



US 20070136947A1

(19) **United States**(12) **Patent Application Publication**
Limpert(10) **Pub. No.: US 2007/0136947 A1**(43) **Pub. Date: Jun. 21, 2007**(54) **MEDICAL TABLE CLAMP AND ACCESSORY INCLUDING SAME**(57) **ABSTRACT**(76) Inventor: **Clifford P. Limpert**, Port Charlotte, FL (US)

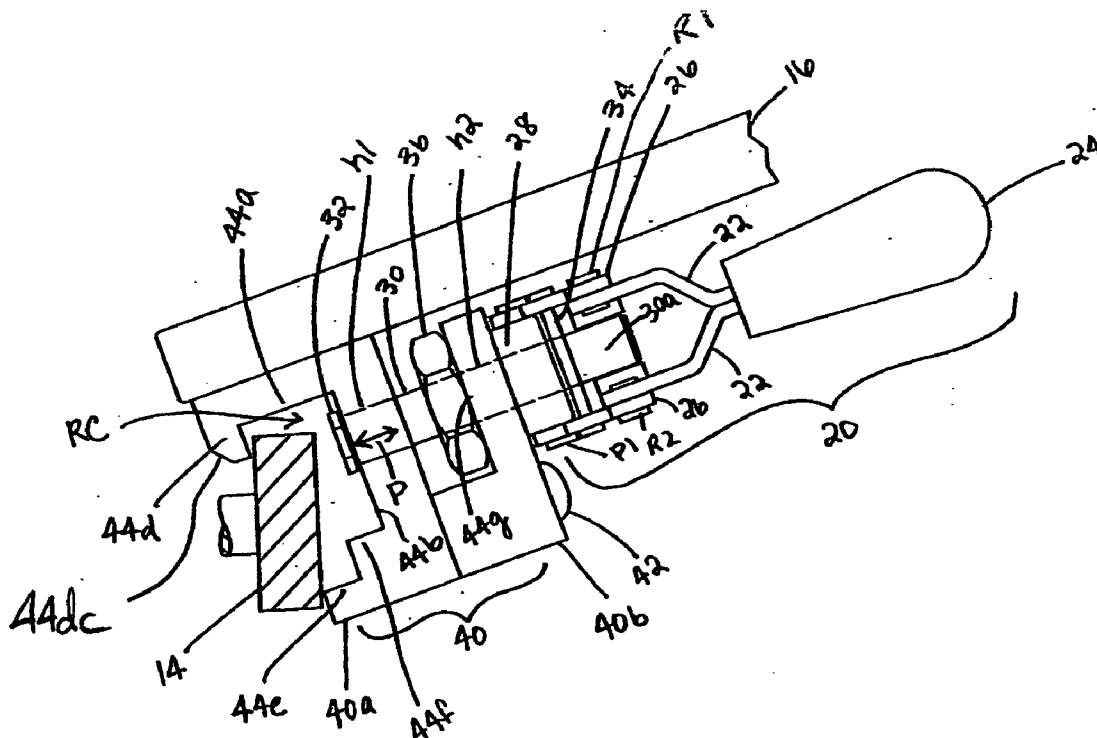
Correspondence Address:

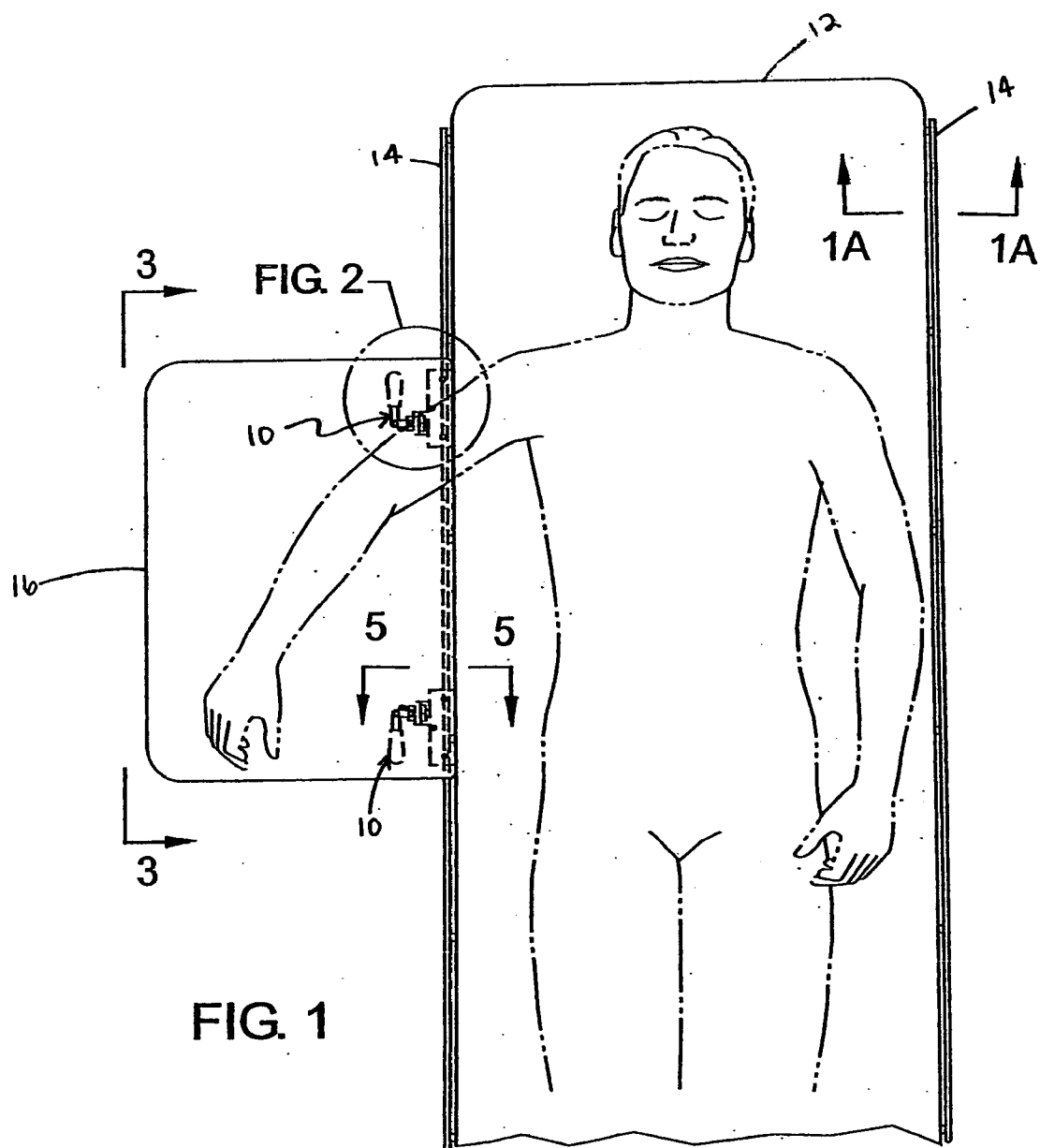
FAY SHARPE LLP**1100 SUPERIOR AVENUE, SEVENTH FLOOR
CLEVELAND, OH 44114 (US)**(21) Appl. No.: **11/580,612**(22) Filed: **Oct. 14, 2006****Related U.S. Application Data**

