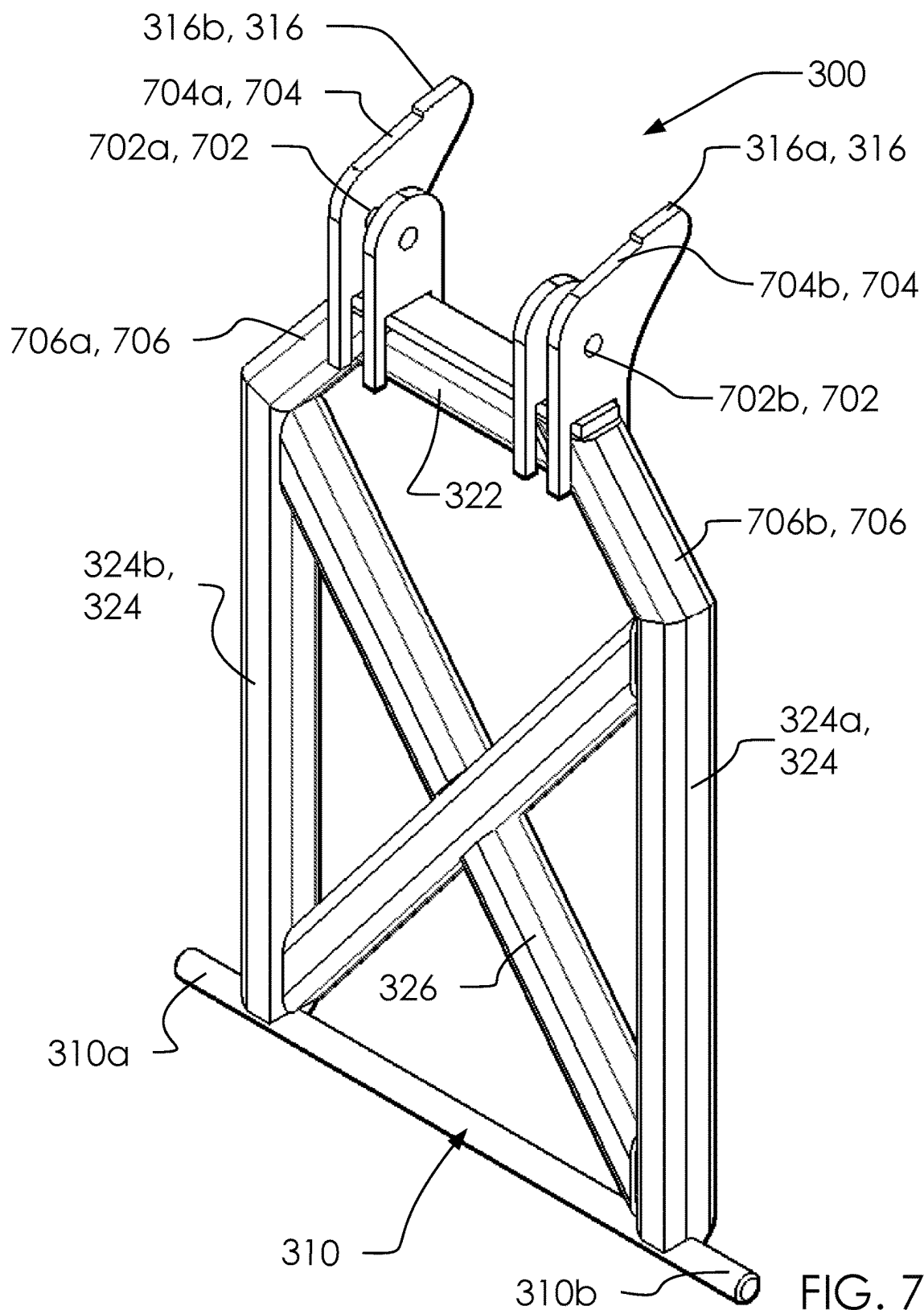


FIG. 6D



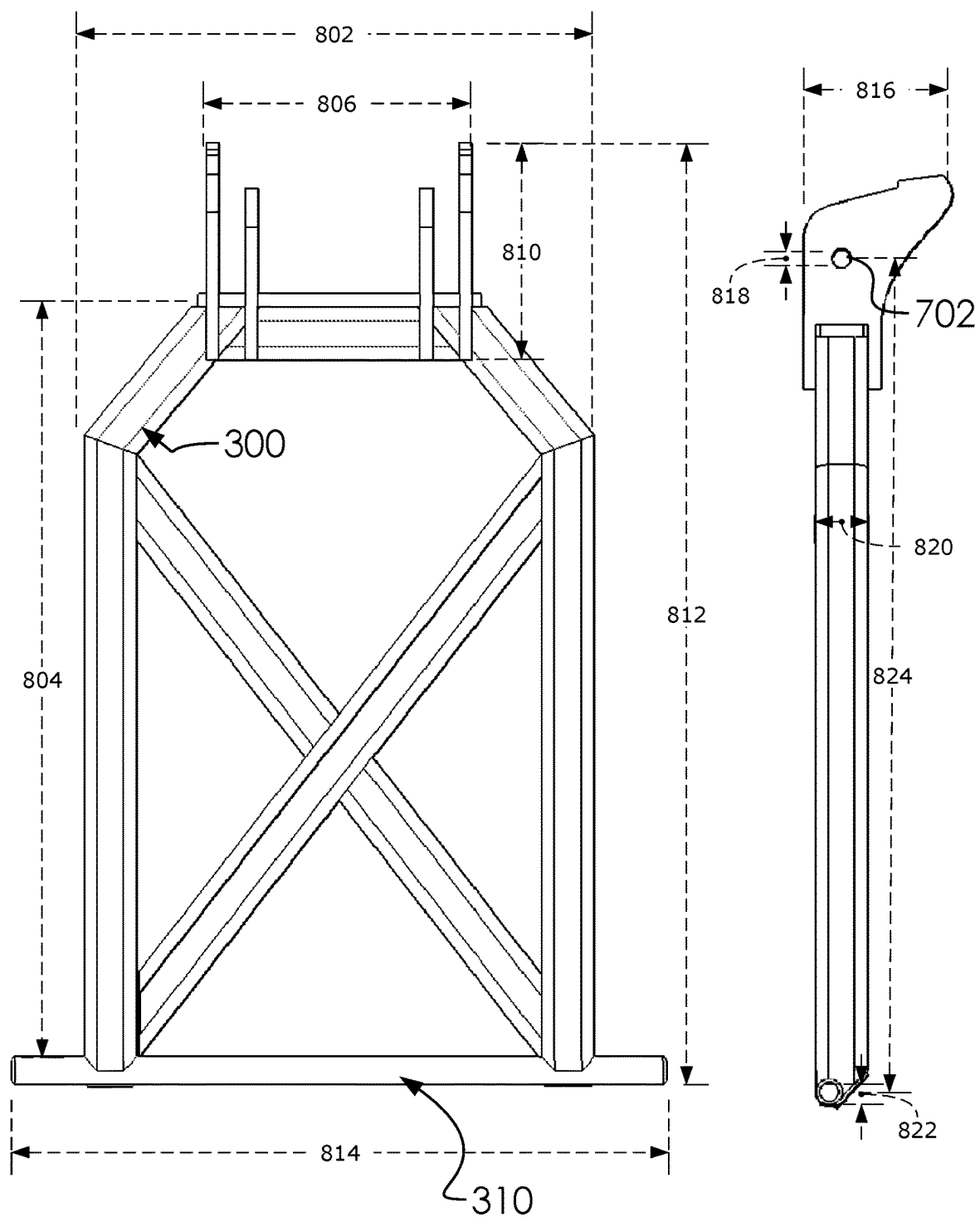


FIG. 8A FIG. 8B

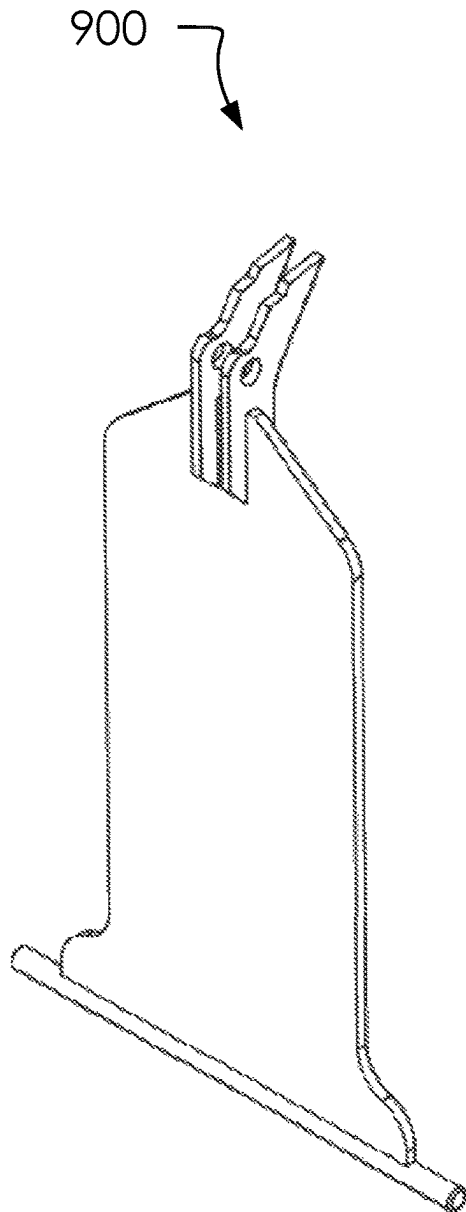


FIG. 9A

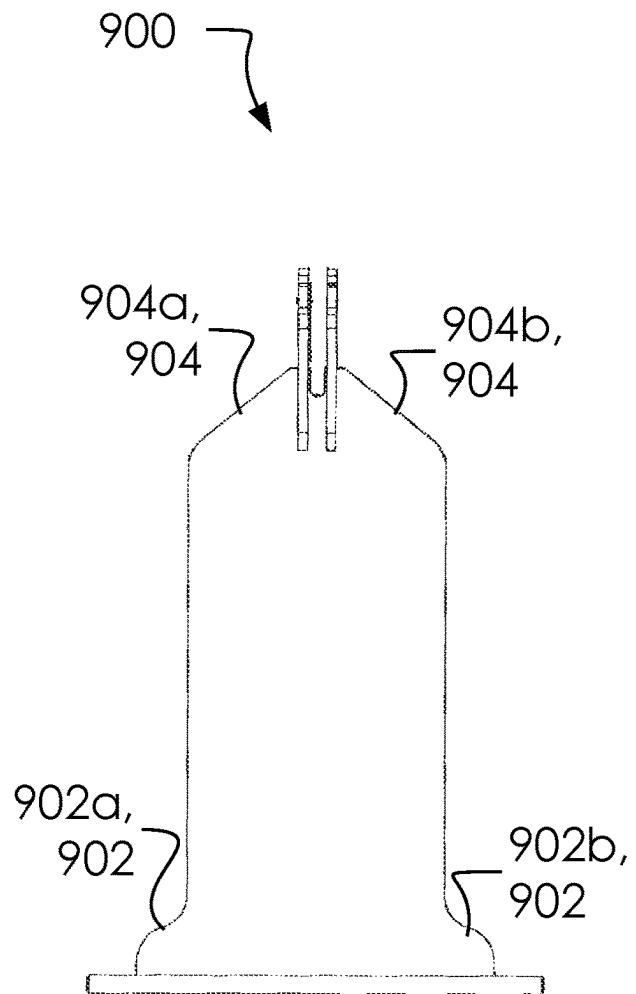


FIG. 9B

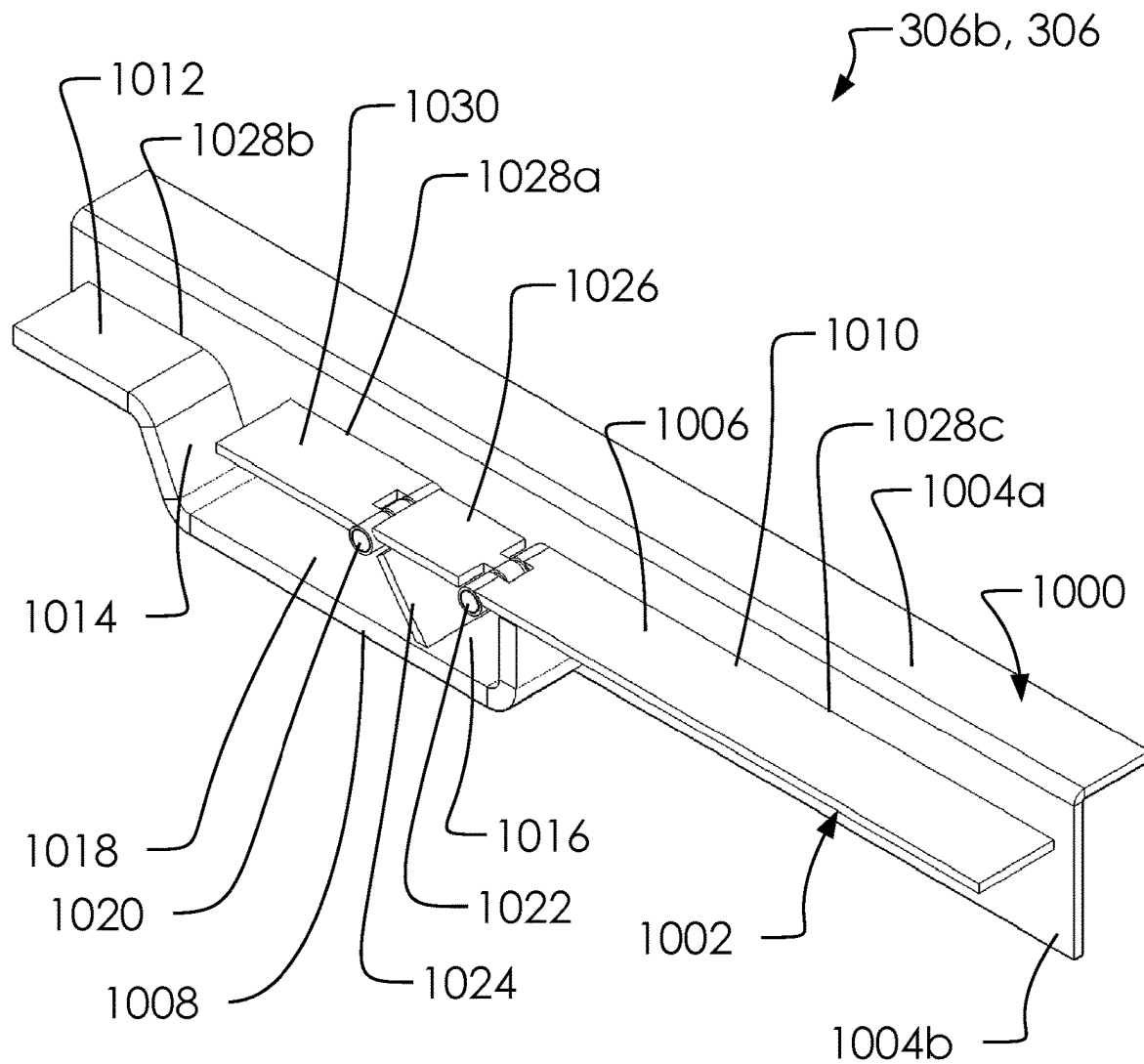


FIG. 10

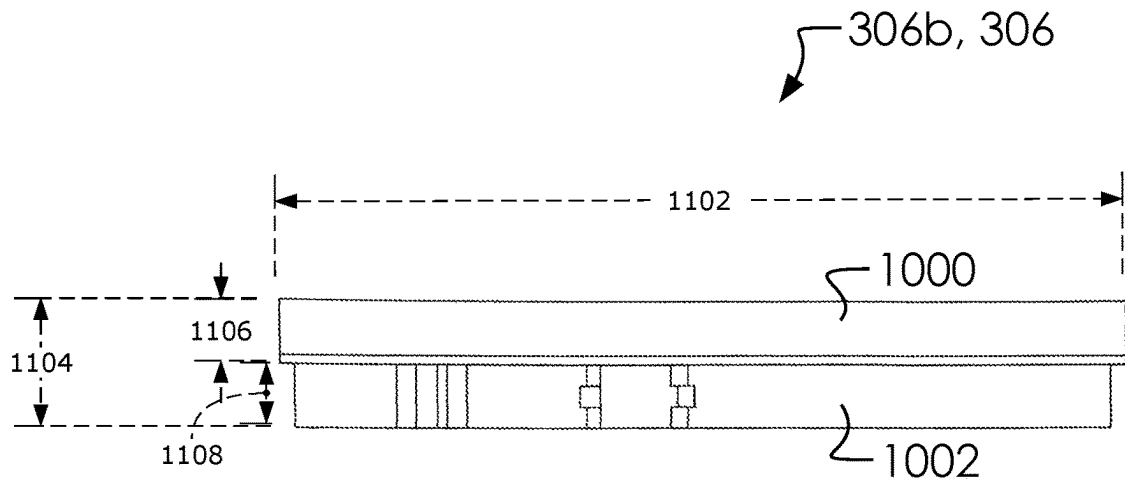


FIG. 11A

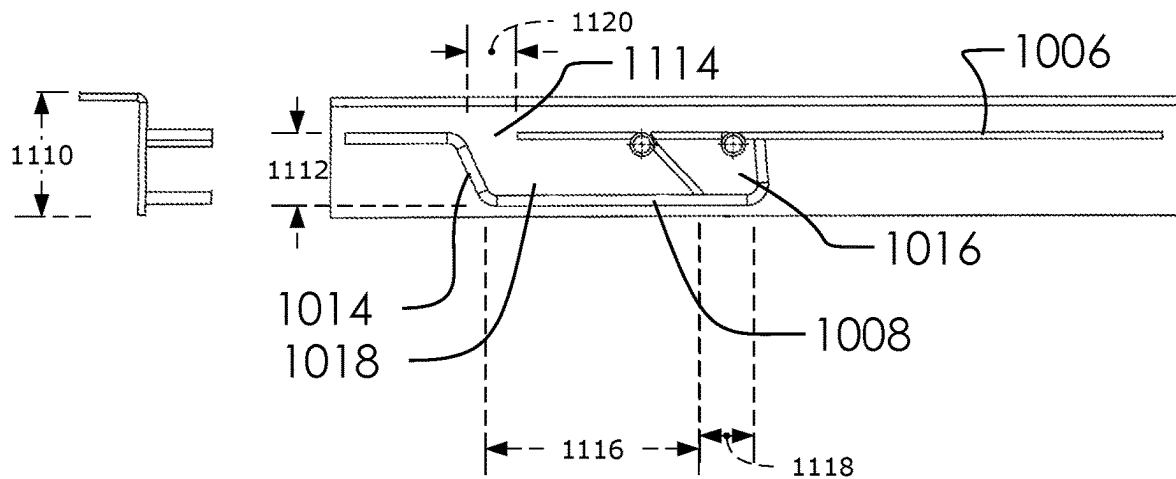


FIG. 11B

FIG. 11C

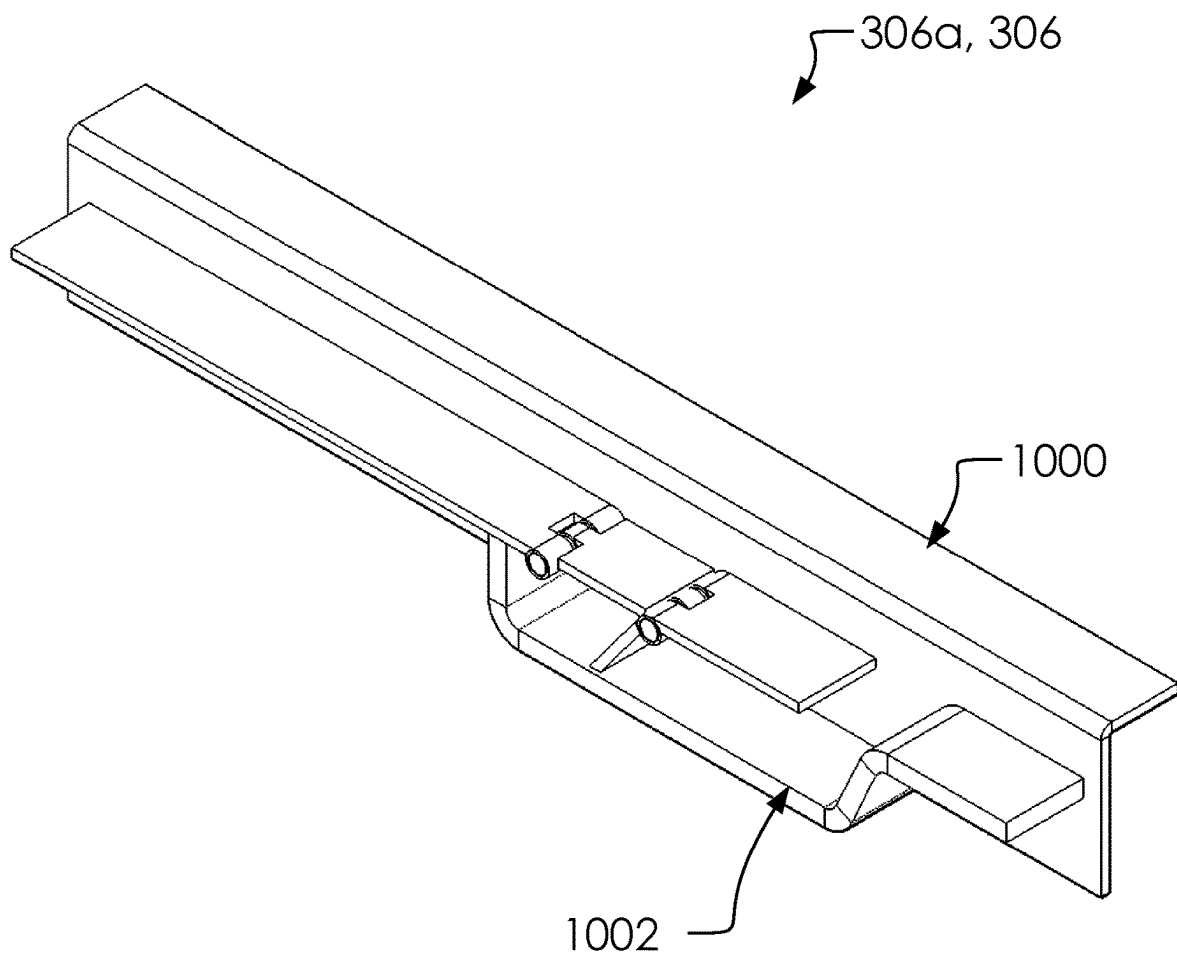


FIG. 12

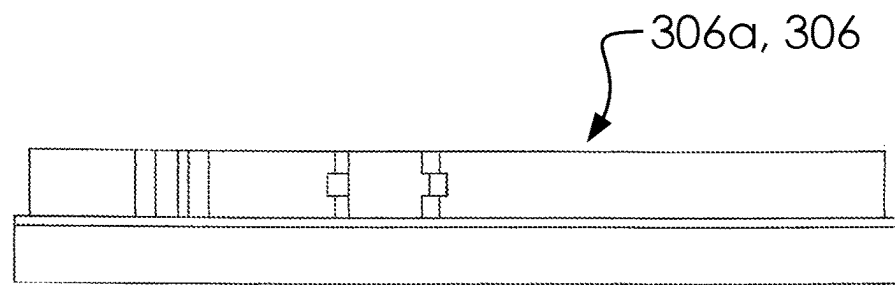


