



(51) International Patent Classification:  
*B60P 3/00* (2006.01)

(21) International Application Number:

PCT/US2011/060964

(22) International Filing Date:

16 November 2011 (16.11.2011)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/414,756 17 November 2010 (17.11.2010) US  
61/438,870 2 February 2011 (02.02.2011) US

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(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,  
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,  
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,  
HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR,  
KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,  
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,  
OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD,  
SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR,  
TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ,  
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU,  
TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE,  
DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,

[Continued on next page]

(54) Title: MOBILITY DEVICE DOCKING SYSTEM

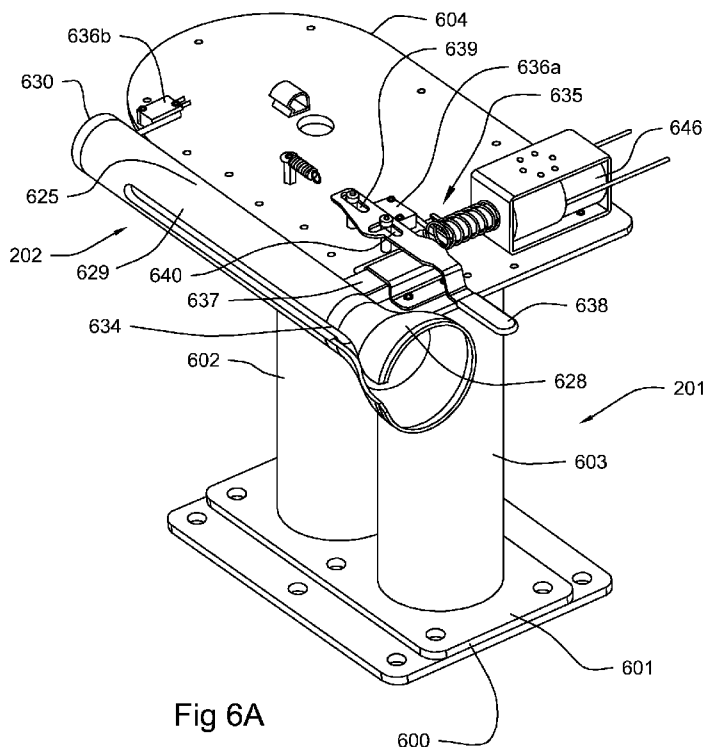


Fig 6A

(57) Abstract: A device for securing a mobility device in a mobility vehicle or on a lifting device that is installed in or on a mobility vehicle or trailer. The securing device comprises a docking assembly, a locking assembly and a guide assembly. The locking assembly includes a receiving member having an interior passageway and a locking pin. The guide assembly includes a support plate attachable to the mobility device and an alignment rod whereby the alignment rod extends out from one side of the mobility device and engages the receiving member. The alignment rod is sized and configured to extend into the interior passageway thereby allowing the locking pin to extend into the interior passageway to secure the alignment rod.



LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,  
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

— of inventorship (Rule 4.17(iv))

**Published:**

**Declarations under Rule 4.17:**

- as to the identity of the inventor (Rule 4.17(i))
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

— with international search report (Art. 21(3))

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

## TITLE OF THE INVENTION

Mobility Device Docking System

## CROSS-REFERENCE TO RELATED APPLICATION

- [0001] This application claims priority to United States Provisional Patent Application No. 61/414,756 filed on November 17, 2010, which is hereby incorporated by reference in its entirety. This application also claims priority to United States Provisional Patent Application No. 61/438,870, filed on February 2, 2011, which is hereby incorporated by reference in its entirety.

## TECHNICAL FIELD

- [0002] This invention relates in general to devices for securing a mobility device, such as a wheelchair or scooter, to a mobility vehicle, and more particularly to a securing device that automatically locks a mobility device in a desired position in a mobility vehicle or on a lifting device that is installed in or on a mobility vehicle or trailer.

## BACKGROUND ART

- [0003] It has remained a long standing problem in the mobility vehicle industry to provide an economical means for securing a mobility device, such as a wheelchair or scooter, in a fail safe manner, and fixing the mobility device in a desired position that is easily engaged or disengaged by the mobility device occupant without additional assistance.
- [0004] Over the past decades, multiple solutions for securing a mobility device have been proposed. These include various tie-down devices, locking mechanisms affixed to the vehicle floor and provided with pivoting arms to hold the mobility device in place, clamp posts with jaw members to engage the mobility device, one or more post members extending vertically from the vehicle floor with mobility device mounted locking devices engaging the vertical posts, side press assemblies, as well as many other mobility device engaging and locking devices. Despite the time, effort and monies expended, there remains a need to provide an economical means for securing a mobility device in a fail safe manner, and fixing the mobility device in a

desired position that is easily engaged or disengaged by the mobility device occupant without additional assistance.

#### DISCLOSURE OF THE INVENTION

[0005] An object of this invention is to provide a device for securing in a fail safe manner a mobility device, such as a wheelchair or scooter, in a mobility vehicle in a desired position. Another object of this invention is to provide a securing device that reliably inhibits twisting or rotation of the mobility device once it is locked into position. Another object of this invention is to provide a securing device that permits the mobility device to be easily maneuvered by the mobility device occupant into locking engagement with the securing device. Still another object of this invention is to provide a securing device that is generally universal and can be utilized with most mobility devices currently in the marketplace. A still further object of this invention is to provide a securing device that not only secures a mobility device in a desired position, but further provides additional functions of storage, cup holder, storage shelf, storage bins, HVAC air duct with heating assembly, power adaptor connections, trash depositing, or control module for operation of the securing device locking assembly. Still a further object of this invention is to provide a device for securing a mobility device on a lifting device that is installed in or on a mobility vehicle or trailer. Additional objects and advantages of this invention shall become apparent from the ensuing descriptions of the invention.

[0006] Accordingly, a securing device is disclosed having a docking assembly, a locking assembly and a guide assembly for positioning and securing a mobility device in a desired position in a mobility vehicle or on a lifting device that is installed in or on a mobility vehicle or trailer. The docking assembly includes a base plate that can be fixed to the vehicle floor or lifting device, at least one support member affixed to and extending vertically upward from the base plate, and a positioning member attachable to the support member whereby the positioning member is positioned parallel to and at a pre-determined height from the vehicle floor or lifting device. The locking assembly includes a receiving member having an interior passageway and affixed to the positioning member at its outer end section. The receiving member

has a locking end opening. The guide assembly includes a support plate attachable to the mobility device and an arm member affixed to the support plate whereby the arm member extends out from one side of the mobility device and engages the receiving member.

[0007] In one embodiment the receiving end section of the receiving member is formed of one or more tapered side walls forming an enlarged receiving opening and a smaller inner passageway opening, preferably in the shape of a truncated cone or pyramid. In an alternate preferred embodiment the receiving end section truncated cone has a “D” shaped cross-section with the straight side of the “D” extending further from the outer end section of the positioning member. In still a further embodiment the receiving end section is a concentric or eccentric reducer. There may be a sensor, such as a micro switch, that detects and transmits a signal upon sensing the presence of an object entering the passageway. In addition, a locking pin assembly including a locking pin may be operatively connected to a sensor to receive a signal upon sensing the presence of an object entering the passageway. The guide assembly includes a support plate attachable to the mobility device. It further includes an alignment rod affixed to the support plate and positioned parallel to and outside the one side of the mobility device at a height from the vehicle floor to align with the receiving member passageway.

[0008] Another aspect of this invention is a device for securing a mobility device in a desired position on a lifting device that is installed in or on a mobility vehicle or trailer. The device for securing a mobility device comprises a docking assembly, a locking assembly, and a guide assembly. The docking assembly comprises a base plate, and at least one vertical support structure extending upward from the base plate. The locking assembly comprises a receiving member having an interior passageway and affixed to the docking assembly, and a locking pin assembly to drive a locking pin through an opening in the receiving member and into the interior passageway. The guide assembly is configured to align the mobility device into position for locking engagement with the receiving member. The guide assembly comprises a support plate attachable to the mobility device, and an alignment rod affixed to the support plate and having an opening extending through the rod, the

alignment rod positioned parallel to and outside the one side of the mobility device at a height from the vehicle floor to align with the receiving member passageway, the alignment rod being sized to extend into the passageway.

[0009] The foregoing has outlined rather broadly the features and technical advantages of the present invention in order that the detailed description of the invention that follows may be understood. Additional features and advantages of the invention will be described hereinafter which form the subject of the claims of the invention. It should be appreciated by those skilled in the art that the conception and specific embodiments disclosed may be readily utilized as a basis for modifying or designing other structures for carrying out the same purposes of the present invention. It should also be realized by those skilled in the art that such equivalent constructions do not depart from the spirit and scope of the invention as set forth in the appended claims. The novel features which are believed to be characteristic of the invention, both as to its organization and method of operation, together with further objects and advantages will be better understood from the following description when considered in connection with the accompanying figures. It is to be expressly understood, however, that each of the figures is provided for the purpose of illustration and description only and is not intended as a definition of the limits of the present invention.

#### BRIEF DESCRIPTION OF THE DRAWINGS

- [0010] The accompanying drawings illustrate preferred embodiments of this invention. However, it is to be understood that these embodiments are not intended to be exhaustive, nor limiting of the invention. These embodiments are but examples of some of the forms in which the invention may be practiced.
- [0011] **Figure 1A** illustrates a typical powered wheelchair that is to be secured inside a mobility vehicle, such as a van.
- [0012] **Figure 1B** is a side view of the powered wheelchair of **Figure 1A**.
- [0013] **Figure 1C** is a three-quarter perspective view of a preferred embodiment of the guide assembly affixable to the base of a powered wheelchair of **Figure 1A**.

- [0014] **Figure 2A** is a three-quarter front perspective view of a preferred embodiment of the guide assembly affixable to the base of the powered wheelchair of **Figure 1A**, the docking assembly affixable to the mobility vehicle floor panel and the locking assembly affixed to the docking assembly for receiving the guide assembly and locking the powered wheelchair in the desired position.
- [0015] **Figure 2B** is a three-quarter front perspective view of a preferred embodiment of the cabinet of the docking assembly.
- [0016] **Figure 2C** is a three-quarter rear perspective view of a preferred embodiment of the hinge plate of the docking assembly to permit the positioning member to pivot into the docking assembly structure.
- [0017] **Figure 2D** is a three-quarter front perspective view of a preferred embodiment of the positioning member of this invention illustrated in **Figure 2A**.
- [0018] **Figure 2E** is a three-quarter front perspective view of the positioning member illustrated in **Figure 2A** pivoted into the docking assembly structure when not in use as shown in **Figure 2C**.
- [0019] **Figure 3** is a three-quarter perspective view of an alternate preferred embodiment of the docking assembly structured to permit the docking of two mobility devices.
- [0020] **Figures 4A** and **4B** depict a three-quarter front perspective view and bottom perspective view, respectively, of an alternate preferred embodiment of the alignment plate with its alignment rod positioned in the docking assembly of this invention.
- [0021] **Figures 5A-5E** are the front view, top view, bottom view, alignment rod insertion side view and opposing side view, respectively of an alternate embodiment of the docking assembly.
- [0022] **Figure 6A** illustrates an alternate preferred embodiment of the vertical support structure utilizing tubular support columns and a top plate.

- [0023] **Figure 6B** illustrates is a top-view of the top plate of the embodiment of the docking assembly shown in **Figure 6A**.
- [0024] **Figure 6C** illustrates is a perspective view the embodiment of the docking assembly shown in **Figure 6A**.
- [0025] **Figures 6D-6H** illustrate three-dimensional depictions of a docking assembly in combination with various auxiliary elements.
- [0026] **Figures 7A-7F** illustrate an alternate preferred embodiment of the receiving end section of the docking assembly receiving member.
- [0027] **Figures 8A-8B** illustrate a wheel chair docked to the docking assembly.
- [0028] **Figure 9** illustrates an alternative embodiment of a device for securing a mobility device in accordance with this invention wherein the docking assembly is affixed to a lifting device for a mobility vehicle.

#### MODES FOR CARRYING OUT THE INVENTION

- [0029] Without any intent to limit the scope of this invention, reference is made to the Figures in describing the preferred embodiments of the invention. Although the accompanying description below is discussed in relation to a powered wheelchair, a device for securing a mobility device in accordance with this invention is not limited only to powered wheelchairs. A device for securing a mobility device in accordance with this invention may also be used with other mobility devices, such as scooters, manually propelled wheelchairs, and so forth.
- [0030] **Figures 1A and 1B** depict a conventional powered wheelchair shown generally at **100**. Such wheelchairs generally include a base frame **101** to which are operatively attached sets of front and rear wheels **102** and **103**, respectively. Also attached to the base frame **101** is a power source contained in housing **104**. In addition, there will be a seat frame **105** also affixed to the base frame **101** on which a seat **106** having a back rest **107** is mounted. Typically, a pair of arm rests **108** and **109** are attached to the seat frame **105**, wherein steering control mechanism **110** is mounted on one of the arm rests **108, 109** where it can be manipulated by a person sitting in the seat **106** and can be operatively

connected to the power source (such as batteries) in housing **104**. If desired, removable foot rests **111** can also be affixed to the base frame **101**. The actual construction of the powered wheelchair **100** can vary, but almost universally there will be a gap **112** between the base frame **101** and the seat frame **105** of sufficient size to bolt or otherwise affix a support plate to one or the other or both of the frames **101**, **105**.

[0031] Referring now to **Figures 2A-2E**, a device for securing a mobility device **200** of this invention includes three basic assemblies: a docking assembly **201** affixable to the floor panel **113** of a mobility vehicle (not shown), a locking assembly **202** attached to the docking assembly **201**, and a guide assembly **203** attached to the base frame **101** or the seat frame **105** of powered wheelchair **100** as shown in **Figure 1C**.

[0032] The docking assembly **201** may include a cabinet-type structure formed from a base plate **204** that is bolted or otherwise attached to the vehicle floor panel **113** at a position substantially parallel to the desired location to affix the wheelchair **100**, one pair of opposing, separated side walls **205**, **206** vertically extending from the base plate **204**, one or more back support members **207** affixed perpendicularly between and to the side walls **205**, **206** to rigidify the cabinet-type structure, and a positioning member **208** attachable to at least one of the back support members **207** at a position parallel to and at a pre-determined height from the vehicle floor panel **113** and sized to extend beyond the side walls **205**, **206**. In a preferred embodiment illustrated in **Figure 2A**, positioning member **208** will be attached to the back support members **207** whereby it can be locked into the desired parallel position when the docking assembly **201** is in use or whereby it can be pivoted to fit between side walls **205**, **206** when not in use. In this embodiment, positioning member **208** is provided with a pivot plate **209** that is attached to back support member **207** by hinges **210**. Pivot plate **209** is provided with two aligned shoulder members **211**, **212**, each having openings **213**, **214**, respectively, extending through their respective shoulder member **211**, **212**. Shoulder members **211**, **212** are positioned on pivot plate **209** to fit between corresponding pairs of shoulder members **215**, **216** and **217**, **218** also each having an opening, respectively, whereby securing means **223**, **224**, respectively, can be inserted through the corresponding openings **213** and **214**, respectively, to fix pivot plate **209** in a position perpendicular to docking assembly back support member **207**. Positioning member **208** is bolted or

otherwise affixed to pivot plate **209** whereby receiving member **225** will be fixed at the desired position when in use, but which will be positioned within docking assembly **201** when not in use. This preferred embodiment minimizes the vertical profile of the docking assembly **201** to reduce possible snagging of other things on the docking assembly **201**, as well as to allow additional storage capacity in the mobility vehicle when the docking assembly **201** is not in use. To maximize the stability of docking assembly **201**, it is preferred that back support member **207** is a plate that runs the full length of side walls **205**, **206**.