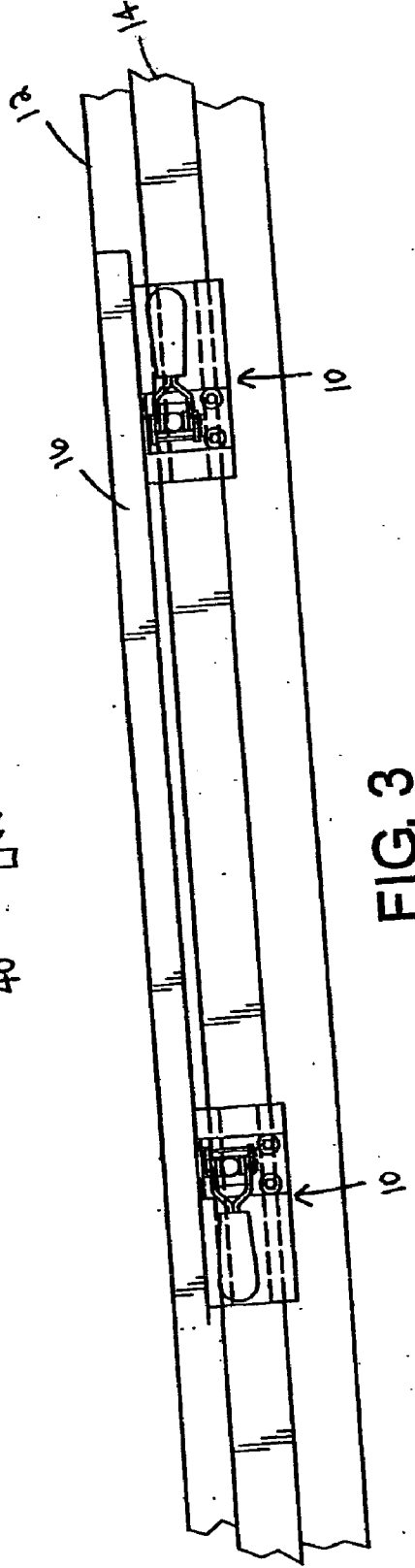
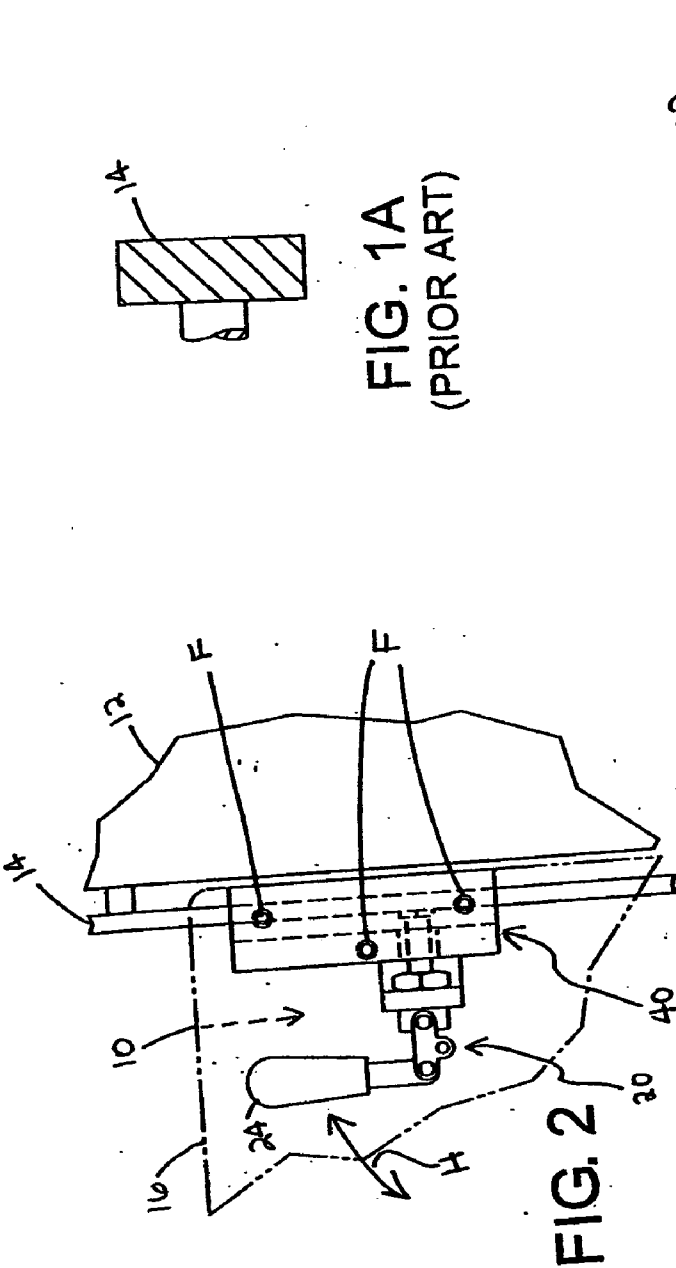
(60) Provisional application No. 60/726,824, filed on Oct. 14, 2005.