FIG. 13A

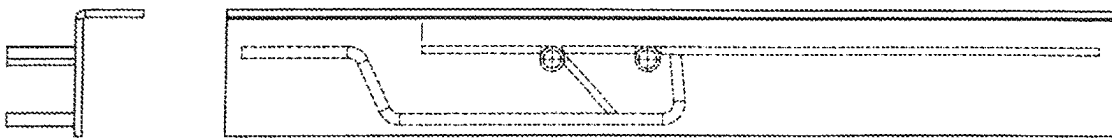


FIG. 13B

FIG. 13C

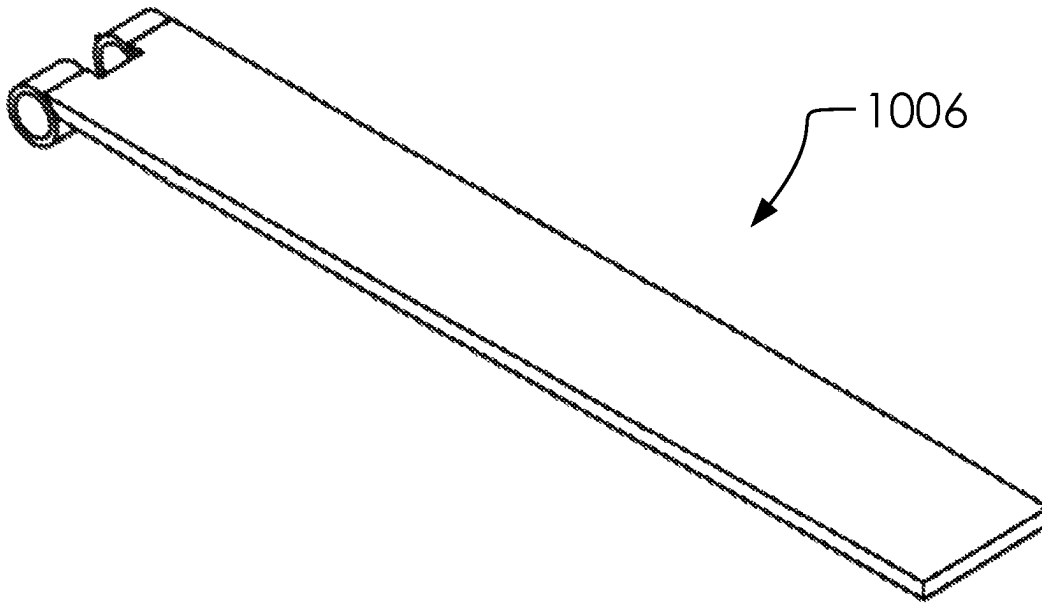


FIG. 14A

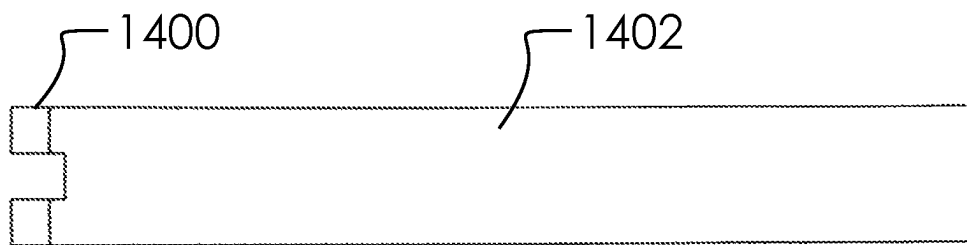


FIG. 14B

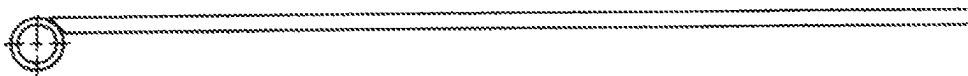


FIG. 14C

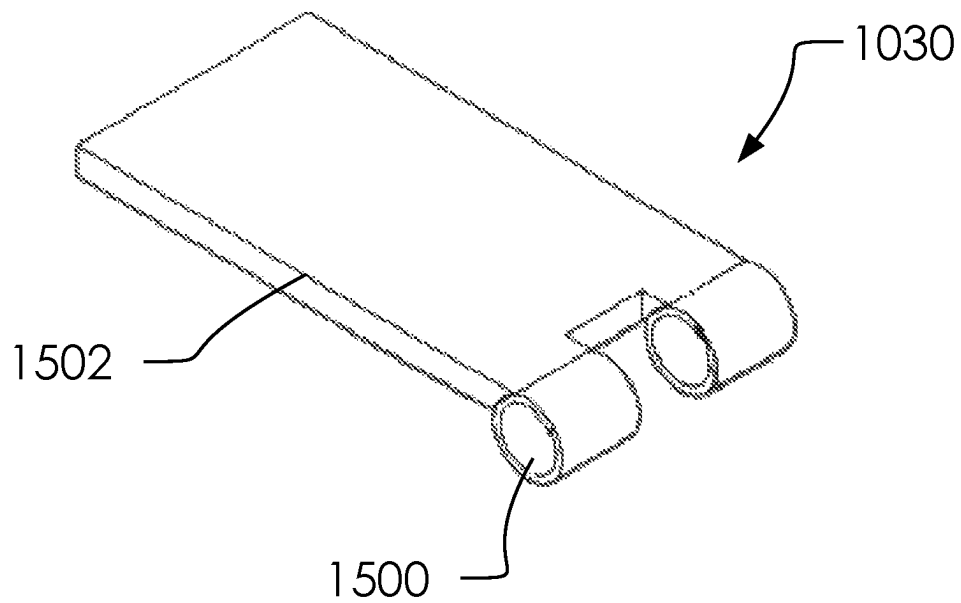


FIG. 15A

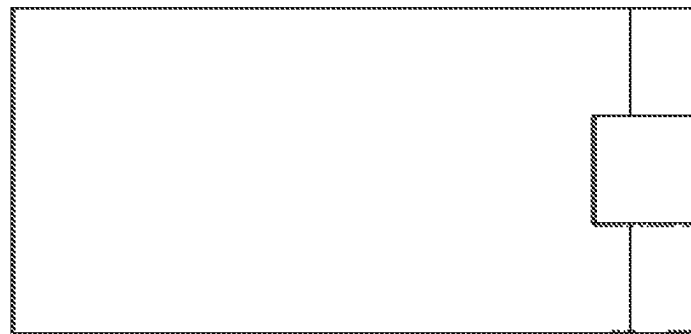


FIG. 15B

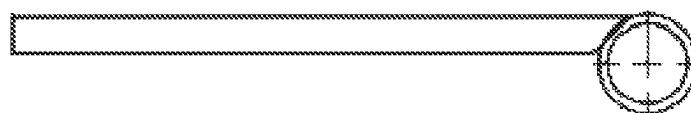


FIG. 15C

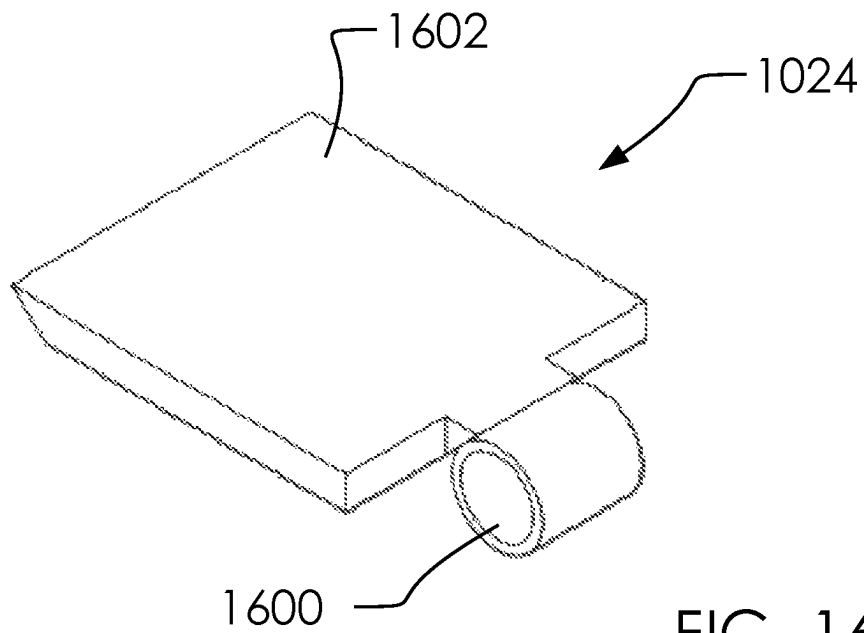


FIG. 16A

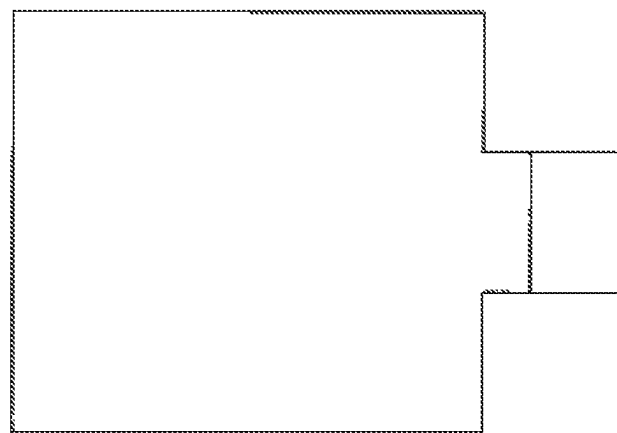