[0033] In an alternate preferred embodiment shown in **Figure 3**, docking assembly **201** is structured to secure two wheelchairs. In this embodiment, secured to opposite sides **300** and **301** of back support member **302** are positioning members **303** and **304**, respectively. Each positioning member **303** and **304** is sized to extend beyond the side walls **305**, **306**, respectively. It is also preferred that both positioning members **303** and **304** are attached to the back support member **302** in similar fashion as illustrated in **Figures 2A-2E** whereby each positioning members **303** and **304** can be locked into the desired parallel position when the docking assembly **201** is in use or whereby each positioning members **303** and **304** can be pivoted to fit between side walls **305** and **306** when not in use.

[0034] The locking assembly **202** as illustrated in **Figures 2C-2E** includes an extension plate **226** that is bolted or otherwise conventionally affixed to pivot plate **209**. It further includes a receiving member **225**, preferably a tubular member, affixed to and running parallel to the outer edge **227** of extension plate **226**. The length of extension plate **226** is set to position receiving member **225** at the desired distance from docking assembly **201** to permit powered wheelchair **100** unencumbered passage to permit the guide assembly **203** to engage the locking assembly receiving member **225**. Receiving member **225** has a receiving end section **228**, a main body section **229**, and a stop end section **230**. Each of the sections **228**, **229**, **230** may be structured having a circular, square, rectangular, oval or other shaped cross section. It is preferred that the same cross section shape be used for each section. However, regardless of the shape used, the receiving end section **228** will be greater at its outer edge **231** and tapered to the size and shape of the main body section **229**. If the receiving end section **228** has a circular cross

section, then its overall shape would resemble a truncated cone. On the other hand, if the receiving end section **228** has a square cross section, then its overall shape would resemble a truncated pyramid. Receiving member **225** also has a slot **232** that runs horizontally through each of sections **228**, **229**, **230** that is sized to permit the alignment rod **233** of guide assembly **203** to enter into receiving member passageway **234**.

[0035] In addition to the receiving member **225**, locking assembly **202** also includes one or more sensors that provide signals to a locking pin assembly **235**. The locking pin assembly **235** includes conventional switch means **236a**, **236b** that react to the signals to extend or retract a locking pin **237** from its initial position. As explained below, the sensors are positioned to detect the presence of powered wheelchair **100** and when the powered wheelchair **100** is in the desired position to send a signal to activate the locking pin assembly **235** to extend locking pin **237** into passageway **244** to secure the wheelchair **100** in that position.

[0036] The guide assembly **203** includes a support plate **241** that is affixed to wheelchair base frame **101** or seat frame **105**. The guide assembly **203** may further include a positioning arm member **242** affixed to wheelchair base frame **101** or seat frame **105** and alignment rod **233** affixed to positioning arm member **242**. The position at which support plate **241** is affixed depends on the construction of wheelchair **100**. However, in most wheelchair constructions there is a gap **112** between the wheelchair base frame **101** and the seat frame **105** to position and affix support plate **241** horizontally to either frame **101** or frame **105**. It is preferred to affix support plate **241** to wheelchair **100** at that position which is more stable and will reliably maintain support plate **241** at a known height above the vehicle floor panel **113**. It is further preferred that support plate **241** not extend beyond the wider spaced of wheelchair wheels **102** or **103** in order to maintain the normal width of wheelchair **100**. Positioning arm member **242** is shaped to serve as a platform that permits alignment rod **233** to be fixed at a pre-determined height above the vehicle floor panel **113**. In an alternate embodiment (see **Figure 6H**), the guide assembly **203** may comprise the support plate **241** which is affixed to the alignment rod **203**.

[0037] In operation, the docking assembly 201 is first affixed to the vehicle floor panel 113. In one preferred embodiment, threaded studs 114 are welded or otherwise conventionally affixed to the floor panel 113 at the desired locations. Docking assembly base plate 204 is provided with a series of openings 243 through which studs 114 can be extended to permit nuts 115 to affix base plate 204 to the vehicle floor panel 113. Alternatively, if one desires the docking assembly 201 be permanently affixed to the vehicle floor panel 113, then base plate 204 can be directly welded to the vehicle floor panel 113. Positioning member 208 is locked in a horizontal position to position receiving member 225 parallel to and distanced from the vehicle floor panel 113 at the desired height. For each locking pin assembly 235, receiving member 225 is provided with an opening 244 to permit locking pin 237 to move into and out of tubular receiving member passageway 234. Locking pin assembly 235 is affixed in position, preferably vertically, on receiving member 225. A preferred combination of sensor and locking pin assembly 235 would include a micro switch 236 positioned to detect the fully engaged position of the alignment rod 233 in the tubular receiving member passageway 234 and solenoid 246 controlling the movement of a locking pin 237. Examples of solenoids that could be used include a Deltrol Controls Med 12x1.500 solenoid or a Ledex Tubular Linear STA Series Pull 1" diameter x 1.125" solenoid. In this embodiment, the locking pin 237 is retracted into the solenoid 246 and is not moved into passageway 234 until the micro switch 236 has detected the alignment rod 233 and signaled the solenoid 246 to move the locking pin 237 into passageway 234. Alignment rod 233 is provided with an opening 247 positioned to receive locking pin 237 when it is in the fully engaged position within passageway 234. If multiple solenoids are utilized, such as illustrated in **Figures 2A** and **2D**, then alignment rod 233 is provided with one opening 247, 248 for each locking pin 237. The alignment rod openings 247, 248 are positioned whereby they will be engaged by one of the locking pins 237 when the alignment rod 233 is properly positioned in passageway 234. It is preferred that tubular receiving member stop end section 230 be constructed to block passageway 234 to prevent alignment rod 233 from traveling past the fully engaged position. In a preferred embodiment, the stop end section 230 has a stop shoulder sufficiently extending into passageway 234 to prohibit alignment rod 233 from continuing movement past stop shoulder. In a preferred embodiment, the stop end section 230 can be constructed as a cap having internal

threads (not shown) sized to screw onto a threaded end section (not shown) of main body section **229** so as to completely block one end of passageway **234**. Alternatively, the stop end section **230** may be welded onto the end of the main body section **229**.

[0038] Powered wheelchair **100** is driven up a ramp into the interior of mobility vehicle (such as a van or similar vehicle) and steered to position alignment rod **233** to enter tubular receiving member receiving end **228**. Receiving end **228** has a large opening to facilitate easier maneuvering of wheelchair **100** into position. In a preferred embodiment the cross-sectional shape of alignment rod **233** will match, but be slightly smaller than the cross-sectional shape of passageway **234** in tubular receiving member main body section **229** to permit a small tolerance between the alignment rod **233** and the interior surfaces forming the main body section **229**. Wheelchair **100** will be driven forward until alignment rod **233** contacts stop end section shoulder located substantially near or at the end of the main body section **230**. This contact will engage a micro switch **236a**, **236b** that signals solenoid **246a**, **246b** to magnetically disengage locking pin **237** to permit the solenoid spring to drive locking pin **237** into alignment rod opening **247**, thus completing the docking procedure. To disengage the locking pin **237** from the alignment rod opening **247** to permit wheelchair **100** to be moved, switch **236a**, **236b** is operatively connected to solenoid **246a**, **246b** and is activated to signal solenoid **246** to magnetically engage locking pin **237** which will lift locking pin **237** from alignment rod opening **247** to permit the wheelchair **100** to be backed out of its docking position. In a preferred embodiment, switch **236a**, **236b** will be affixed to docking assembly side wall **206** to permit easy access, but which is not in the path of normal movement by a person sitting in wheelchair seat **106**. If docking assembly **201** is designed to dock two wheelchairs, it is preferred that the first wheelchair is locked into place as described above, and then this process is repeated for the second wheelchair.

[0039] Because of the considerable weight of conventional powered wheelchairs and the speed at which they can be maneuvered, it is important that the construction of docking assembly **201**, the locking assembly **202** and guide assembly **203**, each be constructed of materials that can withstand the forces to which they will be subjected during the docking of wheelchair **100**. In addition these elements of the invention must be constructed of materials that can maintain wheelchair **100** in fixed position should it be

inadvertently engaged after it has been docked or should the mobility vehicle be involved in a collision.

[0040] **Figures 4A and 4B** illustrate another preferred embodiment of a docking assembly **201** in accordance with this invention. These Figures illustrate a docking assembly cabinet **400** comprising a base plate **401** provided with openings **402** to permit the cabinet **400** to be bolted to the mobility vehicle flooring **113**. The cabinet **400** includes a series of vertical support plates **403** affixed at their lower ends to the base plate **401** or toe plate **404** and at their upper ends to top plate **405**. The docking assembly **201** further comprises a tubular positioning member **406** affixed to the vertical support plates **403**. Tubular positioning member **406** has an enlarged receiving end section **407** and a slot **408** running along its exterior facing side **409** to receive the guide assembly alignment rod **410**. Sensor assembly **411** is illustrated positioned on side **409** below slot **408** to provide an unobstructed top to cabinet **400**. In addition this embodiment provides a more contemporary, cleaner look that is easy to manufacture and provides the structural stability necessary to withstand the impact of the powered wheelchair **100** during the docking procedure while maintaining wheelchair **100** in locked position during vehicle operation.

[0041] **Figures 5A-5E** illustrate a still further preferred embodiment of the docking assembly **201**. This embodiment is similar to that illustrated in Figures **4A and 4B**. However, the vertical panels **500** are narrower at their lower end section **501** and wider at their upper end section **502** to provide additional clearance for powered wheelchair **100** to dock. Also, this embodiment does not employ a sloped wall receiver end section of the tubular receiving member **503** illustrated in the other embodiments. If desired, such a wall receiver end section could be incorporated on the receiving end of tubular receiving member **503**.

[0042] Figure **6A and 6B** illustrate another preferred alternate preferred construction of docking assembly **201**. In this embodiment, the cabinet type structure is replaced with a vertical support structure. In this structure, a base plate **600** can be affixed to the vehicle flooring in the same manner as described above for base plate **204**. In one preferred embodiment, a vertical support structure comprising two tubular support structures

602, 603 extends perpendicularly from the top surface 601 of base plate 600. In an alternate embodiment, one or more tubular support structures could be used. A top plate 604 is affixed to the tubular support structures 602, 603. Affixed at one end section 627 of the top plate 604 is receiving member 625, preferably a tubular receiving member. Receiving member 625 has a receiving end section 628, a main body section 629 and a stop end section 630 similar to that of receiving member 225 described above. In a preferred embodiment, the receiving end section may be a concentric reducer with a truncated cone shape (See **Figure 6A**). In another preferred embodiment, the receiving end section may be an eccentric reducer (See **Figure 6B**). In an alternate embodiment, the receiving end section 628 is constructed to have a truncated cone shape wherein the cone has been shaped to have a “D” shape cross-section. The receiving member 625 is also provided with at least one opening sized to allow the locking pin 637 to extend into the receiving member passageway 634. In a preferred embodiment, the top plate 604 may have an adjusting means so that the top plate is vertically adjustable, which allows for looser tolerances between the receiving member and the alignment rod. The adjusting means can be any conventional means such as a hinge and so forth. For example, if the tires on the wheelchair 100 are flat, the top plate 604 may be adjusted vertically so that the alignment rod can be inserted into the passageway of the receiving member. In a preferred embodiment (not shown), the top plate 604 can be constructed of two separated plates. A first separated plate is attached to at least one of vertical support structure and a second separated plate is adjustably attached to the first separated plate to permit a variance in the position of the receiving member from the docking assembly. The adjusting means can be any conventional means such as a hinge and so forth.

[0043] As shown in **Figures 6A-6C**, the locking assembly 202 may also include disengagement means 638, such as a lever, for manually disengaging locking pin assembly 635 so that the wheelchair 100 is released from the docking assembly. In a preferred embodiment, a release lever 638 is configured to disengage the locking pin 637 from the passageway 634 to release the wheelchair 100 from the locking assembly 202. The release lever 638 is positioned substantially parallel to the receiving member 625 and affixed to the top plate 604 at one end section 627 of the top plate 604. The release lever 638 may

disengage the locking pin **637** in one step, but it is preferred that the release lever **638** disengage the locking pin **637** in a two step process to prevent accidentally disengagement of the wheelchair **100** from the locking assembly **202**. In a preferred embodiment, the release lever **638** may be provided with a first slot **639** and a second slot **640**. The first slot **639** is a substantially linear slot configured to allow the release lever **638** to move along an axis parallel to the receiving member **625** when the release lever **638** is subjected to a linear force. The second slot **640** is configured to allow the release lever **638** to move along an axis parallel to the receiving member **625** when the release lever **638** is subjected to a linear force and to move along an axis perpendicular to the receiving member **625** when the release lever **638** is subjected to a horizontal force. The second slot **640** is preferably an “L” shaped slot.

[0044] Referring now to Figure **6B**, in a preferred embodiment, the locking pin **637** may be extended and retracted manually. A first micro switch **636a** is operatively connected to the locking assembly **202** to detect when the locking pin **637** extends to or retracts from the receiving member passageway **634**. The end of the locking pin **637** is configured so that it retracts when the alignment rod **233** enters the receiving member passageway **634**. In a preferred embodiment, the end of the locking pin **637** is angled, preferably angled to a tapered point, so that when the alignment rod **233** contacts the end of the locking pin **637**, the alignment rod pushes the locking pin **637** out of the receiving member passageway **634** thereby retracting the locking pin **637**. The alignment rod **233** moves through the receiving member passageway **634** until it is in the fully engaged position. When the alignment rod **233** is in the fully engaged position, the locking pin **637** extends into the window or opening provided on the receiving member passageway **634**. In a preferred embodiment as shown in Figure **6F**, the locking pin **637** may extend into the receiving member passageway **634** behind the end of the alignment rod **233** near the receiving end section **628** to secure the alignment rod **233** in position. In an alternate embodiment, the alignment rod **233** may be provided with at least one opening configured to engage the locking pin thereby securing the alignment rod **233**, i.e. when the opening on the alignment rod **233** is aligned with the opening on the receiving member **625**, the locking pin **637** extends through both openings to secure the mobility device.

- [0045] A second micro switch **636b** is positioned to detect when alignment rod **233** is in the fully engaged position. The second micro switch **636b** should be located near the stop end section **630** of the main body **629**. In a preferred embodiment, both micro switches **636a**, **636b** are affixed to the top plate **604**. To manually disengage the locking pin **637**, the release lever **638** is pulled outward from the locking assembly **202**, and then moved perpendicularly away from the receiving member **625**. As the release lever **638** is moved away from the receiving member **625**, the release lever **638** manually disengages the locking pin **637** and retracts the locking pin **637** from the receiving member passageway **634**.
- [0046] In an alternate embodiment, the locking pin may be extended or retracted with the aid of a solenoid **646**. Upon detecting the alignment rod **233** entering the tubular member passageway **634**, the first micro switch **636a** signals solenoid **646** to engage its locking pin **637** and lift it out of passageway **634**. Upon detecting alignment rod **233** in the fully engaged position, second micro switch **636a** signals the solenoid **646** to magnetically disengage its locking pin **637** to permit the solenoid spring member to drive its locking pin **637** into the corresponding alignment rod opening **247**. The locking assembly **202** may be in communication with a control module that controls the locking assembly **202**, particularly the extension and retraction of the locking pin **637**.
- [0047] A control module can be in communication with a control panel that allows an operator to engage or disengage the locking pin. The control panel may be any conventional means such as a push button control panel, a touch screen control panel, and so forth. In addition, the control module can be programmed with warning alarms. For example, if the micro switches **636a**, **636b** do not detect full engagement of the locking pin **637** or full insertion of the alignment rod **233** into the receiving member **625**, the operator may be alerted by a visual alert, audio alert, or combination thereof.
- [0048] Top plate **604**, in addition to providing a support to receiving member **625**, can also serve as a platform on which various auxiliary elements can be affixed. **Figure 6H** illustrates still further design configurations employing auxiliary elements that can be attached to docking assembly **201**. One such element is a shallow storage unit **662** that

can be provided with a lid **663** pivotally attached to storage unit body **664**. Other elements that may be attached to a docking assembly **201** in accordance with this invention. Without limitation these can include a control panel **665**, a day glow bezel in combination with lid; a heating unit **666** in combination with cup holder **667** and storage unit **664**; the cup holder **667** may be a dual cup holder in combination with storage unit **664** having a top surface **668** to serve as an arm rest; control panel **665** in combination with a storage unit **664** having its top section shaped to serve as a dual cup holder; and a multitude of various elements further including by way of example a trash can, music player, smart phone, and/or power adapter pack.