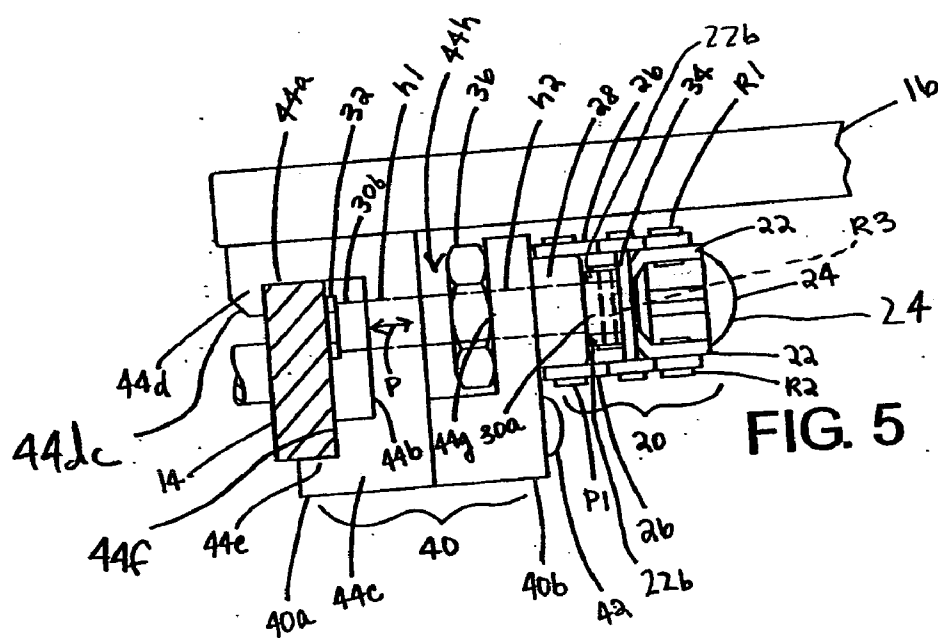
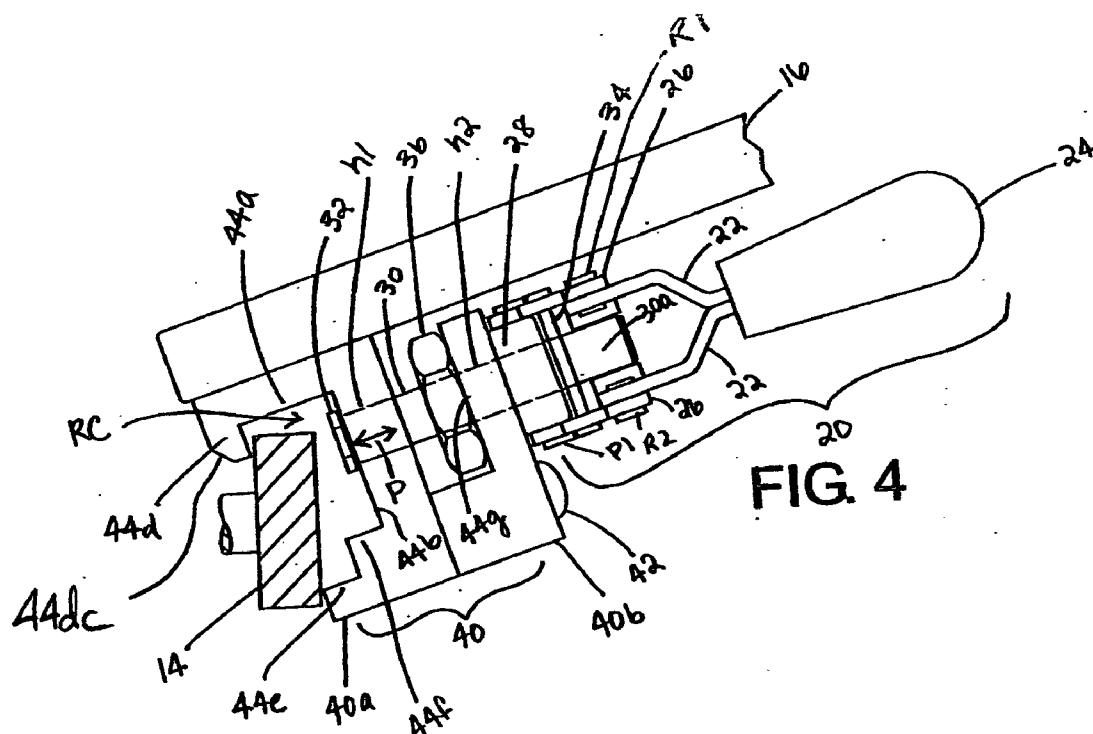
Publication Classification(51) **Int. Cl.****A47B 71/00** (2006.01)(52) **U.S. Cl.** 5/600