FIG. 16B

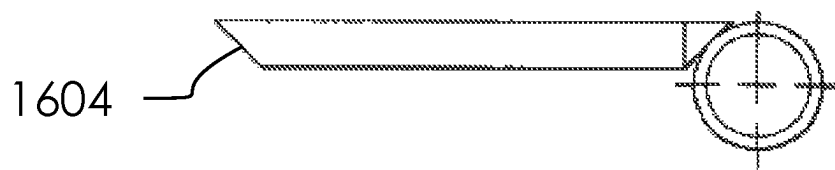


FIG. 16C

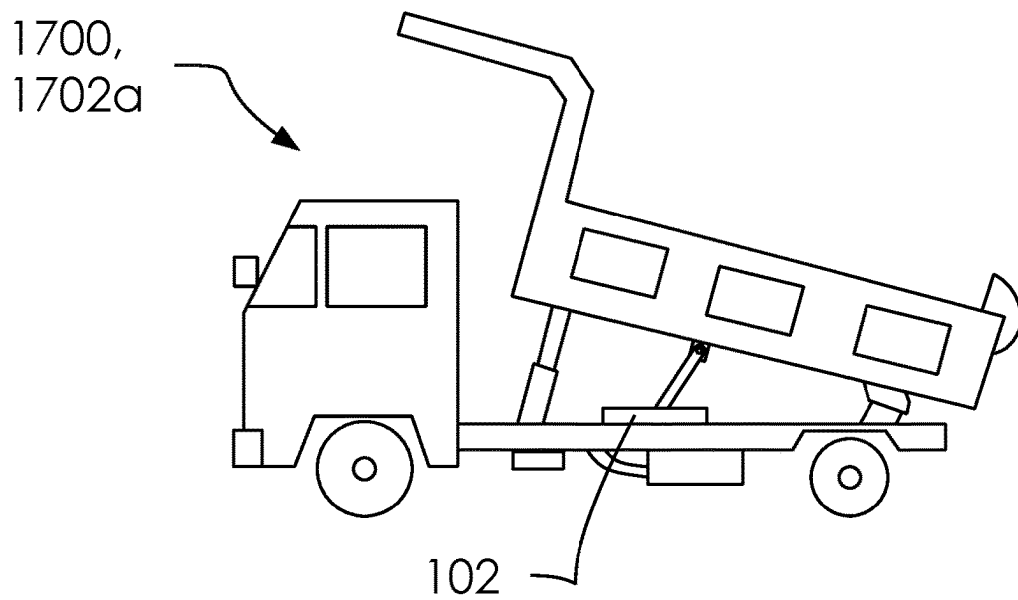


FIG. 17A

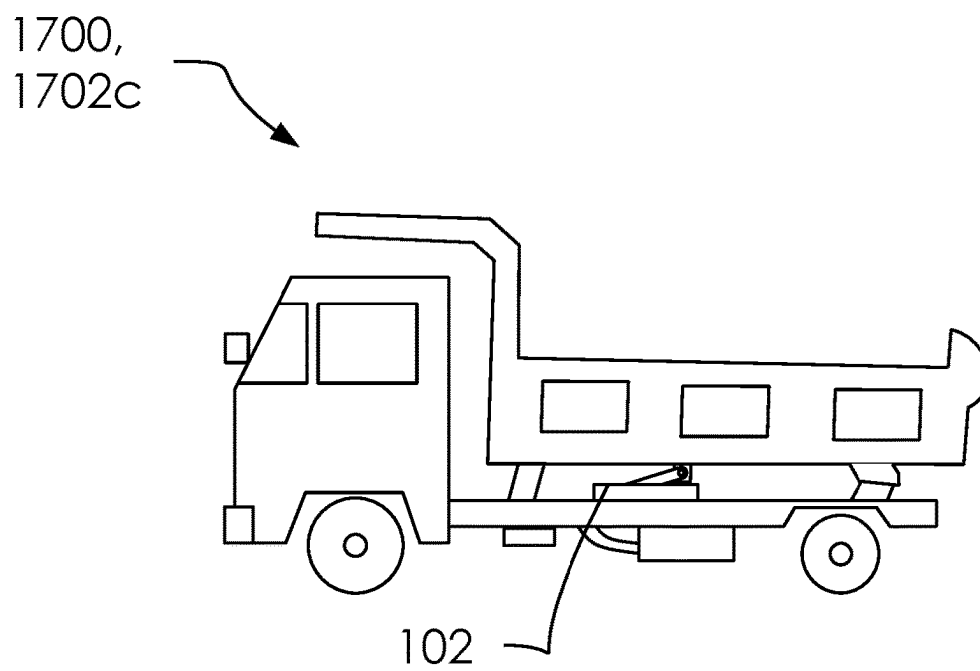


FIG. 17B

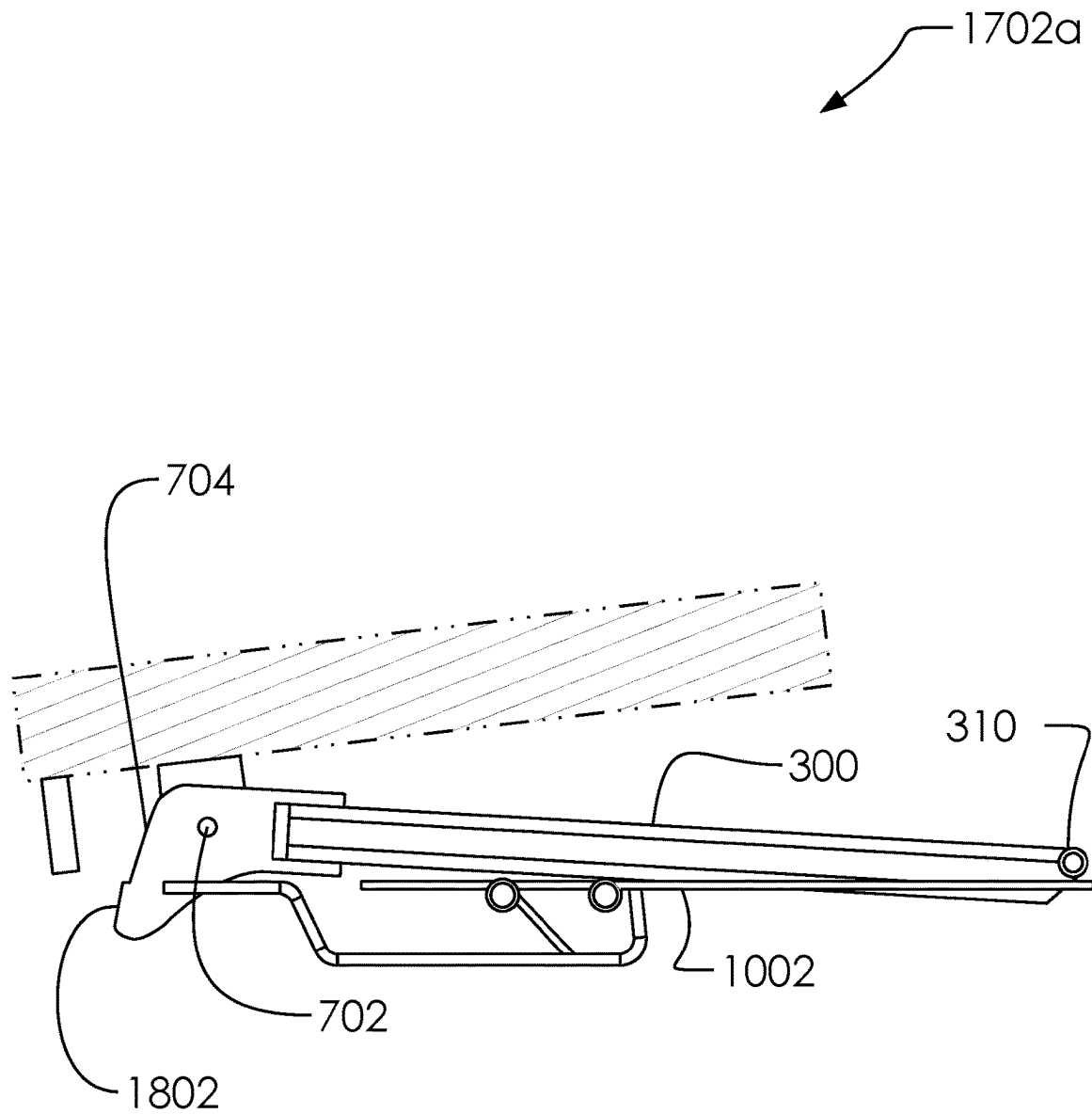


FIG. 18

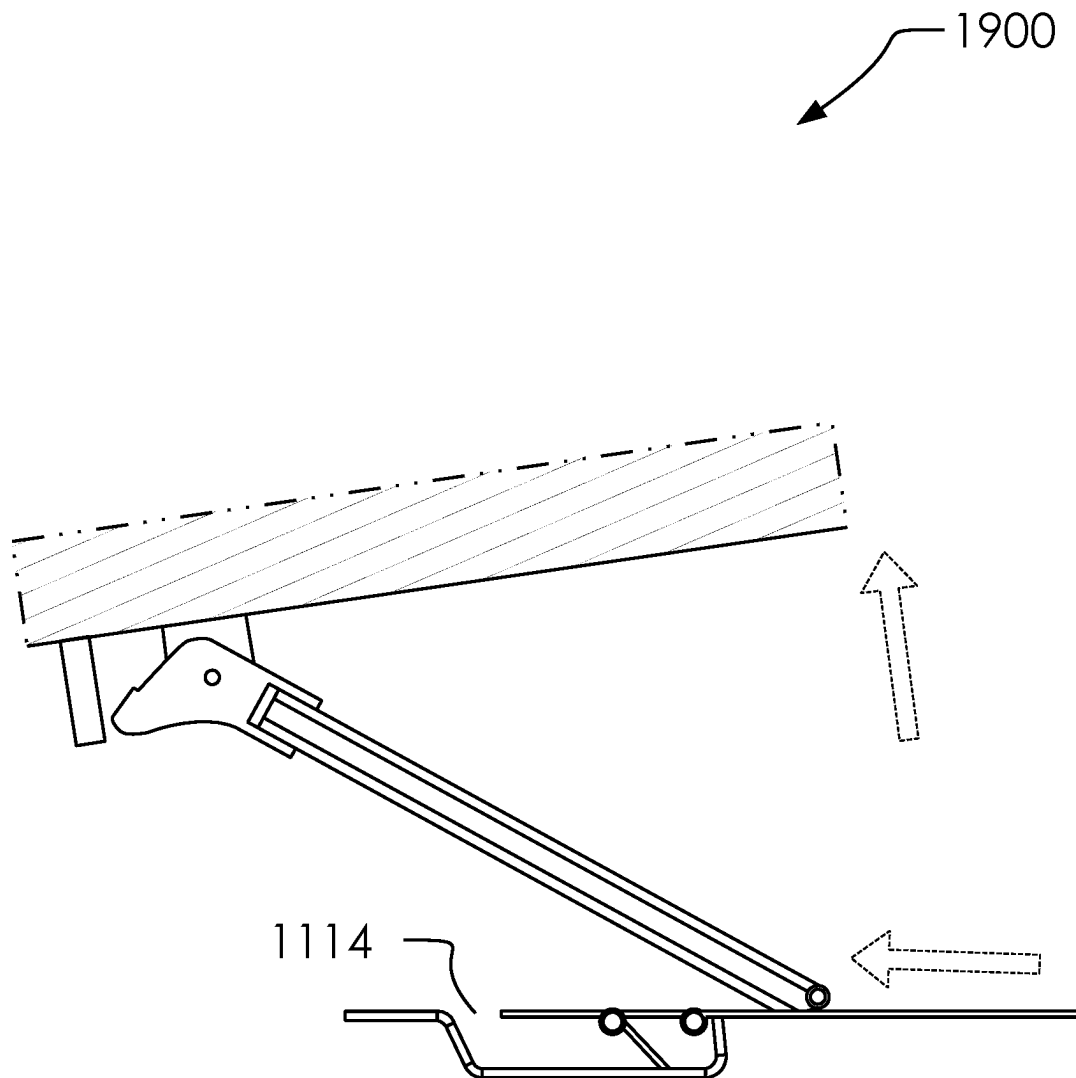


FIG. 19

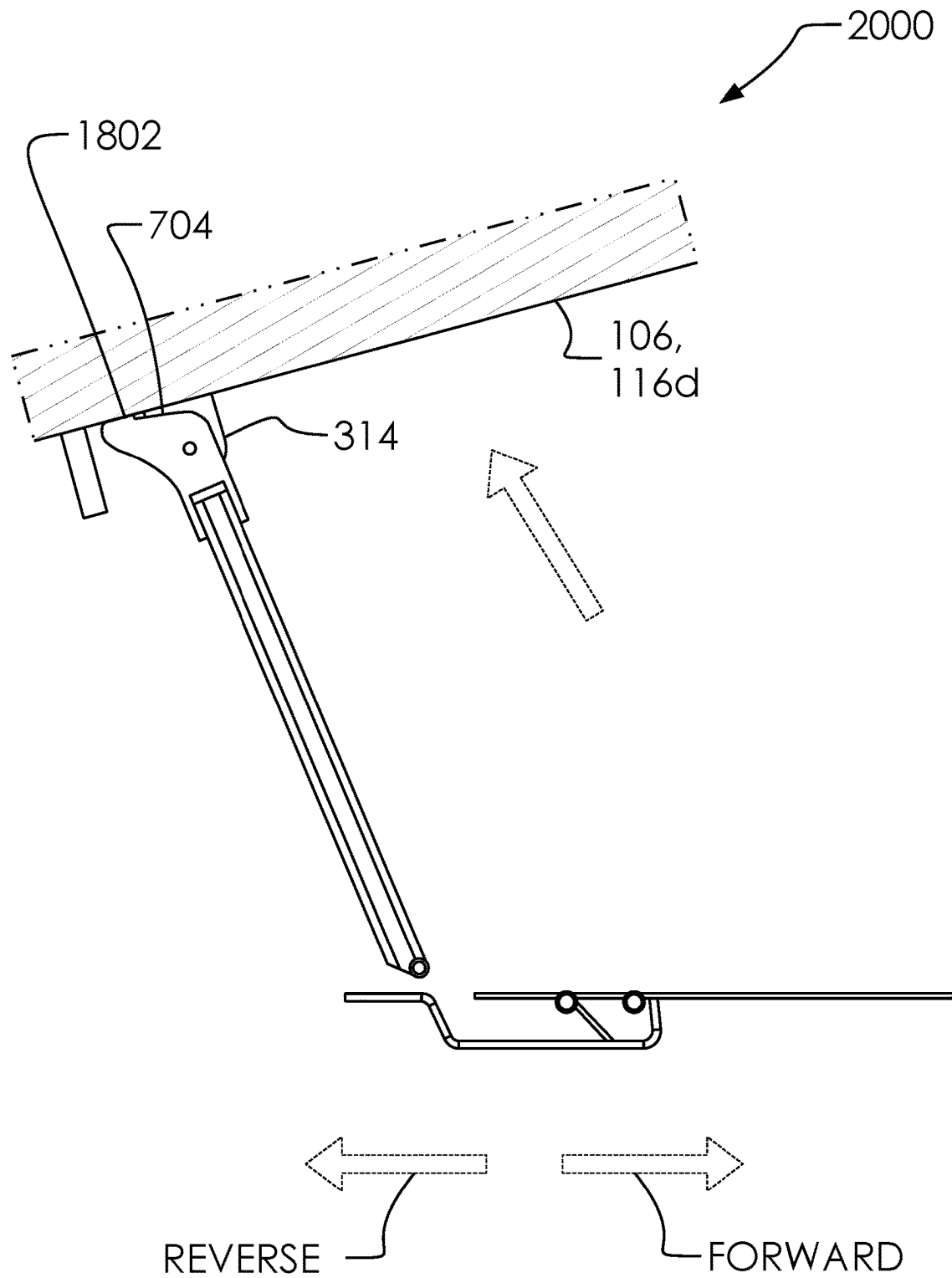


FIG. 20

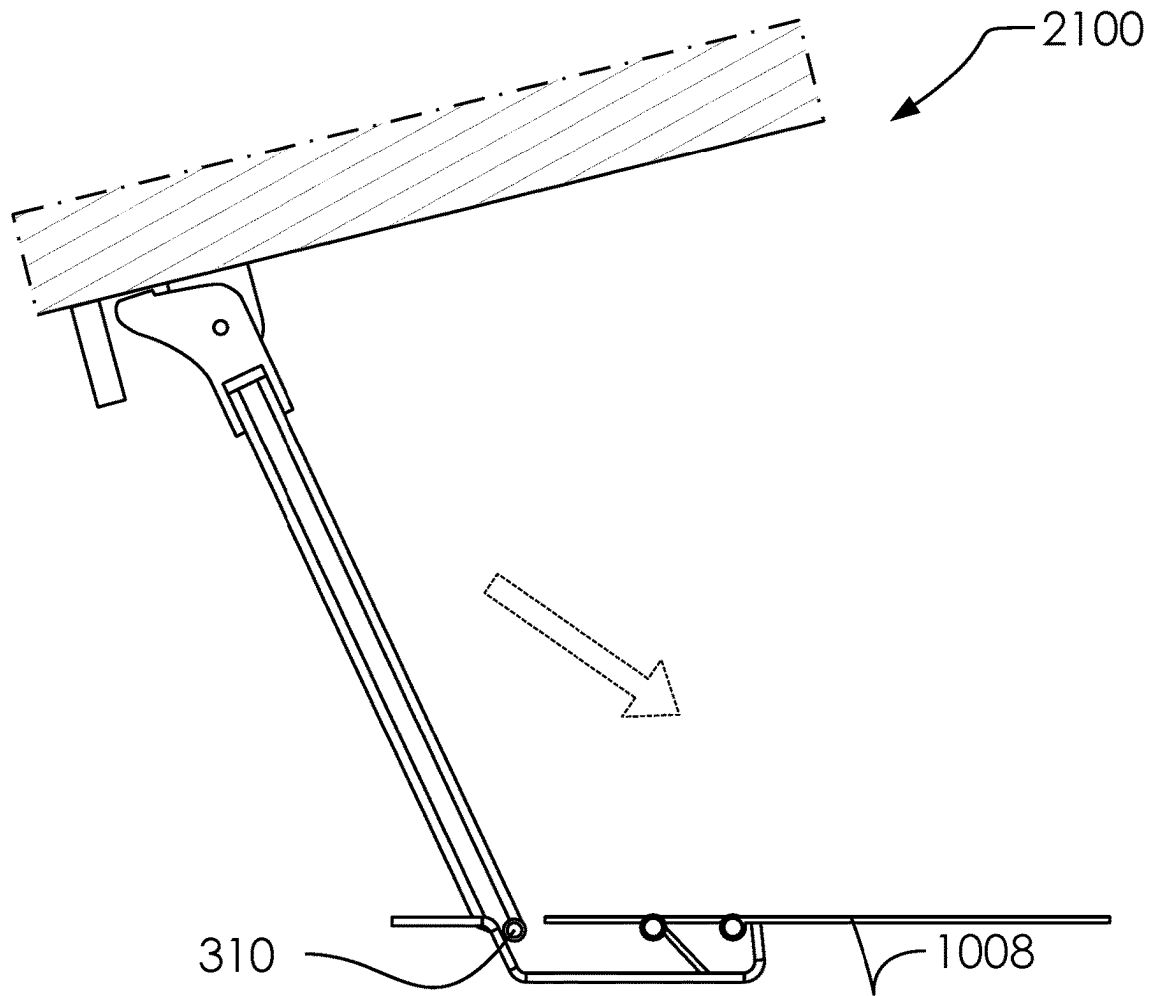


FIG. 21A

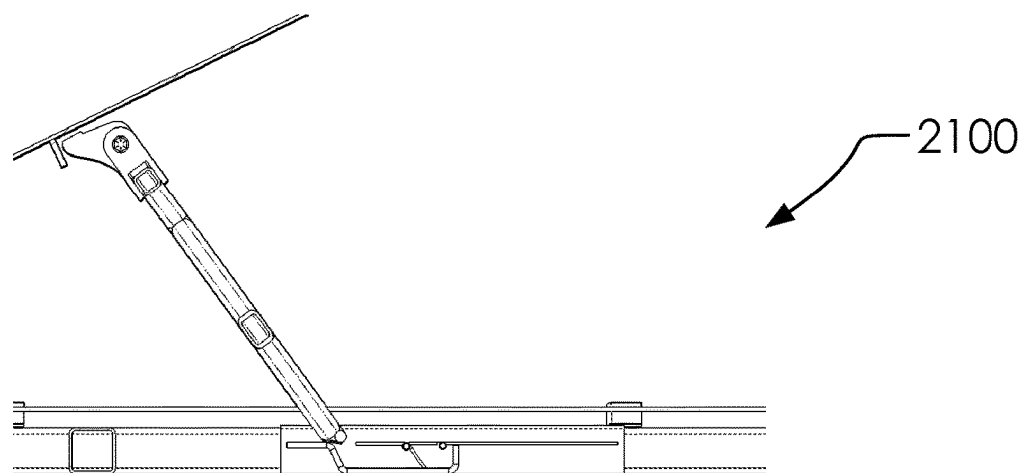


FIG. 21B

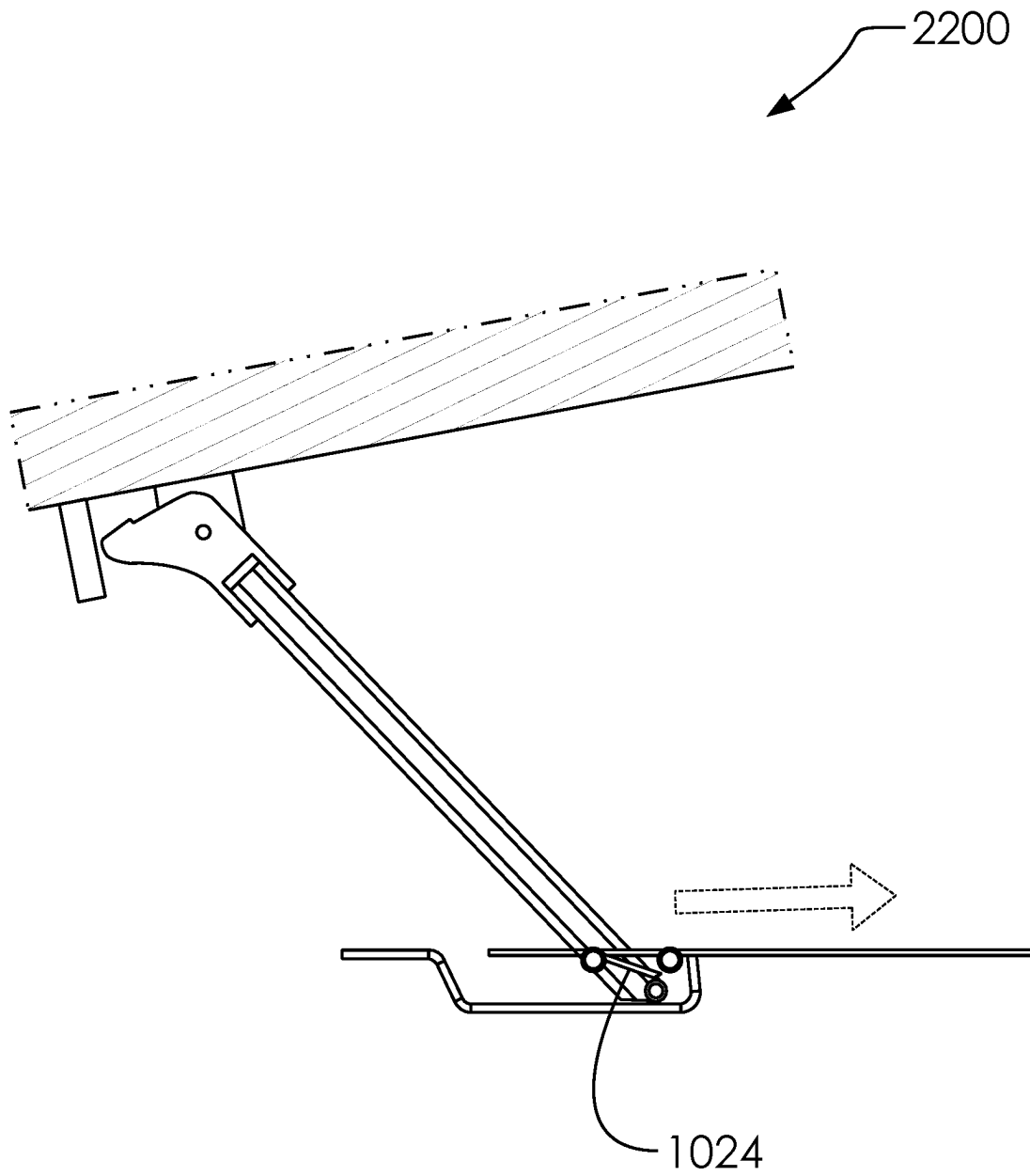


