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(54) Title: SUPPORT BRACKET FOR A TRACTION FRAME

(57) Abstract: A support bracket coupled to a hospital bed to support a traction frame member. The support bracket has a support member that is moveable between a storage position and a deployed position. The support bracket is adapted to support the traction frame member when the support member is in the deployed position.

SUPPORT BRACKET FOR A TRACTION FRAME

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of U.S. Provisional Patent Application Serial No. 60/712,656, filed August 30, 2005, entitled SUPPORT BRACKET FOR A TRACTION FRAME, and claims the benefit of U.S. Provisional Patent Application Serial No. 60/689,912, entitled SUPPORT BRACKET FOR A TRACTION FRAME, filed June 13, 2005, the disclosures of which are expressly incorporated by reference herein.

BACKGROUND OF THE DISCLOSURE

[0002] The present invention relates to a support bracket for a traction frame.

[0003] It is sometimes necessary to mount a traction frame about a hospital bed or similar patient support unit to provide a framework for supporting traction equipment and/or other healthcare equipment or accessories. For example, traction frames are often used to suspend a "patient helper" above a hospital bed. Such patient helpers can be grasped by a patient to thereby assist the patient in repositioning themselves on the hospital bed or during ingress and egress from the hospital bed.

[0004] Support brackets are oftentimes attached to the bed when erecting a traction frame so that the traction frame is attached to the bed and movement of the bed will not result in relative movement between the traction frame and the bed.

SUMMARY

[0005] The present invention may comprise one or more of the features recited in the appended claims and/or one or more of the following features or combinations thereof.

[0006] One embodiment of the invention takes the form of a support bracket that is securable to a hospital bed and adapted to support a traction frame member. The support bracket includes a mounting member load bearingly securable to the bed and a support member. The support member includes a frame coupling feature that can be coupled with the traction frame member to thereby support the traction frame member. The support member is moveably coupled to the mounting member and is moveable between a storage position and a deployed or use position relative to the mounting member. Moving the support member from the storage position to the deployed position positions the frame coupling feature further outwardly from the bed. When the support member is in the deployed position, the support

member is load bearingly coupled with the mounting member and the traction frame member is supportable on the support member.

[0007] A biasing member is operably coupled to the support member to biasingly retain the support member in the storage position.

[0008] The support bracket can include a first pair of cooperating camming surfaces wherein movement of the support member out of the storage position towards the deployed position mutually engages the first pair of camming surfaces. The biasing member can be positioned to urge the support member toward the storage position when the first pair of camming surfaces is mutually engaged.

[0009] The biasing member can exert a force substantially parallel to the vertical axis and when the support member is pivoted about the vertical axis with the first pair of camming surfaces in mutual engagement, the first pair of camming surfaces vertically displaces the first pair of camming surfaces and operatively engages the biasing member.

[0010] Mutually engageable first and second positioning members can be relatively repositioned by movement of the support member between the storage position and the deployed position. The first positioning member can include a projection defining one of the first pair of cooperating camming surfaces. The second positioning member can include at least one recess defining another one of the first pair of cooperating camming surfaces. Seating of the projection in the recess provides a positive mutual engagement of the first and second positioning members and can discretely define the storage position.

[0011] The second positioning member can include a second recess. The first and second positioning members further define a second pair of cooperating camming surfaces. The projection defines one of the second pair of camming surfaces and the second recess defining another one of the second pair of camming surfaces. The support member can be pivoted about the vertical axis with the second pair of camming surfaces in mutual engagement. The second pair of camming surfaces can vertically displace the first and second positioning members and operatively engage the biasing member. Seating of the projection in the second recess provides a positive mutual engagement of the first and second positioning members and discretely defines the deployed position.

[0012] Mutually engageable first and second positioning members can be relatively repositioned by movement of the support member between the storage position and the deployed position. A positive mutual engagement of the first and second members discretely defines the storage position and the deployed position.

[0013] In one exemplary embodiment thereof, the present invention provides a support bracket securable to a hospital bed and adapted to support a traction frame member. The support bracket comprises a mounting member load bearingly securable to the bed, a support member coupled to the mounting member and having a frame coupling feature supportingly coupleable with the traction frame member. The support member is configured to move relative to the mounting member between a storage position and a deployed position, and a positioning member is fixably coupled to the support member and configured to assist positioning the support member relative to the mounting member as the support member is moved between the storage position and the deployed position.

[0014] In another exemplary embodiment thereof, the present invention provides a support assembly for a traction frame. The assembly comprises a patient support including a frame, a support bracket mounted on the frame, the support bracket comprising a mounting member load bearingly secured to the frame, a support member moveably coupled to the mounting member and having a frame coupling feature supportingly coupleable with the traction frame member, the support member being configured to move relative to the mounting member between a storage position and a deployed position, and a positioning member fixably coupled to the support member and configured to assist positioning the support member relative to the mounting member as the support member is moved between the storage position and the deployed position.

[0015] In yet a further exemplary embodiment thereof, the present invention provides a traction frame support bracket for a bed. The bracket comprises a mounting member load bearingly securable to the bed, a support member coupled to the mounting member and having a frame coupling feature supportingly coupleable with the traction frame member, the support member being configured to move relative to the mounting member between a storage position and a deployed position, a means for rotating the support member relative to the mounting member from the storage position to the deployed position, a means for

releasably locking the support member in one of the storage position and the deployed position, and a means for releasing the support member from one of the locked positions.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The above mentioned and other features of the present invention, and the manner of attaining them, will become more apparent and the present invention itself will be better understood by reference to the following description of an exemplary embodiment of the present invention taken in conjunction with the accompanying drawings, wherein:

[0017] Figure 1 is a perspective view of a hospital bed with a traction frame and supporting bracketry mounted thereon;

[0018] Figure 2 is an exploded perspective view of a support bracket;

[0019] Figure 3 is a partial perspective view of a hospital bed frame and a support bracket in a deployed position;

[0020] Figure 4 is a partial perspective view of a hospital bed frame and a support bracket in a storage position;

[0021] Figure 5 is a side view of a pivotal connection between a mounting member and a support member of the support bracket of Figure 2;

[0022] Figure 6 is a top view of the pivotal connection of Figure 5;

[0023] Figure 7 is a perspective view of a first positioning member of the support bracket of Figure 2;

[0024] Figure 8 is a side view of the first positioning member;

[0025] Figure 9 is another side view of the first positioning member;

[0026] Figure 10 is a perspective view of a second positioning member of the support bracket of Figure 2;

[0027] Figure 11 is a top view of the second positioning member;

[0028] Figure 12 is a schematic side view of the first and second positioning members with a first pair of camming surfaces in mutual engagement;

[0029] Figure 13 is a schematic side view of the first and second positioning members with the support member being located between its storage and deployed positions wherein the outer circular circumference of the two members are represented in a linear format;

[0030] Figure 14 is an exploded perspective view of an exemplary support bracket in accordance with the present invention;

[0031] Figure 15 is an assembled perspective view of the support bracket of Figure 14;

[0032] Figure 16 is a sectional side view of a pivotal connection between a mounting member and a support member of the support bracket of Figure 14;

[0033] Figure 17 is a top perspective view showing a first side of an arm positioning member;

[0034] Figure 18 is a side view of the arm positioning member of Figure 17;

[0035] Figure 19 is a bottom perspective view showing a second side of the arm positioning member of Figure 17;

[0036] Figure 20 is a perspective view of a bushing component in accordance with the present invention;

[0037] Figures 21-23 are perspective views of an arm positioning member coupled to a bushing member in accordance with the present invention; and

[0038] Figure 24 is a perspective view of a tube locking component in accordance with the present invention.

[0039] Corresponding reference characters indicate corresponding parts throughout the several views. Although the exemplification set out herein illustrates an embodiment of the invention, in one form, the embodiment disclosed below is not intended to be exhaustive or to be construed as limiting the scope of the invention to the precise form disclosed.

DETAILED DESCRIPTION

[0040] Figure 1 illustrates an exemplary support bracket 20 that is attached to a hospital bed 22. Support bracket 20 provides support for a traction frame 24 that is mounted to bed 22. In the illustrated embodiment, bed 22 is a CareAssist™ bed commercially available from Hill-Rom Company, Inc. having a place of business in Batesville, Indiana. Bed 22 has a frame 23 and a patient support surface 21, e.g., a mattress, located on frame 23. The present invention, however, may be used with a wide variety of other patient support units in addition to bed 22. For example, Foster et al., U.S. Patent No. 5,479,666 and Weismiller et al., U.S. Patent No. 5,715,548, both describe chair beds that are suitable for use with the present invention and the disclosures of each of these two patents are expressly incorporated herein by reference.

[0041] Support bracket 20 includes a mounting member 26 and two support members 28. Support members 28 each include a coupling feature or socket member 30 for supporting one of the frame members 32 of traction frame 24. In the illustrated embodiment, coupling feature 30 takes the form of a cylindrical socket member, however, other forms of coupling features may also be employed with the present invention.

[0042] The support members 28 can be moved between a deployed position and a storage position. When in the storage position, illustrated in Figure 4, support member 28 is positioned substantially parallel to the longitudinal axis 19 of bed 22 and does not significantly project outwardly from bed 22. When in the deployed position, illustrated in Figures 1 and 3, support member 28 extends further outwardly from bed 22 to position coupling feature 30 outwardly from bed 22 at a location where a traction frame member 32 can be mounted in coupling feature 30.

[0043] The movable feature of support members 28 permitting movement between a storage position and a deployed position allows a traction frame 24 to be installed or removed from bed 22 without also requiring the installation and removal of bracket 20. When or after removing traction frame 24 from bed 22, support members 28 can be repositioned in their storage positions to thereby remove the potential tripping hazard posed by an outwardly projecting bracket member without having to completely dismount support bracket 20 from bed 22. By allowing support bracket 20 to remain secured to bed 22 when no traction frame 24 is mounted to bed 22, traction frame 24 can be reinstalled simply by repositioning support members 28 to their deployed positions.

[0044] An exemplary support bracket 20 is illustrated in an exploded view in Figure 2. Support bracket 20 includes a mounting member 26 which is secured to bed 22 with bolts 34, clamp members 36 and nuts 38. Bolts 34 are passed through openings 40 in mounting member 26 when securing a longitudinal frame member 42 of bed 22 between clamp member 36 and mounting member 26. In this manner, support bracket 20 is load bearingly secured to bed frame 23 and loads applied to support bracket 20 by traction frame 24 are transferred to bed frame 23.