A clamp assembly for a medical table accessory includes a base including: (i) a rail-receiving channel block defining a rail-receiving channel adapted to receive and releasably retain an associated medical table accessory rail; and, (ii) a plunger assembly mount that includes a mounting wall. The plunger assembly is mounted to the mounting wall. The plunger assembly includes a plunger that moves in the aligned plunger holes relative to the base in a straight-line reciprocal manner between a retracted position and an extended position. The plunger includes a working end that extends into the rail-receiving channel when said plunger is located in its extended position to abut an associated medical table accessory rail located in the rail-receiving channel and capture the associated medical table accessory rail between the plunger working end and the front hook to prevent disengagement of the base from the associated medical table accessory rail when the plunger is in its extended position. The plunger assembly further includes a handle operatively connected to the plunger by a linkage, wherein the handle moves pivotably from a disengaged position to an engaged position. The plunger moves to its extended position when the handle is moved to its engaged position, and the plunger moves to its retracted position when the handle moves to its disengaged position. A medical table accessory such as an extension table is connected to the base.









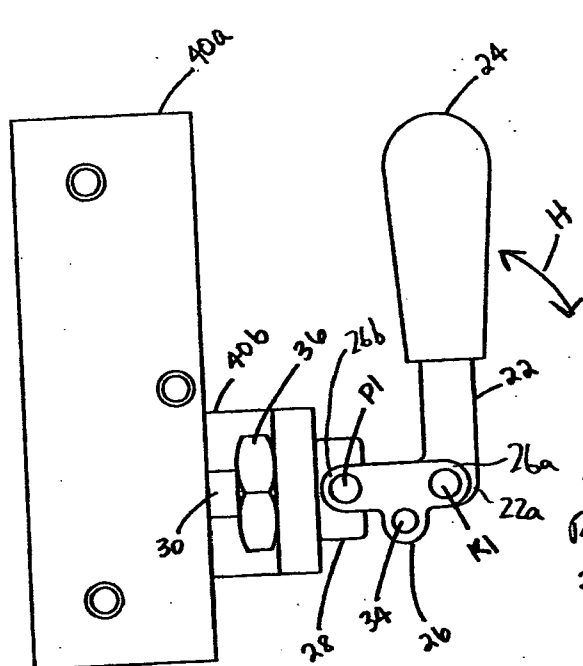


FIG. 6

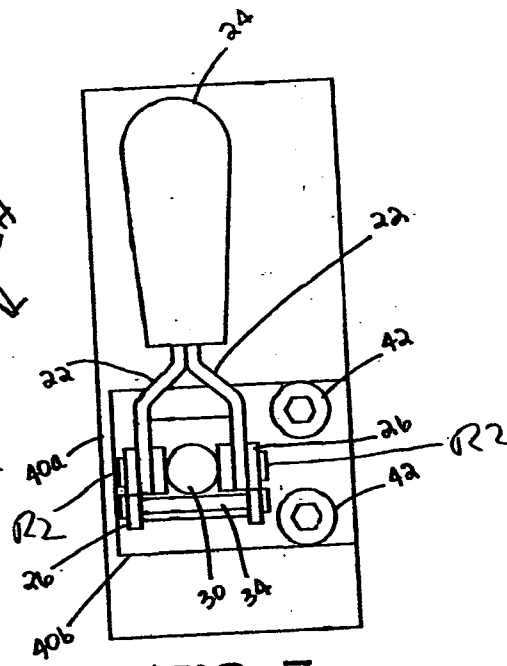


FIG. 7

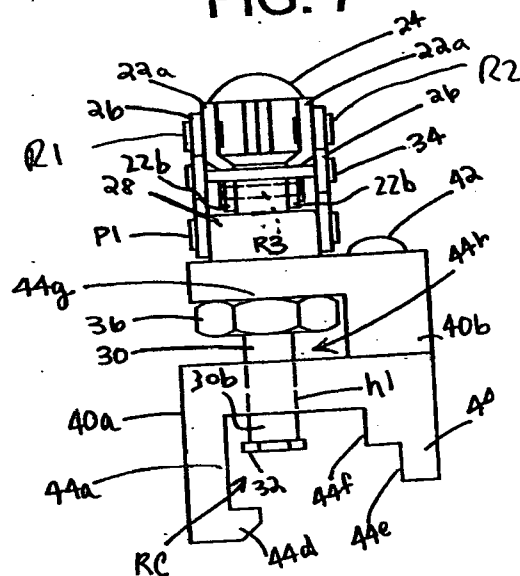


FIG. 8