FIG. 22

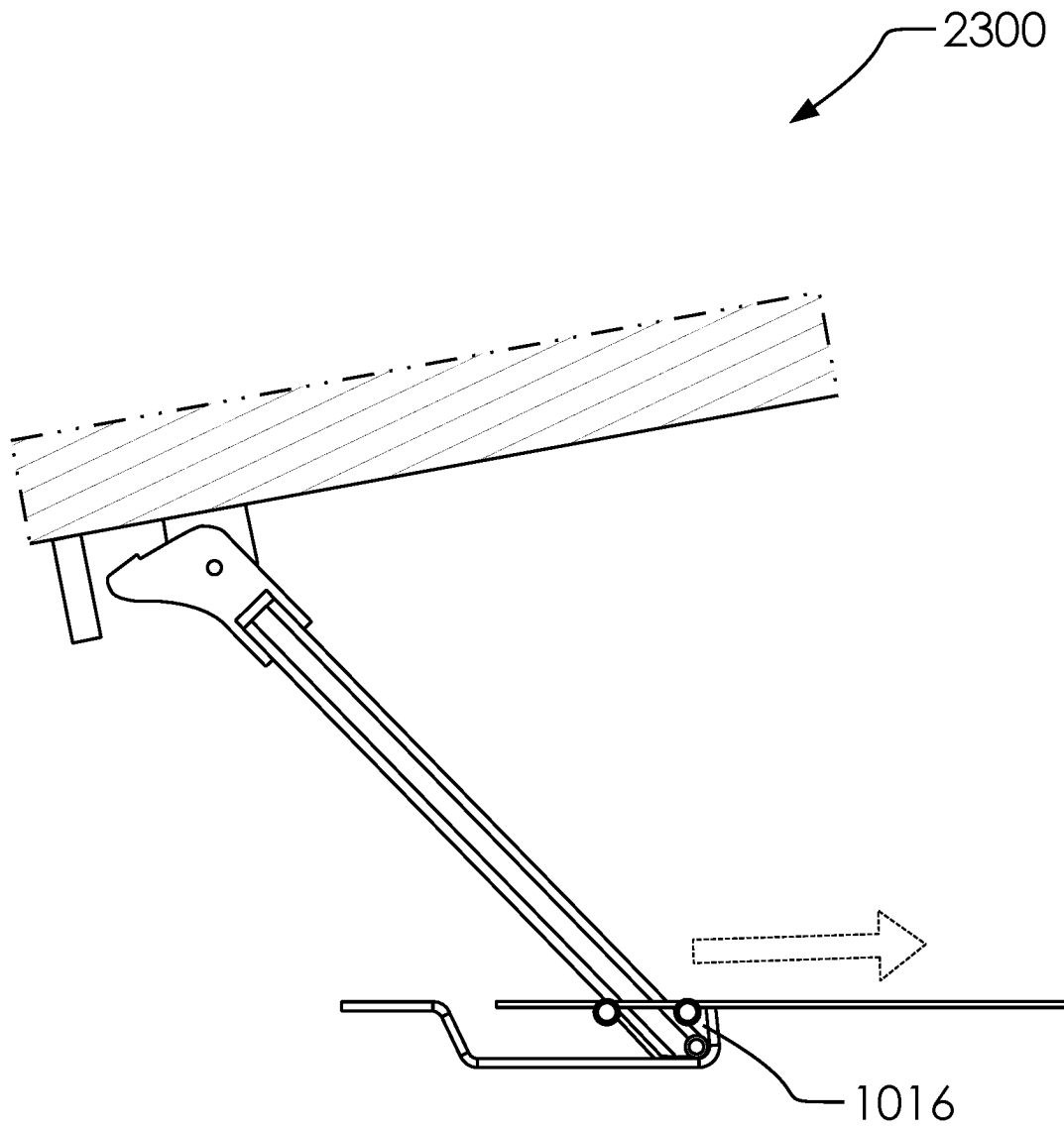


FIG. 23

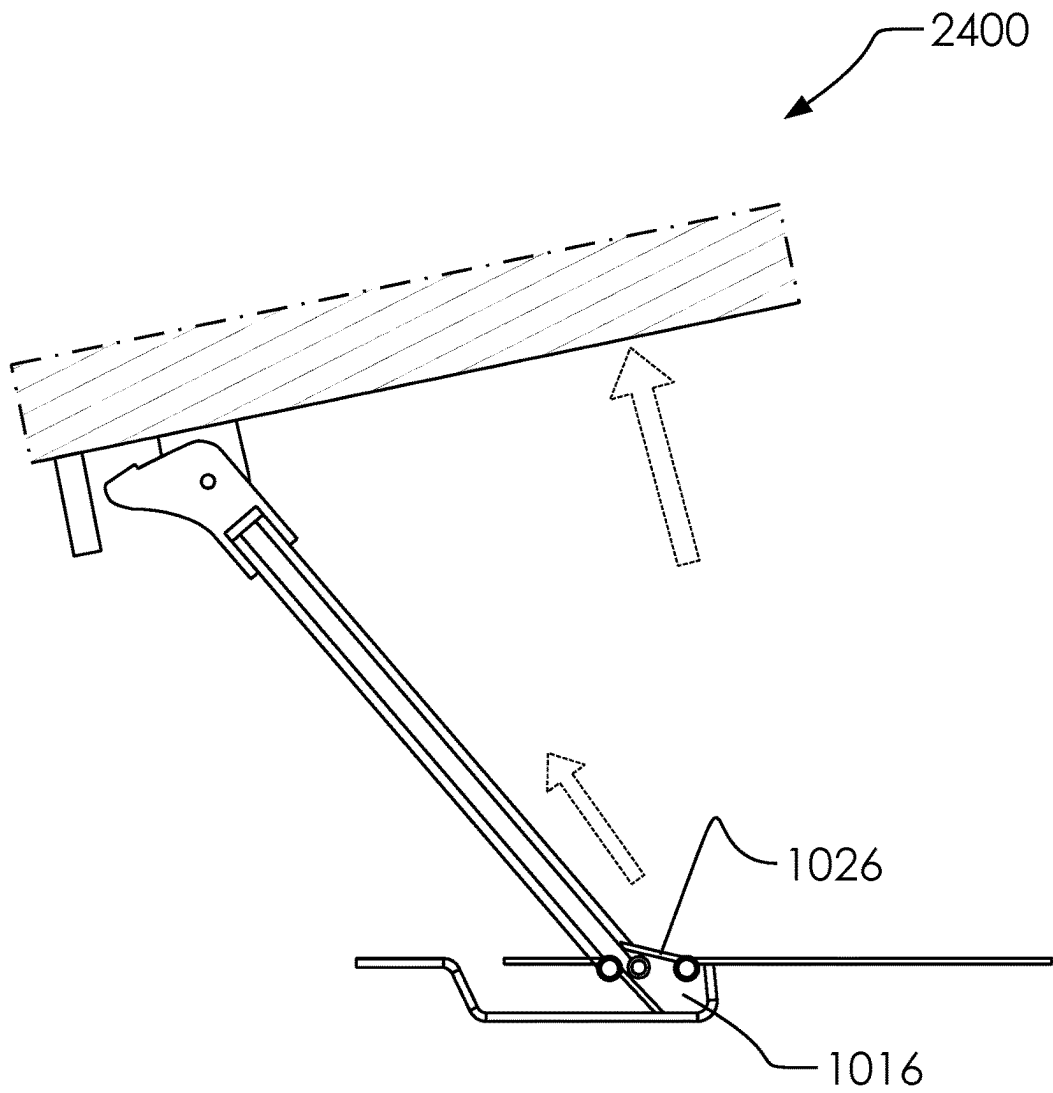


FIG. 24

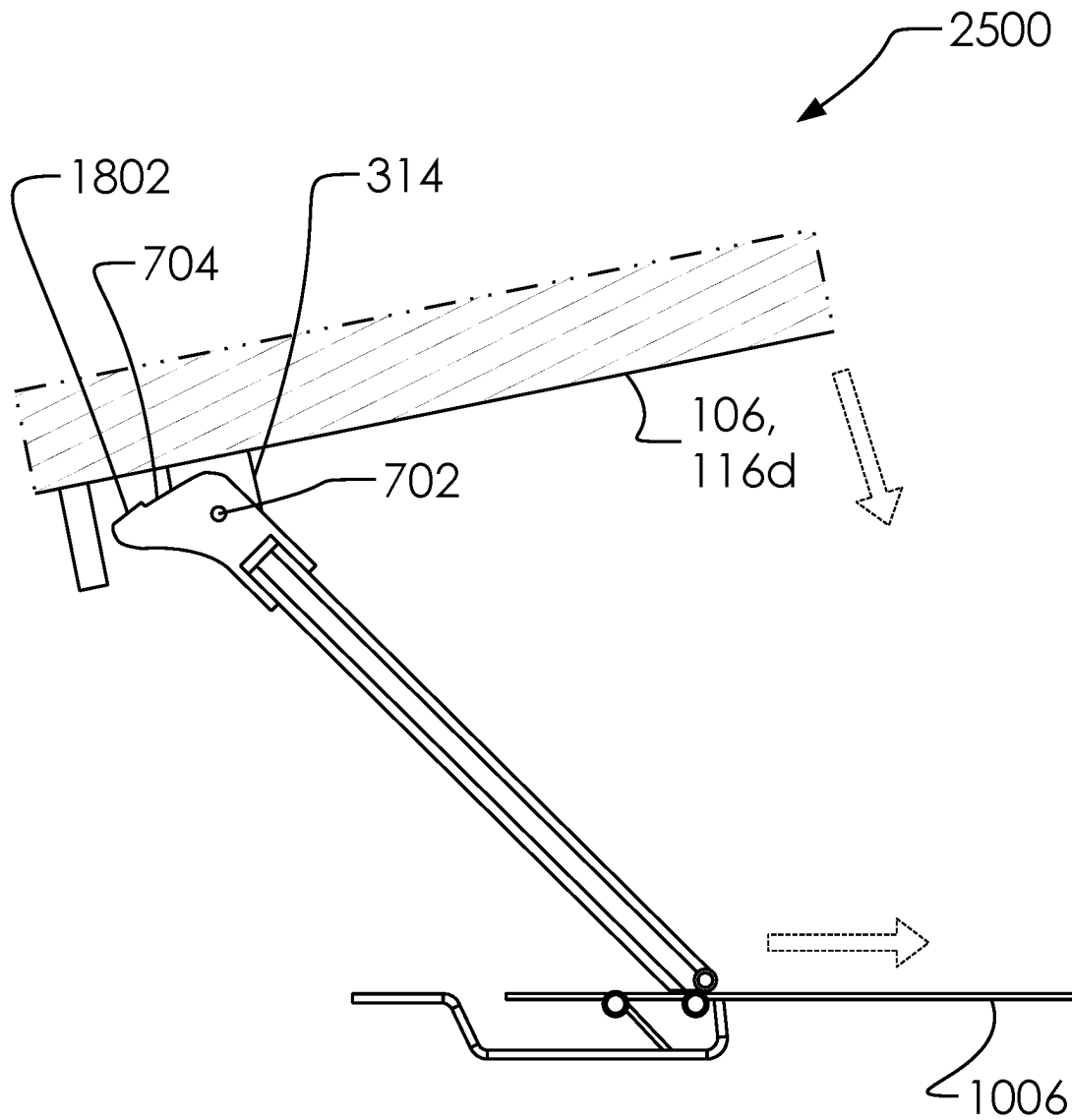


FIG. 25

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BODY PROP ASSEMBLY**CROSS-REFERENCE TO RELATED APPLICATIONS**

This application claims benefit to U.S. Patent Application Number(s) 62/461,182 filed on Feb. 20, 2017.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT (IF APPLICABLE)

Not applicable.