[0045] Mounting member 26 includes an elongate member 50 that extends between a first end 46 and a second end 48 of mounting member 26. Elongate member 50 defines a lateral axis 51 and two stabilizing members 52 extend transversely from elongate member 50. In the illustrated embodiment, stabilizing members 52 extend at an approximately 90 degree angle

to lateral axis 51. When mounting member 26 is mounted to bed frame 23, the upper surface 53 of stabilizing members 52 forms a bearing surface that underlies and bears against longitudinal bed frame members 42. Upper bearing surface 53 is transversely spaced from lateral axis 51 and may thereby prevent rotation of mounting member 26 about axis 51 due to a downward load placed on bracket 20 at coupling feature 30.

[0046] Cylindrical tubes 44 are located at the first and second ends 46, 48 of mounting member 26 for moveably coupling support members 28 to mounting member 26. In the illustrated embodiment, support members 28 are each pivotably mounted to support member 26 and are pivotable about vertical axes 29. Support members 28 each include a support arm 54 which has a coupling feature 30, or socket tube, attached or molded at its distal end. A pivot enclosure 56 is located at the proximal ends of support arms 54 opposite coupling features 30, or socket tubes. Support members 28 are pivotably secured to mounting member 26 at pivot enclosures 56. Bracing members 55 may enhance the rigidity of the joint between support arms 54 and pivot enclosures 56. Mounting member 26 and support member 28 each have a welded steel construction and are formed using conventional manufacturing techniques.

[0047] Shoulder bolts 58 pass through openings 60 in top and bottom walls of pivot enclosures 56. Each shoulder bolt 58 defines one of the pivot axes 29. Nuts 62 are used to secure shoulder bolts 58 in place. Bushings 64, 66 are mounted in the opposite ends of each tube 44 and confine a compression spring 68 therebetween. Spring 68 exerts a force parallel to axis 29 on bushings 64, 66 and urges bushings 64, 66 away from one another. Although the illustrated embodiment utilizes a compression spring 68, a variety of other biasing members are known to those having ordinary skill in the art and alternative biasing members may also be employed with the present invention. The function of the biasing force provided by spring 68 is discussed in greater detail below.

[0048] Bushings 64, 66 are formed of Delrin®, an acetal resin commercially available from E.I. Du Pont De Nemours & Co. Each of the bushings 64, 66 include a cylindrical portion 70 which is inserted into the hollow interior of tube 44 and engages the interior surface of tube 44. Bushings 64, 66 each also include an outwardly extending annular flange 72 that bears against or contacts an axial end face 43, 45 of tube 44 and an axially extending cylindrical passage 74 through which shoulder bolt 58 is inserted. Bushing 66 differs from bushing 64 in that bushing 66 also includes a projection 76 on its annular flange 72 and a cutout 78 in its

cylindrical portion 70. Bushing 66 is shown in greater detail in Figures 7-9 and is rotationally fixed within tube 44 by inserting locking pin 80 through cutout 78 and openings 82 in tube 44.

[0049] A Delrin plate 84 is positioned within enclosure 56 and is engageable with annular flange 72 of bushing 66. Plate 84 is shown in greater detail in Figures 10 and 11. Plate 84 has two opposite side edges 86, 88 that engage the sidewalls of enclosure 56 to prevent the rotation of plate 84 within enclosure 56 and a passageway 90 through which shoulder bolt 58 is inserted. Plate 84 also includes two recesses 92, 94 which are shaped to receive projection 76.

[0050] When support member 28 is rotated, plate 84 rotates along with support member 28 about axis 29. Bushing 66, however, is fixed to tube 44 by pin 80. Thus, plate 84 and bushing 66 are repositioned relative to each other by the pivoting movement of support member 28 about axis 29. When projection 76 is aligned with either recess 92 or recess 94, spring 68 will bias projection 76 into the aligned recess 92, 94. Recesses 92, 94 are shaped to closely receive projection 76. When projection 76 is seated within one of the recesses 92, 94, the close fit between projection 76 and the recess 92, 94 substantially prevents relative rotation between plate 84 and bushing 66 and such relative movement can only occur by unseating projection 76 from the recess. In other words, the seating of projection 76 within a recess 92, 94 provides a positive mutual engagement of plate 84 and bushing 66. Spring 68 exerts a force that acts to retain projection 76 in recesses 92, 94 when projection 76 is seated therein. A force may be applied to support arm 28 to overcome spring 68 to unseat projection 76 from either recess 92, 94 before support arm 28 can be rotated to a different position. Projection 76 and plate 84 thus form two positioning members which facilitate the positioning of support arm 28 in a selected predefined position.

[0051] In the illustrated embodiment, the interaction of projection 76 with recesses 92, 94 defines two discrete positions of support member 28 relative to mounting member 26. When projection 76 is seated within recess 92, support arm 28 will be in its storage position (Figure 4). When projection 76 is seated within recess 94, support arm 28 will be in its deployed position (Figure 3). Various alternative positioning members could also be employed to define one or more predetermined positions for support member 28. For example, projection 76 could be located on plate 84 and recesses 92, 94 could be located on bushing 66, or, these components could be located on another pair of surfaces which are relatively repositioned by

the movement of support member 28 between its storage and deployed positions and/or projection 76 and recesses 92, 94 could have alternative shapes.

[0052] Projection 76 includes first and second camming surfaces 96, 100 to facilitate the unseating of projection 76 from recesses 92, 94 when it is desired to reposition support member 28. An intermediate surface 106 is located between camming surfaces 96, 100 on projection 76. When projection 76 is seated within recess 92 with support member 28 in its storage position, camming surface 96 will face camming surface 98 located in recess 92 and annular flange 72 directly engages the planar upper surface 108 of plate 84. The rotation of support member 28 from its storage position toward its deployed position will engage camming surfaces 96, 98 with each other and cause the relative vertical displacement of bushing 66 and bearing plate 84 and compression of spring 68 until intermediate surface 106 on projection 76 is engaged with upper plate surface 108. Intermediate surface 106 then slides along upper plate surface 108 until projection 76 is seated in recess 94 and annular flange 72 once again directly engages upper plate surface 108 with support member 28 in its deployed position.

[0053] As exemplified by Figure 5 in which projection 76 is seated in recess 92, when projection 76 is seated in a recess 92, 94, annular flange 72 of bushing 66 will be directly engaged with upper plate surface 108 and a gap 110 will be present between the annular flange 72 of bushing 64 and the upper axial end face 43 of tube 44. Annular flange 72 of bushing 66 is engaged with the lower axial end face 45 of tube 44 in Figure 5. Lower bushing 66 is axially fixed within tube 44 by pin 80 and, thus, annular flange 72 of bushing 66 remains in contact with axial end face 45 of tube 44 when projection 76 is seated and unseated from recesses 92, 94. A gap 112, however, is formed between upper plate surface 108 and annular flange 72 of bushing 66 when projection 76 is not fully seated within one of the recesses 92, 94. The gaps 110, 112 correspond to the vertical movement of support member 28 relative to mounting member 26. When support member 28 is in its uppermost position relative to mounting member 26, gap 110 will be at a maximum value and gap 112 will be at a minimum value. As support member 28 is moved downwardly relative to mounting member 26, gap 110 will decrease and gap 112 will increase until annular flange 72 on bushing 64 contacts axial end face 43 on tube 44 and support member 28 is at it lowermost position relative to mounting member 26. Spring 68 acts to bias support arm 28 upwardly and thereby acts to increase gap 110 and decrease gap 112.

[0054] Figure 12 represents the situation where projection 76 is not fully seated within recess 92 and the first pair of camming surfaces 96, 98 is mutually engaged. By acting to decrease gap 112, spring 68 exerts a biasing force which, in the situation depicted in Figure 12, acts to bias plate 84 towards bushing 66 and projection 76 towards a centered and fully seated position in recess 92. Thus, spring 68 acts to bias bushing 66 and plate 84 not only axially, but also rotationally due to the action of camming surfaces 96, 98.

[0055] If a rotational force is exerted on support member 28 toward its deployed position, however, bushing 66 can be displaced upwardly relative to plate 84 until intermediate surface 106 is in contact with upper plate 108 as depicted in Figure 13. As this vertical displacement of bushing 66 and plate 108 takes place, gap 110 is closed and gap 112, between annular flange 72 of bushing 66 and upper plate surface 108, is increased. As described above, support member 28 moves downwardly relative to mounting member 26 and bed frame 23 as gap 110 closes and gap 112 increases.

[0056] When support member 28 reaches its deployed position, projection 76 will be seated in recess 94 and support arm 28 will snap back upwardly under the action of compression spring 68. The seating of projection 76 in recess 94 not only acts to hold support arm 28 in a predefined deployed position, but also provides positive feed back to the operator that they have placed support member 28 in the correct position for mounting traction frame 24.

[0057] When support member 28 is in its deployed position with projection 76 seated in recess 94, camming surface 100 will face camming surface 102 located in recess 94 and annular flange 72 will directly engage upper plate surface 108. The rotation of support member 28 from the deployed position toward the storage position will mutually engage this second pair of camming surfaces 100, 102 and cause the relative vertical displacement of bushing 66 and bearing plate 84 and the compression of spring 68 until intermediate surface 106 is engaged with upper plate surface 108.

[0058] As described above, under the influence of the biasing force of spring 68, camming surfaces 96, 98 act to center projection 76 in recess 92. Similarly, if support member 28 is slightly over rotated when returning support member 28 to its storage position, camming surface 100 will engage slanted surface 99 located in recess 92 and the interaction of surfaces 100 and 99 together with spring 68 will urge projection 76 towards its fully seated and centered position in recess 92. Spring 68 thereby biasingly retains support member 28 in its storage position and requires a positive force to be applied to support member 28 to move it

out of its storage position so long as intermediate surface 106 remains in recess 92 and has not yet engaged upper plate surface 108.

[0059] Recess 94 also includes a slanted surface 103 positioned opposite its camming surface 102. Slanted surface 103 will engage camming surface 96 on projection 76 if support arm 28 is slightly over rotated as it is moved from its storage position to its deployed position. Spring 68 thereby also acts to retain projection 76 within recess 94 when support member 28 is in its deployed position in the same manner that it acts to retain projection 76 within recess 92 when support arm 28 is in its storage position.