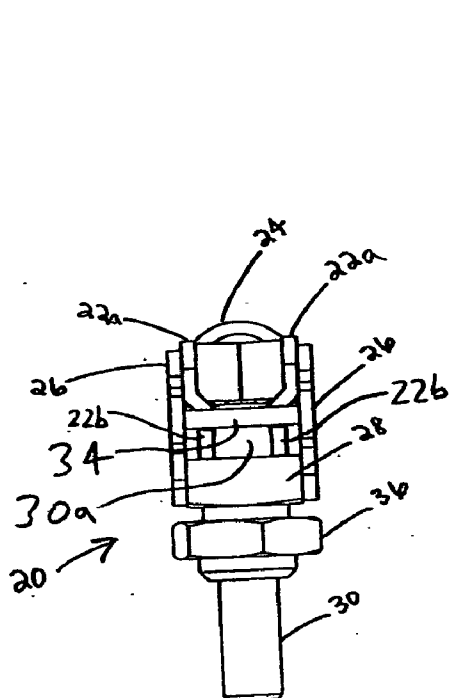


FIG. 10

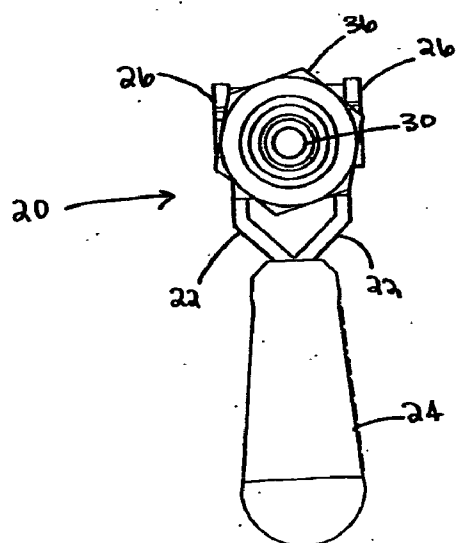


FIG. 11

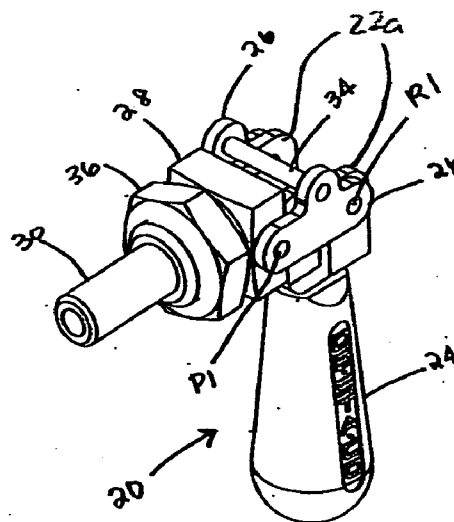


FIG. 9

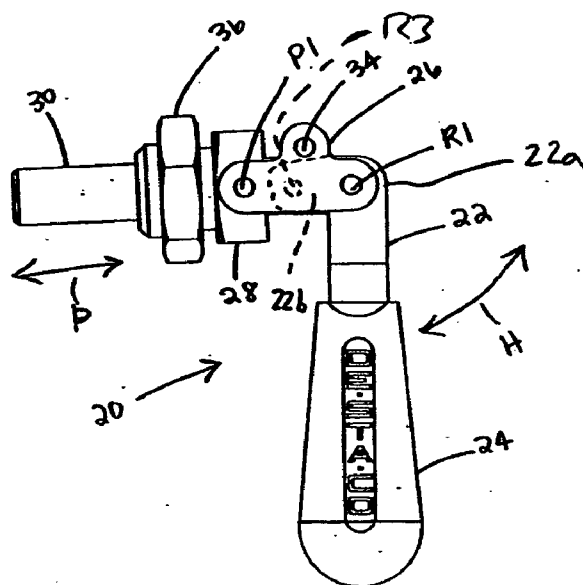


FIG. 12

MEDICAL TABLE CLAMP AND ACCESSORY INCLUDING SAME

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority from and benefit of the filing date of U.S. provisional application Ser. No. 60/726,824 filed Oct. 14, 2005 (Oct. 14, 2005), and said provisional application is hereby incorporated by reference into the present specification.

BACKGROUND

[0002] It is known in the art to employ clamps that attach onto the sides of medical/surgical tables in order to support accessories such as table extensions or auxiliary equipment. However, attaching these clamps often proves to be a difficult task. As is known in the art, medical tables have a standard rectangular accessory rail whereby accessories can be attached onto the table by being clamped to the accessory rail. Prior attempts to clamp accessories onto medical tables using the accessory rail have included utilizing a clamp assembly including a knob or bar that must be repeatedly turned or rotated (often from an inconvenient angle) in order to securely attach the clamp to the accessory rail by advancement of a threaded fastener. Another known clamp assembly requires alignment of components and subsequent insertion of pins into aligned apertures. These prior arrangements have been deemed sub-optimal for attaching (and detaching) medical accessories to a surgical table, due to the time and inconvenience required to engage/disengage the clamp assembly and for other reasons.