REFERENCE TO SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISC APPENDIX (IF APPLICABLE)

Not applicable.

BACKGROUND OF THE INVENTION

The current system is configured to be used on a vacuum truck or other truck with a tilting mechanism for dumping liquids or other contents. In the preferred embodiment, it may be used with a vacuum truck but the system is not limited to such use.

A vacuum truck or vacuum tanker is a type of tank truck that has a pump designed to pneumatically load liquids, sludges (such as fecal sludge) or slurries so that the material can be transported to a treatment or disposal site. They are mainly used to transport sanitary waste (human excreta mixed with water, e.g. from on-site septic tanks) as well as for some industrial liquids or slurries.

Design and Configurations

Commercial vacuum trucks which collect fecal sludge usually have a volume of 10-55 cubic meters. However various smaller versions for specialized applications or low-resource settings can be found with tanks as small as 500 liters.

Pumps

They generally use a low-volume sliding vane pump or a liquid ring pump to create a negative air pressure. The use of diaphragm mud pumps is less common, but with the advantage of a simpler design and usually lower overall costs. The disadvantage is that mechanical parts come into contact with the sludge, which is not the case for the more common vacuum pumps.

The truck can be configured to be a direct belt drive, or a hydraulic drive system. There are two different ways to mount the pump: either directly on the truck with the vacuum drive powered by the truck motor, or on the trailer with an independent motor. The more complicated trailer mounted version allows the utilization of both the negative pressure suction side of the pump as well as the positive pressure side to pump sludge over longer distances or lift it higher into the tank.

Suction Hoses

The suction hoses are typically 2 to 4 inches (5.1 to 10.2 cm) in diameter with 3" or 3 inches (7.6 cm) being the norm. The possible length depends on various factors mainly related to the lift and other pressure losses; Rarely will it be possible to extend it more than 50 m.

An inherent suction limitations of all suction pumps is that can only lift a liquid through utilizing atmospheric pressure (for pure water the theoretical maximum lift is approximately 10.3 m (33.9 feet)). However due to the

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viscosity of sludge it is possible to mix air into it either by sucking close from the surface or adding air with a compressor through a separate hose. Through this the overall density of the sludge/air mixture can be reduced a bit below that of pure water and thus a somewhat higher lift (10-15 m) be reached under optimal conditions. Other factors effecting the possible lift and total length of the suction hose are that single stage vacuum pumps only reach an 85-90% partial vacuum and that small air leakages, pipe friction losses and the viscosity of the liquid further reduce the possible lift.

Uses

Vacuum trucks are used by town, and municipal, governments, and by commercial entities around the world.

Human Excreta

Several types of non-centralized sanitation systems are served by vacuum trucks. They are used to empty septage from cesspits, septic tanks, pit latrines and communal latrines, for street cleanup, for sewer clean out, and for individual septic systems. The trucks are used in the cleaning of sanitary sewer pumping stations. Vacuum trucks are used to empty portable toilets. In commercial aviation, vacuum trucks are used to collect waste from airplane toilets.

Vacuum trucks discharge these wastes to the sewer network, to a wastewater treatment plant, or—usually illegally, for example in many developing countries—into the environment. The latter practice, called “institutionalized open defecation”, is dangerous since it constitutes a public health and environmental hazard.

Industrial Liquids

Vacuum trucks are used in the petroleum industry, for cleaning of storage tanks and spills. They are also an important part of drilling oil and natural gas wells, as they are located at the drilling site. Vacuum trucks are used to remove drilling mud, drilling cuttings, cement, spills, and for removal of brine water from production tanks. They dispose of this in sump pits, treatment plants or if within safe levels may be spread out in a farmer's field.

Others

Vacuum trucks are also used for exposing underground utilities. The ground is jetted with water, and the vacuum truck sucks up the muddy product. This exposes the buried utility without the possibility of damage, as would be possible if a digging machine were used (i.e. tractor backhoe, tracked or wheeled excavator, ditch witches).

Vacuum trucks can also be used for cleanup of contaminated soil.

No prior art is known to the Applicant. Nor are any known inventions and patents, taken either singularly or in combination, is seen to describe the instant disclosure as claimed.

None of the known inventions and patents, taken either singularly or in combination, is seen to describe the instant disclosure as claimed.

BRIEF SUMMARY OF THE INVENTION

A body prop assembly for supporting portions of a tilting trailer assembly. Said body prop assembly comprising a body prop, a hinge assembly, two sidetracks. Said body prop assembly configured to attach to said tilting trailer assembly between tilting portions and a trailer platform. Said tilting portions selectively rotate with respect to said trailer platform on a tilting hinge. Said tilting hinge defines a tilting axis of said tilting trailer assembly. Said body prop is configured to selectively hold a portion of said tilting portions at an incline. Lower guides are configured to slide through portions of said two sidetracks in order to adjust a

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lower portion of said body prop assembly. Said body prop comprises an upper portion, a side portions and said lower guides. Said upper portion is substantially parallel with said lower guides. Said side portions are substantially perpendicular to said lower guides. Said side portions are substantially perpendicular to said upper portion. A prop hinge brackets are attached to said upper portion. A vessel hinge brackets are attached to a bottom of said tilting portions. Said vessel hinge brackets and said prop hinge brackets comprise one or more hinge eyes to receive a portion of a fastener assemblies. Said fastener assemblies comprise an upper axis of said body prop assembly. Said body prop assembly and said tilting portions rotate relative to one another on said upper axis. Said two sidetracks are attached to side portions of said trailer platform. Said two sidetracks comprise a first sidetrack and a second sidetrack. Said two sidetracks comprise a separation width between said first sidetrack and said second sidetrack. Said lower guides comprises a width. Said width is wider than said separation width. Portions of said lower guides are configured to become trapped within portions of said two sidetracks. Said two sidetracks each comprise an L-bracket and a track assembly. Said L-bracket comprise an L shaped bracket configured for attaching to said side portions of said trailer platform. Said two sidetracks comprise a guide tracks. Said guide tracks are configured to guide portions of said lower guides to adjust said body prop assembly between a raised configuration and a closed configuration. Said track assembly comprise an upper level and a lower level. Said upper level and said lower level are substantially parallel planes with provisions for moving said lower guides freely above said upper level and selectively at said lower level. Portions of said track assembly are welded to said L-bracket. Said guide tracks are constructed of said upper level, said lower level, a second flap, a first flap. Said guide tracks defines a space above said lower level which allows said lower guides to move relatively freely, a gap for allowing said lower guides to pass freely below said lower level and into a lower mid portion, and a trap for holding a portion of said lower guides. Said lower guides are configured to enter said lower level through said gap between a rear upper portion and an upper mid portion, slide down a rear ramp, slide between said upper mid portion and said lower mid portion. Slide into said trap. Portions of said track assembly are configured to allow one-way movement of said lower guides into and out of said trap. Said lower guides are configured to slide into said first flap, lift a portion of said first flap, slide into said trap, closing said first flap behind said lower guides so as to selectively hold a portion of said lower guides in said trap, and said lower guides selectively remains in said trap provided downward force is exerted on said body prop assembly. Said body prop assembly is configured to act as a prop for said tilting portions. Removing a portion of said lower guides from said trap comprises reversing said lower guides into a portion of said first flap, sliding up said first flap, opening said second flap, and sliding said lower guides out of said lower level and onto or above said upper level. Said first flap is configured to selectively pivot on a first hinge. Said second flap is configured to selectively pivot on a second hinge. Said body prop assembly is configured to lift said lower guides entirely off of said two sidetracks with said tilting portions raised sufficiently above said lower guides. With said lower guides lifted off of said two sidetracks, a body width is configured to press into said bottom of said tilting portions and thereby prevent rotation of said body prop.

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A body prop assembly for supporting portions of a tilting trailer assembly. Said body prop assembly comprising a body prop, a hinge assembly, two sidetracks. Said body prop assembly configured to attach to said tilting trailer assembly between tilting portions and a trailer platform. Said tilting portions selectively rotate with respect to said trailer platform on a tilting hinge. Said tilting hinge defines a tilting axis of said tilting trailer assembly. Said body prop is configured to selectively hold a portion of said tilting portions at an incline. Lower guides are configured to slide through portions of said two sidetracks in order to adjust a lower portion of said body prop assembly. Said body prop comprises an upper portion, a side portions and said lower guides. A prop hinge brackets are attached to said upper portion. A vessel hinge brackets are attached to a bottom of said tilting portions. Said body prop assembly and said tilting portions rotate relative to one another on an upper axis. Said two sidetracks are attached to side portions of said trailer platform. Said two sidetracks comprise a first sidetrack and a second sidetrack. Said two sidetracks comprise a guide tracks. Said guide tracks are configured to guide portions of said lower guides to adjust said body prop assembly between a raised configuration and a closed configuration.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

FIG. 1 illustrates a perspective overview view of tilting trailer assembly 100.

FIG. 2A illustrates an elevated first side view of tilting trailer assembly 100.

FIG. 2B illustrates an elevated top side view of tilting trailer assembly 100.

FIG. 3 illustrates a perspective overview view of body prop assembly 102.

FIG. 4A illustrates an elevated first side view of raised and locked position 400a.

FIG. 4B illustrates an elevated first side view of transitioning position 400b.

FIG. 5A illustrates an elevated first side view of raised and locked position 400a detailed.

FIG. 5B illustrates an elevated first side view of transitioning position 400b detailed.

FIG. 5C illustrates an elevated first side view of closed position 400c detailed.

FIG. 6A illustrates a detailed elevated first side view of tilting trailer assembly 100.

FIG. 6B illustrates an elevated front side view of first geometry diagram 600a.

FIG. 6C illustrates an elevated front side view of second geometry diagram 600b.

FIG. 6D illustrates an elevated front side view of third geometry diagram 600c.

FIG. 7 illustrates a perspective overview view of body prop assembly 102.

FIG. 8A illustrates an elevated front side view of body prop 300.

FIG. 8B illustrates an elevated second side view of body prop 300.

FIG. 9A illustrates a perspective overview view of alternative body prop 900.

FIG. 9B illustrates an elevated front side view of alternative body prop 900.

FIG. 10 illustrates a perspective overview view of second sidetrack 306b.

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FIG. 11A illustrates an elevated top side view of second sidetrack **306b**.

FIG. 11B illustrates an elevated first side view of second sidetrack **306b**.

FIG. 11C illustrates an elevated front side view of second sidetrack **306b**.

FIG. 12 illustrates a perspective overview view of first sidetrack **306a**.

FIG. 13A illustrates an elevated top side view of first sidetrack **306a**.

FIG. 13B illustrates an elevated first side view of first sidetrack **306a**.

FIG. 13C illustrates an elevated front side view of first sidetrack **306a**.

FIG. 14A illustrates a perspective overview view of upper level **1006**.

FIG. 14B illustrates an elevated top side view of upper level **1006**.

FIG. 14C illustrates an elevated front side view of upper level **1006**.

FIG. 15A illustrates a perspective overview view of upper mid portion **1030**.

FIG. 15B illustrates an elevated top side view of upper mid portion **1030**.

FIG. 15C illustrates an elevated front side view of upper mid portion **1030**.

FIG. 16A illustrates a perspective overview view of first flap **1024**.

FIG. 16B illustrates an elevated top side view of first flap **1024**.

FIG. 16C illustrates an elevated front side view of first flap **1024**.

FIG. 17A illustrates an elevated front side view of tilting truck **1700** in raised configuration **1702a**.

FIG. 17B illustrates an elevated front side view of tilting truck **1700** in closed configuration **1702b**.

FIG. 18 illustrates an elevated front side view of raised configuration **1702a**.

FIG. 19 illustrates an elevated front side view of first moving configuration **1900**.

FIG. 20 illustrates an elevated front side view of fully extended configuration **2000**.

FIGS. 21A and 21B illustrate an elevated front side view of dropping configuration **2100**.

FIG. 22 illustrates an elevated front side view of passing first gate configuration **2200**.

FIG. 23 illustrates an elevated front side view of trapped configuration **2300**.

FIG. 24 illustrates an elevated front side view of trap releasing configuration **2400**.

FIG. 25 illustrates an elevated front side view of resetting configuration **2500**.

DETAILED DESCRIPTION OF THE INVENTION

The following description is presented to enable any person skilled in the art to make and use the invention as claimed and is provided in the context of the particular examples discussed below, variations of which will be readily apparent to those skilled in the art. In the interest of clarity, not all features of an actual implementation are described in this specification. It will be appreciated that in the development of any such actual implementation (as in any development project), design decisions must be made to achieve the designers' specific goals (e.g., compliance with system- and business-related constraints), and that these

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goals will vary from one implementation to another. It will also be appreciated that such development effort might be complex and time-consuming, but would nevertheless be a routine undertaking for those of ordinary skill in the field of the appropriate art having the benefit of this disclosure. Accordingly, the claims appended hereto are not intended to be limited by the disclosed embodiments, but are to be accorded their widest scope consistent with the principles and features disclosed herein.

