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(54) Wheelchair seat back mount assembly and wheelchair therewith

(57) An assembly for mounting a seat back shell (18) to a wheelchair seat back cane (14) comprises a first portion (12) attachable to the seat back cane (14) and a second portion (16) attachable to the seat back shell (18). The portions mate to form a point of attachment by aligning one of the portions with the other portion and displacing one of the portions in relation to the other portion.

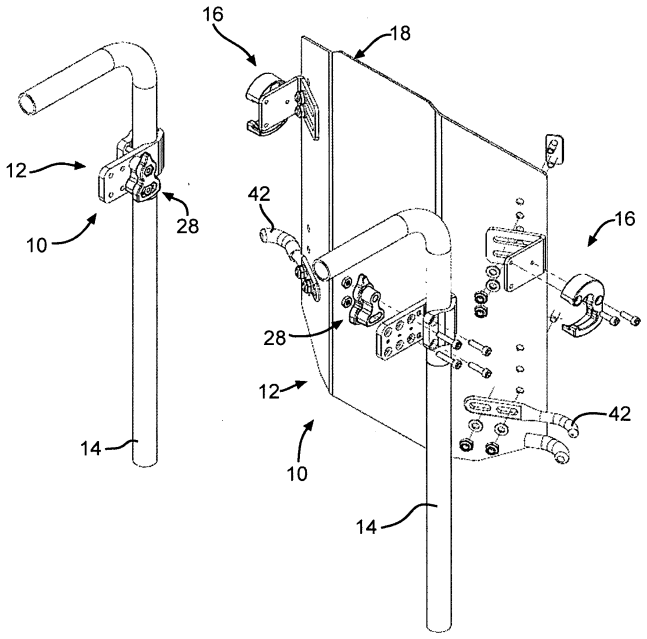

FIG. 1

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of United States Provisional Application No. 60/878,293, filed January 3, 2007, the disclosure of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] This invention relates in general to wheelchairs and more particularly to wheelchair seat back mount assemblies.

SUMMARY OF THE INVENTION

[0003] This invention relates to an assembly for mounting a seat back shell to a seat back cane of a wheelchair. The assembly comprises a first portion attachable to the seat back cane and a second portion attachable to the seat back shell. The portions mate to form a point of attachment by aligning one of the portions with the other portion and displacing one of the portions in relation to the other portion.

[0004] Various aspects of this invention will become apparent to those skilled in the art from the following detailed description of the preferred embodiment, when read in light of the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] Fig. 1 is a partially exploded, environmental perspective view of a seat back mount assembly.

[0006] Fig. 2 is an enlarged-scale, exploded perspective view of the assembly shown in Fig. 1.

[0007] Fig. 3 is an enlarged-scale, exploded perspective view of an adjustable clamp of the assembly shown in Fig. 1.

[0008] Fig. 4 is a reduced-scale, environmental partial rear perspective view of the assembly shown in Fig. 1.

[0009] Figs. 5A-5B are perspective views of a seat back being located and installed with the seat back mount assembly as shown in Fig. 1.

[0010] Figs. 6A-6F are enlarged, elevational views of a mounting block and a c-shaped mounting bracket of the assembly shown in Fig. 1 at various stages of cooperation.

[0011] Fig. 7 is a cross-sectional view of the mounting block and the c-shaped mounting bracket taken along the lines 7-7 in Fig. 6F.

[0012] Fig. 8 is an enlarged-scale, exploded perspective view of a bottom hook for use with the assembly shown in Fig. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] Referring now to the drawings, there is illustrated in Fig. 1 a partially exploded, environmental perspective view of a wheelchair seat back mount assembly 10. The assembly 10 may be comprised of two portions, a first portion, generally indicated at 12, that may be attachable in relation to the wheelchair seat back canes 14 and a second portion, generally indicated at 16, that may be attachable in relation to the wheelchair seat back shell 18. These two portions 12, 16 may mate to form an easy-to-use assembly.