SUMMARY

[0003] In accordance with one aspect of the present invention, a clamp assembly for a medical table accessory includes a base including: (i) a rail-receiving channel block defining a rail-receiving channel adapted to receive and releasably retain an associated medical table accessory rail; and, (ii) a plunger assembly mount that includes a mounting wall spaced from the rear wall of the rail-receiving channel. The rear wall and the mounting wall define respective first and second aligned plunger holes. The plunger assembly is mounted to the mounting wall of the plunger assembly mount. The plunger assembly includes a plunger that moves in the aligned plunger holes relative to the base in a straight-line reciprocal manner between a retracted position and an extended position. The plunger includes a working end that abuts an associated medical table accessory rail located in the rail-receiving channel and captures the associated medical table accessory rail between the plunger working end and the front hook to prevent disengagement of the base from the associated medical table accessory rail when the plunger is in its extended position. The plunger assembly further includes a handle operatively connected to the plunger by a linkage, wherein the handle is adapted to move pivotably from a disengaged position to an engaged position. The plunger moves to its extended position when the handle is moved to its engaged position, and the plunger moves to its retracted position when the handle moves to its disengaged position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] The present development comprises various components and arrangements of components, preferred embodiments of which are illustrated in the accompanying drawings wherein:

[0005] FIG. 1 is a top view of a medical table extension including two medical table clamps formed in accordance with the present invention, with each of the clamps engaged with a standard medical table accessory rail of the medical table in accordance with the present development;

[0006] FIG. 1A is sectional view as taken along line 1A-1A of FIG. 1 showing a cross-section of the accessory rail;

[0007] FIG. 2 is an enlarged detail view of one of the medical table clamps of FIG. 1;

[0008] FIG. 3 is a view as taken along line 3-3 of FIG. 1;

[0009] FIG. 4 shows the accessory rail of FIG. 1A and shows one of the clamps of the table extension of FIG. 1 partially installed thereon;

[0010] FIG. 5 is a sectional view along line 5-5 of FIG. 1 showing a fully installed and engaged medical table clamp;

[0011] FIGS. 6-8 are additional views of a medical table clamp formed in accordance with the present invention;

[0012] FIGS. 9-12 are additional views of a DE-STA-CO model 602 clamp that forms a part of the medical table clamp embodiment disclosed herein.

DETAILED DESCRIPTION

[0013] FIG. 1 shows two medical table clamps 10 being used in a sample practical application to attach a medical accessory 16, such as a surgical table extension for a patient's arm, to a medical table 12 in accordance with the present development. As shown in FIG. 1, a medical table 12 comprises an accessory rail 14 on both sides of the table 12. As it is known in the art and shown in FIG. 1A, these rails 14 are of a universal nature in size and rectangular shape, and the medical table clamp(s) 10 of the present development are correspondingly dimensioned and conformed to be releasably and fixedly secured to the rail 14. A medical accessory, such as the extension table 16, is attached to the medical table rail 14 with one or more clamps 10, e.g., two clamps 10 as shown herein.

[0014] FIGS. 4-8 illustrate the main components of each medical table clamp 10. The outer/upper clamp portion 20, also referred to as a plunger assembly 20, comprises: two handle brackets 22, a handle grip 24, two linkage brackets 26, a handle base 28, plunger 30, adjustable plunger end 32, a stopper bar 34, and a mounting nut 36. The handle grip 24 covers a first end of each of the handle brackets 22.

[0015] Each handle bracket 22 is L-shaped and rotatably attached, with a fastener such as a rivet R1, R2, to a first end 26a of a respective linkage bracket 26 at the elbow 22a of its L-shape structure. Opposite the first end of each linkage bracket 26 is a second end 26b which is rotatably attached, with a fastener such as a pin P1, to the handle base 28. The linkage brackets 26 are parallel and spaced-apart, and approximately midway between the first and second ends 26a, 26b of the linkage brackets 26 the stopper bar 34

extends between and interconnects the two linkage brackets 26. The stopper bar 34 prevents the handle brackets 22 from being able to over rotate when the operator engages or disengages the table clamp 10. The inner end 22b of each L-shaped handle bracket 22 is rotatably attached, with a fastener such as a rivet R3, at a first end 30a of the plunger 30. This linkage arrangement results in reciprocal straight-line translation of the plunger 30 (see arrow P in FIGS. 4 and 5) in response to pivoting movement of the handle grip 24 and handle brackets 22 relative to ends 26a of the linkage brackets 26 (see arrow H in FIGS. 2 and 6). This reciprocal movement of the plunger in response to movement of the handle grip 24 can be seen also by comparing FIGS. 4 and 5, where the plunger 30 is retracted/disengaged in FIG. 4 and extended/engaged in FIG. 5. The geometry of the plunger assembly 20, including the handle brackets 22, linkage brackets 26, plunger 30, and handle base 28, is such that the plunger 30 is held in its extended/engaged position (FIGS. 5-8) when handle 24 is pivoted fully to its engaged position, i.e., the handle 24 and brackets 22 move over-center, so that axial disengaging force exerted on the plunger 30 cannot move the plunger from its engaged position to its disengaged position, absent manual movement of the handle 24 from its engaged position (FIGS. 5-8), where the handle brackets 22 lie parallel to the rail-receiving channel RC, to its disengaged position, where the handle brackets 22 are pivoted away from the engaged position.