These parts are illustrated in the figures and discussed below:

a tilting trailer assembly **100**

a body prop assembly **102**

a trailer platform **104**

tilting portions **106**

a tilting hinge **108**

a door hinge **110**

one or more latches **112**

a side portions **114**

a first side portion **114a**

a second side portion **114b**

a first side **116a**

a second side **116b**

a top **116c**

a bottom **116d**

a front portion **118**

a rear portion **120**

a plurality of perpendicular support portions **122**

a vessel **124**

a tilting axis **126**

a body prop **300**

two sidetracks **306**

a first sidetrack **306a**

a second sidetrack **306b**

lower guides **310**

a first lower guide **310a**

a second lower guide **310b**

a hinge assembly **312**

a vessel hinge brackets **314**

a first vessel hinge bracket **314a**

a second vessel hinge bracket **314b**

a prop hinge brackets **316**

a first prop hinge bracket **316a**

a second prop hinge bracket **316b**

a fastener assemblies **318**

a first fastener assembly **318a**

a second fastener assembly **318b**

an upper axis **320**

an upper portion **322**

a side portions **324**

a first side portion **324a**

a second side portion **324b**

a central support portions **326**

a separation width **328**

a tilting positions **400**

a raised and locked position **400a**

a transitioning position **400b**

a closed position **400c**

a guide tracks **500**

a first guide track **500a**

a second guide track **500b**

one or more geometry diagrams **600**

a first geometry diagram **600a**

a second geometry diagram **600b**

a third geometry diagram **600c**

a first leg **602**

a second leg **604**

a triangle legs **606**
 a first lower leg **606a**
 a second lower leg **606b**
 a third lower leg **606c**
 a tilting hinge angles **608**
 a first tilting hinge angle **608a**
 a second tilting hinge angle **608b**
 a third tilting hinge angle **608c**
 a top hinge angles **610**
 a first top hinge angle **610a**
 a second top hinge angle **610b**
 a third top hinge angle **610c**
 one or more hinge eyes **702**
 a first hinge eye **702a**
 a second hinge eye **702b**
 one or more tracks **704**
 a first track **704a**
 a second track **704b**
 one or more shoulders **706**
 a first shoulder **706a**
 a second shoulder **706b**
 a body width **802**
 a height **804**
 a top width **806**
 a height **810**
 a height **812**
 a width **814**
 a depth **816**
 a diameter **818**
 a depth **820**
 a diameter **822**
 a rotating radius **824**
 an alternative body prop **900**
 one or more lower shoulders **902**
 a first lower shoulder **902a**
 a second lower shoulder **902b**
 one or more upper shoulders **904**
 a first upper shoulder **904a**
 a second upper shoulder **904b**
 an L-bracket **1000**
 a track assembly **1002**
 a top portion **1004a**
 a side portion **1004b**
 an upper level **1006**
 a lower level **1008**
 a front upper portion **1010**
 a rear upper portion **1012**
 a rear ramp **1014**
 a trap **1016**
 a lower mid portion **1018**
 a first hinge **1020**
 a second hinge **1022**
 a first flap **1024**
 a second flap **1026**
 a weld points **1028**
 a first weld point **1028a**
 a second weld point **1028b**
 a third weld point **1028c**
 an upper mid portion **1030**
 a length **1102**
 a width **1104**
 a width **1106**
 a width **1108**
 a height **1110**
 a height **1112**
 a gap **1114**
 a length **1116**

a length **1118**
 a length **1120**
 a hinge socket **1400**
 a planar surface **1402**
 5 a hinge socket **1500**
 a planar surface **1502**
 a hinge socket **1600**
 a planar surface **1602**
 a beveled edge **1604**
 10 a tilting truck **1700**
 a raised configuration **1702a**
 a closed configuration **1702b**
 a stopper portion **1800**
 15 a first moving configuration **1900**
 a fully extended configuration **2000**
 a dropping configuration **2100**
 a passing first gate configuration **2200**
 a trapped configuration **2300**
 20 a trap releasing configuration **2400**
 a resetting configuration **2500**

FIG. 1 illustrates a perspective overview view of tilting trailer assembly **100**.

In one embodiment, said tilting trailer assembly **100** can comprise said body prop assembly **102**, said trailer platform **104**, said tilting portions **106**, said tilting hinge **108** and said tilting axis **126**.

In one embodiment, said trailer platform **104** can comprise said side portions **114**, said first side portion **114a**, said second side portion **114b** and said plurality of perpendicular support portions **122**.

In one embodiment, said tilting portions **106** can comprise said vessel **124**.

In one embodiment, said side portions **114** can comprise said first side portion **114a** and said second side portion **114b**.

In one embodiment, said vessel **124** can comprise said tilting hinge **108**, said door hinge **110**, said one or more latches **112**, said side portions **114**, said first side **116a**, said second side **116b**, said top **116c**, said bottom **116d**, said front portion **118** and said rear portion **120**.

Said tilting trailer assembly **100** can comprise a trailer portion of a vacuum truck, as is known in the art. As stated in the background section, said tilting trailer assembly **100** can be applicable to other tilting trucks such as dump trucks, tip trucks or the like.

Said tilting portions **106** can comprise a vessel **124** being substantially sealed from the outer atmosphere, as is known in the art. In another embodiment, said tilting portions **106** can comprise an open-box bead as in the case of a dump truck (not illustrated).

In one embodiment, said rear portion **120** can comprise a door being selectively sealed to said tilting portions **106** with said one or more latches **112**. Said rear portion **120** can comprise a tailgate in the case of a dump truck. In one embodiment, said rear portion **120** can selectively rotate on said door hinge **110**.

In one embodiment, said tilting portions **106** can selectively rotate with respect to said trailer platform **104** on said tilting hinge **108**.

Said trailer platform **104** can comprise a platform for attaching said tilting trailer assembly **100** to a truck and/or sub frame comprising wheels and mobility parts, as is known in the art.

In one embodiment, said side portions **114** can be substantially parallel with one another with said plurality of perpendicular support portions **122** creating a frame support

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structure for said tilting hinge **108**, said tilting portions **106** and said body prop assembly **102**, as illustrated.

In one embodiment, said trailer platform **104** and said tilting portions **106** rotate relative to one another on said tilting axis **126** defined by said tilting hinge **108**.

FIG. **2A** illustrates an elevated first side view of tilting trailer assembly **100**.

FIG. **2B** illustrates an elevated top side view of tilting trailer assembly **100**.

FIG. **3** illustrates a perspective overview view of body prop assembly **102**.

In one embodiment, said body prop **300** can comprise said lower guides **310**, said hinge assembly **312**, said upper portion **322**, said side portions **324** and said central support portions **326**.

In one embodiment, said two sidetracks **306** can comprise said first sidetrack **306a**, said second sidetrack **306b** and said separation width **328**.

In one embodiment, said lower guides **310** can comprise said first lower guide **310a** and said second lower guide **310b**.

In one embodiment, said hinge assembly **312** can comprise said vessel hinge brackets **314**, said second vessel hinge bracket **314b**, said prop hinge brackets **316**, said second prop hinge bracket **316b**, said fastener assemblies **318** and said upper axis **320**.

In one embodiment, said vessel hinge brackets **314** can comprise said first vessel hinge bracket **314a** and said second vessel hinge bracket **314b**.

In one embodiment, said prop hinge brackets **316** can comprise said first prop hinge bracket **316a** and said second prop hinge bracket **316b**.

In one embodiment, said fastener assemblies **318** can comprise said first fastener assembly **318a** and said second fastener assembly **318b**.

In one embodiment, said side portions **324** can comprise said first side portion **324a** and said second side portion **324b**.

In one embodiment, said tilting trailer assembly **100** can comprise said second lower guide **310b** and said second lower guide **310b**.

In one embodiment, said body prop assembly **102** can comprise said body prop **300** and said two sidetracks **306**.

In one embodiment, said body prop assembly **102** can selectively configure said trailer platform **104** relative to said tilting portions **106**. Said body prop **300** can hold a portion of said tilting portions **106** at an incline, as illustrated.

In one embodiment, said lower guides **310** is configured to slide through portions of two sidetracks **306** in order to adjust a lower portion of body prop assembly **102**. In one embodiment, said upper portion **322** can be rotatably attached to tilting portions **106** with said hinge assembly **312**.

In one embodiment, said hinge assembly **312** can comprise vessel hinge brackets **314**, said prop hinge brackets **316** and said fastener assemblies **318**. In one embodiment, said fastener assemblies **318** can attach said prop hinge brackets **316** and said vessel hinge brackets **314** to one another. In one embodiment, said fastener assemblies **318** can define said upper axis **320**. In one embodiment, said upper axis **320** can comprise an axis of rotation between said tilting portions **106** and said body prop assembly **102**.

In one embodiment, said body prop **300** can comprise a solid piece (as with the provisional application to this application) or as a set of framed elements as illustrated here. In one embodiment, said body prop **300** can comprise upper portion **322** at a top portion. Said upper portion **322**

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can be substantially parallel with said lower guides **310**. Said side portions **324** can be substantially perpendicular to said lower guides **310**, as well as perpendicular to said upper portion **322**. In one embodiment, said central support portions **326** can reinforce and fill a portion of a space between said side portions **324**, said lower guides **310** and said upper portion **322**.

In one embodiment, said prop hinge brackets **316** are attached to said upper portion **322**. In one embodiment, said vessel hinge brackets **314** are attached to bottom **116d** of said tilting portions **106**. In one embodiment, said vessel hinge brackets **314** and said prop hinge brackets **316** comprise apertures to receive a portion of fastener assemblies **318**.

FIG. **4A** illustrates an elevated first side view of raised and locked position **400a**.

FIG. **4B** illustrates an elevated first side view of transitioning position **400b**.

In one embodiment, said tilting positions **400** can comprise said raised and locked position **400a**, said transitioning position **400b** and said closed position **400c**.

In one embodiment, said tilting trailer assembly **100** can comprise said tilting positions **400**.

In one embodiment, said two sidetracks **306** can comprise said closed position **400c**.

Said tilting trailer assembly **100** can comprise said tilting positions **400**, as well as many more, as said body prop assembly **102** is moved between settings.

Said raised and locked position **400a** can comprise said tilting trailer assembly **100** in an upright and locked configuration with said lower guides **310** engaged into a portion of said two sidetracks **306** to hold said tilting portions **106** upright. Said transitioning position **400b** can comprise said lower guides **310** sliding through a portion of said two sidetracks **306** so as to transition toward a lowered position (said closed position **400c**, illustrated below).

FIG. **5A** illustrates an elevated first side view of raised and locked position **400a** detailed.

FIG. **5B** illustrates an elevated first side view of transitioning position **400b** detailed.

FIG. **5C** illustrates an elevated first side view of closed position **400c** detailed.

In one embodiment, said guide tracks **500** can comprise said first guide track **500a** and said second guide track **500b**.

In one embodiment, said two sidetracks **306** can comprise said guide tracks **500**.

Note that the cross section views here are of a previous version of body prop **300**, but the interaction of said lower guides **310** and guide tracks **500** are consistent with the present, preferred embodiment.

Said body prop **300** can be configured to move between said tilting portions **106** and said trailer platform **104**; wherein, said lower guides **310** can move along a horizontal plane between said two sidetracks **306** in said guide tracks **500**.

FIG. **6A** illustrates a detailed elevated first side view of tilting trailer assembly **100**.

FIG. **6B** illustrates an elevated front side view of first geometry diagram **600a**.

FIG. **6C** illustrates an elevated front side view of second geometry diagram **600b**.

FIG. **6D** illustrates an elevated front side view of third geometry diagram **600c**.

In one embodiment, said one or more geometry diagrams **600** can comprise said first geometry diagram **600a**, said second geometry diagram **600b**, said third geometry dia-

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gram **600c**, said first leg **602**, said second leg **604**, said second leg **604** and said triangle legs **606**.

In one embodiment, said triangle legs **606** can comprise said first lower leg **606a**, said second lower leg **606b** and said third lower leg **606c**.

In one embodiment, said tilting hinge angles **608** can comprise said first tilting hinge angle **608a**, said second tilting hinge angle **608b** and said third tilting hinge angle **608c**.

In one embodiment, said top hinge angles **610** can comprise said first top hinge angle **610a**, said second top hinge angle **610b** and said third top hinge angle **610c**.

In one embodiment, said hinge assembly **312** can comprise said top hinge angles **610**.

Now, said tilting trailer assembly **100** can allow said body prop assembly **102**, said trailer platform **104** and said tilting portions **106** to move through said tilting positions **400**. Said one or more geometry diagrams **600** are provided to illustrate the geometry of that movement.

Said one or more geometry diagrams **600** can comprise a triangle having three legs and three angles. Said first leg **602** and said second leg **604** can remain fixed in length whereas said triangle legs **606** can be variable since said lower guides **310** moves along a horizontal plane, as illustrated.

With said tilting trailer assembly **100** in said raised and locked position **400a**, said tilting hinge **108** can be in said **608a**, said hinge assembly **312** can be in said first top hinge angle **610a**, and said triangle legs **606** can be in said first lower leg **606a**. Likewise, said transitioning position **400b** can comprise said tilting hinge **108** in said first tilting hinge angle **608a**, said hinge assembly **312** can be in said second top hinge angle **610b**, and said triangle legs **606** can be in said second lower leg **606b**. Finally, with said closed position **400c**, said third tilting hinge angle **608c** can be zero degrees, said third top hinge angle **610c** can comprise 180 degrees, and said third lower leg **606c** can comprise the sum of the lengths of said first lower leg **606a** and said second lower leg **606b**.

FIG. 7 illustrates a perspective overview view of body prop assembly **102**.

In one embodiment, said one or more hinge eyes **702** can comprise said first hinge eye **702a** and said second hinge eye **702b**.

In one embodiment, said one or more tracks **704** can comprise said first track **704a** and said second track **704b**.

In one embodiment, said one or more shoulders **706** can comprise said first shoulder **706a** and said second shoulder **706b**.

In one embodiment, said body prop **300** can comprise said second track **704b**, said one or more shoulders **706** and said second shoulder **706b**.

In one embodiment, said one or more tracks **704** press against a portion of said tilting portions **106** so as to limit the movement of other portions of said body prop assembly **102** such as said lower guides **310**. For example, said one or more tracks **704** can cause a portion of said lower guides **310** to slide into said two sidetracks **306**, as illustrated and discussed below.

FIG. 8A illustrates an elevated front side view of body prop **300**.

FIG. 8B illustrates an elevated second side view of body prop **300**.

In one embodiment, said body prop assembly **102** can comprise said height **812**, said width **814** and said rotating radius **824**.

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In one embodiment, said body prop **300** can comprise said body width **802**, said height **804**, said top width **806** and said depth **820**.

In one embodiment, said lower guides **310** can comprise said diameter **822**.

In one embodiment, said one or more hinge eyes **702** can comprise said diameter **818**.

In one embodiment, said body prop **300** can comprise various geometries, whether to scale with these diagrams or not to scale. However, these dimensions are labeled for discussion elsewhere.

In one embodiment, said body prop **300** can comprise a metal sufficient to hold a portion of the weight of said vessel **124**, as is known in the art.

In one embodiment, said prop hinge brackets **316** can each comprise two plates each, as illustrated. Wherein, a portion of said vessel hinge brackets **314** can be situated between said prop hinge brackets **316** for accurate alignment of said upper axis **320** and support of said fastener assemblies **318**.

In one embodiment, said lower guides **310** can be configured to slide through portions of said guide tracks **500**. For example, separation width **328** of two sidetracks **306** can be less than rotating radius **824** of lower guides **310**.

FIG. 9A illustrates a perspective overview view of alternative body prop **900**.

FIG. 9B illustrates an elevated front side view of alternative body prop **900**.

In one embodiment, said alternative body prop **900** can comprise said alternative body prop **900**, said one or more lower shoulders **902**, said second lower shoulder **902b** and said one or more upper shoulders **904**.

In one embodiment, said one or more lower shoulders **902** can comprise said first lower shoulder **902a** and said second lower shoulder **902b**.

In one embodiment, said one or more upper shoulders **904** can comprise said first upper shoulder **904a** and said second upper shoulder **904b**.

In one embodiment, said body prop assembly **102** can comprise said alternative body prop **900** and said alternative body prop **900**.

Said alternative body prop **900** is included as one of the earlier embodiments of said body prop **300**.

FIG. 10 illustrates a perspective overview view of second sidetrack **306b**.

In one embodiment, said weld points **1028** can comprise said first weld point **1028a**, said second weld point **1028b** and said third weld point **1028c**.

In one embodiment, said two sidetracks **306** can comprise said L-bracket **1000**, said track assembly **1002**, said top portion **1004a**, said side portion **1004b**, said upper level **1006**, said lower level **1008**, said front upper portion **1010**, said rear upper portion **1012**, said rear ramp **1014**, said trap **1016**, said lower mid portion **1018**, said first hinge **1020**, said second hinge **1022**, said first flap **1024**, said second flap **1026**, said second flap **1026**, said weld points **1028** and said upper mid portion **1030**.

In one embodiment, said two sidetracks **306** can each comprise parts as illustrated by said second sidetrack **306b**. Wherein, said first sidetrack **306a** can comprise a mirror image of said second sidetrack **306b** as illustrated.

In one embodiment, said L-bracket **1000** can comprise an L shaped bracket configured for attaching to said side portions **114** of said trailer platform **104**.

In one embodiment, said track assembly **1002** can comprise said guide tracks **500** for guiding said lower guides **310** of said body prop assembly **102**.

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In one embodiment, track assembly **1002** can comprise said upper level **1006** and said lower level **1008**; wherein, said upper level **1006** and said lower level **1008** are substantially parallel planes with provisions for moving said lower guides **310** freely above said upper level **1006** and selectively at said lower level **1008**.

In one embodiment, portions of said track assembly **1002** are welded to said L-bracket **1000** with said weld points **1028**. For example, in one embodiment, said rear upper portion **1012** is welded to said side portion **1004b** with said second weld point **1028b**; said upper mid portion **1030** with said first weld point **1028a**; and said front upper portion **1010** with said third weld point **1028c**.

Said lower guides **310** can enter said lower level **1008** through said gap **1114** between said rear upper portion **1012** and said upper mid portion **1030**; slide down said rear ramp **1014**; slide between said upper mid portion **1030** and said lower mid portion **1018**; and slide into said trap **1016**.