[0014] In the exemplary embodiment shown in Fig. 2, the first portion 12 may include a clamp bracket having a first part, which may be in the form of a tube clamp plate 20, and a second part, which may be in the form of a tube clamp hinge 22a that may cooperate with the tube clamp plate 20. The tube clamp plate 20 may have a relatively planar main body portion 20a and a curved or hooked portion, generally indicated at 20b, extending from the main body portion 20a. Spaced fingers 20c may extend from the hooked portion 20b. Aligning holes 20d in the fingers 20c may receive a dowel pin 24, which may fit tightly in the holes 20d. The tube clamp hinge 22 may have a curved or hooked portion 22a, which may be similar to the hook portion 20b of the tube clamp plate 20. A tab 22b may extend from the hooked portion 22a. The tab 22b may be sized to fit between the fingers 20c. A groove 22c on the tabs may engage the dowel pin 24 to form a connection between the tube clamp plate 20 and the tube clamp hinge 22. The engaging groove 22c and dowel pin 24, in effect, may form a hinge. Multiple grooves, such as the two grooves 22c shown, may be provided for selective engagement with the dowel pin 24 to adjust the size of the clamp bracket, as will become apparent in the description that follows. A tongue 22d may extend from the hooked portion 22a, opposite the tab 22b. One or more bores 22e may pass the tongue 22d. One or more fasteners 26, such as the cap screws shown, may pass through the bores 22e, which may be counter bores, in the tongue 22d and may be threaded into aligning threaded holes 20e in the main body portion 20a of the clamp bracket to fasten the tongue 22d of the tube clamp hinge 22 to the main body portion 20a of the tube clamp plate 20. The fasteners 26 may be threaded into nuts, such as the lock nuts shown, on the opposite side (i.e., the blind side when viewing Fig. 2) of the main body portion 20a. The nuts may be recessed in hexagonal holes in the main body portion 20a so that the hexagonal holes prevent the nuts from turning.

[0015] In the exemplary embodiment, a mounting block 28 may be supported in relation to the clamp bracket, such as in relation to the tube clamp plate 20 or in relation to the main body portion 20a of the tube clamp plate 20. The mounting block 28 may be mounted with one or more fasteners 30, such as the cap screws shown. For example, one or more bores 20g, which may be coun-

ter bores, may be provided through the main body portion 20a and may align with holes 28a, 28b through the mounting block 28. The fasteners 30 may pass through the bores 20g in the main body portion 20a and further through aligning holes 28a, 28b in the mounting block 28. The fasteners 30 may then be threaded into nuts, such as the lock nuts shown, on the opposite side of the mounting block 28. The nuts may be recessed in holes in the mounting block 28 (i.e., the blind side when viewing Fig. 2). The holes may be dimensioned and configured to prevent the nuts from turning.

[0016] It should be noted that the main body portion 20a may have a plurality of bores 20g, including three sets or pairs of bores. Each pair may be arranged to support the seat back shell 18 at a different angle. For example, the three pairs of bores may support the seat back shell 18 at 0, 5, and 10 degrees (i.e., relative to vertical when viewing Fig. 1). The main body portion 20a may be provided with indicia, as shown in Fig. 3, corresponding with each pair of bores to indicate the angular disposition of the seat back shell 18 if a corresponding pair of bores is used.

[0017] It should further be noted that at least one of the holes 28b through the exemplary mounting block 28 may be curved or arcuate in shape to permit the mounting block 28 to pivot when the fasteners 30 are loosened, such as along the line B-B shown in Fig. 4. In particular, the mounting block 28 may have two holes 28a, 28b. Two fasteners 30 may pass through the two holes 28a, 28b. One fastener 30 passing through one hole 28a may function as a pivot. The other fastener 30 may pass through the other hole 28b, which may be curved or arcuate in shape. In this way, the mounting block 28 may be able to pivot on the one fastener 30 as the mounting block 28 moves in relation to the other fastener 30 due to the provision of the curved or arcuate shaped hole 28b.

[0018] As shown in Fig. 2, the exemplary mounting block 28 may have a substantially circular shaped portion 28c and a substantially oval or kidney shaped portion 28d separated by a necked-down portion 28e, when viewed from a point parallel or along the axes A1, A2 of the holes 28a, 28b therethrough. The hole 28a for the fastener 30 that may function as a pivot passes through the circular portion 28c. The arcuate shaped hole 28b may pass through the substantially oval or kidney shaped portion 28d. Additionally, the mounting block 28 may have a first or outer portion 28f and a second or inner portion 28g, which may be reduced in size so as to be smaller in dimension when viewed from a point transverse or crosswise from the axes A1, A2 of the holes 28a, 28b therethrough. The larger outer portion 28f may form a first flange that extends radially outward in relation to the inner portion 28g. A substantially pointed guide 28h may extend (upwardly when viewing Fig. 2) from the top of the flange.

[0019] The second portion 16 of the assembly 10 may include a substantially C-shaped mounting bracket having a first or outer portion 16a and a second or inner portion 16b, which may be of a different size or dimension relative to the outer portion 16a so that the inner portion 16b may form a second flange that may extend radially inward in relation to the outer portion 16a. The C-shaped mounting bracket may define a radial opening 16d and the flange may define an axial opening 16e. The radial opening 16dmay permit passage of the mounting block 28 when aligned or oriented in a first orientation and prevents passage of the mounting block 28 when displaced or oriented in a second orientation. The axial opening 16emay restrict axial passage of the mounting block 28 when in the second orientation. The outer portion 16a may be dimensioned and configured to be substantially complementary in shape to the outer portion 28f of the mounting block 28, and may include, for example, a region, such as the radial opening 16dor channel 16d shown in Fig. 7, into which the pointed guide 28h may be inserted. The inner portion 16b may be dimensioned and configured to be substantially complementary in shape to the outer portion 28f of the mounting block 28. The two flanges may cooperate to form an attachment between the mounting block 28 and the C-shaped mounting bracket when oriented in a certain orientation (e.g., the first orientation) in relation to one another, as will become more apparent in the description that follows.