[0049] Padding, such as carpet, can be affixed about tubular support units **602** and **603** utilizing Velcro strips or other known fastening means to provide aesthetic appeal and protection should powered wheelchair **100** strike support units **602** or **603**. In addition, in an alternate preferred embodiment the top plate **604** can be constructed of two separated plates to permit an extension of the overall width of top plate **604**. In this embodiment, separated plate is provided with one or more, and preferably at least two slots and that are separated to align with corresponding series of openings to permit securing bolts (not shown) to fix the plates and together to form the desired width of top plate **604**. Cables, such as power, communication, and/or instrument cables, may be inserted through lower opening of tubular support units **602** and/or **603**, and then through upper opening to provide power to any auxiliary elements that may be mounted to top plate **604**. A metal cover or other suitable strong material may be fixed around the tubular support units **602** and **603** to provide protection from being hit by wheel chair **100** as it is docking or undocking.

[0050] **Figure 6G** illustrates yet another auxiliary element that can be affixed to top plate **604**. More particularly a seat belt receptacle **607** may be directly affixed to base plate **601** or affixed to a tube **650** that is affixed to the base plate **601**. The tube may include a flexible rubber or plastic section **651** and a metal section **652**. The flexible rubber or plastic section **651** is preferably affixed to the seat belt receptacle **607** and the metal section **652**. The metal section is preferably affixed to the base plate **601**. The metal section **652** may be affixed to the base plate **601** by any conventional affixing means such as bolting, welding, and so forth. In an alternative embodiment, a seat belt

receptacle **607** can be affixed to top plate **604**. The location of the seat belt receptacle **607** is not limited by the aforementioned embodiments. The seat belt receptacle **607** and/or tube may be located anywhere on the docking assembly **201** that is easily accessibly by a user.

[0051] In still another alternate embodiment, the embodiments depicted in **Figures 6A-6H** may also be configured to secure two wheelchairs by providing a second receiving member on the opposite side of the docking assembly as the first receiving member **625**. The second receiving member can have its own locking assembly to secure the second wheelchair. In another embodiment, the locking assembly associated with the first receiving member may be adapted to function as the securing means for both the first and second receiving members.

[0052] **Figures 7A-7C** illustrates preferred embodiments of the receiving member **725** having a receiving end section **744** shaped to have a concentric reducer. It further illustrates providing the tubular receiving member **725** with slot **747** to permit the alignment of guide assembly rod **233** to enter into tubular passageway **750**. It still further illustrates the use of gripping pads **799** to fit tubular receiving member **725** into a receiving tube **700** that is fixed to top plate **604**. **Figures 7D-7F** illustrate an alternate preferred construction of receiving member **725** that permits receiving end section **744** to be detachable from main body section **745**. In this embodiment, as shown in **Figures 7D-7F**, main body section **745** has a circular groove **705** into which snap fingers **706** formed on receiving end section **725** can fit and secure the receiving end section **744** to the main body section **745**.

[0053] **Figure 8A** illustrates wheel chair **100** being affixed to docking assembly **201**. **Figure 8B** illustrates an alternate embodiment of the locking pin assembly that can be used to secure alignment rod **233** in receiving member **625**.

[0054] In another alternate embodiment, a device for securing a mobility device **900** may be used with a lifting device that is installed in or on a mobility vehicle or trailer. Referring to **Figure 9**, the device for securing a mobility device **900** comprises a docking assembly **901**, a locking assembly **902**, and a guide assembly **903**. The docking assembly **901** comprises a base plate **119**, e.g. a platform for a mobility device, and at

least one vertical support member. The docking assembly **901** may also include two or more vertical support members **908**, **903** as shown in **Figure 9**. The vertical support member may be vertically adjustable to move the base plate **119** vertically. The locking assembly **902** is affixed to the docking assembly **901**. The locking assembly **902** may be configured in the same manner as the locking assemblies described above for the embodiments shown in **202**. Likewise, the guide assembly **203** may be configured in the same manner as the described above. In an alternate embodiment (not shown), the receiving member **925** may be open at both ends of the main body **929** to allow the alignment rod **233** to engage the receiving member **925** from either side of the receiving member **925**. Both ends of the receiving member **925** may be provided with enlarged receiving ends. As described above, the locking pin may be inserted or retracted into the receiving member **925** manually or automatically.

[0055] In operation, a mobility device, such as a wheelchair or scooter, with a guide assembly affixed to it is moved onto the base plate **119**, such as a mobility device platform. As the mobility device **100** is moved onto the base plate **119**, the alignment rod **233** is inserted into the receiving member **925**. When the alignment rod **233** moves through the receiving member passageway it contacts the end of the locking pin so that it retracts when the alignment rod **233** enters the receiving member passageway. In a preferred embodiment, the end of the locking pin is angled, so that when the alignment rod **233** contacts the end of the locking pin the locking pin is retracted from the receiving member passageway. The alignment rod **233** moves through the receiving member passageway until it is in the fully engaged position. When the alignment rod **233** is in the fully engaged position, the locking pin extends into the window or receiving member passageway. In a preferred embodiment, the locking pin extends into the receiving member passageway behind the end of the alignment rod near the receiving end section **928** to secure the alignment rod **233**. In an alternate embodiment, the alignment rod **233** may be provided with at least one opening configured to engage the locking pin thereby securing the alignment rod **233**, i.e. when the opening on the alignment rod **233** is aligned with the opening on the receiving member **925**, the locking pin extends through both openings to secure the mobility device. To disengage the locking pin, the

release lever manually disengages the locking pin and retracts the locking pin from the receiving member passageway and the mobility device is disengaged.

**[0056]** Although the present invention and its advantages have been described in detail, it should be understood that various changes, substitutions and alterations can be made herein without departing from the spirit and scope of the invention as defined by the appended claims. Moreover, the scope of the present application is not intended to be limited to the particular embodiments of the process, machine, manufacture, composition of matter, means, methods and steps described in the specification. As one of ordinary skill in the art will appreciate from the disclosure of the present invention, processes, machines, manufacture, compositions of matter, means, methods, or steps, presently existing or later to be developed that perform substantially the same function or achieve substantially the same result as the corresponding embodiments described herein may be utilized according to the present invention. Accordingly, the appended claims are intended to include within their scope such processes, machines, manufacture, compositions of matter, means, methods, or steps.

## CLAIMS

What is claimed is:

1. A device for securing a mobility device in a desired position within a mobility vehicle having a floor panel, the mobility device having a chair frame with a seat positioned above a base structure on which a person can sit, the device comprising:
  - a. a docking assembly comprising:
    - i. a base plate fixedly attachable to the vehicle floor panel,
    - ii. at least one vertical support structure extending upward from the base plate, and
    - iii. a top plate attachable to the vertical support structure at a position parallel to and at a pre-determined height from the vehicle floor;
  - b. a locking assembly comprising:
    - i. a receiving member having an interior passageway and affixed to the outer end section of the top plate, the receiving member having a receiving end section, a main body section and a stop end section defining the desired position for the mobility device;
    - ii. a sensor configured to sense and transmit a signal upon sensing the presence of an object entering the enlarged receiving end and into the interior passageway;
    - iii. a locking pin assembly operatively connected to the sensor to receive the signal and positioned to drive a locking pin through an opening in the receiving member and into the interior passageway; and
  - c. a guide assembly for aligning the mobility device into position for locking engagement with the receiving member, the guide assembly comprising:
    - i. a support plate attachable to the mobility device;
    - ii. an alignment rod affixed to the support plate and positioned parallel to and outside the one side of the mobility device at a height from the vehicle floor to align with the receiving member passageway, the alignment rod being sized to extend into the passageway.
2. The device for securing a mobility device according to claim 1, wherein the vertical support member comprises at least one tubular shaped support structure.

3. The device for securing a mobility device according to claim 1, wherein one or more auxiliary elements are attachable to the docking assembly.
4. The device for securing a mobility device according to claim 1, wherein the locking pin extends into the receiving member passageway near the receiving end section to secure the alignment rod.
5. The device for securing a mobility device according to claim 1, wherein the top plate is attached to at least one vertical support structure and the top plate is adjustable to permit variance in the position of the receiving member from the docking assembly.
6. The device for securing a mobility device according to claim 1, wherein the receiving end section of the receiving member formed is a tubular member having a “D” shaped cross-section of diminishing size from the enlarged receiving opening to the smaller inner passageway opening.
7. A device for securing a mobility device in a desired position within a mobility vehicle having a floor panel, the mobility device having a chair frame with a seat positioned above the base structure on which a person can sit, the device comprising:
  - a. a docking assembly comprising:
    - i. a base plate fixedly attachable to the vehicle floor panel,
    - ii. wall members affixed to and extending vertically upward from the base plate,
    - iii. a support member affixed perpendicularly between and to the wall members, and
    - iv. a positioning member attachable to the support member or side wall members whereby the positioning member is fixedly positioned parallel to and at a pre-determined height from the vehicle floor, the positioning member having an outer end section extending outward and past the opposing side wall members;
  - b. a locking assembly comprising:
    - i. a tubular receiving member having an interior passageway and affixed to the outer end section of the positioning member, the receiving member having a receiving end section, a main body section and a stop end section defining the desired position for the mobility device;

- ii. a sensor affixed to the receiving member to sense and transmit a signal upon sensing the presence of an object entering the enlarged receiving end and into the interior passageway;
    - iii. a locking pin assembly operatively connected to the sensor to receive the signal and positioned to drive a locking pin through an opening in the tubular receiving member and into the interior passageway; and,
  - c. a guide assembly for aligning the mobility device into position for locking engagement with the receiving member, the guide assembly comprising:
    - i. a support plate attachable to the mobility device,
    - ii. an arm member affixed to the support plate and extending out from one side of the mobility device;
    - iii. an alignment rod affixed to the arm member and having an opening extending through the rod, the alignment rod positioned parallel to and outside the one side of the mobility device at a height from the vehicle floor to align with the receiving member passageway, the alignment rod being sized to extend into the passageway whereby the alignment rod opening can be aligned with the tubular receiving member opening to receive the locking pin.
8. The device for securing a mobility device according to claim 7, wherein the receiving end formed of one or more sloped side walls forming an enlarged receiving opening and a smaller inner passageway opening.
9. The device for securing a mobility device according to claim 7, wherein the docking assembly support member comprises a wall panel extending upward from the base plate a height of the side wall members.
10. The device for securing a mobility device according to claim 7, wherein the positioning member is pivotally attachable to the support member whereby it can be pivoted to fit into the space formed by the base plate, the opposing side wall members and the support member.
11. The device for securing a mobility device according to claim 7, wherein the tubular receiving member has a length whereby the mobility device is positioned at the desired position when the alignment rod has been fully inserted into the receiving member passageway.

12. The device for securing a mobility device according to claim 7, wherein the sensor is a micro switch positioned to be activated by the alignment rod when it is at the desired position, the locking pin assembly is a solenoid operatively connected to the micro switch that upon receiving a signal that the alignment rod has activated the micro switch disengages the locking pin and extends the locking pin through the receiving member opening and into the alignment rod opening.
13. The device for securing a mobility device according to claim 7, wherein the support plate is positioned between the chair frame and the chair frame.
14. The device for securing a mobility device according to claim 7, wherein the locking assembly comprises first and second sensors, the first sensor is positioned to sense the alignment rod entering the receiving end, the second sensor is positioned to sense the alignment rod opening being aligned with the receiving member opening, the first sensor operatively connected to the locking pin assembly to cause the locking pin assembly to position the locking pin outside of the passageway, the second sensor operatively connected to the locking pin assembly to then cause the locking pin assembly to position the locking pin through the receiving member opening and into the alignment rod opening.
15. The securing device according to claim 14 wherein:
  - a. the tubular receiving member having a first opening in the receiving end and a second opening in the main body section, the alignment rod having a first opening and a second opening positioned to align with the first and second openings of the receiving member, respectively, when the alignment rod has been fully extended into the passageway,
  - b. the first sensor upon sensing the presence of the alignment rod in the receiving end signals a first locking pin assembly and a second locking pin assembly to lift a first locking pin and a second locking pin, respectively, out of the passageway, and
  - c. the second sensor upon sensing the presence of the alignment rod fully extended into the passageway signals the first locking pin assembly and the second locking pin assembly to position the first pin and the second pin, respectively into the passageway and through the first and second opening of the receiver member and into the first and second opening of the alignment rod, respectively.

16. A device for securing a mobility device according to claim **15**, wherein the stop end section comprises a stop member positioned in the passageway, the stop member structured to prohibit the alignment rod from further forward movement and defining the desired position.
17. A securing device for securing up to two mobility devices in desired positions within a mobility vehicle having a floor panel, each of the mobility devices having a motor in a base structure of the mobility device and a chair frame having a seat positioned above the base structure on which a person can sit comprising:
  - a. a docking assembly comprising:
    - i. a base plate fixedly attachable to the vehicle floor panel,
    - ii. at least one vertical support structure extending upward from the base plate; and,
    - iii. a top plate attachable to the vertical support structure at a position parallel to and at a pre-determined height from the vehicle floor;
  - b. a first locking assembly comprising:
    - i. a first receiving member forming an interior passageway and affixed to the outer end section, the first receiving member having a receiving end and a stop end;
    - ii. a first sensor to sense and transmit a signal upon sensing the presence of an object entering the enlarged receiving end and into the receiving member,
    - iii. a first locking pin assembly operatively connected to the first sensor to receive the signal and positioned to move a locking pin through an opening in the receiving member and into the interior passageway;
  - c. a second locking assembly comprising:
    - i. a second receiving member forming an interior passageway and affixed to the outer end section, the second receiving member having a receiving end and a stop end;
    - ii. a second sensor affixed to the receiving member to sense and transmit a signal upon sensing the presence of an object entering the enlarged receiving end and into the receiving member, and

- iii. a second locking pin assembly operatively connected to the second sensor to receive the signal and positioned to move a locking pin through an opening in the receiving member and into the interior passageway;
  - d. a first guide assembly for aligning one of the mobility devices into position for locking engagement with the first receiving member, the first guide assembly comprising:
    - i. a first support plate attachable to the mobility device,
    - ii. a first alignment rod affixed to the first support plate and positioned parallel to and outside the one side of the mobility device at a height from the vehicle floor to align with the first receiving member passageway, the alignment rod being sized to extend into the passageway; and,
  - e. a second guide assembly for aligning another of the mobility devices into position for locking engagement with the second receiving member, the second guide assembly comprising:
    - i. a second support plate attachable to the other of the mobility devices,
    - ii. a second alignment rod affixed to the second support plate and positioned parallel to and outside the one side of the mobility device at a height from the vehicle floor to align with the second receiving member passageway, the alignment rod being sized to extend into the passageway.
18. A device for securing a mobility device in a desired position on a lifting device that is installed in or on a mobility vehicle or trailer, the mobility device having a chair frame with a seat positioned above the base structure on which a person can sit, the device comprising:
- a. a docking assembly comprising:
    - i. a base plate; and,
    - ii. at least one vertical support structure extending upward from the base plate;
  - b. a locking assembly comprising:
    - i. a receiving member having an interior passageway and affixed to the docking assembly, the receiving member having a receiving end section, a

- main body section and a stop end section defining the desired position for the mobility device;
  - ii. a locking pin assembly to drive a locking pin through an opening in the receiving member and into the interior passageway; and
  - c. a guide assembly for aligning the mobility device into position for locking engagement with the receiving member, the guide assembly comprising:
    - i. a support plate attachable to the mobility device;
    - ii. an alignment rod affixed to the support plate and positioned parallel to and outside the one side of the mobility device at a height from the base plate to align with the receiving member passageway, the alignment rod being sized to extend into the passageway.
19. The device for securing a mobility device of claim **18**, wherein securing device is secured to a towing hitch on a vehicle, and wherein the locking pin extends into the receiving member passageway near the receiving end section to secure the alignment rod.
20. The device for securing a mobility device of claim **18**, wherein the locking assembly has a sensor configured to sense and transmit a signal upon sensing the presence of an object entering the receiving end and into the interior passageway; and the locking assembly is operatively connected to the sensor to receive the signal and positioned to drive a locking pin through an opening in the receiving member and into the interior passageway.