[0060] To install a traction frame 24, support members 28 are placed in their deployed positions. Conventional traction frame members 32 can then be mounted on bracket 20 by inserting the cylindrical end 114 of frame members 32 into socket members 30. The shafts 116 of frame members 32 typically have an octagonal cross section to facilitate the attachment of clamps and other components. The shaft portion 116 of frame members 32 bears against the upper axial end surface 118 of socket member 30 to transfer a vertical load to support member 28. The positioning of cylindrical end 114 within socket member 30 maintains frame member 32 in a substantially vertical orientation.

[0061] Support member 28 acts as a cantilever beam in supporting frame member 32. The pivotal joint between support member 28 and mounting member 26 transfers not only the vertically oriented load imposed by frame member 32 but also resists a moment force generated by the cantilever nature of support member 28. More specifically, cylindrical portions 70 of bushings 64, 66 bear against the radially inner surface of tube 44 in a horizontal direction to provide moment resisting force. The bearing contact between cylindrical portions 70 and tube 44 creates a vertically oriented frictional force that acts to support member 28. Spring 68 also exerts a vertical force upward force on support member 28. Together, the frictional forces between bushings 64, 66 and tube 44 and the biasing force of spring 68 transfer the vertical load imposed on support member 28 by frame member 32 to mounting member 26.

[0062] If an excessive downward load is imposed on support member 28, gap 110 would be closed and a vertical force would be transferred from support member 28 to mounting member 26 via the engagement of bushing 64 with axial end face 43 of tube 44. If such a situation was anticipated, the orientation of bracket 20 could be reversed with bushing 66 and plate 28 being located above tube 44 and bushing 66 being located below tube 44.

[0063] In the illustrated embodiment, a single bracket 20 is mounted to bed 22 to support the two vertical frame members 32 located proximate the foot of bed 22. Two additional brackets 120 are also mounted to bed 22 to support the two frame members 32 proximate the head of bed 22. Brackets 120 are attached to longitudinal bed frame members 42 and have a construction known in the art. Brackets 120 are described by Ruschke in U.S. Patent No. 6,581,897 B2 which is hereby incorporated herein by reference. It would also be possible to mount a second bracket 20 proximate the head end of bed 22 to replace brackets 120 whereby frame 24 would be supported on bed 22 by two brackets 20.

[0064] Another exemplary support bracket 200 in accordance with the present invention is illustrated in Figures 14 and 15. Support bracket 200 includes a mounting member 202 which is adapted to be secured to bed 22 with bolts 204, washers 210 and clamp nut members 206. Bolts 204 are passed through openings 208 in mounting member 202 and secured therein by conventional nuts (not shown) when securing longitudinal frame member 42 of bed 22 to clamp nut member 206. The support bracket 200 is secured to bed frame 23 in a load bearing fashion such that loads applied to the support bracket 200 by traction frame 24 are transferred to bed frame 23, as explained above.

[0065] Mounting member 202 includes an elongate member 216 that extends between a first end 212 and a second end 214 of mounting member 202 and defines a lateral axis 215 and two stabilizing members 218, which extend transversely from elongate member 216. In the illustrated embodiment, stabilizing members 218 extend approximately 90 degrees to lateral axis 215. When mounting member 202 is mounted to bed frame 23, the upper surface 230 of stabilizing members 218 forms a bearing surface that underlies and bears against longitudinal bed frame members 42. Upper bearing surface 230 is transversely spaced from lateral axis 215 and may thereby prevent rotation of mounting member 202 about axis 215 due to a downward load placed on bracket 200 at coupling feature 232.

[0066] Cylindrical tube locking assemblies 234 are located at the first and second ends 212, 214 of mounting member 202 for moveably coupling support members 236 to mounting member 202. In the illustrated embodiment, support members 236 are each pivotably mounted to mounting member 202 and are pivotable about vertical axes 238. Support members 236 each include a support arm 240, which has a coupling feature 232 attached or molded at its distal end. A pivot enclosure 242 is located at the proximal ends of support arms 240 opposite coupling features 232. Support members 236 are pivotably coupled to

mounting member 202 at pivot enclosures 242. Bracing members 244 may enhance the rigidity of the joint between support arms 240 and pivot enclosures 242. Mounting member 202 and support member 236 each have a welded steel construction and are formed using conventional manufacturing techniques.

[0067] As shown in Figure 16, bolts 246 pass through openings 248 in top and bottom walls 243a, 243b of pivot enclosures 242. Each bolt 246 defines one of the vertical pivot axes 238 and also passes through washer 250 as it is assembled. Bushings 252, 254 are mounted in the opposite ends of each tube locking assembly 234 and are adapted to engage the interior surface of the tube locking assembly 234 once inserted into its hollow interior section. Bushing 254 includes a cylindrical portion 256 for engaging the interior surface of tube locking assembly 234, as well as an outwardly extending annular flange portion 258 that is adapted to bear against or contact a lower axial end face 262 of tube locking assembly 234 during rotation of support member 236 from one position to another as will be explained in greater detail below. Bushing 252 includes a cylindrical portion 260 that engages the interior surface of tube locking assembly 234 and is adapted to be fixably coupled to annularly shaped arm positioning member 266, which serves as a flange for bearing against upper axial end face 264 of pivot enclosure 242 during assembly. More particularly, bushing 252 and arm positioning member 266 are coupled together by inserting protrusion 268 of arm positioning member 266 into notch 270 of bushing 252 and securing the attachment with bolt 246 (as best shown in Figure 21).

[0068] According to one exemplary embodiment, and with reference to Figures 17-19, arm positioning member 266 has protruding dowel 272 extending outwardly away from its first or top surface 267, which is adapted to fit into engaging hole 273 of pivot enclosure 242 during assembly. By inserting dowel 272 into hole 273, the orientation of support member 236 is held in a fixed arrangement and discouraged from misaligning once the correct orientation has been established for attaching traction frame 24 to the bed. While Figures 17-19 show the arm positioning member 266 as having a dowel member 272 for securing the orientation of support member 236, it should be understood and appreciated that other arrangements may be established as known within the art without straying from the present teachings herein. As such, the present disclosure is not intended to be limiting herein.

[0069] In addition to dowel 272, arm positioning member 266 also has a projection 268, which extends outwardly away from its second or bottom surface 269 and is adapted to

engage or fit into notch 270 of bushing 252 (see Figures 20-23). More particularly, notch 270 of bushing 252 functions as an internal groove or indentation which is shaped to closely receive the protruding portion 279 of projection 268. After projection 268 is seated into notch 270, the two components are placed into pivot enclosure 242 and held together by threading bolt 246 through their respective central openings 248, 249, 251. By threading arm positioning member 266 and bushing 252 to pivot enclosure 242 with bolt 246, the components are held together in a fixable relationship (i.e., when the components are rotated or turned along vertical pivot axes 238, they maintain their structural orientation to one another and do not pivot relative to one another). As such, when support member 236 is rotated, bushing 252 and arm positioning member 266 rotate along with support member 236 about axis 238. Moreover, bushing 254 also maintains a fixed relationship with support member 236 such that when support member 236 is rotated about vertical pivot axes 238, bushing 254 also rotates along with the support member. The fixed relationship of bushing 254 to support member 236 is achieved by threading the bushing to pivot enclosure 242 with bolt 246.

[0070] In the illustrated embodiment, the interaction of bushing 252 to tube locking assembly 234 of mounting member 202 defines two discrete positions to which support members 236 can be oriented, i.e., a first or storage position (Figure 4) and a second or deployed position (Figure 3). These positions are determined by how the support members 236 are positioned relative to first and second arm notches 278a, 278b of tube locking assembly 234 (see Figure 24). More particularly, once bushing 252 and arm positioning member 266 are coupled together with bolt 246, projection 268 is adapted to engage or fall into one of arm notches 278a, 278b and temporarily lock the support member 236 into place. This locking/unlocking arrangement is described in greater detail below.

[0071] As support member 236 is moved between the storage and deployed positions, projection 268 assists in locking the support member into place. More particularly, as shown in Figures 21-22, when projection 268 is seated into notch 270 of bushing 252, a portion 280 of the projection 268 extends outside of the notch and is thereby exposed to view. When support member 236 is rotated to either the storage position or the deployed position, exposed portion 280 of projection 268 moves along with support member 236 because of its fixed relationship thereto and eventually becomes aligned with one of arm notches 278a, 278b. Once projection 268 is properly aligned with one of arm notches 278a or 278b, projection

268 is adapted to respectively fit into or engage such arm notch 278a, 278b where it is temporarily locked into place and prevented from pivotal movement or rotation. For instance, when support bracket 200 is in the storage position, the bottom surface 285 of exposed portion 280 engages top surface 281 of arm notch 278b. By seating exposed portion 280 into notch 278b, support member 236 is in a locked position and cannot be rotated inwardly or outwardly along vertical axis 238 with respect to the bed (i.e., when support member 236 is pushed inwardly or outwardly with respect to the bed frame, the side walls 286a, 286b of arm notch 278b directly interfere with and facially interact with projection 268 in such a manner that side-to-side movement along pivotal vertical axis 238 is prevented). Upon lifting up on support member 236, however, exposed portion 280 becomes disengaged from arm notch 278 whereby support member 236 can freely pivot from side-to-side along vertical axis 238 without interacting with the sidewalls of arm notch 278a. When exposed portion 280 becomes aligned with arm notch 278a upon rotating support member 236 to the deployed position, gravity encourages exposed portion 280 to fall into arm notch 278a and engage top surface 282 such that support member 236 is once again temporarily locked into place (i.e., cannot be rotated inwardly or outwardly along vertical axis 238).

[0072] In other words, when support member 236 is positioned at either the storage position or deployed position, annular flange portion 258 of bushing 254 is separated from lower axial end face 262 of tube locking assembly 234 by gap 290 (see Figure 16). Upon lifting up on support member 236, projection 268 becomes disengaged or unseated from arm notches 278a, 278b and annular flange portion 258 of bushing 254 becomes directly engaged with the lower axial end face 262 of tube locking assembly 234 thereby eliminating gap 290. It should be understood, gap 290 corresponds to the vertical movement of support member 236 relative to mounting member 202. More particularly, when support member 236 is in its uppermost position relative to mounting member 202, gap 290 will be eliminated and annular flange portion 258 will be flush with lower axial end face 262 of tube locking assembly 234. As support member 236 is moved downwardly relative to mounting member 202, annular flange portion 258 will disengage from the surface of lower axial end face 262 of tube locking assembly 234 and gap 290 will be present as shown in Figure 16. As such, gap 290 represents the distance to which support member 236 can travel as it is lifted and rotated between the storage and deployed positions.