[0020] The exemplary C-shaped mounting bracket may be mounted in relation to the seat back shell 18 by a top mount bracket 32. The exemplary top mount bracket 32 is a substantially L-shaped or V-shaped bracket having one or more holes or slots 32a therein that permit adjustment, such as lateral adjustment, of the top mount bracket 32 in relation to the seat back shell 18. The C-shaped mounting bracket may have one or more bores 16c, such as the counter bores shown, passing therethrough. The top mount bracket 32 may have threaded holes 32b that may align with the bores 16c. Fasteners 38, such as the cap screws shown, may pass through the bores 16c and be threaded into the holes 32b to fasten the C-shaped mounting bracket to the top mount bracket 32. The top mount bracket 32 may, in turn, be fastened to the seat back shell 18 in any suitable manner, such as via the stud plate 40, washers 39, and nuts 41 (e.g., locknuts) shown.

[0021] Referring back to Fig. 1, a mounting block 28 is shown fastened in relation to each seat cane 14 and a C-shaped mounting bracket is fastened in relation to each side of the seat back shell 18. An attachment may be formed between each mounting block 28 and a corresponding C-shaped mounting bracket. This may form two points of attachment of the seat back shell 18 in relation to the seat back canes 14. With the mounting block 28 and the C-shaped mounting bracket installed in relation to the seat back canes 14 and the seat back shell 18, the seat back shell 18 may be easily installed by aligning the second portions 16 in relation to (e.g. over) the first portions 12 and then rotating, or otherwise displacing, the seat back shell 18 downward into a positive latched position, as depicted in Figs. 5A-5B.

[0022] With the provision of only two points of attachment, it may be simple to align the mounting block 28 with the C-shaped mounting bracket. With the mounting block 28 and the C-shaped mounting bracket aligned, the mounting block 28 may be inserted into the C-shaped mounting bracket with the pointed guide 28h entering the channel 16d of the C-shaped mounting bracket, as shown in Figs. 6A-6B. The seat back shell (not shown) may then be rotated or pivoted (e.g., in a clockwise direction when viewing Fig. 6D) or otherwise displaced until the pointed guide 28h makes abutting contact with the C-shaped mounting bracket at the end of the channel 16d and the substantially oval or kidney shaped portion 28d of the mounting block 28 makes abutting contact with a corresponding portion of the C-shaped mounting bracket, as shown in Figs. 6E-6F. The abutting contact may resist further rotation or pivotal movement of the seat back shell 18 (e.g., in a clockwise direction when viewing Fig. 6D).

[0023] As shown in Fig. 7, the respective flanges of the mounting block 28 and the C-shaped mounting bracket may cooperate to prevent lateral movement of the mounting block 28 and the C-shaped mounting bracket in relation to one another to form a point of attachment on each seat back cane 14.

[0024] To supplement the support provided by the two points of attachment, a bottom hook 42, shown in Fig. 8, may be attached to each side of the seat back shell 18 at a lower portion of the seat back shell 18 (i.e., below the attachment points). The exemplary bottom hooks 42 may be provided with one or more holes or slots 42a therein that permit lateral adjustment of the bottom hooks 42 in relation to the seat back shell 18. This may permit proper alignment of the bottom hooks 42 in relation to the seat back canes 14. As shown in Fig. 1, the bottom hooks 42 may abut the seat back canes 14 to limit movement of the lower portion to the seat back shell 18 in relation to the canes 14. The bottom hooks 42 may be fastened to the seat back shell 18 in any suitable manner, such as with the stud plates 44, washers 46 and nuts 48 shown. The nuts 48 may be lock nuts. A covering material 50, such as a plastic or rubber covering may cover the bottom hooks 42 to provide a relatively resilient contact between the bottom hooks 42 and the canes 14.

[0025] It should be noted that different shaped back canes can be accommodated by the pivotal adjustment of the mounting block 28 in relation to the tube clamp plate 20. This may further insure that the bottom hooks 42 are properly aligned with the seat back canes 14. For example, different back canes may be at different angles relative to vertical, or not may not follow a straight line and thus have portions that are at different angles relative to vertical. In these cases, the orientation of the mounting block 28 may be pivotally adjusted in relation to the back canes, depending on the angle of the back cane in relation to vertical at the point which the mounting block 28 is mounted to the back cane.