Fig 1B

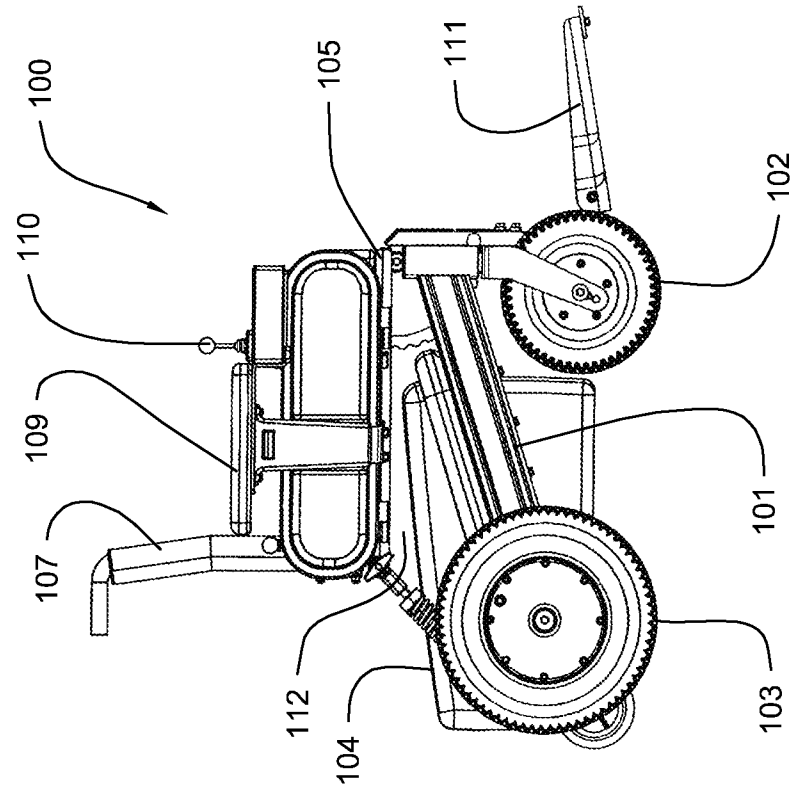
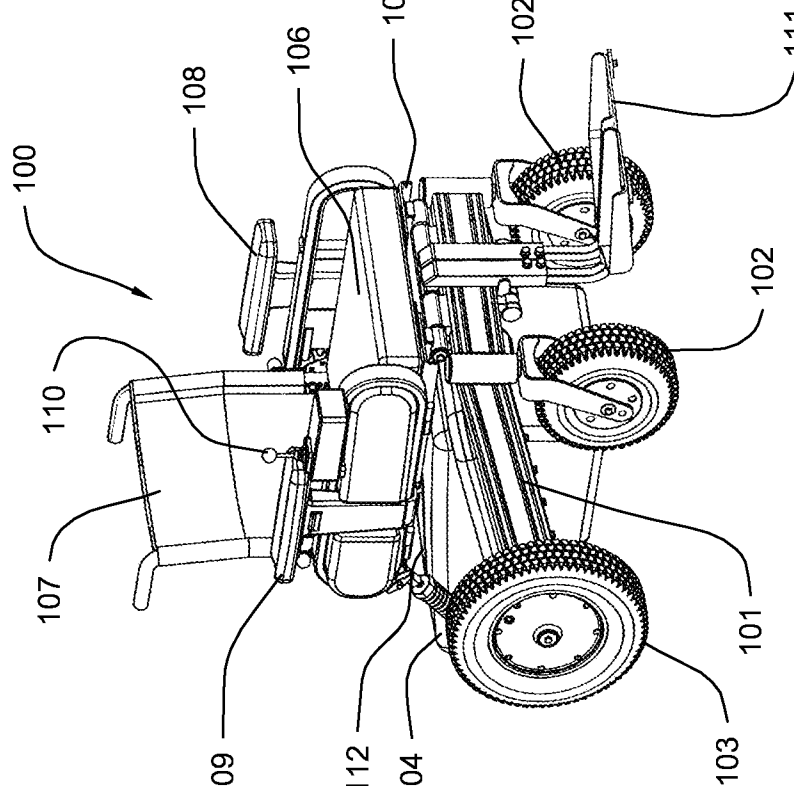


Fig 1A



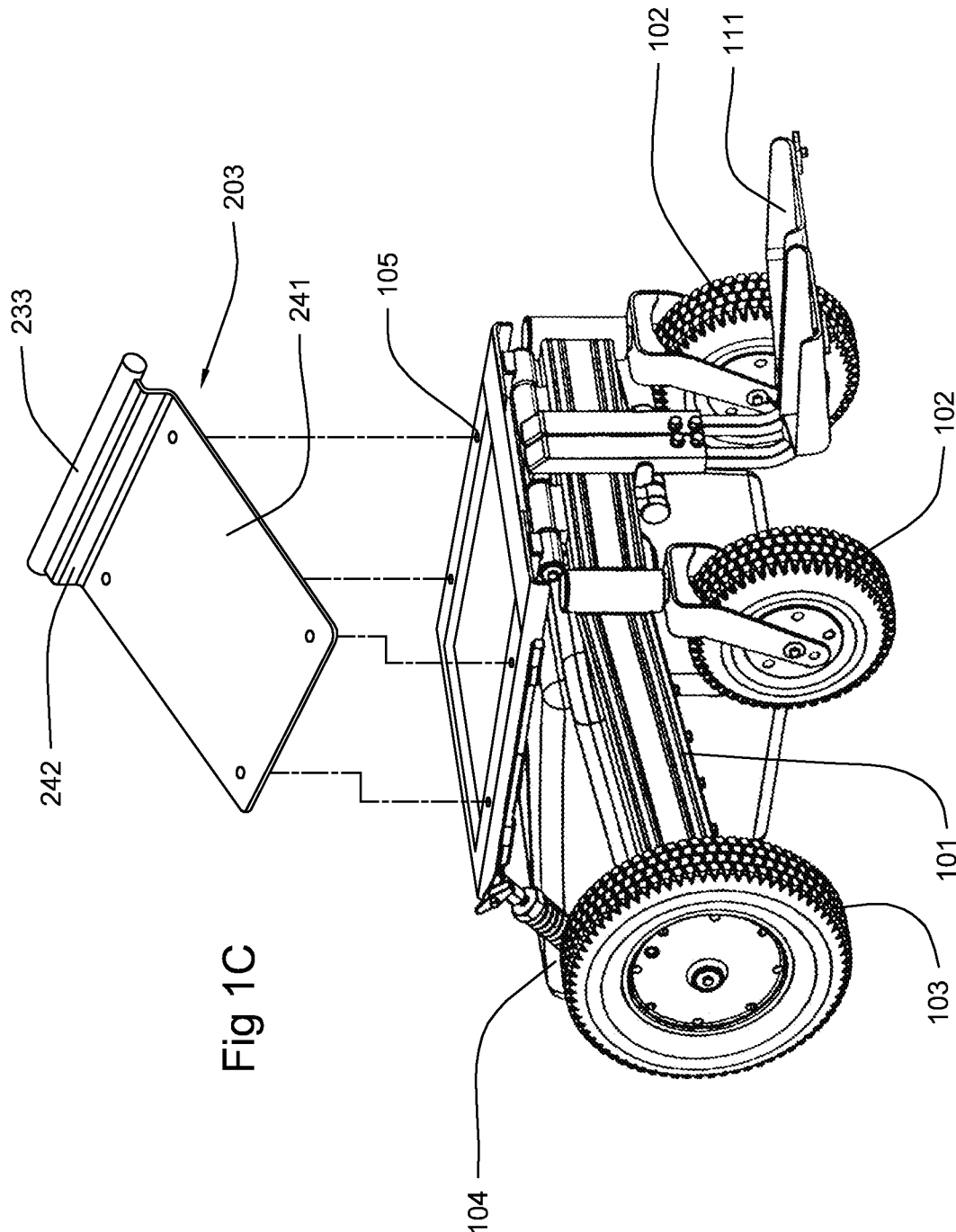


Fig 1C

Fig 2A

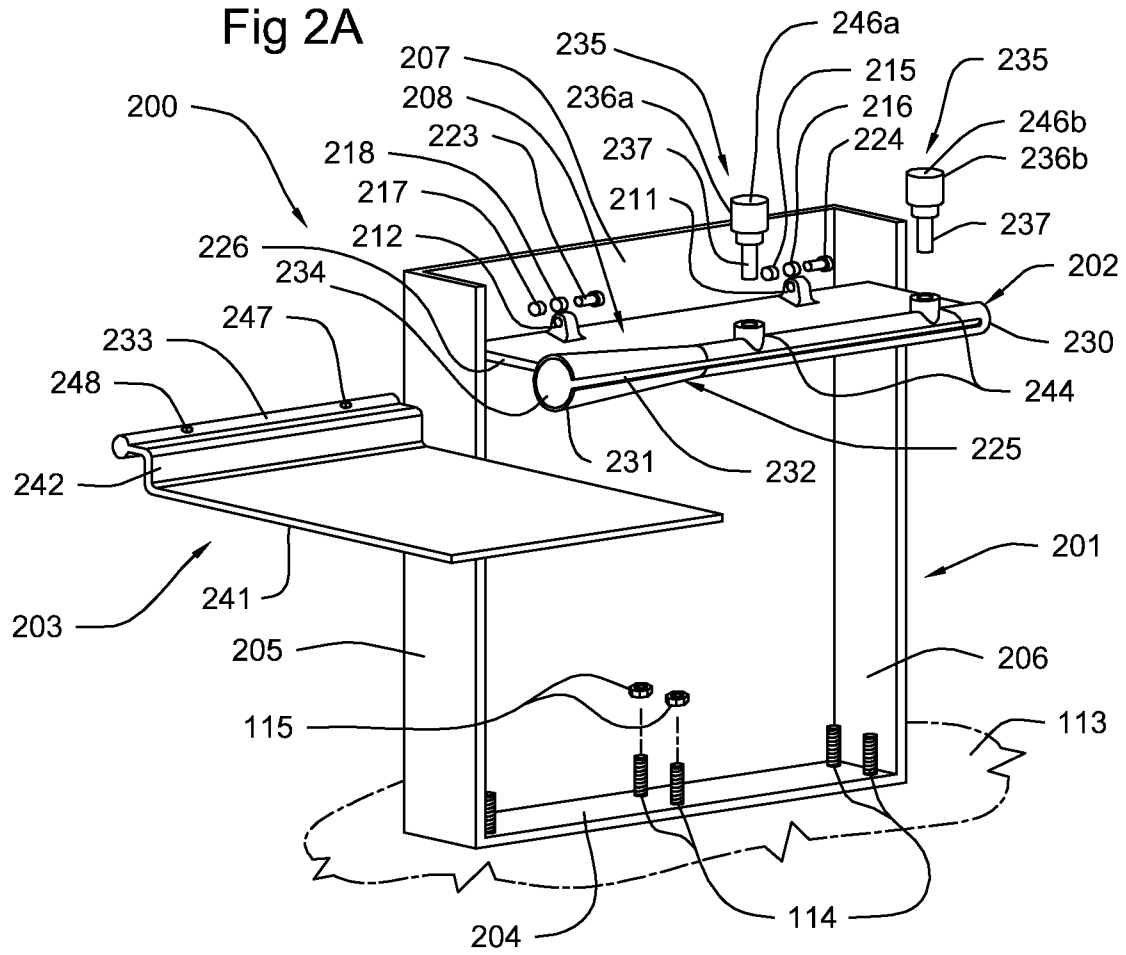
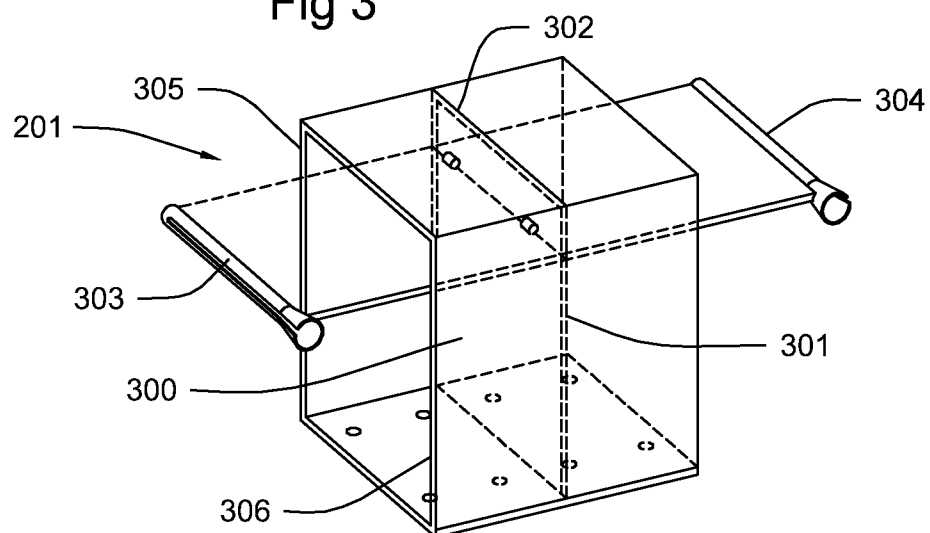
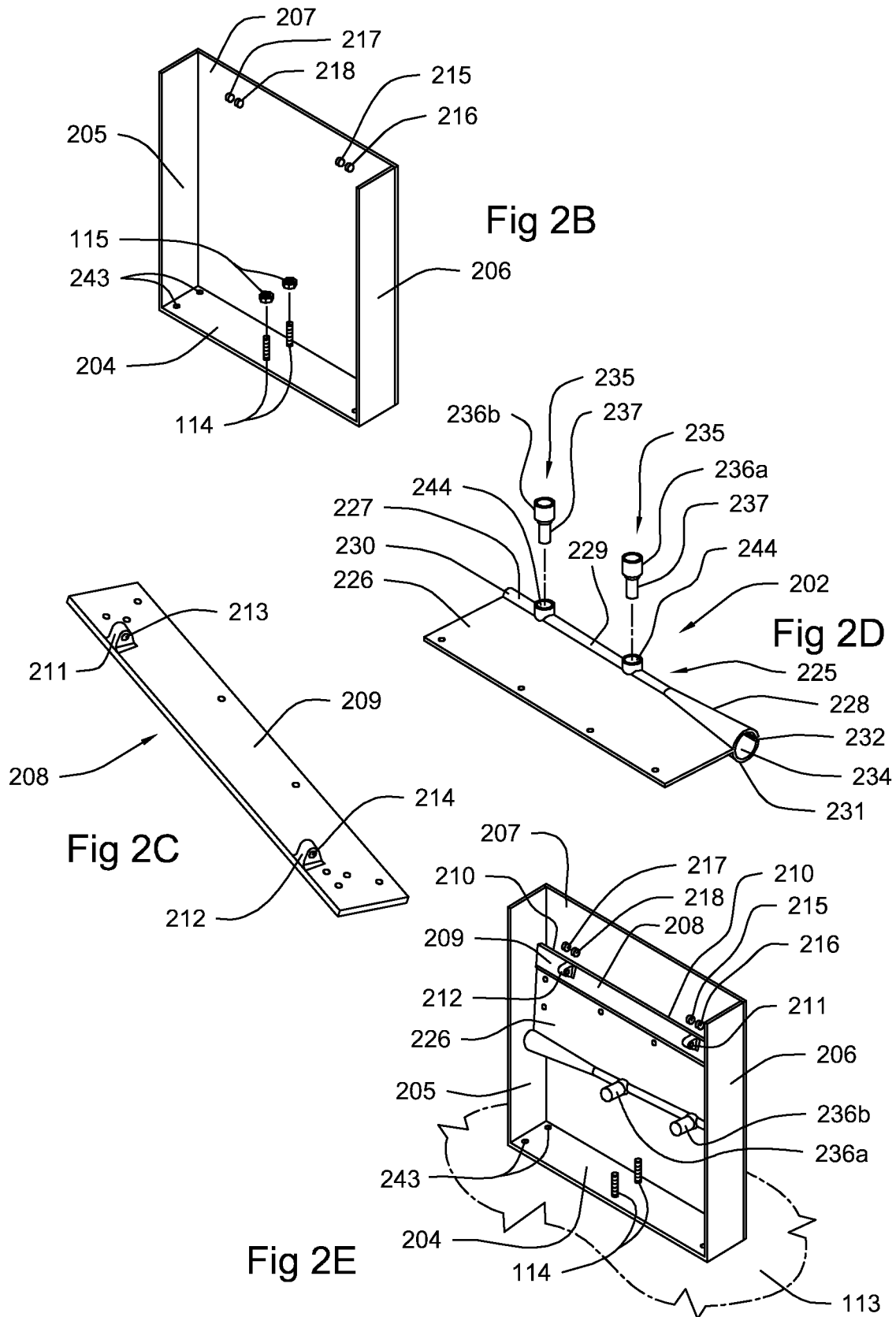
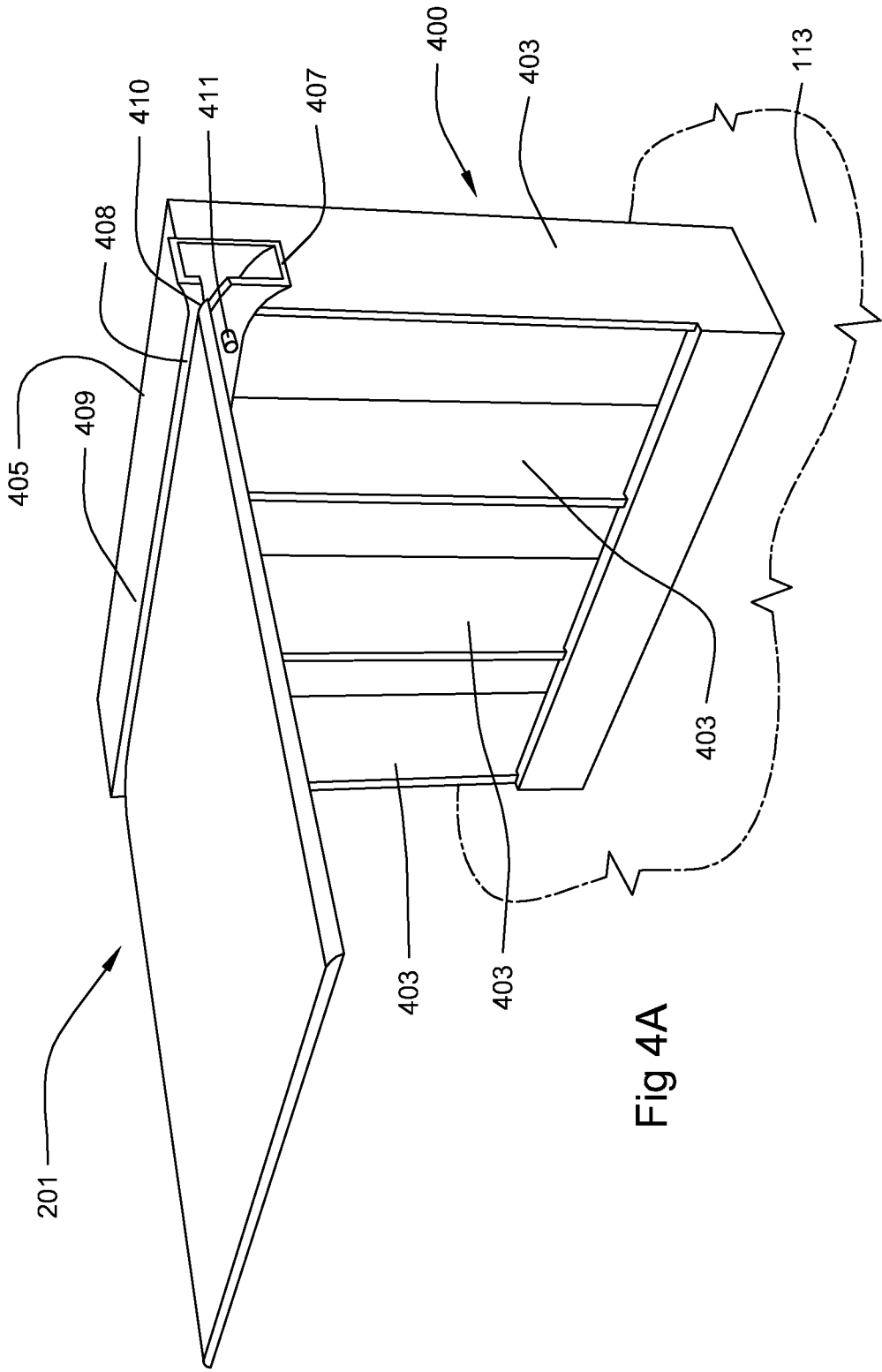