[0016] With continuing reference to FIGS. 4 and 5, the plunger assembly 20, which can be provided by a DE-STA-CO model 602 clamp or other straight-line plunger clamp, is fixedly secured to a base 40 of the clamp assembly 10. The base 40 comprises two main portions: (i) a rail-receiving channel block 40a; and, (ii) a plunger assembly mount 40b. The base 40 can be molded or extruded from Aluminum or a polymeric material as a one-piece construction and/or can be machined and/or fabricated from one or more pieces. As shown herein, the rail-receiving channel block 40a is machined and/or extruded and/or molded and/or fabricated to have the profile shown in FIGS. 4 and 5, and the plunger assembly mount 40b, which can be formed in any suitable manner as described for the rail-receiving channel block 40a, is secured thereto by fasteners 42.

[0017] With particular reference now to the rail-receiving channel block 40a, as shown in FIGS. 4, 5, and 8, it is conformed and dimensioned to be releasably engaged with a standard accessory rail 14 of a medical table 12. To that end, the rail-receiving channel block 40a comprises an upper horizontally extending wall 44a that projects outwardly from a vertically extending rear wall 44b. A lower wall 44c projects horizontally outward from the rear wall 44b and is vertically spaced from the upper wall 44a. A front hook 44d projects downwardly from the outer end of the upper wall 44a, i.e., generally toward the lower wall 44c, although the lower wall 44c is not vertically aligned with the front hook 44d owing to the reduced length of the lower wall 44c relative to the upper wall 44a. Also, the lower wall 44c defines steps 44e, 44f. As such, rail-receiving channel block 40a defines an open rail-receiving channel RC.

[0018] The plunger assembly mount 40b includes a mounting wall 44g that is spaced from and preferably parallel to the rear wall 44b of the rail-receiving channel block 40a so that an open space or channel 44h is defined therebetween. The walls 44b, 44g define respective first and

second plunger apertures h1, h2 that are aligned with each other to accommodate the plunger 30.

[0019] The plunger assembly 20 is mounted to the base 40, e.g., by a nut 36 located in channel 44h and that engages the handle base 28 of the plunger assembly 20 to capture the wall 44g therebetween. In one embodiment, as illustrated herein, the plunger assembly 20 comprises a DE-STA-CO model 602 clamp, but it is to be understood that any other similar type clamp may be used and the present development is not to be limited to same. The working or inner end 30b of the plunger 30 has an internal thread which allows for the length of the plunger 30 to be adjusted by threaded advancement or retraction of a head 32, which allows for the precise length of the plunger 30 to be determined in order to provide an unyielding fit onto every table rail 14. In other words, the length of the plunger 30 is adjustable based on the length necessary for clamping.

[0020] One or more clamp assemblies 10 are secured to an extension table or other accessory 16 by fasteners F that extend through the accessory 16 and into the clamp base 40, or the accessory 16 is otherwise fixedly secured to the base 40.

[0021] FIGS. 4 and 5 illustrate the process of attaching the medical table clamp assembly 10 to the table rail 14 so that the associated extension table 16 or other accessory can be fixedly but releasably secured to the rail 14. The plunger holes h1,h2 in the clamp 40 allows for the plunger 30 to extend back and forth (see arrow P) in a reciprocal fashion through the clamp base 40 in order to clamp onto the associated table rail 14. In order to engage the plunger 30 onto the table rail 14, the operator must pivot the clamp handle 24 from its disengaged position (FIG. 4) to its engaged position (FIG. 5) to extend plunger 30 through the holes h1,h2 until the clamp handle 24 is in its engaged position. When handle 24 is moved in the opposite direction 180 degrees, the plunger 30 fully retracts. When the handle 24 is in a perpendicular position to walls 44b and 44g of the clamp base 40, the adjustable end 32 of the plunger 30 is approximately flush with rear wall 44b of the clamp base 40.

[0022] When the medical table clamp 10 is securely attached to the table rail 14, as illustrated by FIG. 5, the rail 14 will fit snugly against steps 44e and 44f and also against wall 44a and front hook 44d of the clamp base 40a, but is spaced from the rear wall 44b to define an open channel 44h, which is important to allow for some movement of the plunger 30 between the wall 44b and the rail 14 which is required for the handle 24 to be able to move over-center as described, and to allow the adjustable plunger end 32 to be easily adjusted. The front hook 44d preferably includes an outwardly facing chamfer 44dc (i.e., facing away from the rail-receiving channel RC) to allow for ease of use when sliding the clamp 10 onto or off of the table rail 14, i.e., to prevent the hook 44d from catching on the rail 14 during installation or removal of the clamp assembly 10 relative to rail 14.

[0023] When the table rail 14 is fully received in the rail channel RC and plunger 30 is fully extended as shown in FIG. 5, the table rail 14 is firmly and immovably captured in rail channel RC, so that an extension table or other accessory 16 connected to the clamp assembly 10 is fixedly secured to the table rail 14. FIG. 3 shows an alternative view of the medical table clamp 10 when looking at a side of the medical

table 12 demonstrating when the clamps 10 are engaged and attaching a medical accessory 16 to the table rail 14.