[0026] To accommodate different diameter canes 14, the clamp bracket may be adjustable. As described above, the clamp bracket may have a tube clamp plate 20 with a pin 24 and a tube clamp hinge 22 with grooves 22c that may be selectively engageable with the pin 24 so the clamp 22 may be used with different sized seat back canes 14. For example, one groove may accommodate 7/8 inch (22 mm) diameter canes while another groove may accommodate 1 inch (25 mm) diameter canes.

[0027] Most of the load applied on the seat back shell 18 may be applied in the shoulder area of the shell 18. The main attachment points of the assembly 10 may be in the same area, providing good support and minimizing risk that the seat back shell 18 will become unintentionally detached.

[0028] It should be appreciated that the clamp bracket and top mount bracket are exemplary brackets and other forms of connection may be provided for the mounting block 28 and the C-shaped mounting bracket. It should further be appreciated that the mounting block 28 and the C-shaped mounting bracket are exemplary embodiments and that the mounting block and the mounting bracket may take on other shapes or forms. Further, the fasteners 26, 30, 38 and stud plates 40, 44 are exemplary fasteners and other fasteners may be employed. The bottom hook 42 is described for exemplary purposes and other structure may be suitable for use in the place of the bottom hooks 42.

[0029] It should be appreciated that the mounting block and mounting bracket may be cooperatively configured in any suitable manner, whereby at least one of either the mounting block or mounting bracket may be oriented in such a way to cooperate with the other one of either the mounting block or mounting bracket, such as by insertion, and then displaced, such as by rotation or other suitable displacement, to interlock the mounting block and the mounting bracket. The axial opening is provided as an example of a captive or restrictive opening, which may be defined by an annular flange or other suitable structure or configuration. Other structure may be suitable for interlock the mounting block and the mounting bracket. Further, the pointed guide functions in cooperation with the mounting bracket as an interference member. It should be appreciated that other structure may be suitable for functioning as an interference member.

[0030] The principle and mode of operation of this invention have been explained and illustrated in its preferred embodiment. However, it must be understood that this invention may be practiced otherwise than as specifically explained and illustrated without departing from its spirit or scope.

Claims

1. An assembly for mounting a seat back shell to a wheelchair seat back cane, the assembly comprising:

a first portion attachable to the seat back cane, and
a second portion attachable to the seat back shell, the portions mating to form a point of attachment by aligning one of the portions with the other portion and displacing one of the portions in relation to the other portion.

2. The assembly of claim 1 wherein the shell is attachable to two spaced apart seat back canes, thus forming two points of attachment.

3. An assembly for mounting a seat back shell to a wheelchair seat back cane, the assembly comprising:

a first portion attachable in relation to the seat back cane; and
a second portion attachable in relation to the seat back shell, the second portion being configured to receive the first portion and rotate in relation to the first portion to lock the second portion in relation to the first portion.

4. The assembly of claim 3 wherein the first portion comprises a tube clamp that is attachable in relation to the seat back cane.

5. The assembly of claim 4 wherein the tube clamp comprises a first part and a second part hinged in relation to the first part.

6. The assembly of claim 5 wherein the second part is hinged in relation to the first part in a plurality of positions to accommodate different size seat back canes.

7. The assembly of claim 4 wherein the first portion further comprises a mounting block attachable in relation to the tube clamp, the second portion being configured to receive the mounting block and rotate in relation to the mounting block to lock the second portion in relation to the first portion.

8. The assembly of claim 7 wherein the mounting block is attachable in relation to the tube clamp in a plurality of positions to adjust the angle of the seat back shell in relation to the seat back canes.

9. The assembly of claim 7 wherein the mounting block is pivotally adjustable in relation to the tube clamp in any one of the plurality of positions to accommodate different shaped back canes.

10. The assembly of claim 3 wherein the second portion comprises a mounting bracket that is attachable in relation to the seat back shell.

11. The assembly of claim 10 wherein the mounting bracket is adjustable in relation to the seat back shell.

12. The assembly of claim 10 wherein the mounting bracket is laterally adjustable in relation to the seat back shell.

13. The assembly of claim 3 wherein the first portion comprises a mounting block and the second portion comprises a mounting bracket, the mounting bracket comprising a radial opening and an axial opening, the radial opening permitting passage of the mounting block when oriented in a first orientation and preventing passage of the mounting block when oriented in a second orientation, the axial opening restricting axial passage of the mounting block.

14. The assembly of claim 13 wherein the mounting block comprises an inner portion and an outer portion, the inner portion comprising a substantially circular shaped portion and a kidney shaped portion with a necked-down portion therebetween, the outer portion defining a first flange, and wherein the mounting bracket is substantially C-shaped and comprises an inner portion defining a second flange, the axial opening being bound by the second flange and having a shape complementary to the mounting block inner portion, the first and second flanges being dimensioned and configured to restrict axial passage of the mounting block inner portion through the mounting bracket.