Fig 3



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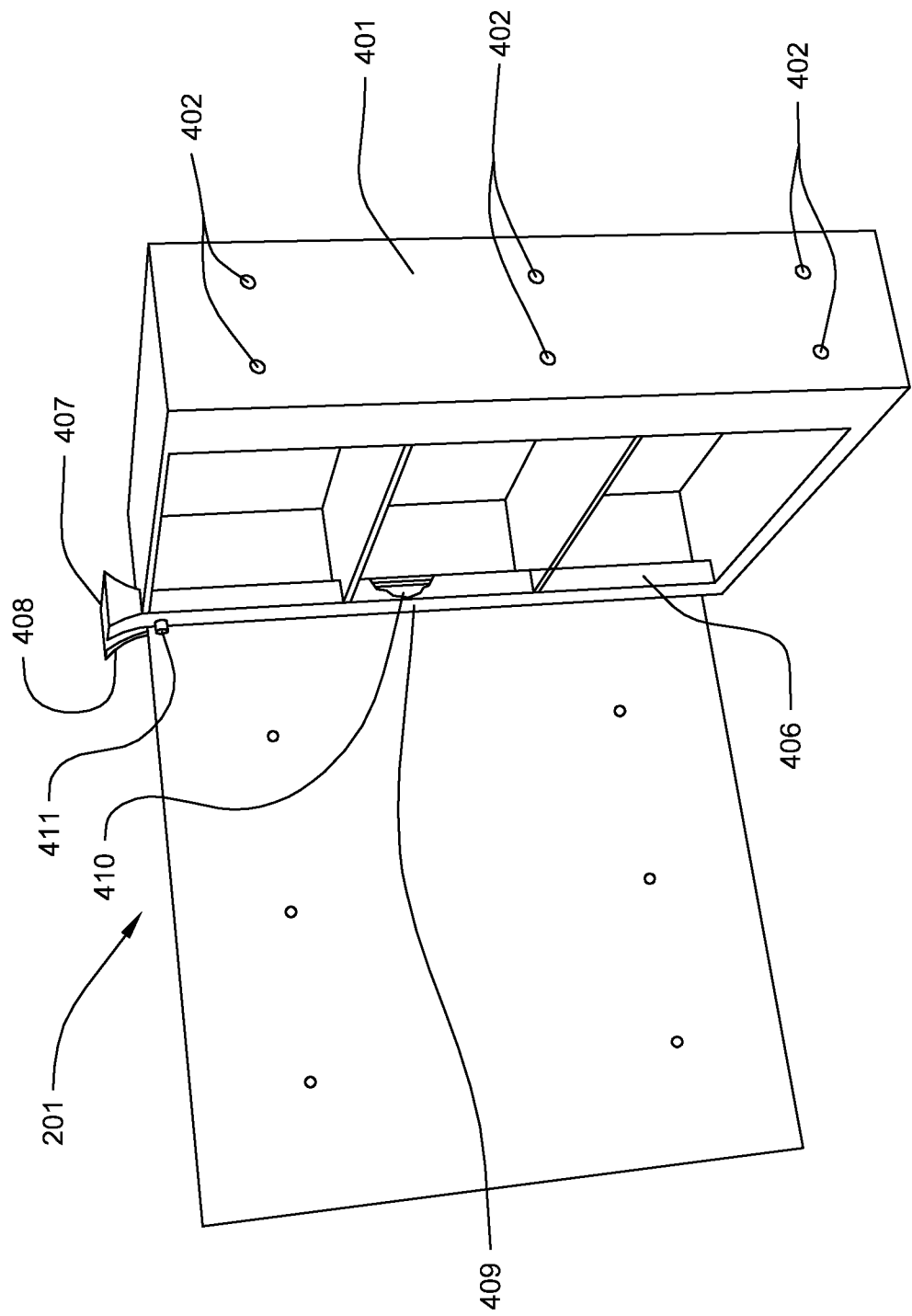


Fig 4B

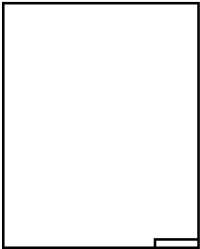


Fig 5B

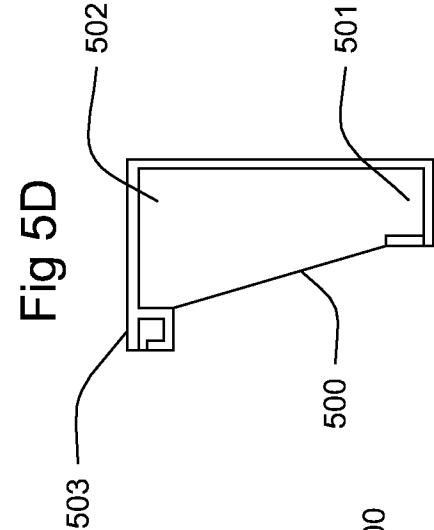


Fig 5D

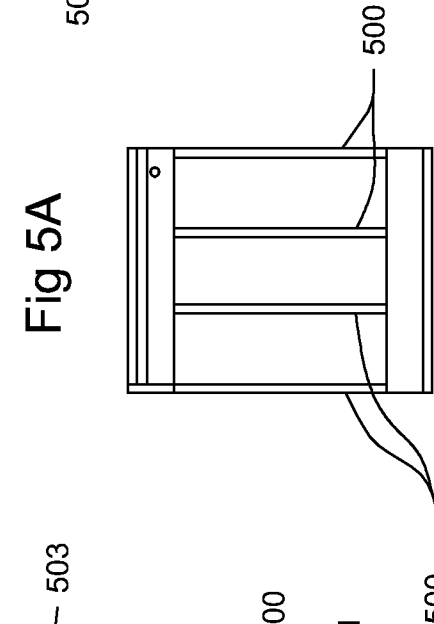


Fig 5A

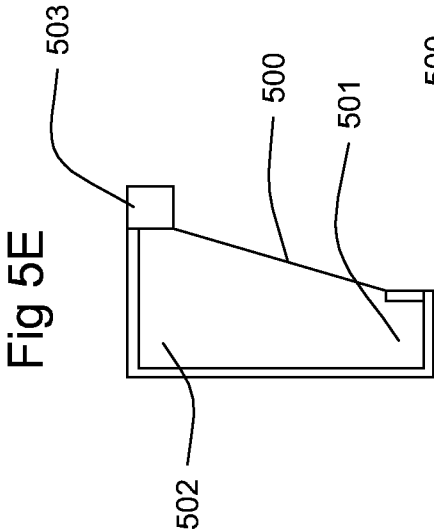
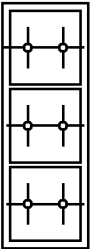
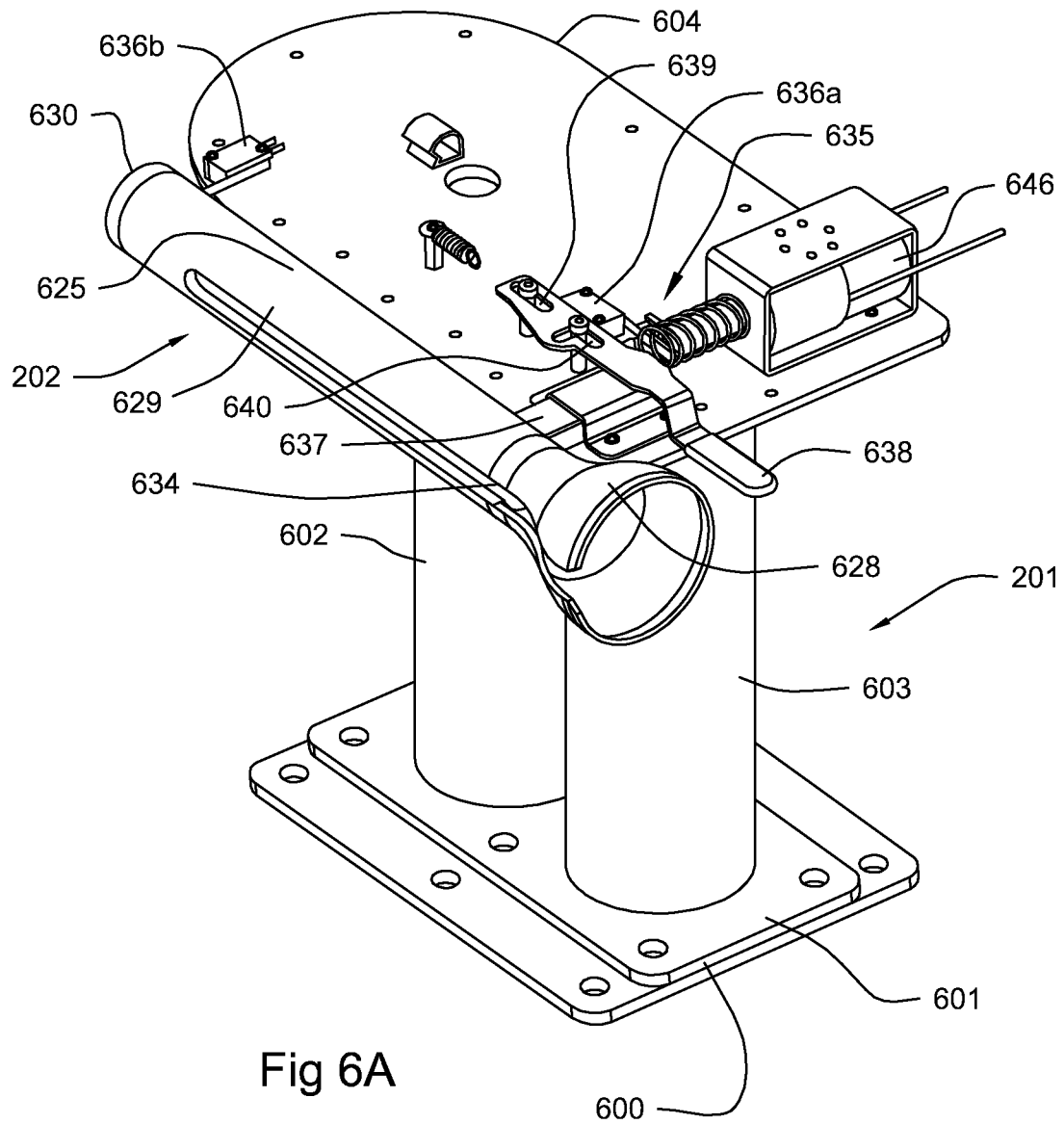