[0073] The present invention has been described with reference to an exemplary embodiment. The present invention may be modified within the spirit and scope of this disclosure. This application is therefore intended to cover any variations, uses, or adaptations of the present invention using its general principles.

WHAT IS CLAIMED IS:

1. A support bracket securable to a hospital bed and adapted to support a traction frame member, the support bracket comprising:

a mounting member load bearingly securable to the bed;

a support member coupled to the mounting member and having a frame coupling feature supportingly coupleable with the traction frame member, the support member being configured to move relative to the mounting member between a storage position and a deployed position; and

a positioning member fixably coupled to the support member and configured to assist positioning the support member relative to the mounting member as the support member is moved between the storage position and the deployed position.

2. The support bracket of claim 1, wherein moving the support member from the storage position to the deployed position causes the frame coupling feature to be positioned further outwardly from the bed.

3. The support bracket of claim 1, wherein the support member is load bearingly coupled with the mounting member when in the deployed position whereby the traction frame member is supportable by the support member in the deployed position.

4. The support bracket of claim 1, wherein movement of the support member between the storage position and the deployed position pivots the support member about a substantially vertical axis.

5. The support bracket of claim 1, wherein the positioning member comprises a dowel member adapted to engage the support member and hold the support member in a fixed orientation relative to the traction frame member.

6. The support bracket of claim 1, wherein the mounting member comprises a locking assembly adapted to releasably hold the positioning member into place as the support member is moved between the storage position and the deployed position.

7. The support bracket of claim 6, wherein the locking assembly comprises first and second notches for holding the support member at either the storage position or the deployed position.

8. The support bracket of claim 1, wherein the mounting member has a first end and an opposite second end, the support member being moveably coupled to the mounting member proximate the first end and wherein the support bracket further comprises a second support member moveably coupled to the mounting member proximate the second end, the second support member including a second frame coupling feature supportingly coupleable with the traction frame member, the second support member being moveable between a storage position and a deployed position relative to the mounting member wherein moving the support member from the storage position to the deployed position positions the second frame coupling feature further outwardly from the bed; the second support member being load bearingly coupled to the mounting member in the deployed position whereby the traction frame member is supportable on the support member in the deployed position; and wherein when the support member and the second support member are in the deployed positions, the support member and the second support member extend outwardly from opposite longitudinal sides of the bed.

9. The support bracket of claim 8, wherein the mounting member includes a substantially elongate member extending from the first end to the second end and defining a lateral axis, the mounting member further comprising at least one stabilizing member extending substantially transversely from the elongate member, the stabilizing member bearingly engageable with the frame of the patient support unit at a location transversely spaced from the lateral axis.

10. A support assembly for a traction frame, the assembly comprising:

a patient support including a frame;

a support bracket mounted on the frame, the support bracket comprising:

a mounting member load bearingly secured to the frame;

a support member moveably coupled to the mounting member and having a frame coupling feature supportingly coupleable with the traction frame member, the support

member being configured to move relative to the mounting member between a storage position and a deployed position; and

a positioning member fixably coupled to the support member and configured to assist positioning the support member relative to the mounting member as the support member is moved between the storage position and the deployed position.

11. The support assembly of claim 10, wherein moving the support member from the storage position to the deployed position causes the frame coupling feature to be positioned further outwardly from the bed.

12. The support assembly of claim 10, wherein the support member is load bearingly coupled with the mounting member when in the deployed position whereby the traction frame member is supportable on the support member in the deployed position.

13. The support assembly of claim 10, wherein movement of the support member between the storage position and the deployed position pivots the support member about a substantially vertical axis.

14. The support assembly of claim 10, wherein the positioning member comprises a dowel member adapted to engage the support member and hold the support member in a fixed orientation relative to the traction frame member.

15. The support assembly of claim 10, wherein the mounting member comprises a locking assembly adapted to releasably hold the positioning member into place as the support member is moved between the storage position and the deployed position.

16. The support assembly of claim 15, wherein the locking assembly comprises first and second notches for holding the support member at either the storage position or the deployed position.

17. The support assembly of claim 10, wherein the patient support unit includes a bed frame and a mattress.

18. The support assembly of claim 10, wherein the mounting member has a first end and an opposite second end, the support member being moveably coupled to the

mounting member proximate the first end and wherein the support bracket further comprises a second support member moveably coupled to the mounting member proximate the second end, the second support member including a second frame coupling feature supportingly coupleable with the traction frame member, the second support member being moveable between a storage position and a deployed position relative to the mounting member wherein moving the support member from the storage position to the deployed position positions the second frame coupling feature further outwardly from the bed; the second support member being load bearingly coupled to the mounting member in the deployed position whereby the traction frame member is supportable on the support member in the deployed position; and wherein when the support member and the second support member are in the deployed positions, the support member and the second support member extend outwardly from opposite longitudinal sides of the bed.

19. The support assembly of claim 18, wherein the mounting member includes a substantially elongate member extending from the first end to the second end and defining a lateral axis, the mounting member further comprising at least one stabilizing member extending substantially transversely from the elongate member, the stabilizing member bearingly engageable with the frame of the patient support unit at a location transversely spaced from the lateral axis.

20. A traction frame support bracket for a bed, comprising:

a mounting member load bearingly securable to the bed;

a support member coupled to the mounting member and having a frame coupling feature supportingly coupleable with the traction frame member, the support member being configured to move relative to the mounting member between a storage position and a deployed position;

means for rotating the support member relative to the mounting member from the storage position to the deployed position;

means for releasably locking the support member in one of the storage position and the deployed position; and

means for releasing the support member from one of the locked positions.