15. An assembly for mounting a seat back shell to spaced apart wheelchair seat back canes, the assembly comprising:

a pair of first portions, the first portions being attachable in relation to the seat back canes; and
a pair of second portions, the second portions being attachable in relation to opposing sides of the seat back shell, the second portions being configured to receive the first portions and rotate in relation to the first portions to lock the second portions in relation to the first portions and thus form a two-point mounting assembly.

16. The assembly of claim 15 wherein the first portions each comprises a tube clamp attachable in relation to the seat back canes, the tube clamp comprising a first part and a second part hinged in relation to the first part in a plurality of positions to accommodate different size seat back canes.

17. The assembly of claim 16 wherein the first portions each comprises a mounting block attachable in relation to the tube clamp, the second portions being configured to receive the mounting blocks and rotate in relation to the mounting blocks to lock the second

portions in relation to the first portions.

18. The assembly of claim 17 wherein the mounting blocks are attachable in relation to the tube clamps in a plurality of positions to adjust the angle of the seat back shell in relation to the seat back canes.

19. The assembly of claim 15 wherein the second portions each comprise a mounting bracket that is attachable in relation to the seat back shell, the mounting bracket being laterally adjustable in relation to the seat back shell.

20. The assembly of claim 15 further comprising a pair of hooks, the hooks each being attachable in relation to the seat back shell below the second portions.