Fig 5E

Fig 5C





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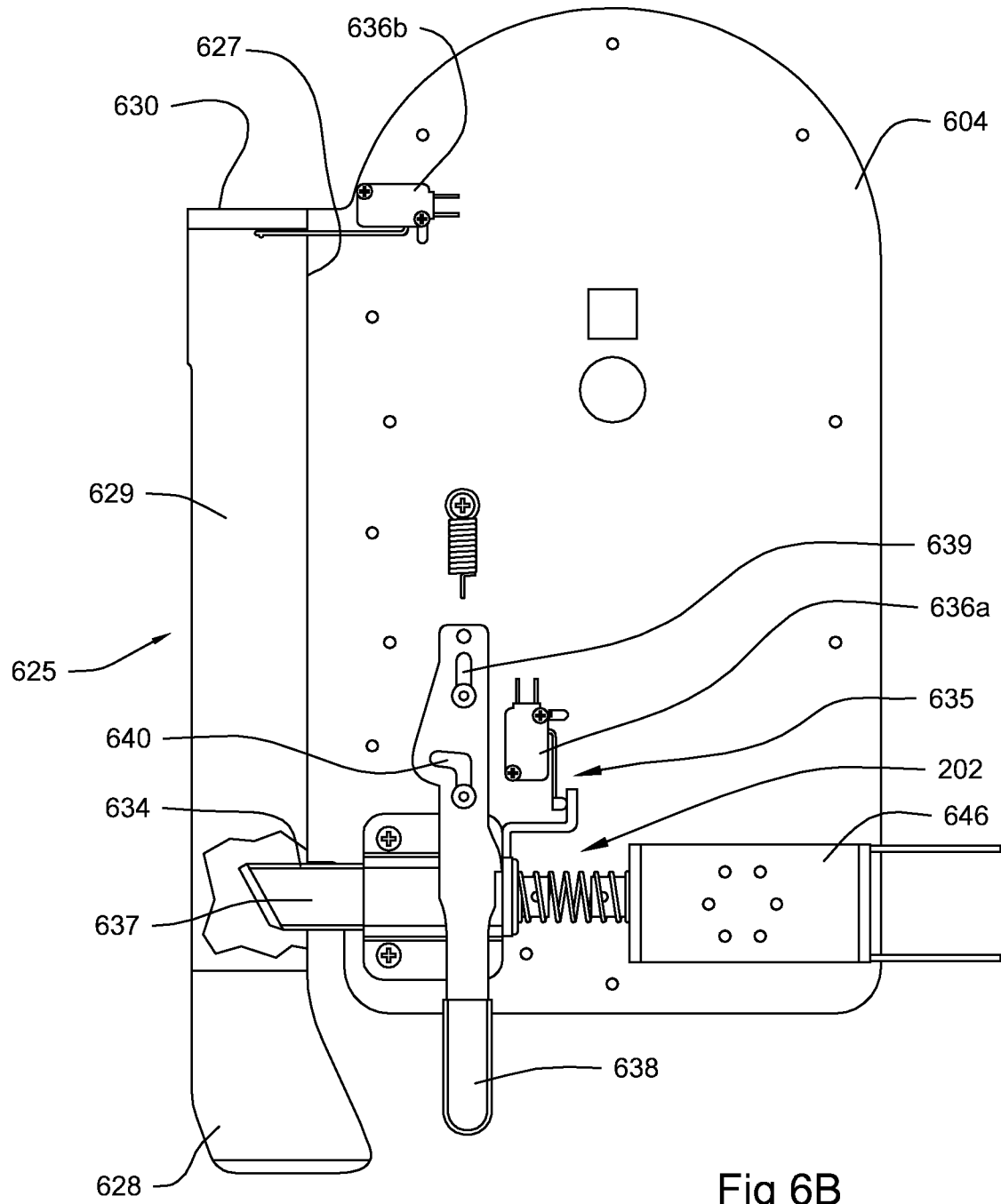
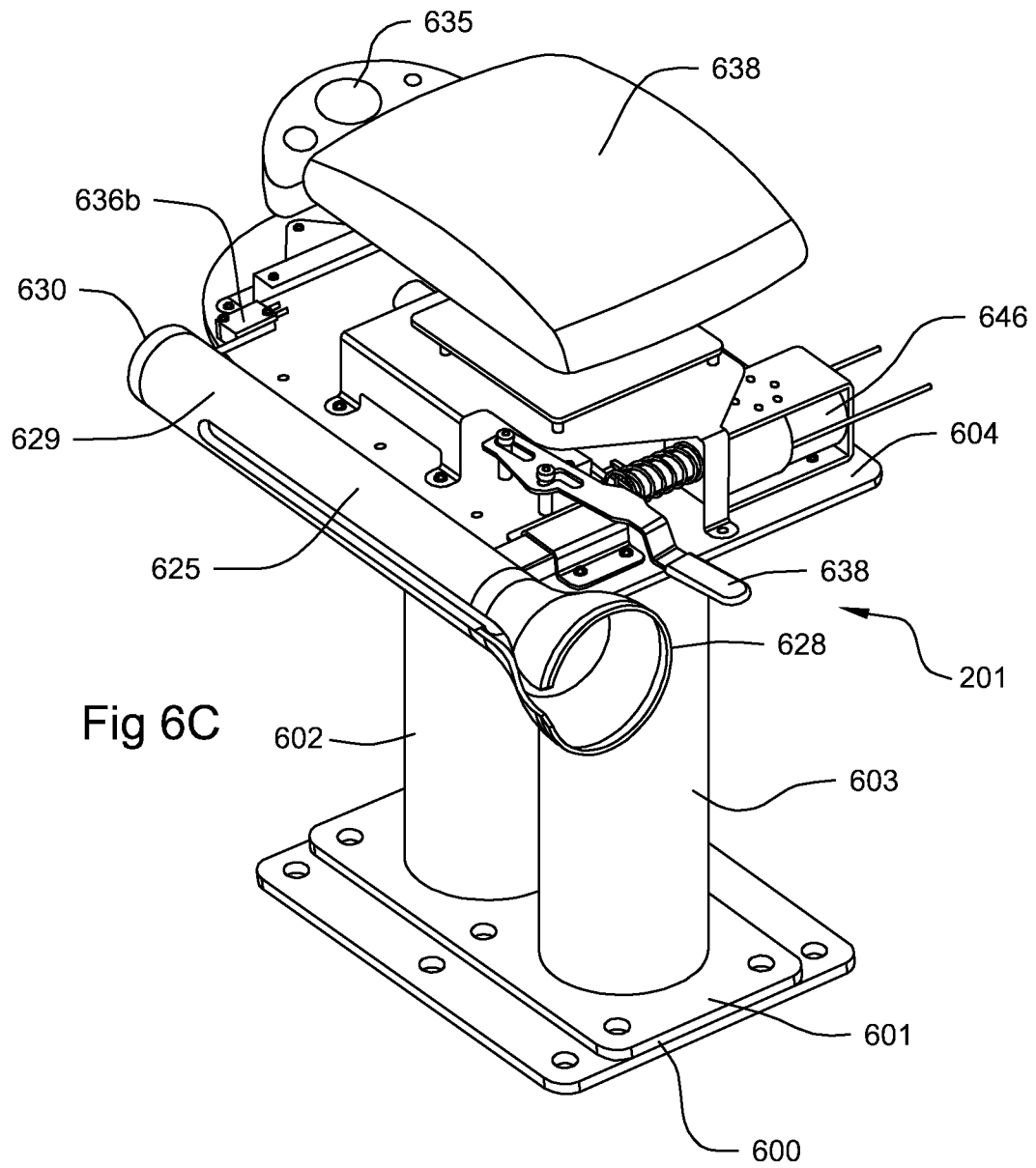
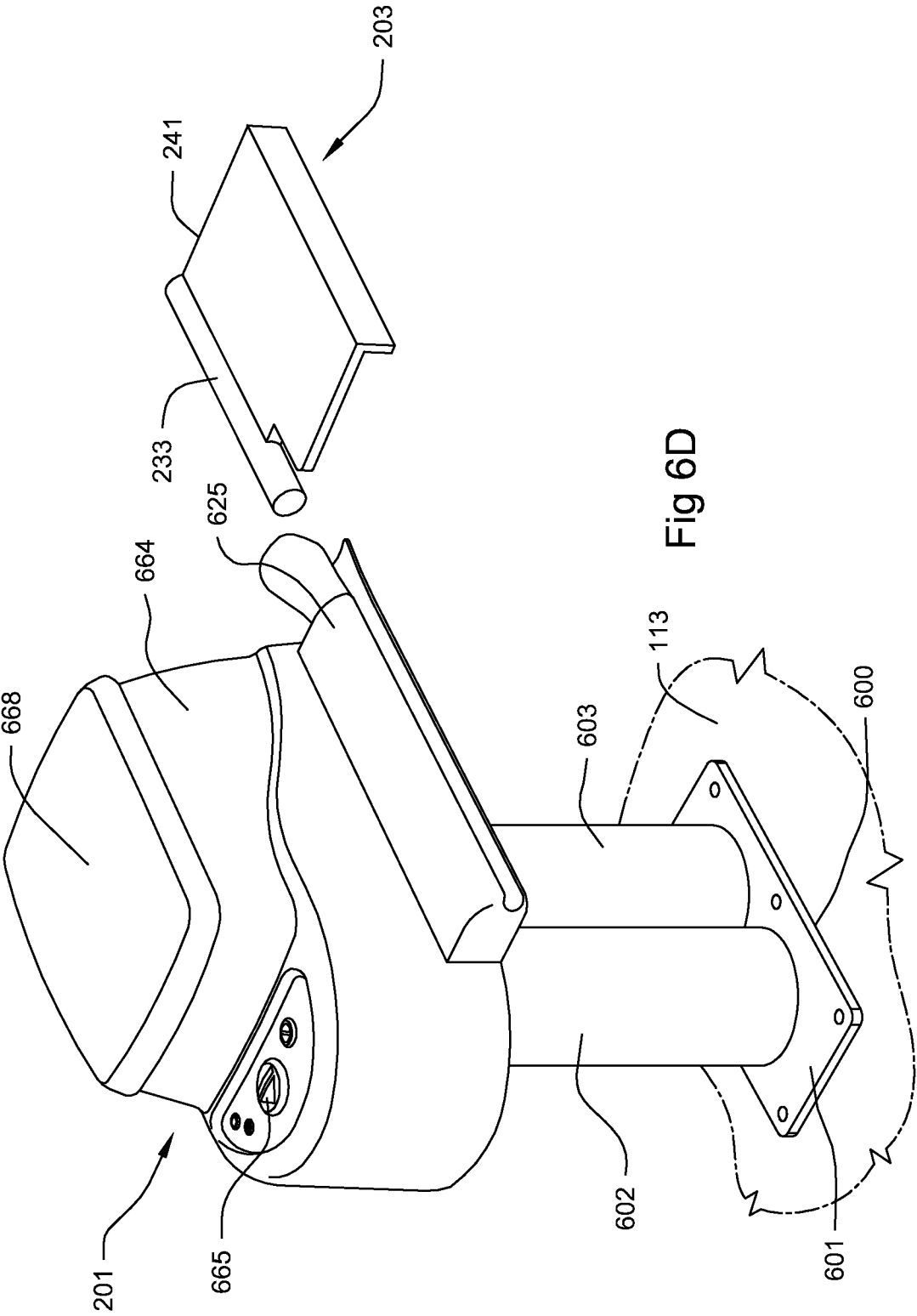
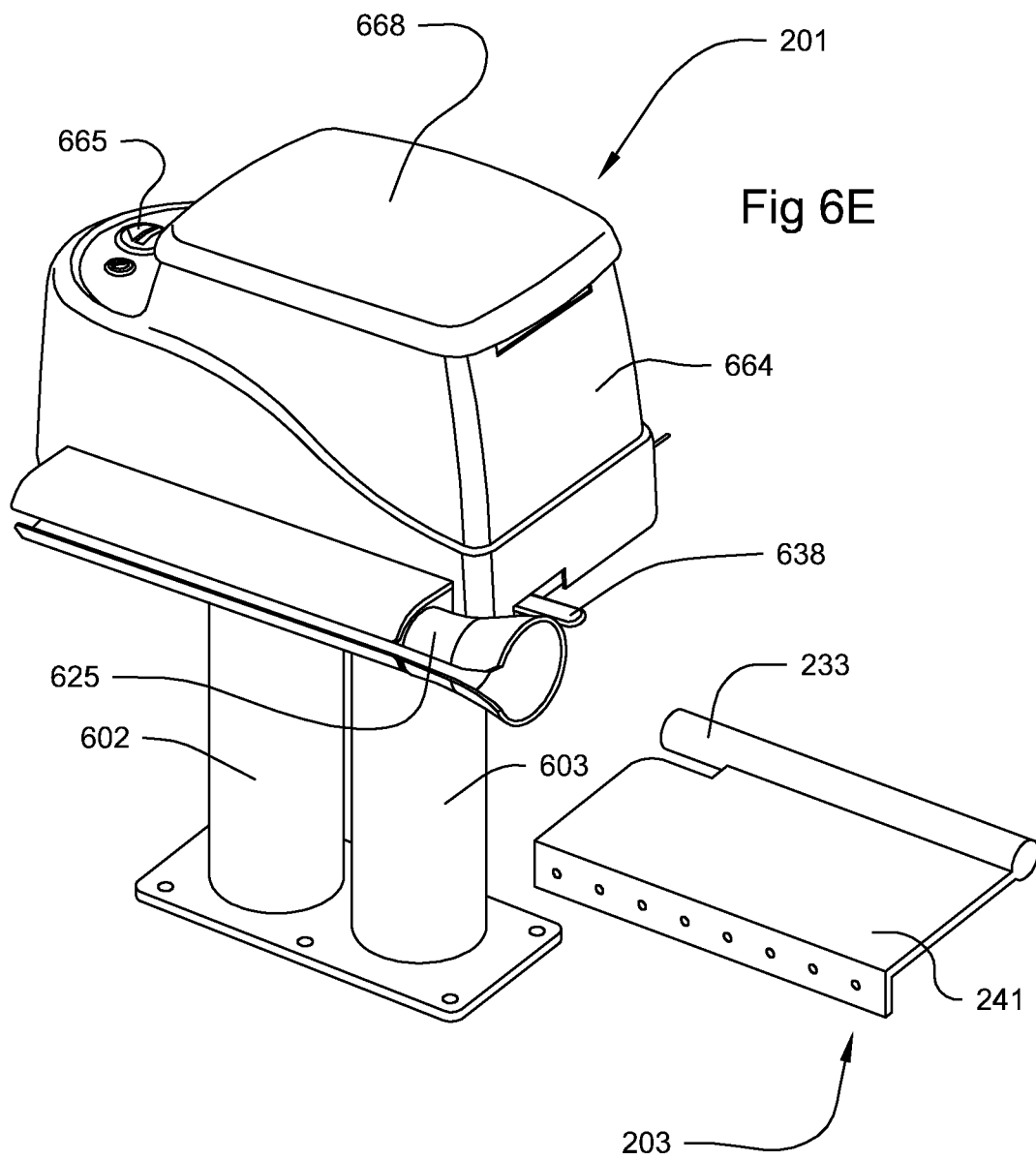