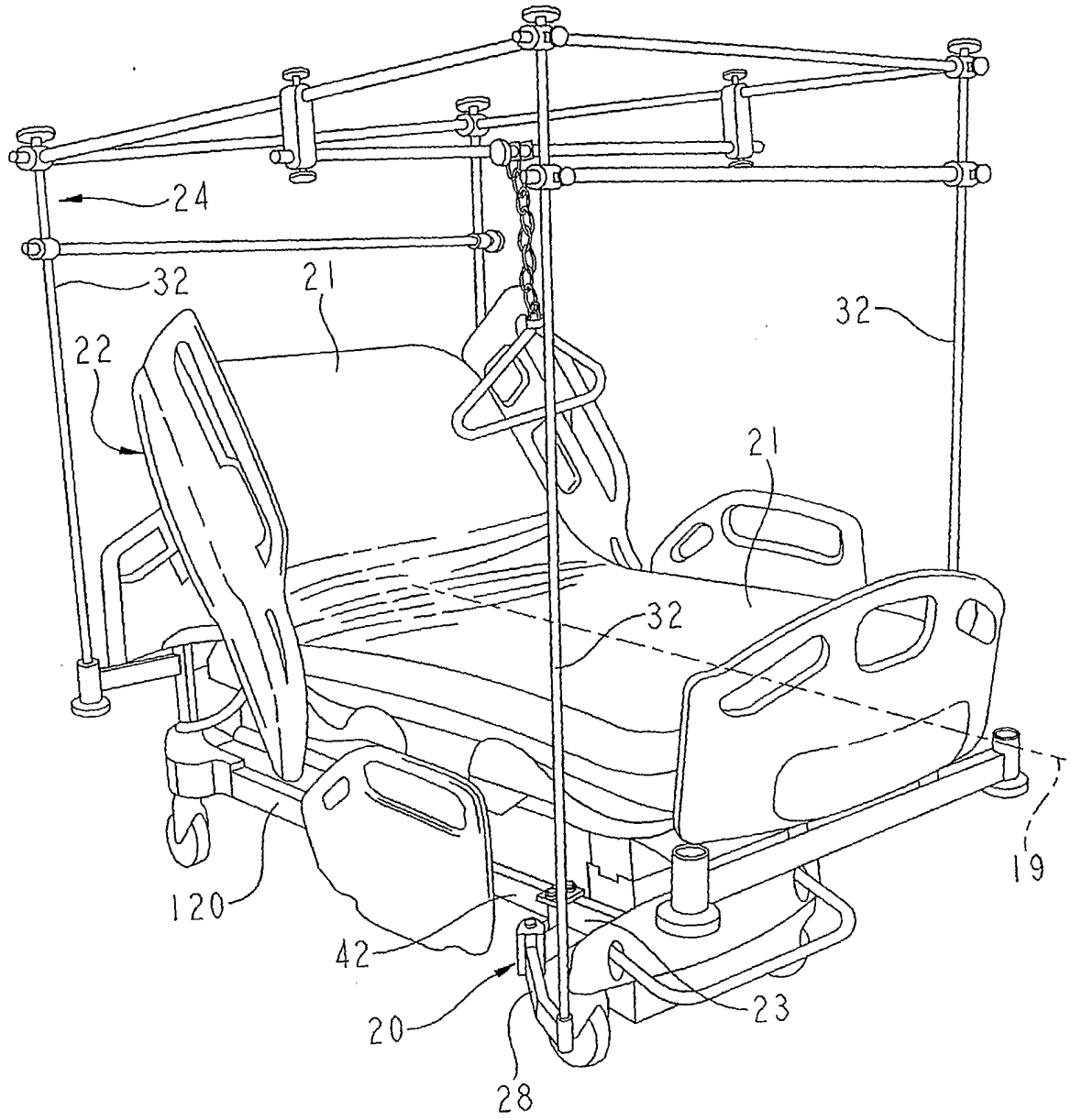

FIG. 1

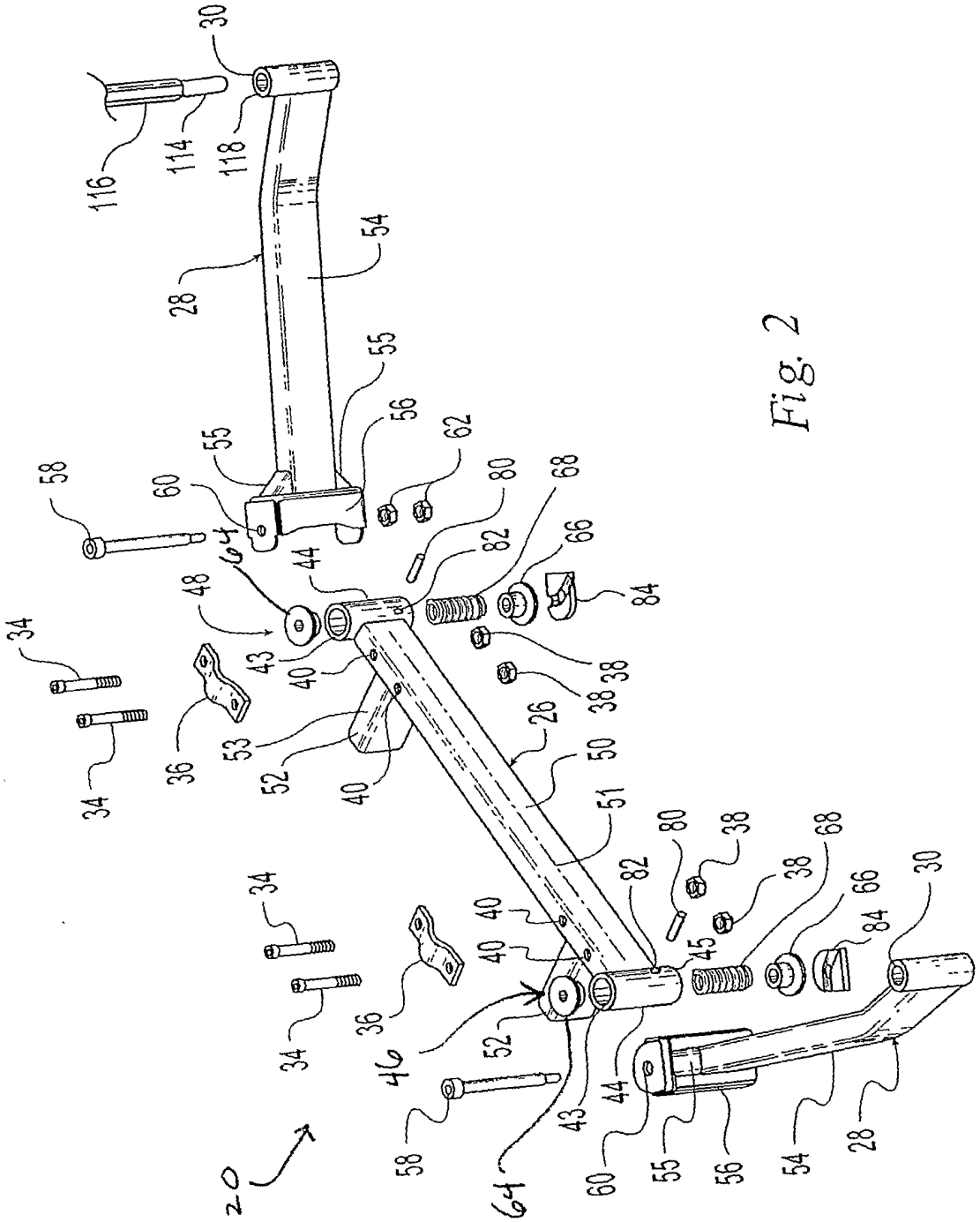
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Fig. 2