Portions of said track assembly **1002** can allow one-way movement of said lower guides **310** into and out of said trap **1016**. For example, in one embodiment, said lower guides **310** can slide into said first flap **1024**, lift a portion of said first flap **1024**; slide into said trap **1016**; said first flap **1024** can close behind said lower guides **310** so as to selectively hold a portion of said lower guides **310** in said trap **1016**; and said lower guides **310** can remain in said trap **1016** provided any downward force is exerted on said body prop assembly **102**. In this configuration, said body prop assembly **102** can act as a stand or prop for said tilting portions **106**, as illustrated in FIG. 1.

In one embodiment, removing a portion of said lower guides **310** from said trap **1016** can comprise reversing said lower guides **310** into a portion of said first flap **1024**, sliding up said first flap **1024**, opening said second flap **1026**, and sliding out of said lower level **1008** and onto or above said upper level **1006**.

Said first flap **1024** can selectively pivot on said first hinge **1020**. Said second flap **1026** can selectively pivot on said second hinge **1022**.

FIG. 11A illustrates an elevated top side view of second sidetrack **306b**.

FIG. 11B illustrates an elevated first side view of second sidetrack **306b**.

FIG. 11C illustrates an elevated front side view of second sidetrack **306b**.

In one embodiment, said gap **1114** can comprise said length **1120**.

In one embodiment, said two sidetracks **306** can comprise said length **1102** and said width **1104**.

In one embodiment, said L-bracket **1000** can comprise said width **1106** and said height **1110**.

In one embodiment, said trap **1016** can comprise said length **1118**.

In one embodiment, said lower mid portion **1018** can comprise said length **1116**.

In one embodiment, said track assembly **1002** can comprise said width **1108**, said height **1112** and said gap **1114**.

In one embodiment, said two sidetracks **306** can be adapted in scale to ensure a preferred range of motion for said body prop **300**. For example, said gap **1114** can comprise a gap in upper level **1006** sufficient to allow a portion of lower guides **310** to pass from said upper level **1006** down to said lower level **1008**, as discussed above. In one embodiment, said height **1112** and gap **1114** can be large enough to allow said first lower guide **310a** and said second lower guide **310b** to pass therethrough.

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Said trap **1016** can be large enough to allow said lower guides **310** to pass in and said first flap **1024** to close there behind.

FIG. 12 illustrates a perspective overview view of first sidetrack **306a**.

In one embodiment, said first sidetrack **306a** can comprise a mirror image of said second sidetrack **306b**, and can have a similar or identical arrangement of parts, as is known in the art.

FIG. 13A illustrates an elevated top side view of first sidetrack **306a**.

FIG. 13B illustrates an elevated first side view of first sidetrack **306a**.

FIG. 13C illustrates an elevated front side view of first sidetrack **306a**.

FIG. 14A illustrates a perspective overview view of upper level **1006**.

FIG. 14B illustrates an elevated top side view of upper level **1006**.

FIG. 14C illustrates an elevated front side view of upper level **1006**.

In one embodiment, said upper level **1006** can comprise said hinge socket **1400** and said planar surface **1402**.

In one embodiment, said upper level **1006** can be attached to a portion of said L-bracket **1000**. In one embodiment, said second hinge **1022** and said second flap **1026** can be attached to said hinge socket **1400**.

FIG. 15A illustrates a perspective overview view of upper mid portion **1030**.

FIG. 15B illustrates an elevated top side view of upper mid portion **1030**.

FIG. 15C illustrates an elevated front side view of upper mid portion **1030**.

In one embodiment, said upper mid portion **1030** can comprise said hinge socket **1500** and said planar surface **1502**.

In one embodiment, said hinge socket **1500** can rotateably attach to said first hinge **1020** and said first flap **1024**. In one embodiment, said hinge socket **1500** can also selectively receive and support a portion of said second flap **1026**.

In one embodiment, said planar surface **1502** can be welded to a portion of said L-bracket **1000**. In one embodiment, said upper mid portion **1030** can remain motionless with respect to said L-bracket **1000**.

FIG. 16A illustrates a perspective overview view of first flap **1024**.

FIG. 16B illustrates an elevated top side view of first flap **1024**.

FIG. 16C illustrates an elevated front side view of first flap **1024**.

In one embodiment, said first flap **1024** can comprise said hinge socket **1600**, said planar surface **1602** and said beveled edge **1604**.

In one embodiment, said hinge socket **1600** can rotateably attach to said first hinge **1020**. In one embodiment, said beveled edge **1604** can be angled so as to enable said first flap **1024** to rest flat on said lower level **1008**, as illustrated.

In one embodiment, said second flap **1026** and said first flap **1024** can be of a similar design. However, said hinge socket **1600** for said second flap **1026** can be configured to rotateably attach to said second hinge **1022**, and said beveled edge **1604** can be configured to rest evenly on said first hinge **1020**.

FIG. 17A illustrates an elevated front side view of tilting truck **1700** in raised configuration **1702a**.

FIG. 17B illustrates an elevated front side view of tilting truck **1700** in closed configuration **1702b**.

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In one embodiment, said tilting truck **1700** can comprise said raised configuration **1702a** and said closed configuration **1702b**.

In one embodiment, said body prop assembly **102** can be used with tilting truck **1700** (such as dump trucks) with similar benefits as with a vacuum truck, as discussed above.

FIG. **18** illustrates an elevated front side view of raised configuration **1702a**.

In one embodiment, said one or more tracks **704** can comprise said stopper portion **1800**.

FIG. **18** and following show a progression of said body prop **300** relative to said track assembly **1002**, as described herein.

FIG. **19** illustrates an elevated front side view of first moving configuration **1900**.

In one embodiment, said body prop assembly **102** can comprise said first moving configuration **1900**.

As said tilting portions **106** raises, said body prop assembly **102** can slide forward toward said gap **1114**.

FIG. **20** illustrates an elevated front side view of fully extended configuration **2000**.

In one embodiment, said body prop assembly **102** can comprise said fully extended configuration **2000**.

In one embodiment, said tilting portions **106** can raise sufficiently far that said lower guides **310** can lose contact with two sidetracks **306**; wherein, said **1** body width **802** can press into said tilting portions **106** and said bottom **116d** and thereby prevent rotation of said body prop **300**.

FIGS. **21A** and **21B** illustrate an elevated front side view of dropping configuration **2100**.

In one embodiment, said body prop assembly **102** can comprise said dropping configuration **2100**.

In one embodiment, said lower guides **310** can slide forward into said lower level **1008** as said tilting portions **106** are closing.

FIG. **22** illustrates an elevated front side view of passing first gate configuration **2200**.

In one embodiment, said body prop assembly **102** can comprise said passing first gate configuration **2200**.

Said first flap **1024** can open so as to allow said lower guides **310** to pass into said trap **1016**.

FIG. **23** illustrates an elevated front side view of trapped configuration **2300**.

In one embodiment, said body prop assembly **102** can comprise said trapped configuration **2300**.

With said lower guides **310** in said trap **1016**, said tilting portions **106** can be securely held without movement; wherein, gravitational forces hold said lower guides **310** within said trap **1016** by pressing said lower guides **310** into a front portion of said trap **1016**.

FIG. **24** illustrates an elevated front side view of trap releasing configuration **2400**.

In one embodiment, said body prop assembly **102** can comprise said trap releasing configuration **2400**.

In one embodiment, as said tilting portions **106** raises back up, said lower guides **310** can exit said second flap **1026** can open as lower guides **310** moves backward and up, as illustrated.

FIG. **25** illustrates an elevated front side view of resetting configuration **2500**.

In one embodiment, said body prop assembly **102** can comprise said resetting configuration **2500**.

In one embodiment, as said lower guides **310** returns to said raised configuration **1702a**, said body prop **300** can slide forward along said upper level **1006**, as illustrated.

The following sentences are included for completeness of this disclosure with reference to the claims.

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A body prop assembly **102** for supporting portions of a tilting trailer assembly **100**. Said body prop assembly **102** comprising a body prop **300**, a hinge assembly **312**, two sidetracks **306**. Said body prop assembly **102** configured to attach to said tilting trailer assembly **100** between tilting portions **106** and a trailer platform **104**. Said tilting portions **106** selectively rotates with respect to said trailer platform **104** on a tilting hinge **108**. Said tilting hinge **108** defines a tilting axis **126** of said tilting trailer assembly **100**. Said body prop **300** is configured to selectively hold a portion of said tilting portions **106** at an incline. Said lower guides **310** is configured to slide through portions of said two sidetracks **306** in order to adjust a lower portion of said body prop assembly **102**. Said body prop **300** comprises an upper portion **322**, a side portions **324** and said lower guides **310**. Said upper portion **322** is substantially parallel with said lower guides **310**. Said side portions **324** is substantially perpendicular to said lower guides **310**. Said side portions **324** is substantially perpendicular to said upper portion **322**. A prop hinge brackets **316** are attached to said upper portion **322**. A vessel hinge brackets **314** are attached to a bottom **116d** of said tilting portions **106**. Said vessel hinge brackets **314** and said prop hinge brackets **316** comprise one or more hinge eyes **702** to receive a portion of a fastener assemblies **318**. Said fastener assemblies **318** comprise an upper axis **320** of said body prop assembly **102**. Said body prop assembly **102** and said tilting portions **106** rotate relative to one another on said upper axis **320**. Said two sidetracks **306** are attached to a side portions **114** of said trailer platform **104**. Said two sidetracks **306** comprise a first sidetrack **306a** and a second sidetrack **306b**. Said two sidetracks **306** comprise a separation width **328** between said first sidetrack **306a** and said second sidetrack **306b**. Said lower guides **310** comprises a width **814**. Said width **814** is wider than said separation width **328**. Portions of said lower guides **310** can become trapped within portions of said two sidetracks **306**. Said two sidetracks **306** each comprise a L-bracket **1000** and a track assembly **1002**. Said L-bracket **1000** comprise an L shaped bracket configured for attaching to said side portions **114** of said trailer platform **104**. Said two sidetracks **306** comprise a guide tracks **500**. Said guide tracks **500** is configured to guide portions of said lower guides **310** to adjust said body prop assembly **102** between a raised configuration **1702a** and a closed configuration **1702b**. Said track assembly **1002** comprise an upper level **1006** and a lower level **1008**. Said upper level **1006** and said lower level **1008** are substantially parallel planes with provisions for moving said lower guides **310** freely above said upper level **1006** and selectively at said lower level **1008**. Portions of said track assembly **1002** are welded to said L-bracket **1000**. Said guide tracks **500** is constructed of said upper level **1006**, said lower level **1008**, a second flap **1026**, a first flap **1024**. Said guide tracks **500** defines a space above said lower level **1008** which allows said lower guides **310** to move relatively freely, a gap **1114** for allowing said lower guides **310** to pass freely below said lower level **1008** and into a lower mid portion **1018**, and a trap **1016** for holding a portion of said lower guides **310**. Said lower guides **310** is configured to enter said lower level **1008** through said gap **1114** between a rear upper portion **1012** and an upper mid portion **1030**, slide down a rear ramp **1014**, slide between said upper mid portion **1030** and said lower mid portion **1018**. Slide into said trap **1016**. Portions of said track assembly **1002** are configured to allow one-way movement of said lower guides **310** into and out of said trap **1016**. Said lower guides **310** are configured to slide into said first flap **1024**, lift a portion of said first flap **1024**, slide into said trap

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1016, closing said first flap 1024 behind said lower guides 310 so as to selectively hold a portion of said lower guides 310 in said trap 1016, and said lower guides 310 selectively remains in said trap 1016 provided downward force is exerted on said body prop assembly 102. Said body prop assembly 102 is configured to act as a prop for said tilting portions 106. Removing a portion of said lower guides 310 from said trap 1016 comprises reversing said lower guides 310 into a portion of said first flap 1024, sliding up said first flap 1024, opening said second flap 1026, and sliding said lower guides 310 out of said lower level 1008 and onto or above said upper level 1006. Said first flap 1024 is configured to selectively pivot on a first hinge 1020. Said second flap 1026 is configured to selectively pivot on a second hinge 1022. Said body prop assembly 102 is configured to lift said lower guides 310 entirely off of said two sidetracks 306 with said tilting portions 106 raised sufficiently above said lower guides 310. With said lower guides 310 lifted off of said two sidetracks 306, a body width 802/are configured to press into said bottom 116d of said tilting portions 106 and thereby prevent rotation of said body prop 300. A body prop assembly 102 for supporting portions of a tilting trailer assembly 100.

Said body prop assembly 102 comprising a body prop 300, a hinge assembly 312, two sidetracks 306. Said body prop assembly 102 configured to attach to said tilting trailer assembly 100 between tilting portions 106 and a trailer platform 104. Said tilting portions 106 selectively rotates with respect to said trailer platform 104 on a tilting hinge 108. Said tilting hinge 108 defines a tilting axis 126 of said tilting trailer assembly 100. Said body prop 300 is configured to selectively hold a portion of said tilting portions 106 at an incline. Said lower guides 310 is configured to slide through portions of said two sidetracks 306 in order to adjust a lower portion of said body prop assembly 102. Said body prop 300 comprises an upper portion 322, a side portions 324 and said lower guides 310. A prop hinge brackets 316 are attached to said upper portion 322. A vessel hinge brackets 314 are attached to a bottom 116d of said tilting portions 106. Said body prop assembly 102 and said tilting portions 106 rotate relative to one another on an upper axis 320. Said two sidetracks 306 are attached to a side portions 114 of said trailer platform 104. Said two sidetracks 306 comprise a first sidetrack 306a and a second sidetrack 306b. Said two sidetracks 306 comprise a guide tracks 500. Said guide tracks 500 is configured to guide portions of said lower guides 310 to adjust said body prop assembly 102 between a raised configuration 1702a and a closed configuration 1702b.

Said body prop 300 comprises a metal sufficient to hold a portion of the weight of a portion of said tilting portions 106.

Said body prop 300 comprises a set of framed elements. Said body prop 300 comprises said upper portion 322 at a top portion. Said upper portion 322 is substantially parallel with said lower guides 310. Said side portions 324 is perpendicular to said lower guides 310. Said side portions 324 is perpendicular to said upper portion 322. A central support portions 326 is configured to reinforce and fill a portion of a space between said side portions 324, said lower guides 310 and said upper portion 322.

Said body prop 300 comprises a solid piece. Said body prop 300 comprises said upper portion 322 at a top portion. Said upper portion 322 is substantially parallel with said lower guides 310. A central support portions 326 is config-

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ured to reinforce and fill a portion of a space between said side portions 324, said lower guides 310 and said upper portion 322.

Said body prop assembly 102, said tilting portions 106 and said trailer platform 104 form a triangle from an elevated side view consisting of said hinge assembly 312 as a first top hinge angle 610a, said upper axis 320 as a tilting hinge angles 608 and said lower guides 310 forming a sliding third angle. Said body prop assembly 102 comprises a second leg 604. A portion of said tilting trailer assembly 100 between said tilting hinge 108 and said hinge assembly 312 comprises a first leg 602. A distance between said tilting hinge 108 and said lower guides 310 comprises a variable distance comprising a first lower leg 606a. Said tilting trailer assembly 100 comprise at least a raised and locked position 400a, a transitioning position 400b and a closed position 400c. Wherein, said closed position 400c comprises said body prop assembly 102 supporting said tilting portions 106. Wherein, said transitioning position 400b comprises said body prop assembly 102 in transition between said raised and locked position 400a and said closed position 400c. Wherein, said raised and locked position 400a comprises said body prop assembly 102 collapsed and said first top hinge angle 610a being substantially 180 degrees and a first tilting hinge angle 608a being substantially zero degrees.

Said two sidetracks 306 each comprise said L-bracket 1000 and a track assembly 1002. Said L-bracket 1000 comprise an L shaped bracket configured for attaching to said side portions 114 of said trailer platform 104. Said two sidetracks 306 comprise a separation width 328 between said first sidetrack 306a and said second sidetrack 306b. Said lower guides 310 comprises a width 814. Said width 814 is wider than said separation width 328. Portions of said lower guides 310 can become trapped within portions of said two sidetracks 306.

Said two sidetracks 306 each comprise said L-bracket 1000 and a track assembly 1002. Said L-bracket 1000 comprise an L shaped bracket configured for attaching to said side portions 114 of said trailer platform 104.

Said two sidetracks 306 comprise a separation width 328 between said first sidetrack 306a and said second sidetrack 306b. Said lower guides 310 comprises a width 814. Said width 814 is wider than said separation width 328. Portions of said lower guides 310 can become trapped within portions of said two sidetracks 306.

A fastener assemblies 318 comprise said upper axis 320 of said body prop assembly 102.

Said vessel hinge brackets 314 and said prop hinge brackets 316 comprise one or more hinge eyes 702 to receive a portion of a fastener assemblies 318.