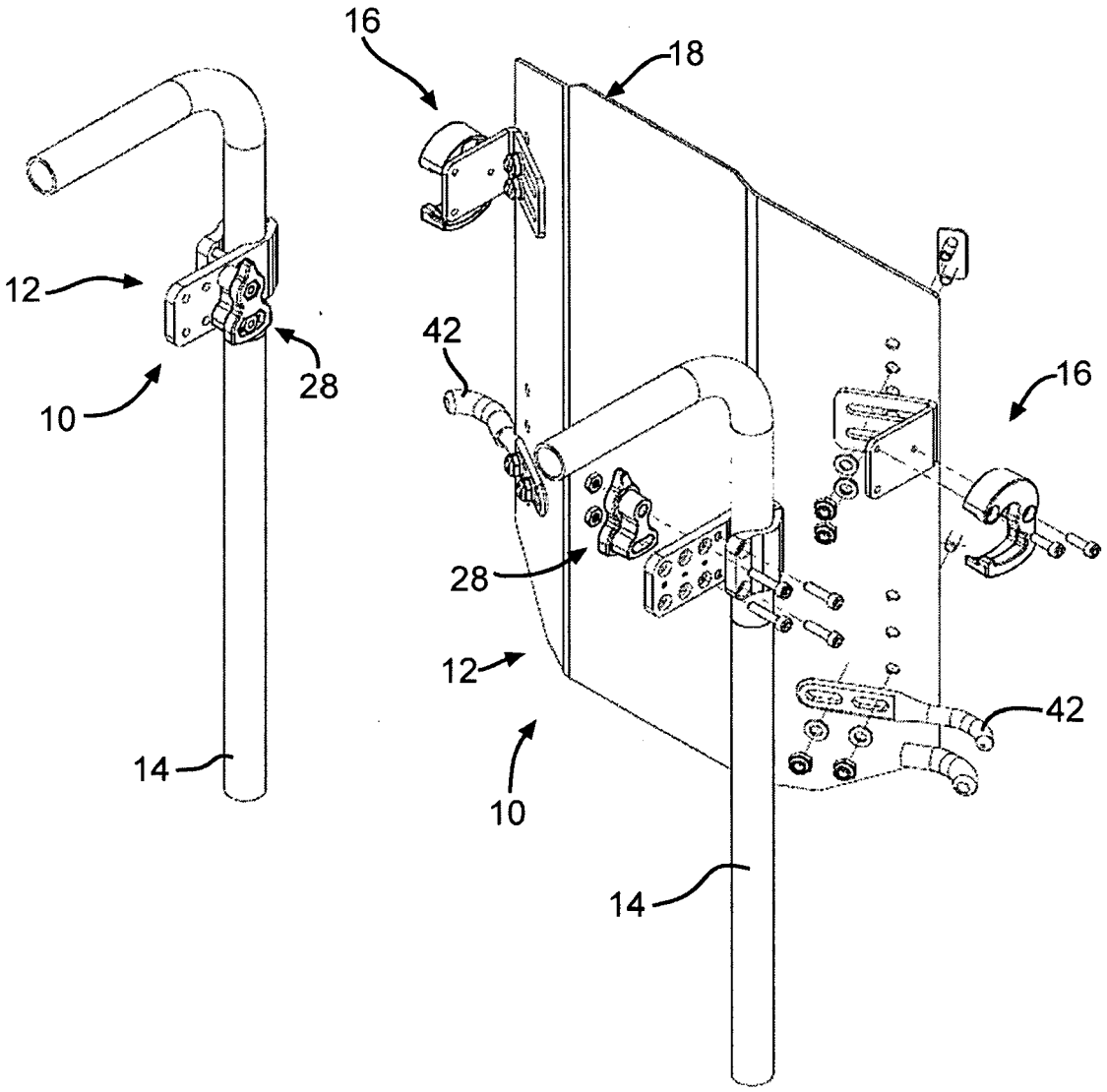

FIG. 1

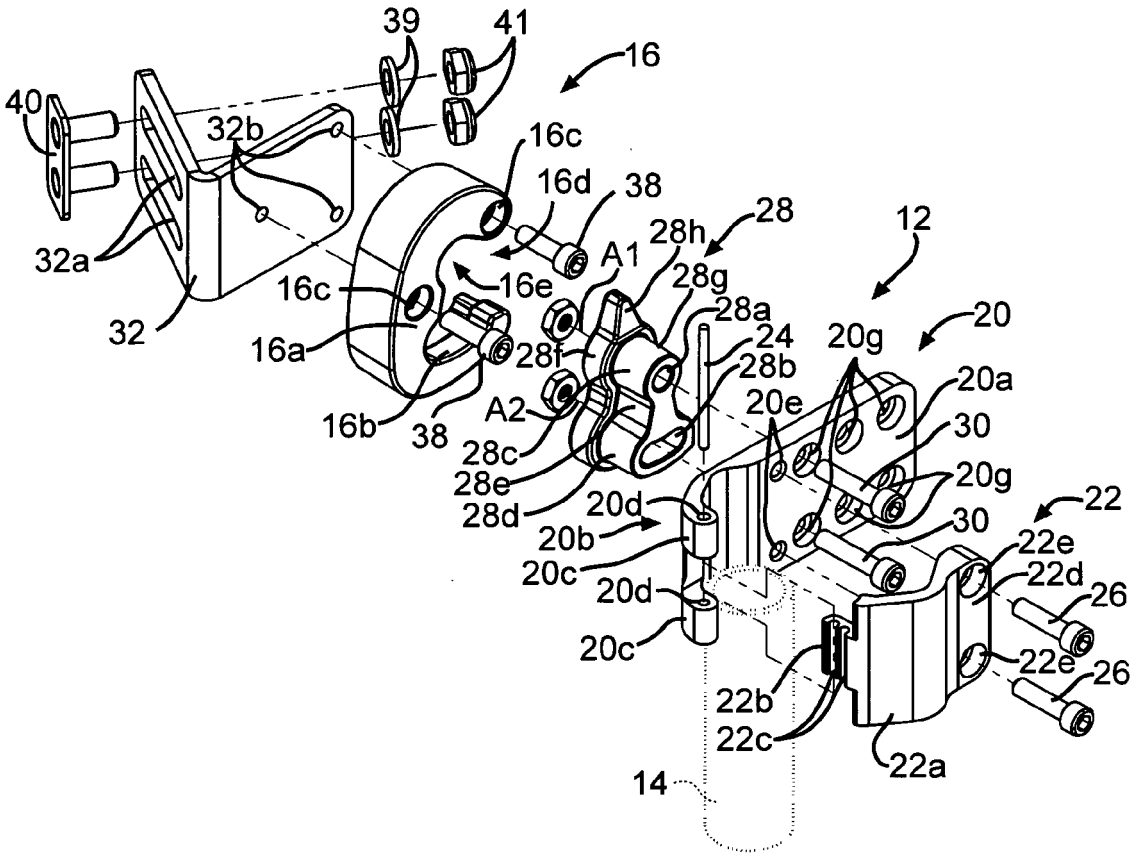
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FIG. 2

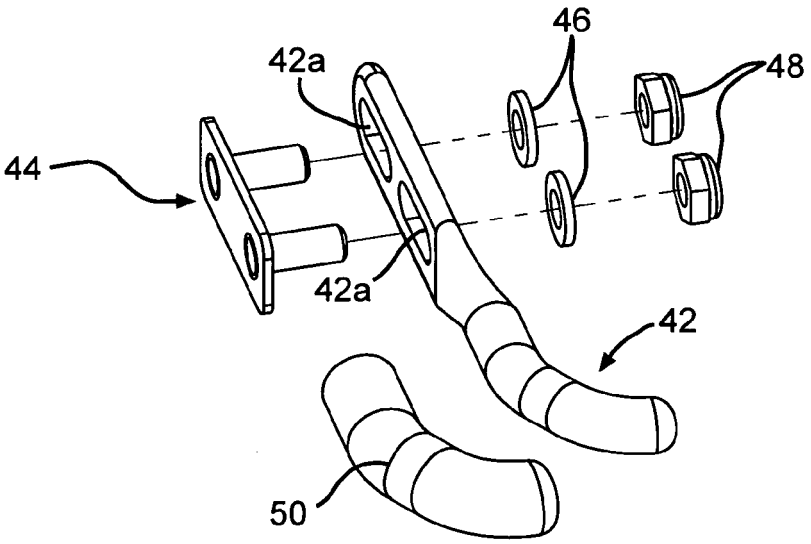
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FIG. 8