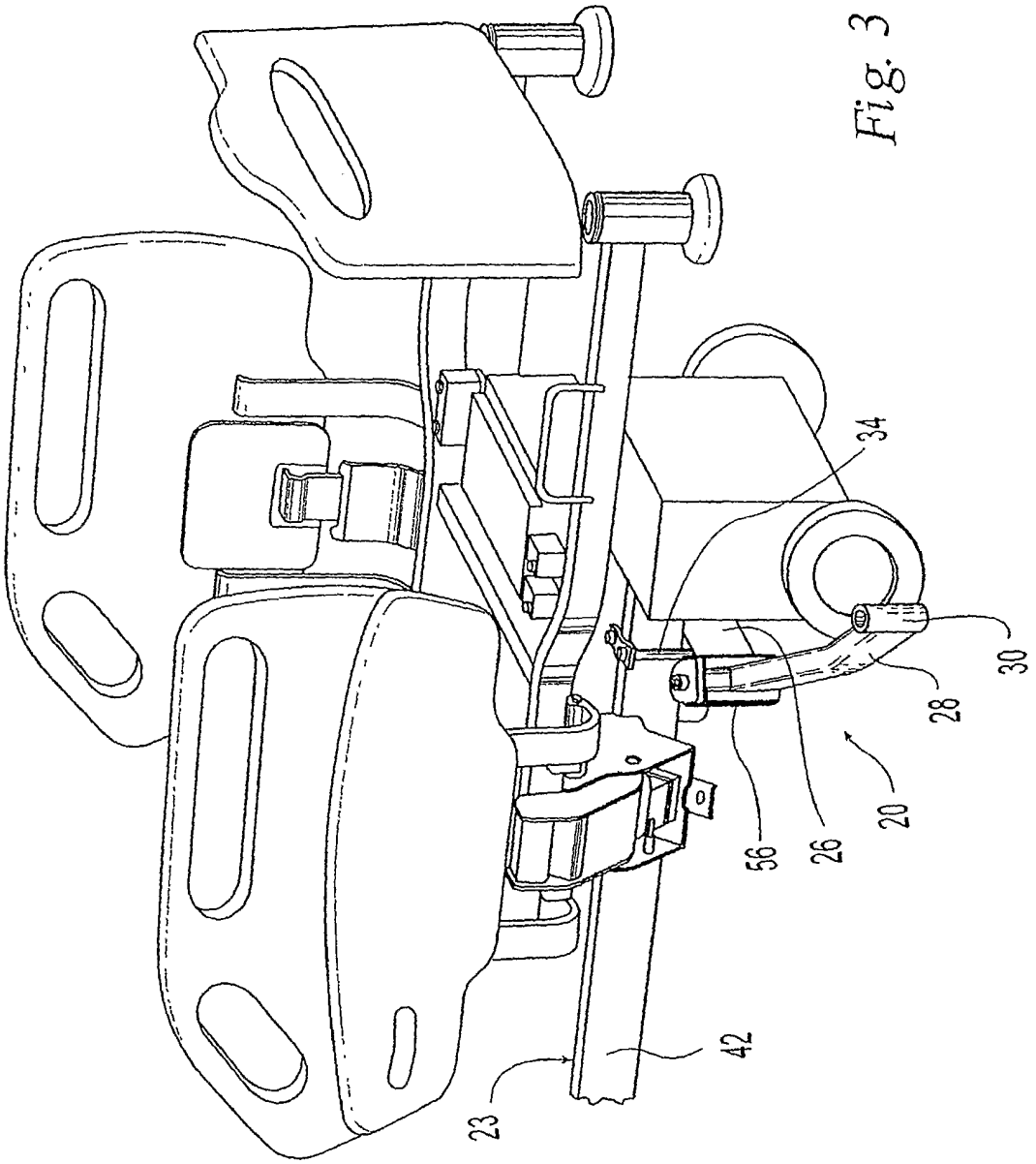

Fig. 3

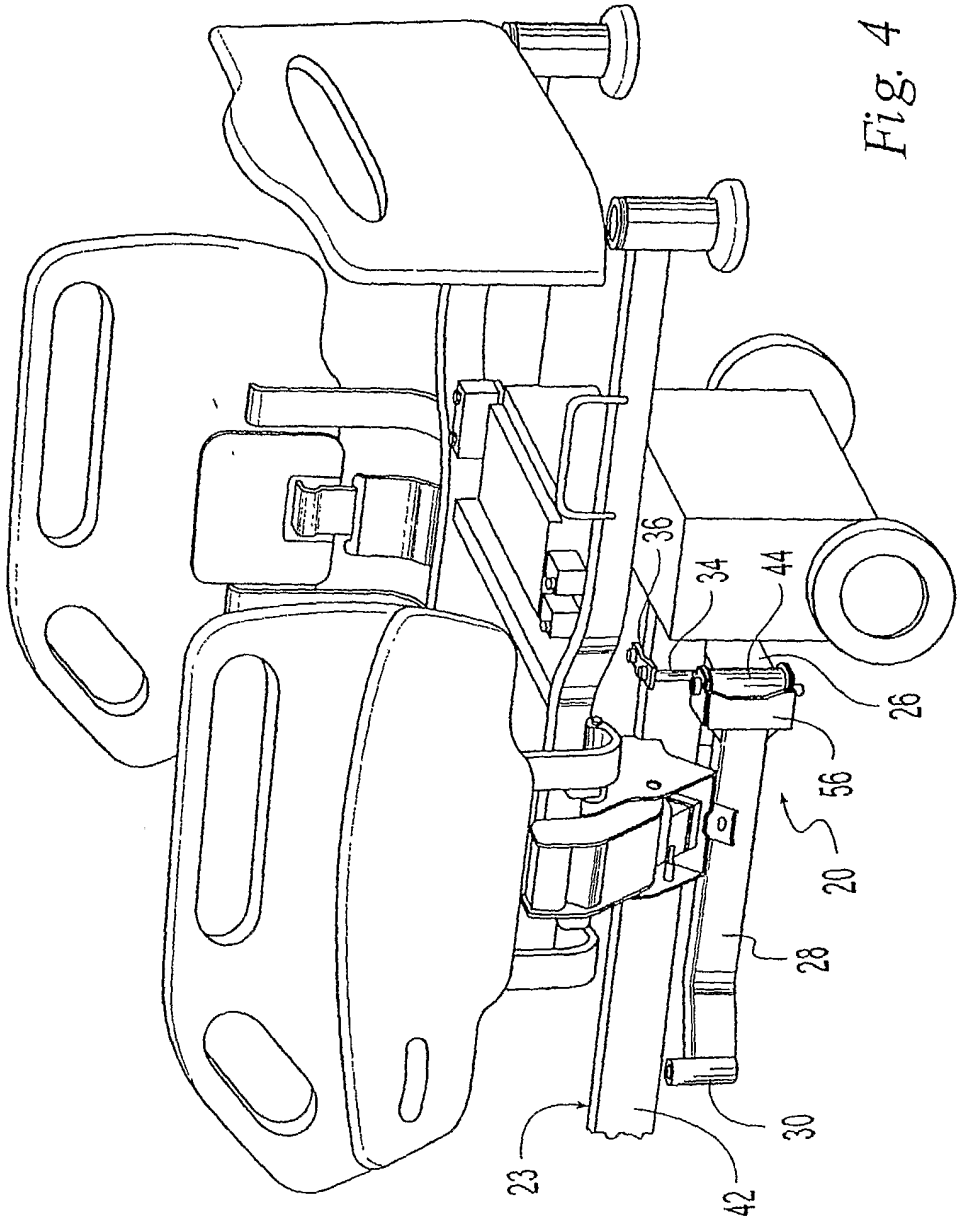

Fig. 4

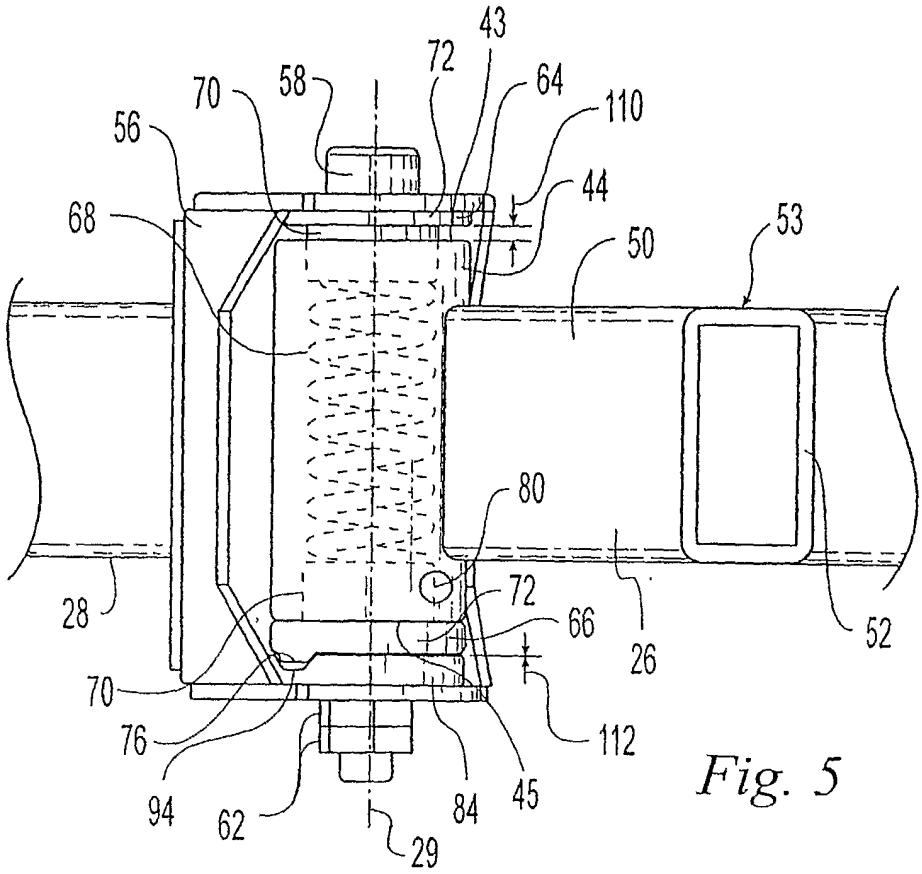
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Fig. 5

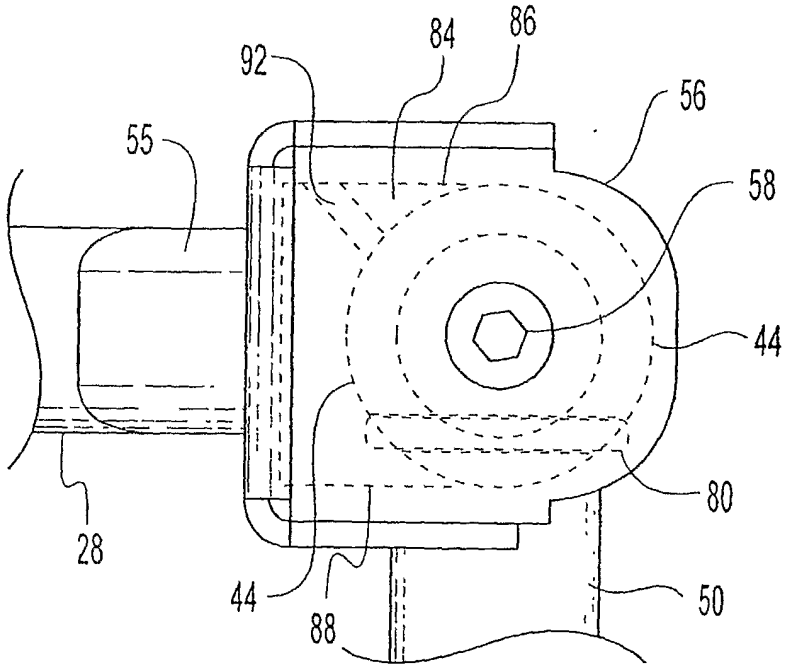
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Fig. 6