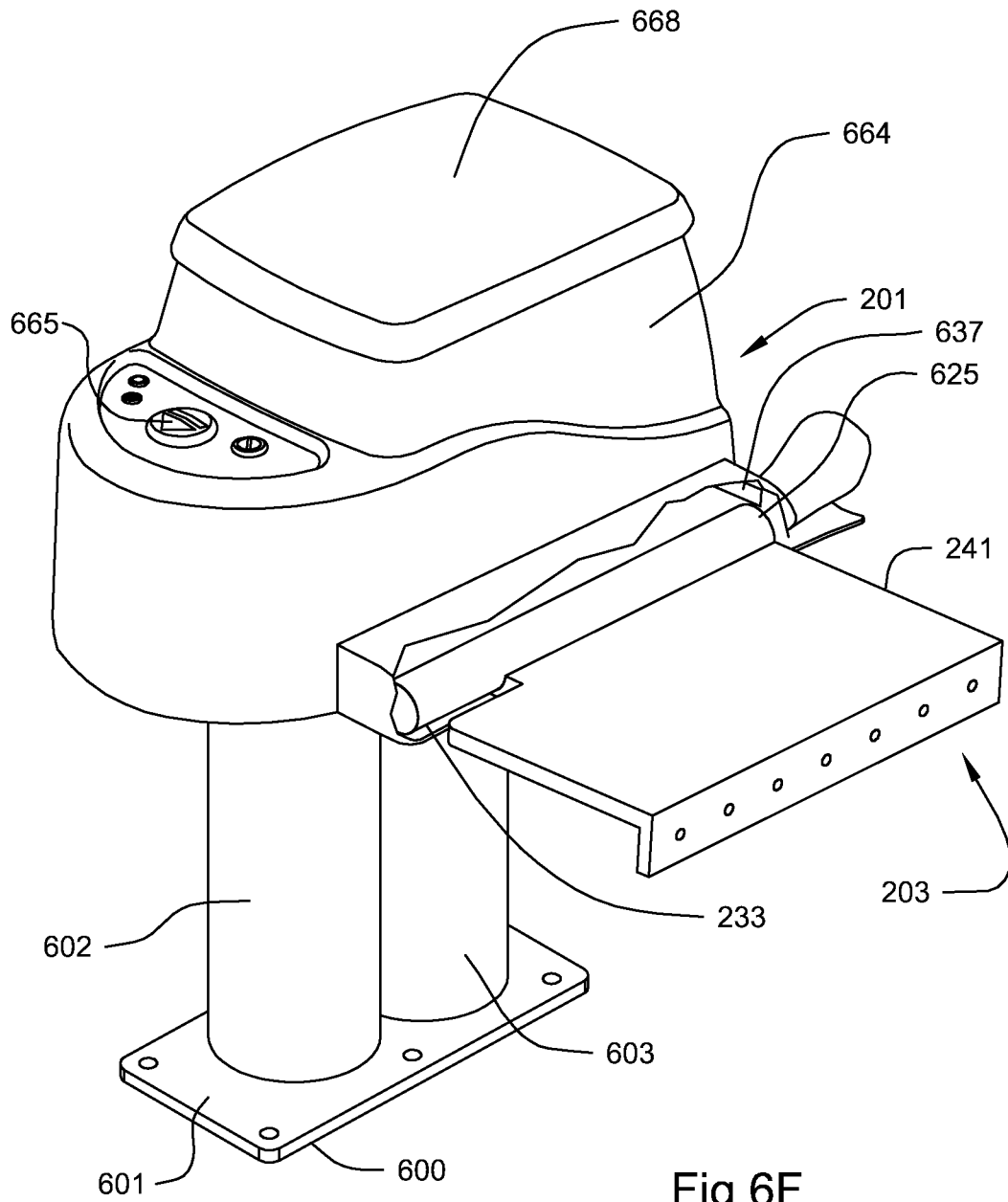
Fig 6B





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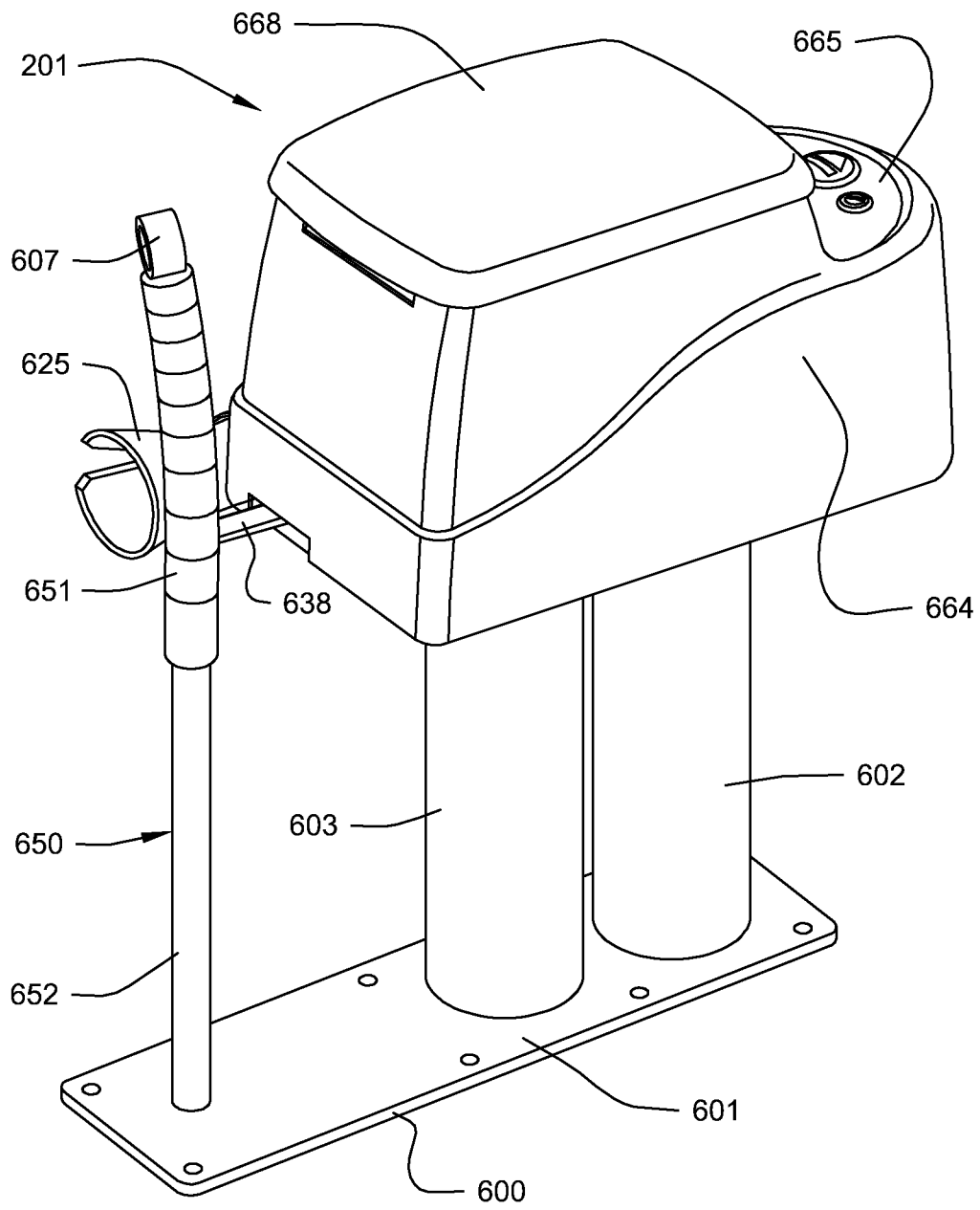
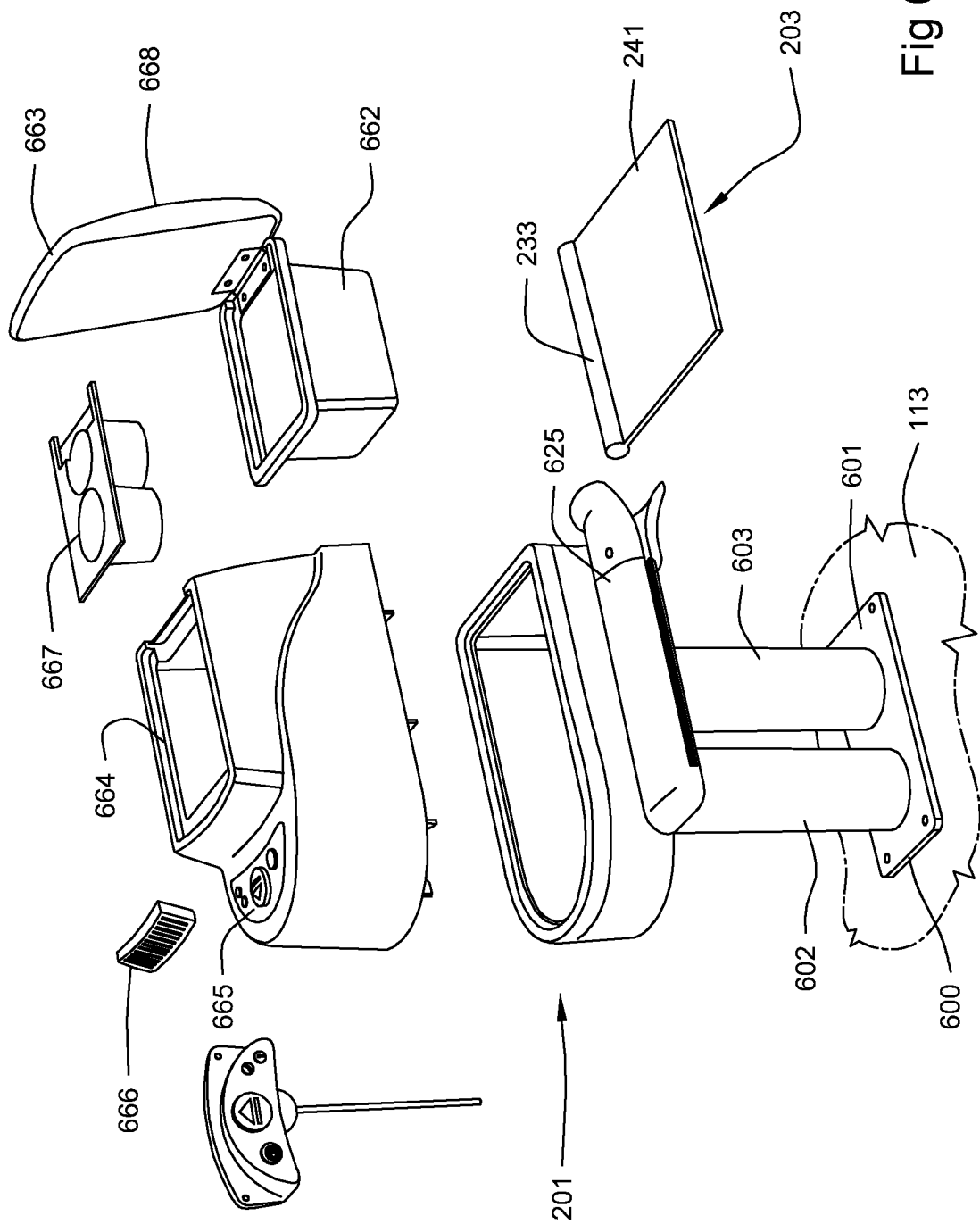


Fig 6G



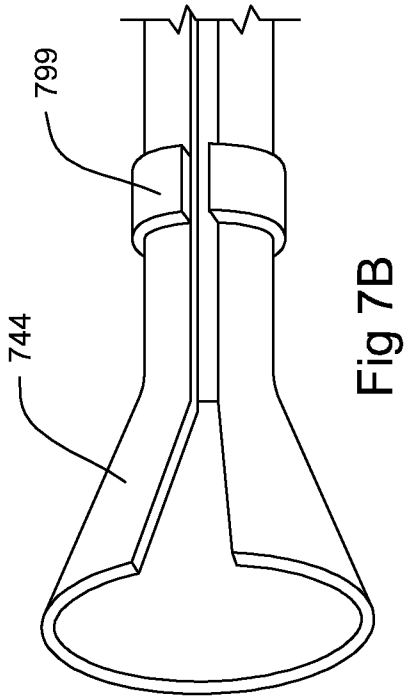
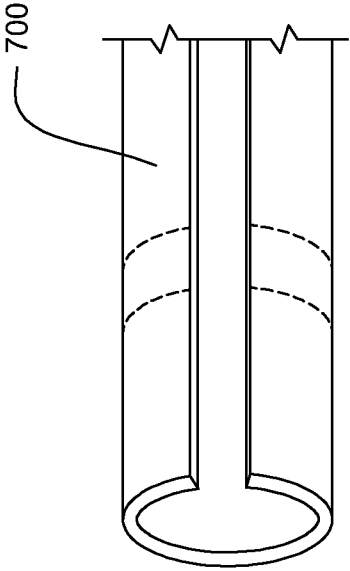
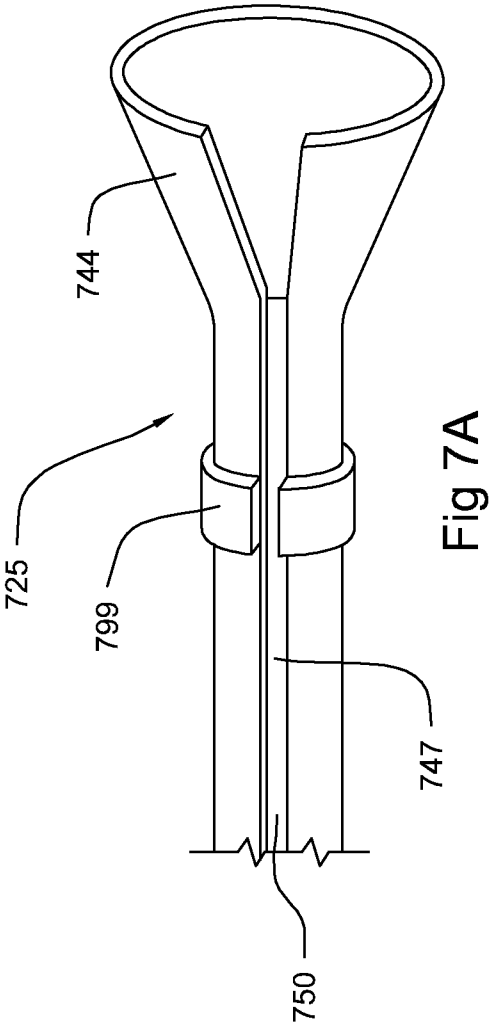
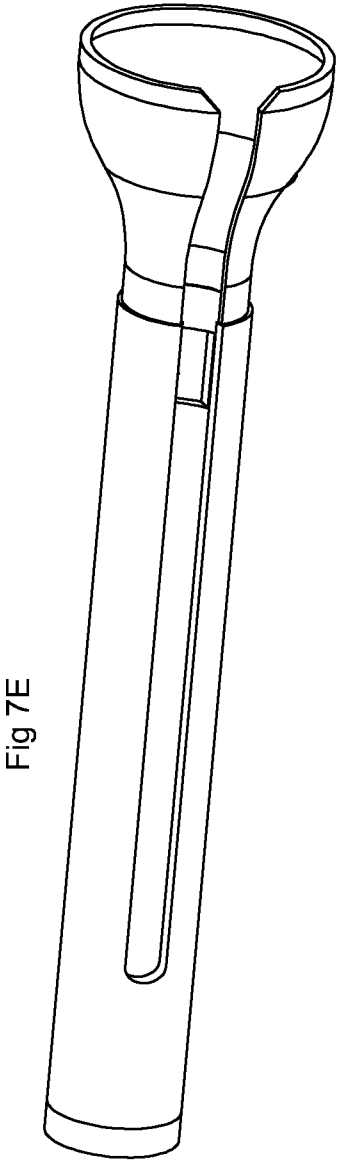
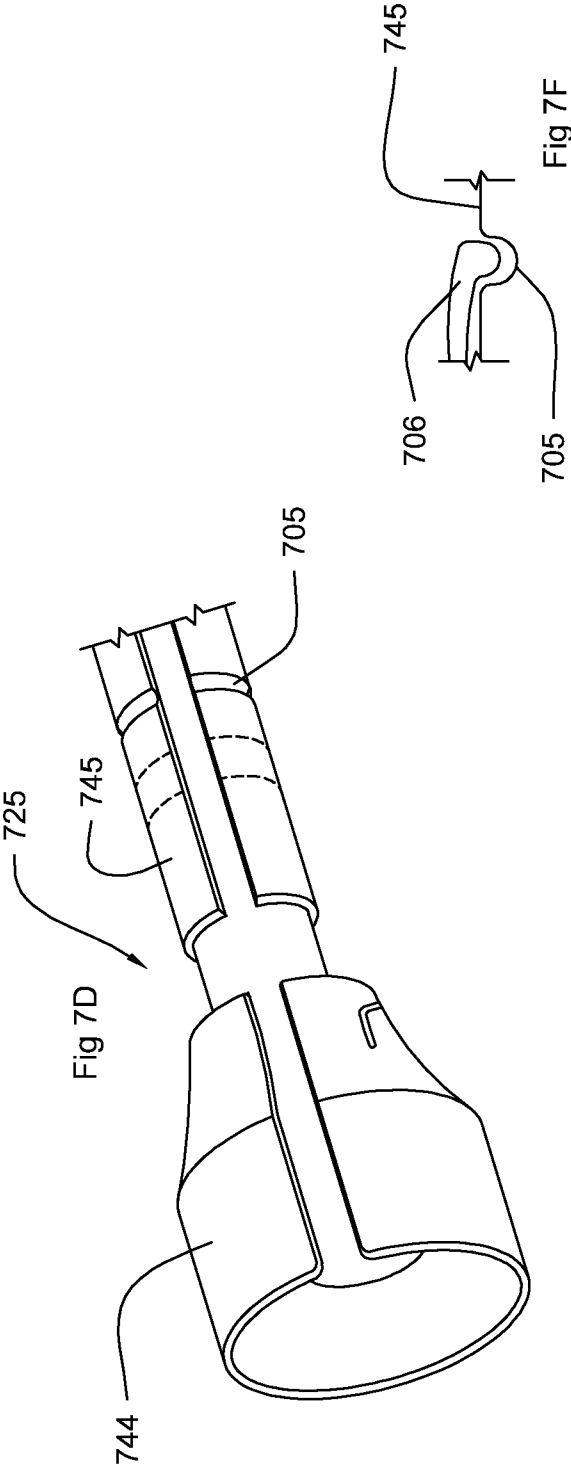