[0024] FIGS. 6-8 are additional top, front and side views of the medical table clamp assembly 10 formed in accordance with the present development. FIGS. 9-12 are views of the DE-STA-CO model 602 clamp by itself, which, in the illustrated embodiment, forms the plunger assembly 20.

[0025] The present development has been described with reference to preferred embodiments. Modifications and alterations will be apparent to those of ordinary skill in the art after reading this specification, and it is intended that the claims be construed literally and/or according to the doctrine of equivalents to the fullest possible extent to encompass all such modifications and alterations.

1. A clamp assembly for a medical table accessory, said clamp assembly comprising:

a base comprising: (i) a rail-receiving channel block defining a rail-receiving channel adapted to receive and releasably retain an associated medical table accessory rail; and, (ii) a plunger assembly mount that comprises a mounting wall spaced from said rear wall of said rail-receiving channel, said rear wall and said mounting wall defining respective first and second aligned plunger holes;

a plunger assembly mounted to the mounting wall of said plunger assembly mount, said plunger assembly comprising a plunger that moves in said aligned plunger holes relative to said base in a straight-line reciprocal manner between a retracted position and an extended position, said plunger comprising a working end that abuts an associated medical table accessory rail located in said rail-receiving channel and captures the associated medical table accessory rail between said plunger working end and said front hook to prevent disengagement of said base from the associated medical table accessory rail when said plunger is in its extended position;

said plunger assembly further comprising a handle operatively connected to said plunger by a linkage, wherein said handle is adapted to move pivotably from a disengaged position to an engaged position, wherein said plunger moves to its extended position when said handle is moved to its engaged position, and wherein said plunger moves to its retracted position when said handle moves to its disengaged position.

2. The clamp assembly as set forth in claim 1, wherein said rail-receiving channel block of said base comprises: a rear wall;

an upper wall that projects outwardly from the rear wall;

a lower wall that projects from the rear wall at a location vertically spaced from the upper wall; and,

a front hook that projects downwardly from the upper wall.

3. The clamp assembly as set forth in claim 2, further comprising a medical table accessory connected to said base.

4. The clamp assembly as set forth in claim 3, wherein said medical table accessory comprises an extension table accessory connected to said base by at least one fastener.

5. The clamp assembly as set forth in claim 4, wherein said lower wall of said rail-receiving channel block com-

prises a stepped surface, wherein said rail-receiving channel is defined between said stepped surface and said front hook projecting downwardly from said upper wall, such that when an associated medical table accessory rail is located in said rail-receiving channel, the associated medical table accessory rail is spaced from said rear wall of said rail-receiving channel block.

6. The clamp assembly as set forth in claim 5, wherein said working end of said plunger is adjustable to lengthen or shorten said plunger.

7. The clamp assembly as set forth in claim 6, wherein said front hook includes a chamfer oriented outwardly away from said rail-receiving channel to facilitate mounting and dismounting said base relative to an associated medical table accessory rail.

8. The clamp assembly as set forth in claim 7, wherein said plunger assembly is secured to said plunger assembly mount of said base by a nut that is secured to said plunger assembly and that captures said mounting wall of said plunger assembly mount.

9. The clamp assembly as set forth in claim 8, wherein said base is a multi-piece construction, wherein said plunger assembly mount is connected to said rail-receiving channel block by at least one fastener.

10. The clamp assembly as set forth in claim 9, wherein said linkage by which said handle is operatively connected to said plunger moves to an over-center position when said handle is moved to said engaged position to move said plunger to said extended position, such that when said plunger is in said extended position and said handle is in said engaged position, said plunger is prevented from moving from said extended position to said retracted position in response to axial force exerted on said working end of said plunger.

11. The clamp assembly as set forth in claim 1, wherein said medical table accessory comprises an extension table accessory connected to said base by at least one fastener.

12. The clamp assembly as set forth in claim 11, wherein said lower wall of said rail-receiving channel block comprises a stepped surface, wherein said rail-receiving channel is defined between said stepped surface and said front hook projecting downwardly from said upper wall, such that when an associated medical table accessory rail is located in said rail-receiving channel, the associated medical table accessory rail is spaced from said rear wall of said rail-receiving channel block.

13. The clamp assembly as set forth in claim 12, wherein said working end of said plunger is adjustable to lengthen or shorten said plunger.

14. The clamp assembly as set forth in claim 13, wherein said front hook includes a chamfer oriented outwardly away from said rail-receiving channel to facilitate mounting and dismounting said base relative to an associated medical table accessory rail.

15. The clamp assembly as set forth in claim 14, wherein said plunger assembly is secured to said plunger assembly mount of said base by a nut that is secured to said plunger assembly and that captures said mounting wall of said plunger assembly mount.

16. The clamp assembly as set forth in claim 15, wherein said base is a multi-piece construction, wherein said plunger assembly mount is connected to said rail-receiving channel block by at least one fastener.

17. The clamp assembly as set forth in claim 16, wherein said linkage by which said handle is operatively connected to said plunger moves to an over-center position when said handle is moved to said engaged position to move said plunger to said extended position, such that when said plunger is in said extended position and said handle is in said

engaged position, said plunger is prevented from moving from said extended position to said retracted position in response to axial force exerted on said working end of said plunger.

* * * * *