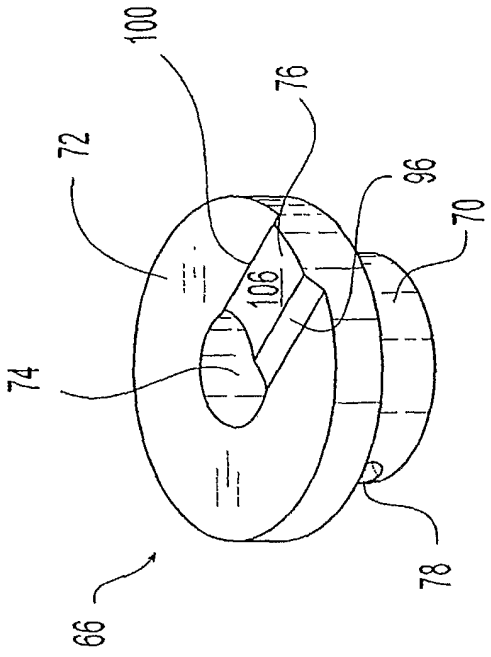

Fig. 7

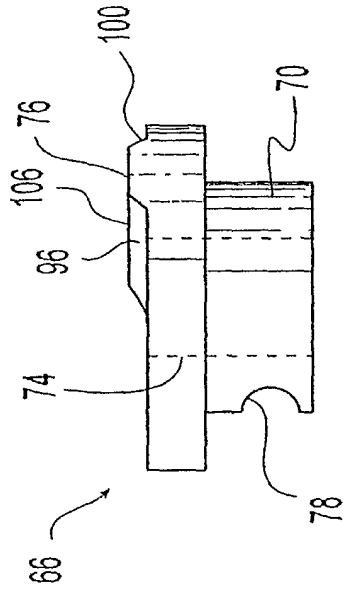

Fig. 8

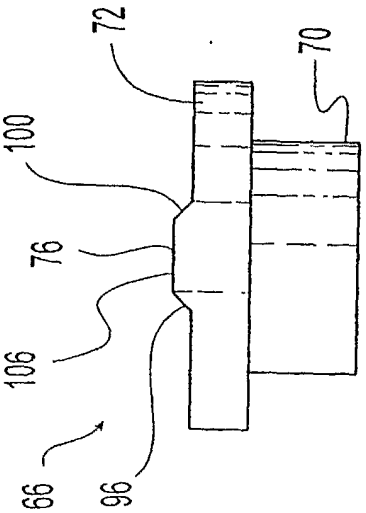

Fig. 9

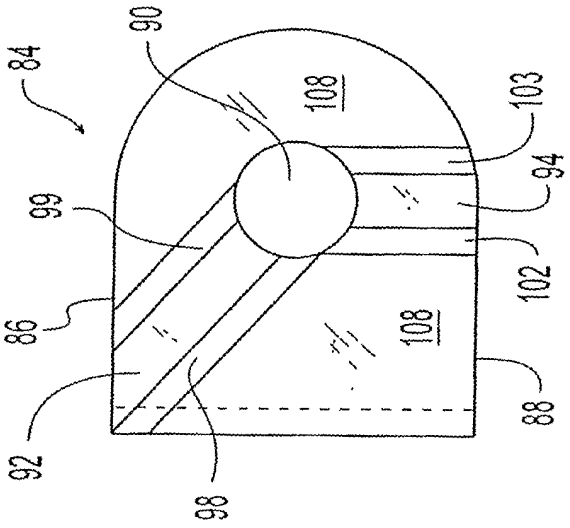

Fig. 10

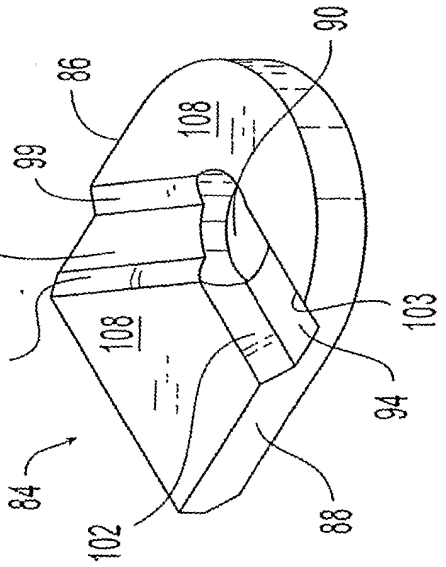

Fig. 11

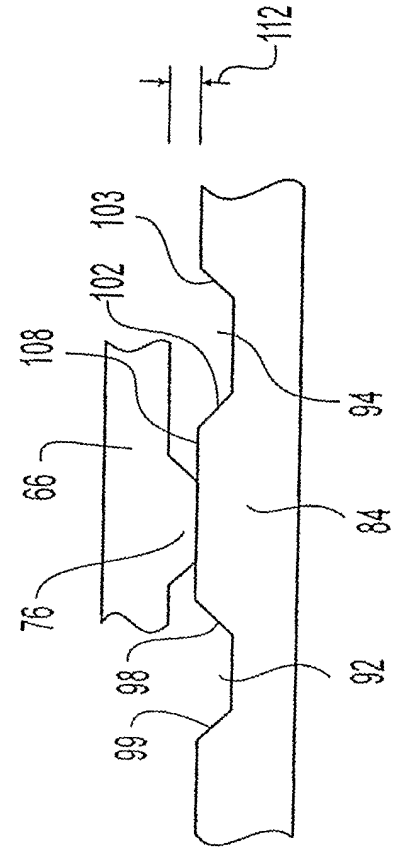

Fig. 13

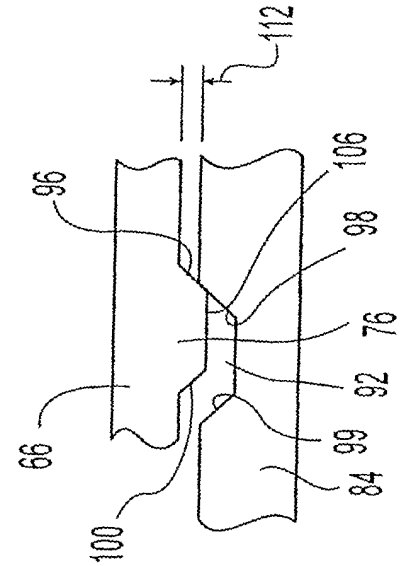

Fig. 12

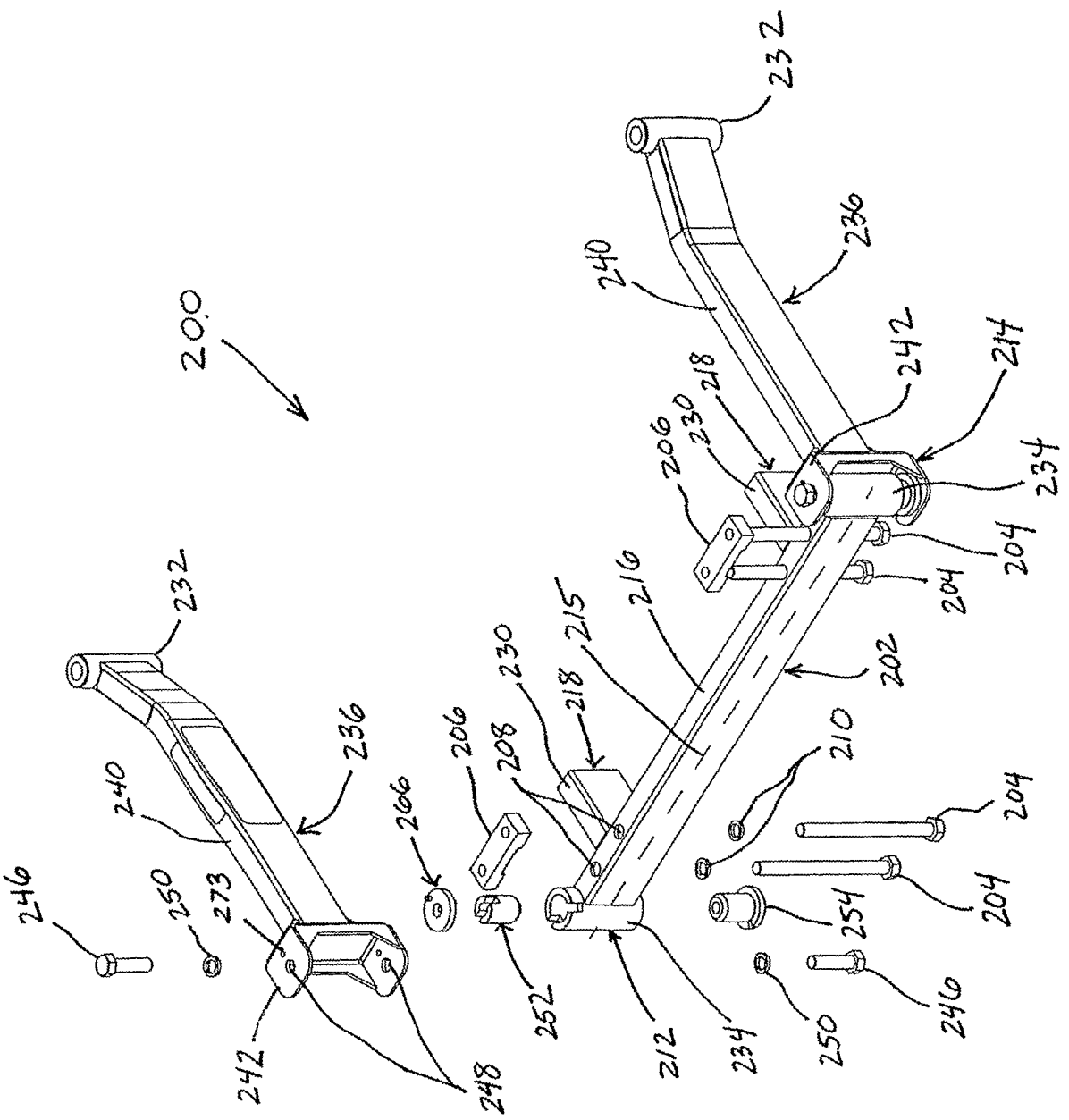
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FIG. 14