Fig 7C

Fig 7B

Fig 7A



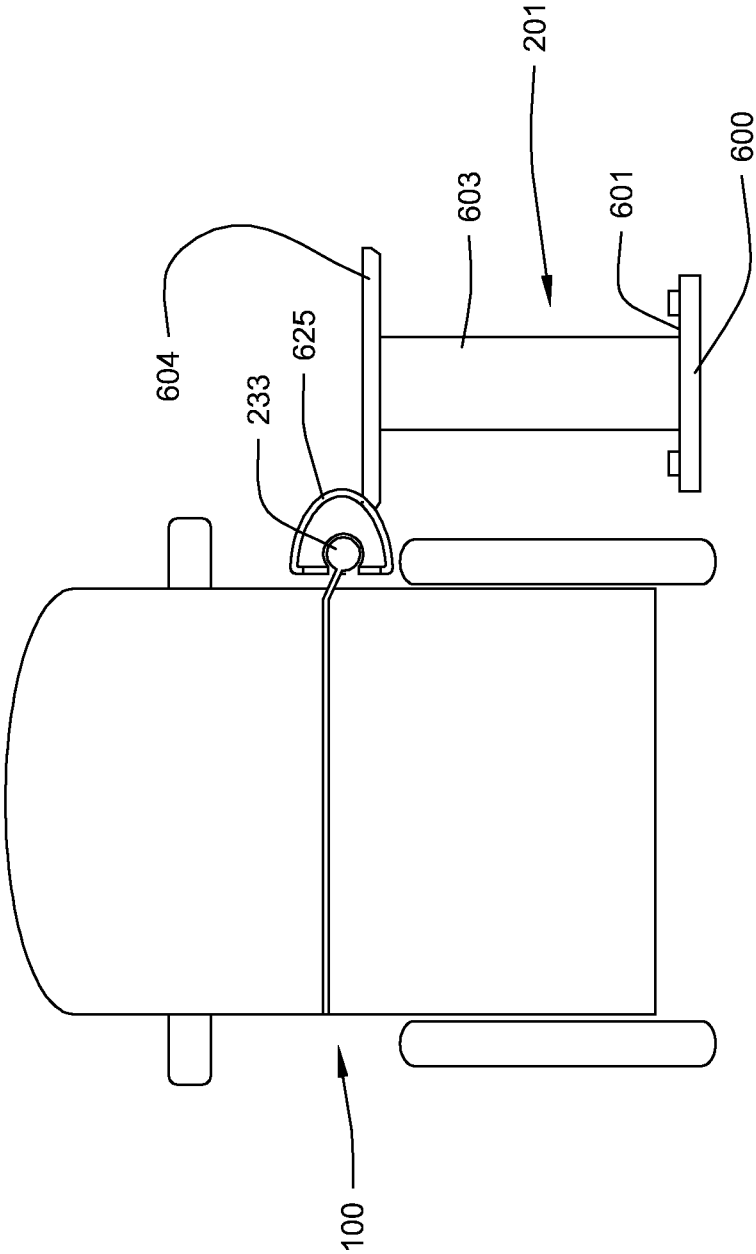


Fig 8A

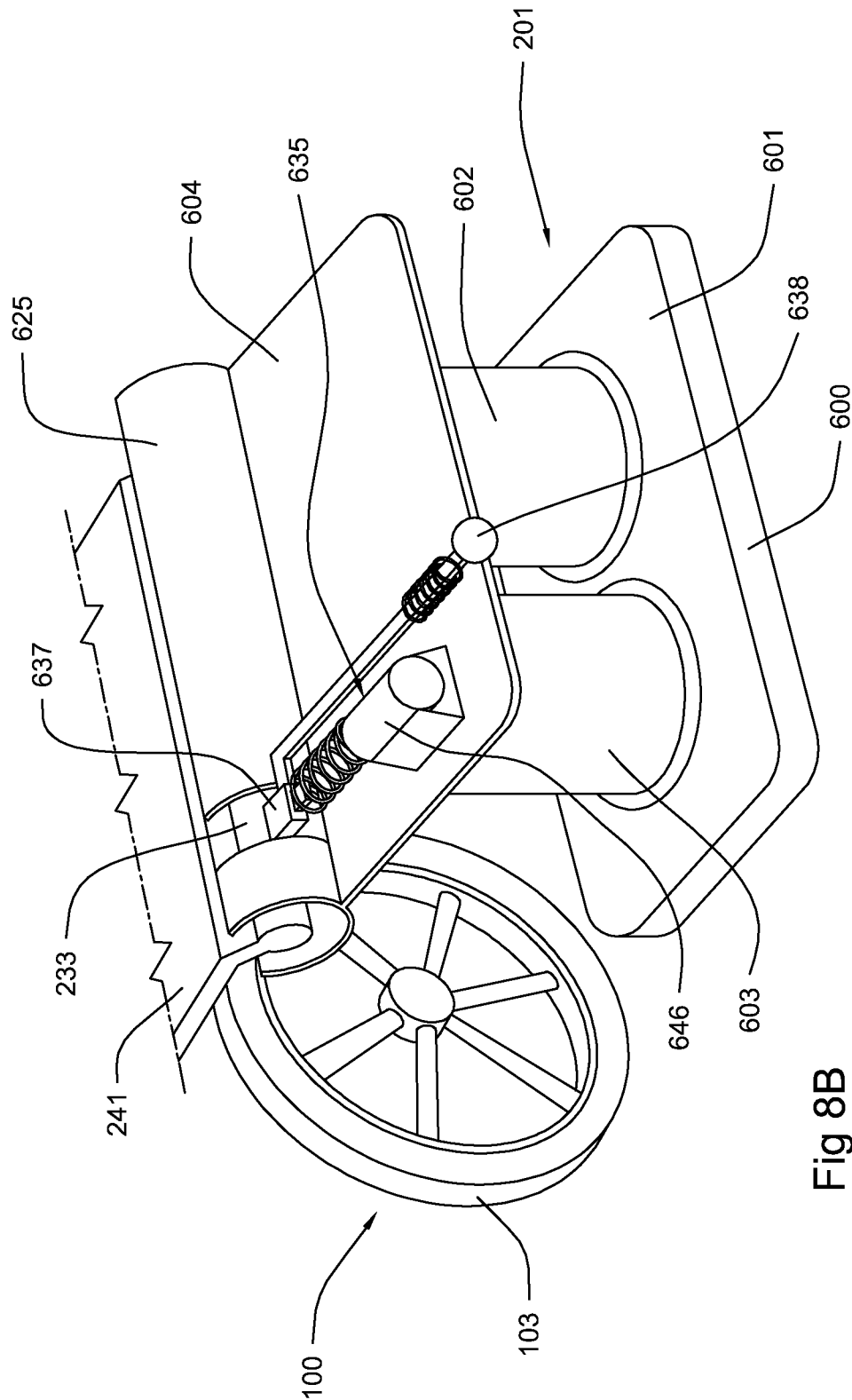
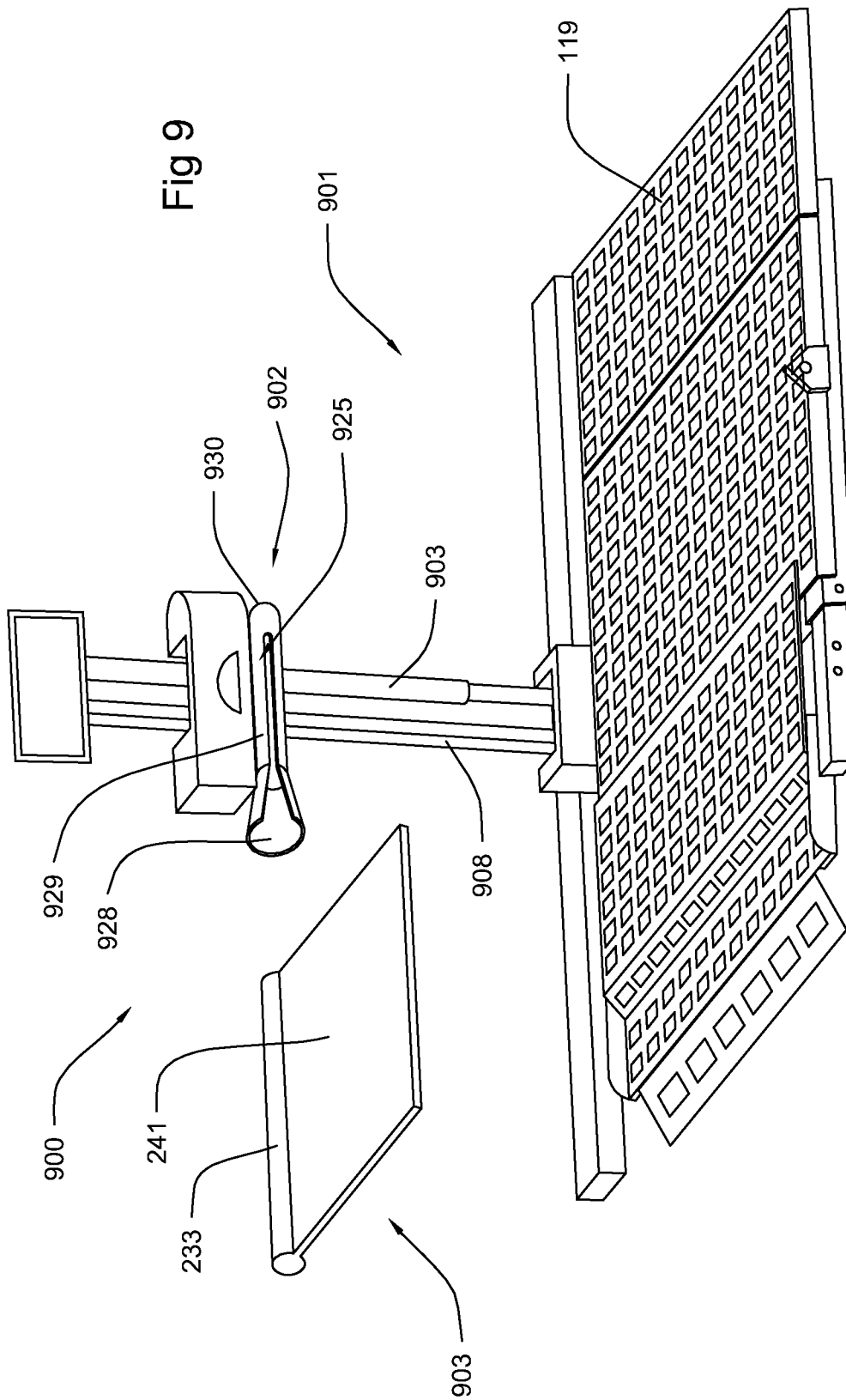


Fig 8B

Fig 9



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 11/60964

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B60P 3/00 (2012.01)

USPC - 410/7

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

USPC: 410/7

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

USPC: 410/1, 2, 3, 7; 414/539,540 (keyword limited, see terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PubWEST(PGPB, USPT, EPAB, JPAB), Google Scholar, Thomson Innovation. Search terms used: Wheelchair, wheel, chair, scooter, motorized, powered, docket, secure, attach, vehicle, car, van, automobile, automotive, lock, pin, guide, insert, slide, tube, tubing, rod, sensor, detect, wall, vertical, upright, solenoid, D, Shaped, base, plate, driver, passe

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                               | Relevant to claim No. |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Y         | US 2003/0012617 A1 (CONSTANTIN) 16 January 2003 (16.01.2003)<br>entire document, especially: Abstract, Fig 1, para [0016], [0021]-[0024], [0028] | 1-20                  |
| Y         | US 4,062,209 A (DOWNING et al.) 13 December 1977 (13.12.1977)<br>Fig 6, col 4, ln 10-35                                                          | 1-20                  |
| Y         | US 5,026,244 A (DORN) 25 June 1991 (25.06.1991)<br>Fig 2, col 4, ln 47 to col 5, ln 20                                                           | 7-16                  |
| Y         | US 2006/0193708 A1 (DITCH et al.) 31 August 2006 (31.08.2006)<br>Abstract                                                                        | 17                    |
| A         | US 2009/0214314 A1 (GIRADIN et al.) 27 August 2009 (27.08.2009)<br>entire document                                                               | 1-20                  |

☐ Further documents are listed in the continuation of Box C.

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

07 March 2012 (07.03.2012)

Date of mailing of the international search report

**21 MAR 2012**

Name and mailing address of the ISA/US

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