A track assembly 1002 comprise an upper level 1006 and a lower level 1008. Said upper level 1006 and said lower level 1008 are substantially parallel planes with provisions for moving said lower guides 310 freely above said upper level 1006 and selectively at said lower level 1008. Portions of said track assembly 1002 are welded to said L-bracket 1000. Said guide tracks 500 is constructed of said upper level 1006, said lower level 1008, a second flap 1026, a first flap 1024. Said guide tracks 500 defines a space above said lower level 1008 which allows said lower guides 310 to move relatively freely, a gap 1114 for allowing said lower guides 310 to pass freely below said lower level 1008 and into a lower mid portion 1018, and a trap 1016 for holding a portion of said lower guides 310. Said lower guides 310 is configured to enter said lower level 1008 through said gap 1114 between a rear upper portion 1012 and an upper mid portion 1030, slide down a rear ramp 1014, slide between

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said upper mid portion 1030 and said lower mid portion 1018. Slide into said trap 1016. Portions of said track assembly 1002 are configured to allow one-way movement of said lower guides 310 into and out of said trap 1016. Said lower guides 310 are configured to slide into said first flap 1024, lift a portion of said first flap 1024, slide into said trap 1016, closing said first flap 1024 behind said lower guides 310 so as to selectively hold a portion of said lower guides 310 in said trap 1016, and said lower guides 310 selectively remains in said trap 1016 provided downward force is exerted on said body prop assembly 102. Said body prop assembly 102 is configured to act as a prop for said tilting portions 106. Removing a portion of said lower guides 310 from said trap 1016 comprises reversing said lower guides 310 into a portion of said first flap 1024, sliding up said first flap 1024, opening said second flap 1026, and sliding said lower guides 310 out of said lower level 1008 and onto or above said upper level 1006. Said first flap 1024 is configured to selectively pivot on a first hinge 1020. Said second flap 1026 is configured to selectively pivot on a second hinge 1022. Said body prop assembly 102 is configured to lift said lower guides 310 entirely off of said two sidetracks 306 with said tilting portions 106 raised sufficiently above said lower guides 310. With said lower guides 310 lifted off of said two sidetracks 306, a body width 802/are configured to press into said bottom 116d of said tilting portions 106 and thereby prevent rotation of said body prop 300.

Said upper portion 322 is substantially parallel with said lower guides 310. Said side portions 324 is substantially perpendicular to said lower guides 310. Said side portions 324 is substantially perpendicular to said upper portion 322.

Various changes in the details of the illustrated operational methods are possible without departing from the scope of the following claims. Some embodiments may combine the activities described herein as being separate steps. Similarly, one or more of the described steps may be omitted, depending upon the specific operational environment the method is being implemented in. It is to be understood that the above description is intended to be illustrative, and not restrictive. For example, the above-described embodiments may be used in combination with each other. Many other embodiments will be apparent to those of skill in the art upon reviewing the above description. The scope of the invention should, therefore, be determined with reference to the appended claims, along with the full scope of equivalents to which such claims are entitled. In the appended claims, the terms “including” and “in which” are used as the plain-English equivalents of the respective terms “comprising” and “wherein.”

The invention claimed is:

1. A body prop assembly for supporting portions of a tilting trailer assembly, wherein:

- said body prop assembly comprising a body prop, a hinge assembly, and two sidetracks;
- said tilting trailer assembly comprises tilting portions and a trailer platform;
- said body prop assembly is configured to attach to said tilting trailer assembly between said tilting portions and said trailer platform;
- said tilting portions are configured to selectively rotate with respect to said trailer platform on a tilting hinge;
- said tilting hinge defines a tilting axis of said tilting trailer assembly;
- said body prop is configured to selectively hold a portion of said tilting portions at an incline;

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said body prop assembly further comprises lower guides configured to slide through portions of said two sidetracks in order to adjust a lower portion of said body prop assembly;

said body prop comprises an upper portion, and a side portions;

said upper portion of said body prop is substantially parallel with said lower guides;

said side portions are substantially perpendicular to said lower guides;

said hinge assembly comprises prop hinge brackets and vessel hinge brackets;

said prop hinge brackets are attached to said upper portion;

said vessel hinge brackets are attached to a bottom of said tilting portions;

said vessel hinge brackets and said prop hinge brackets each comprise one or more hinge eyes and fastener assemblies;

said one or more hinge eyes are configured to receive a portion of a fastener assembly;

said fastener assemblies comprise an upper axis of said body prop assembly;

said body prop assembly and said tilting portions rotate relative to one another on said upper axis;

said two sidetracks are attached to side portions of said trailer platform;

said two sidetracks comprise a first sidetrack and a second sidetrack;

said two sidetracks comprise a separation width between said first sidetrack and said second sidetrack;

said lower guides comprise a width;

said width of said lower guides is wider than said separation width;

portions of said lower guides are configured to become trapped within portions of said two sidetracks;

said two sidetracks each comprise an L-bracket and a track assembly;

each said L-bracket is configured for attaching to said side portions of said trailer platform;

each of said two sidetracks is configured to guide portions of said lower guides and thereby to adjust said body prop assembly between a raised configuration and a closed configuration;

each said track assembly comprise an upper level and a lower level, a second flap, a first flap;

said upper level and said lower level are substantially parallel planes with provisions for moving said lower guides freely above said upper level and selectively at said lower level;

portions of each said track assembly are welded to said L-bracket;

each said track assembly is configured with a space above said lower level which allows said lower guides to move relatively freely,

a gap for allowing said lower guides to pass freely below said upper level and into a lower mid portion, and

a trap for holding a portion of said lower guides;

with reference to each said track assembly, said lower guides are configured to

enter said lower level through said gap between a rear upper portion and an upper mid portion,

slide down a rear ramp,

slide between said upper mid portion and said lower mid portion, and

slide into said trap;

portions of each said track assembly are configured to allow one-way movement of said lower guides into and out of said trap;

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said lower guides are configured to
 slide into said first flap,
 lift a portion of said first flap,
 slide into said trap,
 be held in said trap by closing said first flap behind said
 lower guides, and remain in said trap provided
 downward force is exerted on said body prop assembly;
 said body prop assembly is configured to act as a prop for
 said tilting portions;
 said body prop assembly is configured to selectively allow
 a portion of said lower guides out of said trap when
 a portion of said first flap is pressed reversed into said
 lower guides,
 said first flap slides up,
 said second flap opens, and
 said lower guides slide out of said lower level and onto
 or above said upper level;
 said first flap is configured to selectively pivot on a first
 hinge;
 said second flap is configured to selectively pivot on a
 second hinge;
 said body prop assembly is configured to lift said lower
 guides entirely off of said two sidetracks with said
 tilting portions raised sufficiently above said lower
 guides; and
 with said lower guides lifted off said two sidetracks, a
 body width is configured to press into said bottom of
 said tilting portions and thereby prevent rotation of said
 body prop.

2. A body prop assembly for supporting portions of a
 tilting trailer assembly, wherein:
 said body prop assembly comprising a body prop, a hinge
 assembly, and two sidetracks;
 said tilting trailer assembly comprises tilting portions and
 a trailer platform;
 said body prop assembly is configured to attach to said
 tilting trailer assembly between said tilting portions and
 said trailer platform;
 said tilting portions are configured to selectively rotate
 with respect to said trailer platform on a tilting hinge;
 said tilting hinge defines a tilting axis of said tilting trailer
 assembly;
 said body prop is configured to selectively hold a portion
 of said tilting portions at an incline;
 said body prop assembly further comprises lower guides
 configured to slide through portions of said two side-
 tracks in order to adjust a lower portion of said body
 prop assembly;
 said body prop comprises an upper portion, and a side
 portions;
 said hinge assembly comprises prop hinge brackets and
 vessel hinge brackets;
 said prop hinge brackets are attached to said upper
 portion;
 said vessel hinge brackets are attached to a bottom of said
 tilting portions;
 said vessel hinge brackets and said prop hinge brackets
 each comprise one or more hinge eyes and fastener
 assemblies;
 said body prop assembly and said tilting portions rotate
 relative to one another on an upper axis;
 said two sidetracks are attached to side portions of said
 trailer platform;
 said two sidetracks comprise a first sidetrack and a second
 sidetrack;

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each of said two sidetracks is configured to guide portions
 of said lower guides and thereby to adjust said body
 prop assembly between a raised configuration and a
 closed configuration;
 said two sidetracks each comprise a track assembly;
 each said track assembly comprise an upper level and a
 lower level, a second flap, a first flap;
 said upper level and said lower level are substantially
 parallel planes with provisions for moving said lower
 guides freely above said upper level and selectively at
 said lower level;
 portions of each said track assembly are welded to an
 L-bracket;
 each said track assembly are configured with
 a space above said lower level which allows said lower
 guides to move relatively freely,
 a gap for allowing said lower guides to pass freely
 below said upper level and into a lower mid portion,
 and
 a trap for holding a portion of said lower guides;
 with reference to each said track assembly, said lower
 guides are configured to
 enter said lower level through said gap between a rear
 upper portion and an upper mid portion,
 slide down a rear ramp,
 slide between said upper mid portion and said lower
 mid portion;
 slide into said trap;
 portions of each said track assembly are configured to
 allow one-way movement of said lower guides into and
 out of said trap;
 said lower guides are configured to
 slide into said first flap,
 lift a portion of said first flap,
 slide into said trap,
 be held within said trap by closing said first flap behind
 said lower guides, and
 remain in said trap provided downward force is exerted
 on said body prop assembly;
 said body prop assembly is configured to act as a prop for
 said tilting portions;
 said body prop assembly is configured to selectively allow
 a portion of said lower guides out of said trap when
 a portion of said first flap is pressed reversed into said
 lower guides,
 said first flap slides up,
 said second flap opens, and
 said lower guides slide out of said lower level and onto
 or above said upper level;
 said first flap is configured to selectively pivot on a first
 hinge;
 said second flap is configured to selectively pivot on a
 second hinge;
 said body prop assembly is configured to lift said lower
 guides entirely off of said two sidetracks with said
 tilting portions raised sufficiently above said lower
 guides; and
 with said lower guides lifted off said two sidetracks, a
 body width is configured to press into said bottom of
 said tilting portions and thereby prevent rotation of said
 body prop.

3. The body prop assembly from claim 2, wherein:
 said body prop comprises a metal sufficient to hold a
 portion of the weight of a portion of said tilting
 portions.

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4. The body prop assembly from claim 2, wherein:
 said body prop comprises a set of framed elements;
 said body prop comprises said upper portion at a top
 portion;
 said upper portion is substantially parallel with said lower
 guides;
 said side portions are perpendicular to said lower guides;
 said side portions are perpendicular to said upper portion;
 and
 central support portions are configured to reinforce and
 fill a portion of a space between said side portions, said
 lower guides and said upper portion. 10

5. The body prop assembly from claim 2, wherein:
 said body prop comprises a solid piece;
 said body prop comprises said upper portion at a top
 portion;
 said upper portion is substantially parallel with said lower
 guides; and
 central support portions are configured to reinforce and
 fill a portion of a space between said side portions, said
 lower guides and said upper portion. 20

6. The body prop assembly from claim 2, wherein:
 said body prop assembly forms a side of a triangle with
 said tilting portions and said trailer platform;
 said triangle comprises 25
 a first angle comprising a first top hinge angle at said
 hinge assembly,
 a second angle comprising a tilting hinge angle at said
 upper axis, and
 a third angle comprising a sliding third angle at said lower
 guides; 30
 said triangle further comprises
 a first leg comprising a portion of said tilting trailer
 assembly between said tilting hinge and said hinge
 assembly comprises, 35
 a second leg comprising said body prop assembly, and
 a third leg comprising a portion of said trailer platform;
 said first leg comprises a variable distance between said
 tilting hinge and said lower guides;
 said tilting trailer assembly comprises at least a raised and
 locked position, a transitioning position and a closed
 position; 40
 wherein, said closed position comprises said body prop
 assembly supporting said tilting portions;
 wherein, said transitioning position comprises said body
 prop assembly in transition between said raised and
 locked position and said closed position; and
 wherein, said raised and locked position comprises said
 body prop assembly collapsed and said first top hinge
 angle being substantially 180 degrees and a first tilting
 hinge angle being substantially zero degrees. 50

7. The body prop assembly from claim 2, wherein:
 said two sidetracks each comprise said L-bracket and said
 track assembly;
 said L-bracket is configured for attaching to said side
 portions of said trailer platform;
 said two sidetracks comprise a separation width between
 said first sidetrack and said second sidetrack;
 said lower guides comprises a width;
 said width is wider than said separation width; and 60
 portions of said lower guides are configured to become
 trapped within portions of said two sidetracks.

8. The body prop assembly from claim 2, wherein:
 said two sidetracks each comprise an L-bracket and said
 track assembly; and 65
 said L-bracket is configured for attaching to said side
 portions of said trailer platform.

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9. The body prop assembly from claim 2, wherein:
 said two sidetracks comprise a separation width between
 said first sidetrack and said second sidetrack;
 said lower guides comprises a width;
 said width is wider than said separation width; and
 portions of said lower guides are configured to become
 trapped within portions of said two sidetracks.

10. The body prop assembly from claim 2, wherein:
 said fastener assemblies comprise said upper axis of said
 body prop assembly.

11. The body prop assembly from claim 2, wherein:
 said vessel hinge brackets and said prop hinge brackets
 comprise one or more hinge eyes to receive a portion of
 said fastener assemblies.

12. The body prop assembly from claim 2, wherein:
 said upper portion is substantially parallel with said lower
 guides;
 said side portions are substantially perpendicular to said
 lower guides; and
 said side portions are substantially perpendicular to said
 upper portion.

13. A body prop assembly for supporting portions of a
 tilting trailer assembly, wherein:
 said body prop assembly comprising a body prop, a hinge
 assembly, and two sidetracks;
 said tilting trailer assembly comprises tilting portions and
 a trailer platform;
 said body prop assembly is configured to attach to said
 tilting trailer assembly between said tilting portions and
 said trailer platform;
 said tilting portions are configured to selectively rotate
 with respect to said trailer platform on a tilting hinge;
 said tilting hinge defines a tilting axis of said tilting trailer
 assembly;
 said body prop is configured to selectively hold a portion
 of said tilting portions at an incline;
 said body prop assembly further comprises lower guides
 configured to slide through portions of said two side-
 tracks in order to adjust a lower portion of said body
 prop assembly;
 said body prop comprises an upper portion, and a side
 portions;
 said hinge assembly comprises prop hinge brackets and
 vessel hinge brackets;
 said prop hinge brackets are attached to said upper
 portion;
 said vessel hinge brackets are attached to a bottom of said
 tilting portions;
 said vessel hinge brackets and said prop hinge brackets
 each comprise one or more hinge eyes and fastener
 assemblies;
 said body prop assembly and said tilting portions rotate
 relative to one another on an upper axis;
 said two sidetracks are attached to side portions of said
 trailer platform;
 said two sidetracks comprise a first sidetrack and a second
 sidetrack;
 each of said two sidetracks is configured to guide portions
 of said lower guides and thereby to adjust said body
 prop assembly between a raised configuration and a
 closed configuration;
 said two sidetracks each comprise a track assembly;
 each said track assembly comprises an upper level and a
 lower level;
 each said track assembly comprises a first flap and a
 second flap;

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said upper level and said lower level are in substantially parallel planes with provisions for moving said lower guides freely above said upper level and selectively at said lower level;

each said track assembly is configured with 5

- a space above said lower level which allows said lower guides to move relatively freely,
- a gap for allowing said lower guides to pass freely below said upper level and into a lower mid portion, 10 and
- a trap for holding a portion of said lower guides;

with reference to each said track assembly, said lower guides are configured to

- enter said lower level through said gap between a rear 15 upper portion and an upper mid portion,
- slide down a rear ramp,
- slide between said upper mid portion and said lower mid portion;
- slide into said trap; 20

said lower guides are configured to

- slide into said first flap,
- lift a portion of said first flap,
- slide into said trap,
- be held in said trap by closing said first flap behind said 25 lower guides, and
- remain in said trap provided downward force is exerted on said body prop assembly; and

said body prop assembly is configured to act as a prop for said tilting portions.

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14. The body prop assembly from claim **13**, wherein: portions of each said track assembly are welded to an L-bracket.

15. The body prop assembly from claim **13**, wherein: said first flap is configured to selectively pivot on a first hinge;

said second flap is configured to selectively pivot on a second hinge.

16. The body prop assembly from claim **13**, wherein: said body prop assembly is configured to lift said lower guides entirely off of said two sidetracks with said tilting portions raised sufficiently above said lower guides; and

with said lower guides lifted off said two sidetracks, a body width is configured to press into said bottom of said tilting portions and thereby prevent rotation of said body prop.

17. The body prop assembly from claim **13**, wherein: portions of each said track assembly are configured to allow one-way movement of said lower guides into and out of said trap.

18. The body prop assembly from claim **13**, wherein: said body prop assembly is configured to selectively allow a portion of said lower guides out of said trap when a portion of said first flap is pressed reversed into said lower guides,

said first flap slides up,

said second flap opens, and

said lower guides slide out of said lower level and onto or above said upper level.

* * * * *