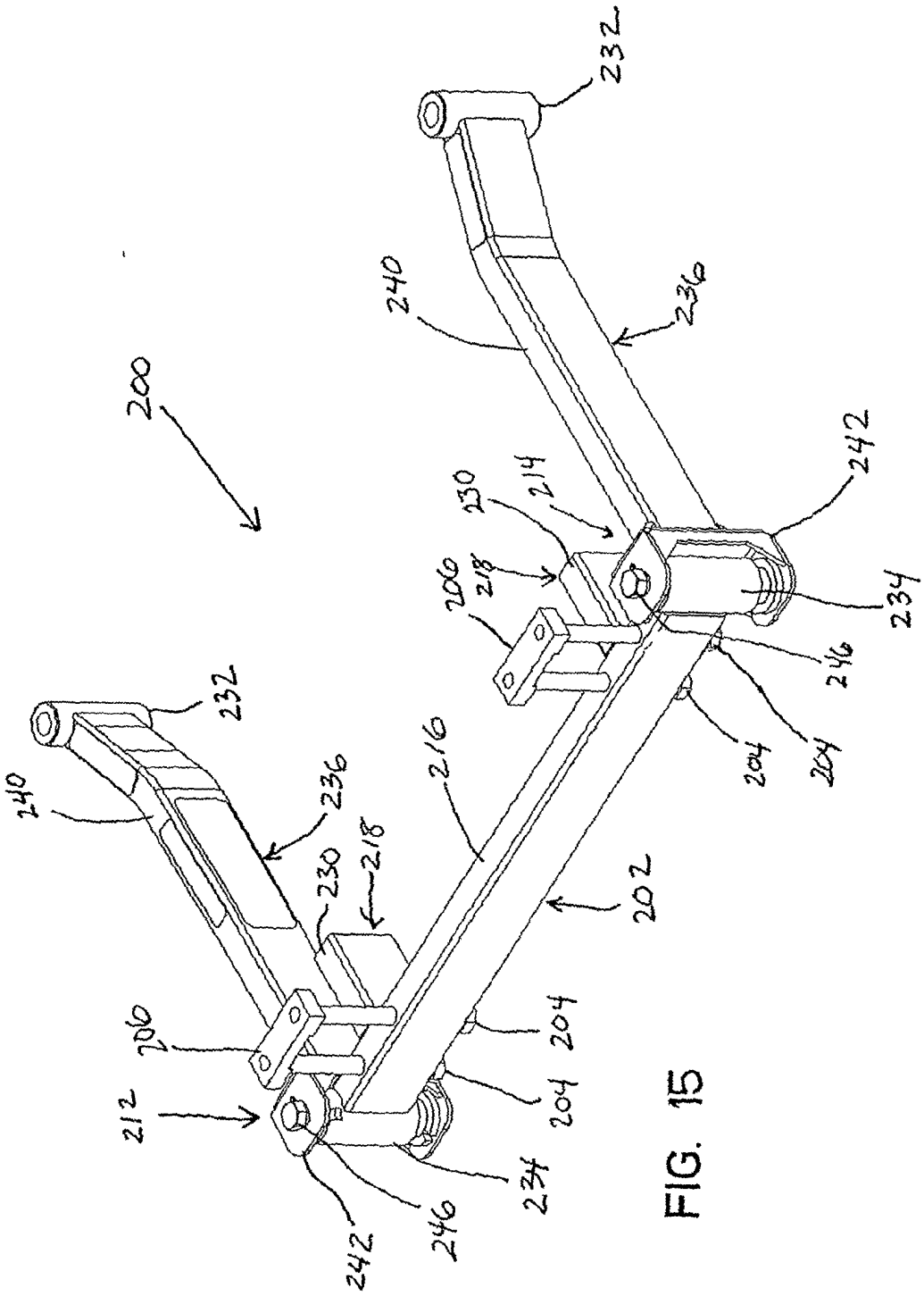

FIG. 15

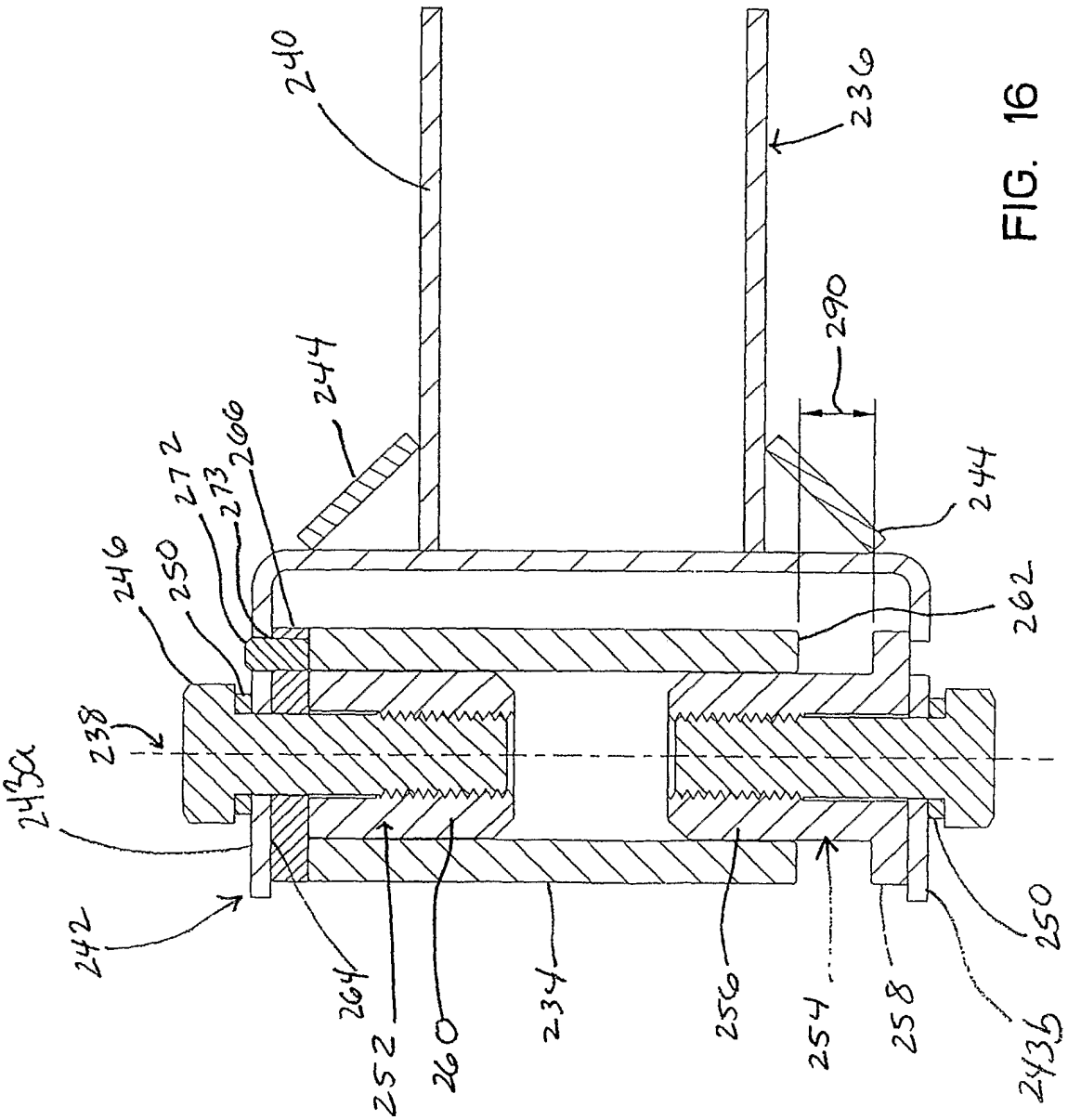
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FIG. 16

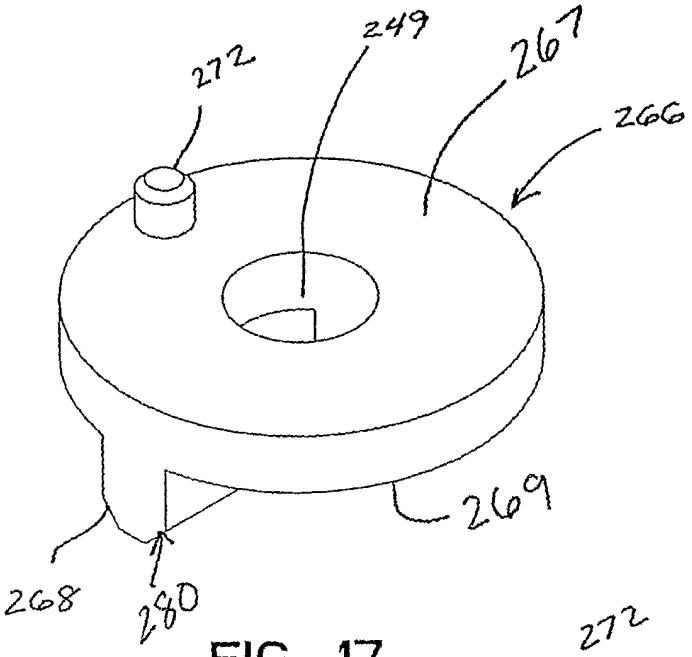

FIG. 17

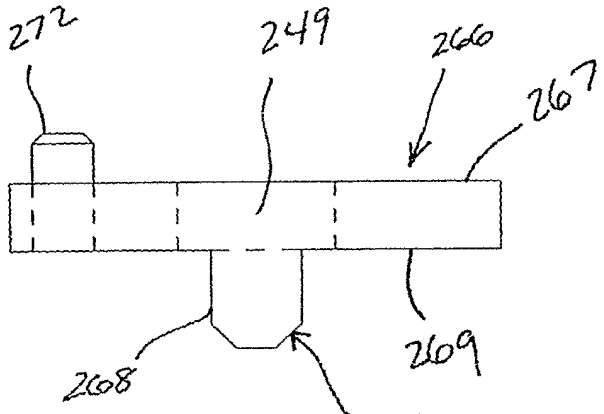

FIG. 18

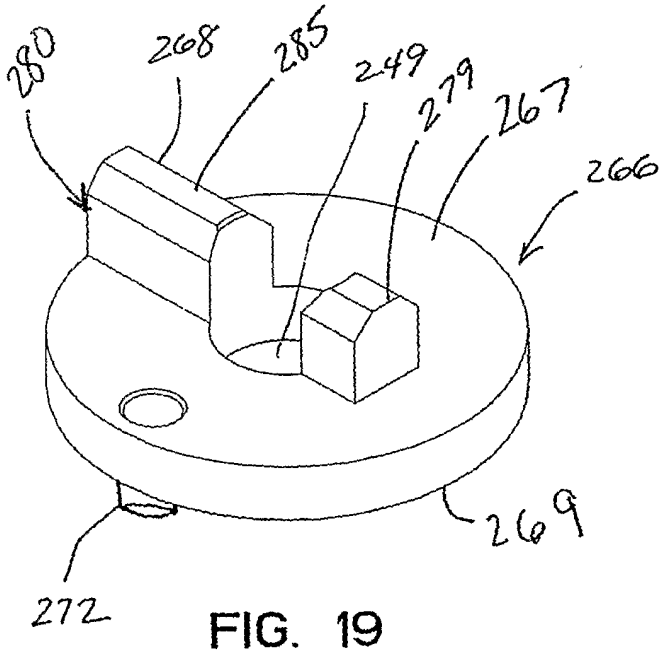

FIG. 19

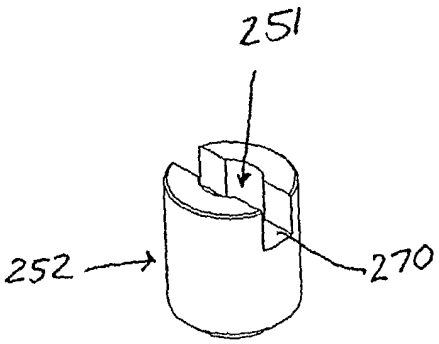

FIG. 20

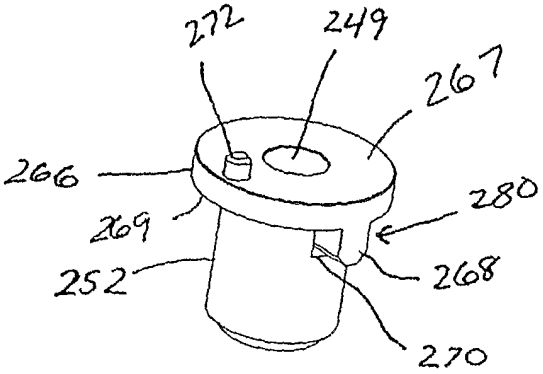

FIG. 21

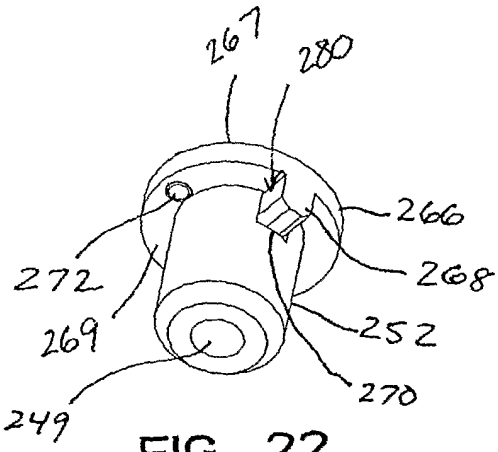

FIG. 22

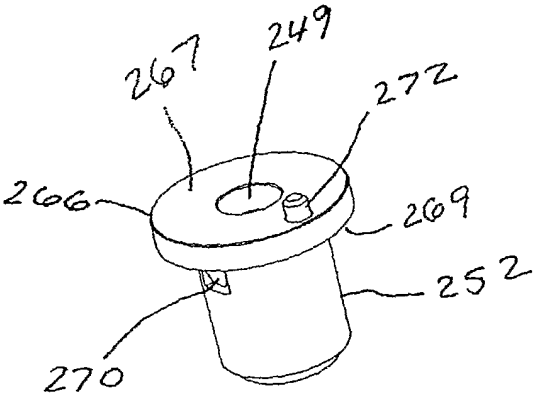

FIG. 23

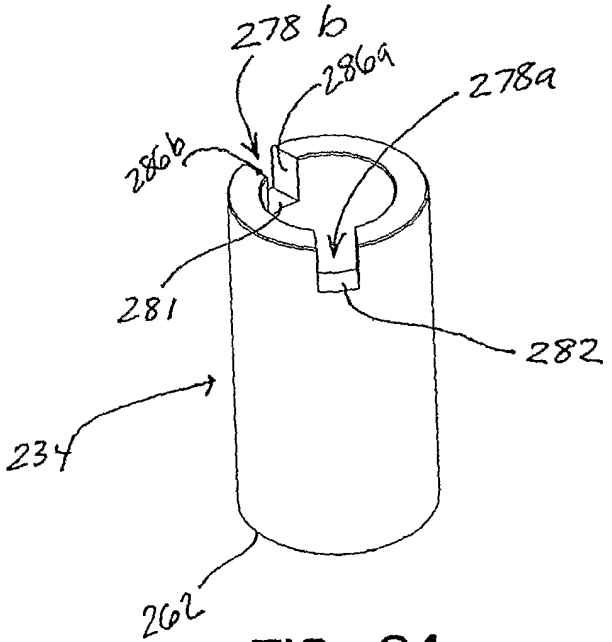

FIG. 24