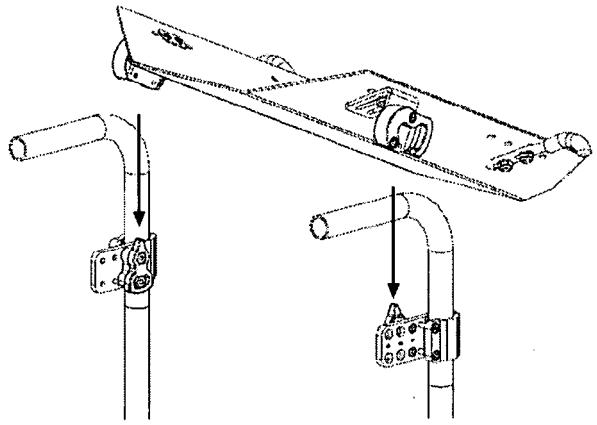

FIG. 5A

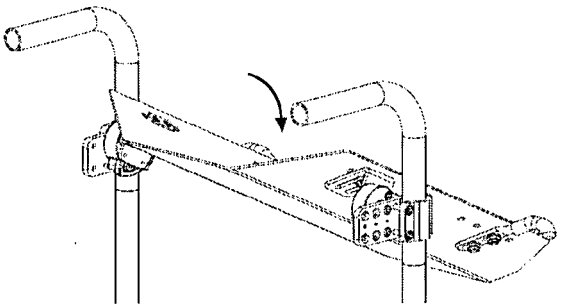

FIG. 5B

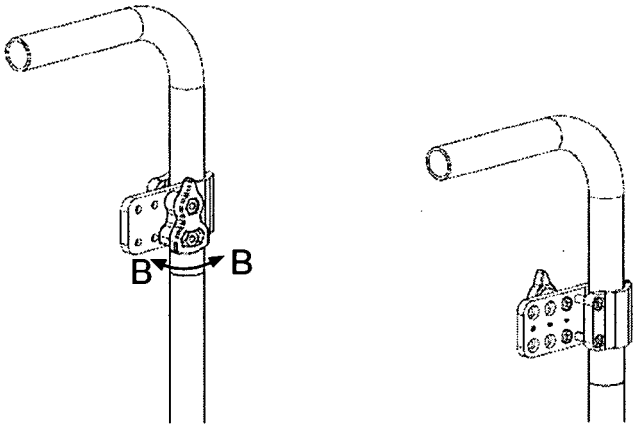

FIG. 4

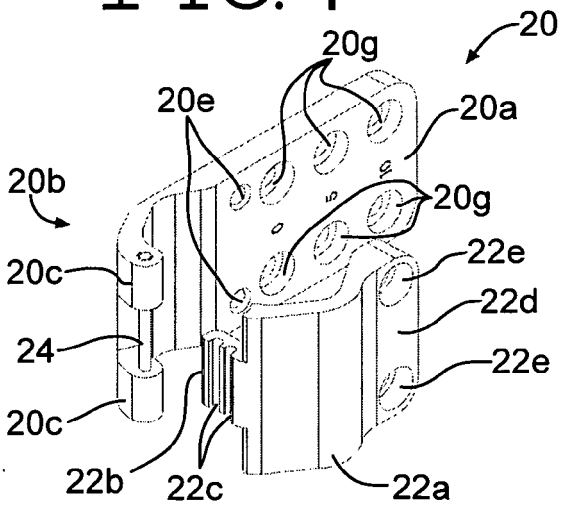

FIG. 3

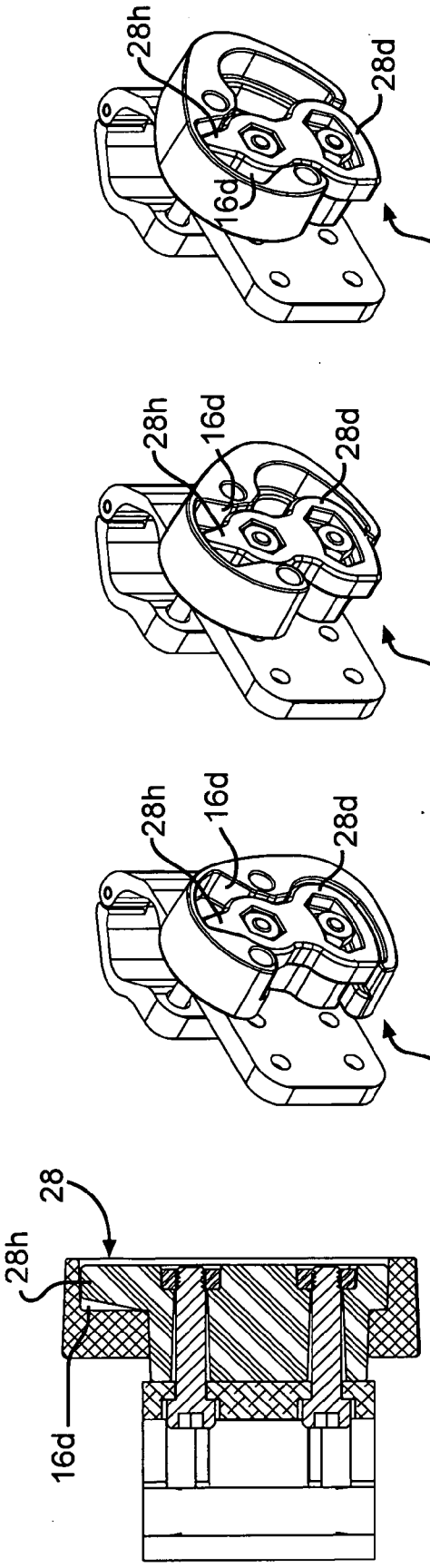

FIG. 7

FIG. 6A

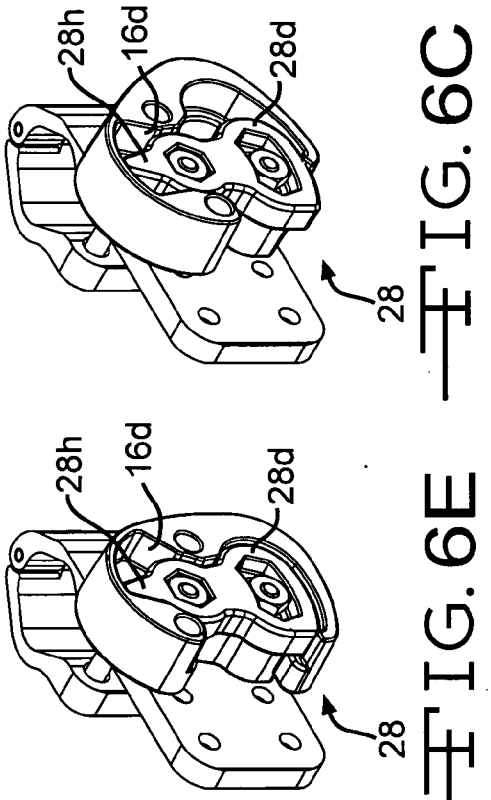

FIG. 6C

FIG. 6E

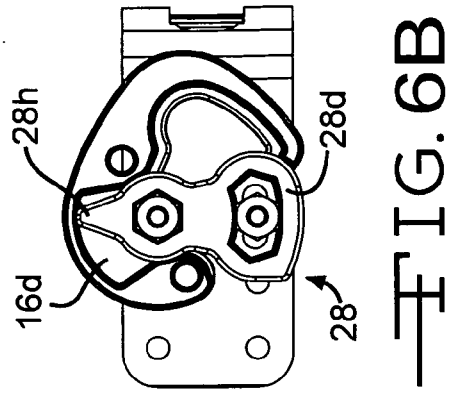

FIG. 6B

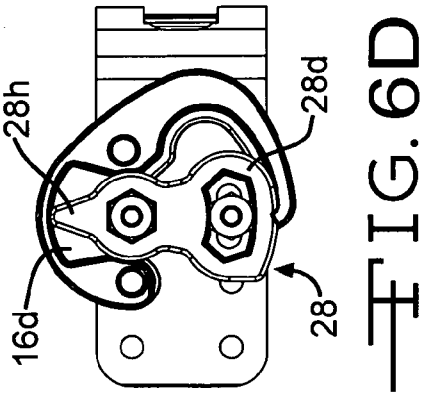

FIG. 6D

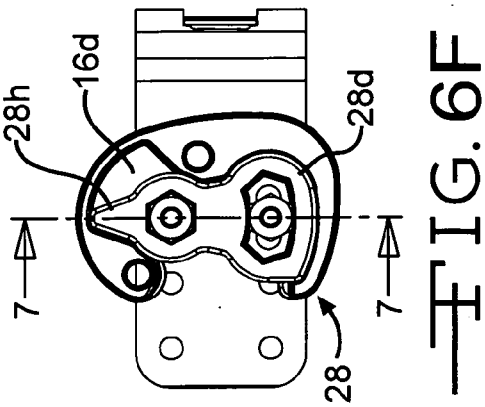

FIG. 6F

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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