

A Tiltable Commode

Field of the Invention

This invention relates to a commode for an infirm. More particularly, this invention
5 relates to a tiltable commode for an infirm. Still more particularly, this invention relates to a
tiltable commode with tiltable mechanism to tilt the commode with ease.

Prior Art

It is a problem that many people have ailments or infirmities that hamper movement.
10 Often, care-givers require medical aids such as wheelchair, adjustable chair and the like for
assistance in transporting the handicapped individual to a shower room to shower. Various
tiltable chairs are available which typically include hydraulic, pneumatic or electrical power
assisted assemblies. As such tiltable chairs are used for shower purposes, water proofing
of the electrical power assisted assemblies are required. These increase the cost of
15 manufacturing the tiltable chair. Further, these electrical power assisted assemblies are
usually bulky and may obstruct movements. Thus, those skilled in the art are constantly
striving to design an improved tiltable chair that assists a care giver in transporting a patient
to a shower room for shower with ease.

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Summary of the Invention

The above and other problems are solved and an advance in the art is made by a
tiltable commode in accordance with this invention. A first advantage of a tiltable commode
in accordance with this invention is that the tiltable commode is simple in structure and can
be easily manufactured. A second advantage of a tiltable commode in accordance with this
25 invention is that the tiltable commode does not require any electrical power assisted
assemblies. This lowers the cost to produce the tiltable commode. A third advantage of a
tiltable commode in accordance with this invention is that the tiltable commode provides the

ability for displacing the tiltable commode angularly while maintaining the center of gravity within a certain proximity.

In accordance with embodiments of this invention, a tiltable commode is configured in the following manner. The tiltable commode includes a bottom assembly, a tiltable assembly and a top assembly. The bottom assembly has a bottom frame, a number of wheels supporting the bottom frame, a first upright extending from the bottom frame and a second upright extending from the bottom frame. The first and second uprights are spaced apart from each other. The tiltable assembly is connected to the bottom frame and the first and second uprights of the bottom assembly. The top assembly has a chair frame being connected to the tiltable assembly and a seat connected to the chair frame. The tiltable assembly is adapted to move the top assembly between an upright position in which the seat is parallel to the bottom frame and a tilted position in which the seat is angularly displaced.

In accordance with an embodiment of this invention, the tiltable assembly includes a first guide, a second guide, a first double rail sliding mechanism, a second double rail sliding mechanism, a first frictional pivot support, and a second frictional pivot support. The first guide connects the first upright of the bottom assembly to a first upright of the top assembly. The second guide connects the second upright of the bottom assembly to a second upright of the top assembly. The first double rail sliding mechanism is connected to a first side of the chair frame. The second double rail sliding mechanism is connected to a second side of the chair frame. The first frictional pivot support connects the first double rail sliding mechanism to the bottom frame. The second frictional pivot support connects the second double rail sliding mechanism to the bottom frame.

In accordance with an embodiment of this invention, the first guide comprises a guide rail, a first clamp, a second clamp, and a locking mechanism. The guide rail connects to the first upright of the top assembly and is parallel to the first upright of the top assembly. The first clamp is adapted to be movable along the guide rail. The second clamp connects
5 the first clamp to the first upright of the bottom assembly. The locking mechanism is adapted to lock the tiltable commode when in the tilted position by preventing the first clamp from moving along the guide rail. In some embodiment, a roller adapted to assist movement of the first clamp is provided.

10 In accordance with an embodiment of this invention, the second guide comprises a guide rail, a first clamp, a second clamp, and a locking mechanism. The guide rail connects to the second upright of the top assembly and is parallel to the second upright of the top assembly. The first clamp is adapted to be movable along the guide rail. The second clamp connects the first clamp to the second upright of the bottom assembly. The locking
15 mechanism is adapted to lock the tiltable commode when in the tilted position by preventing the first clamp from moving along the guide rail. In some embodiment, a roller adapted to assist movement of the first clamp is provided.

In accordance with an embodiment of this invention, each of the first and second
20 double rail sliding mechanism comprises a top rail connected to the chair frame, a bottom rail parallel to the top rail, a first bracket and a second bracket. Each of said first and second brackets has a first side, a second side, a roller disposed between the first and second sides. The first and second sides define a first aperture for securing the top rail. The first and second sides and the roller define a second aperture adapted to allow the
25 bottom rail to be moveably inserted there through.

In accordance with an embodiment of this invention, each of the first and second frictional pivot support comprises a rotatory base, a first plate, a second plate, a rotatory block. The rotatory base has a bottom surface secured to the bottom frame and a top surface having a concave surface. The first plate connects to a first side of the rotatory
5 base. The second plate connected to a second side of the rotatory base. The rotatory block is between the first plate and the second plate. The rotatory block has a top surface secured to the bottom rail and a bottom surface having a convex surface resting on the concave surface of the rotatory base. In some further embodiment, a fastening means is provided which is adapted to adjust the frictional force being applied onto the rotatory block
10 by the first and second plates. Preferably, the first and second rotatory block is made of polyoxymethylene. Still more preferably, the first and second rotatory base is made of polyoxymethylene.

In accordance with an embodiment of this invention, the tiltable commode further
15 comprises an adjustable leg rest. The adjustable leg rest includes a first bar hingedly connected to the bottom frame, a second bar hingedly connected to the bottom frame, a first foot rest moveably connectable to the first bar, a second foot rest moveable connectable to the second bar, a first locking bar adapted to prevent the first bar from moving when the first bar is in a required position, and a second locking bar adapted to prevent the second bar
20 from moving when the second bar is in a required position.

In accordance with an embodiment of this invention, the tiltable commode further comprises a first detachable armrest, and a second detachable armrest.

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Brief Description of the Drawings

The above and other features and advantages in accordance with this invention are described in the following detailed description and are shown in the following drawings:

Figure 1 illustrating a side view of a tiltable commode in a tilted position in accordance with an embodiment of this invention;

Figure 1a illustrating a side view of the tiltable commode in an upright position in accordance with an embodiment of this invention;

5 Figure 2 illustrating a perspective view of the tiltable commode in the tilted position in accordance with an embodiment of this invention;

Figure 2a illustrating a perspective view of the tiltable commode in the upright position in accordance with an embodiment of this invention;

10 Figure 3 illustrating perspective view of a bottom assembly of the tiltable commode in accordance with an embodiment of this invention;

Figure 4 illustrating a perspective view of a top assembly of the tiltable commode in accordance with an embodiment of this invention;

Figure 5 illustrating an exploded view of the top assembly of the tiltable commode in accordance with an embodiment of this invention;

15 Figure 6 illustrating a perspective of a chair frame of the tiltable commode in accordance with an embodiment of this invention;

Figure 6a illustrating a side view of the chair frame of the tiltable commode in accordance with an embodiment of this invention;

20 Figure 6b illustrating a top view of the chair frame of the tiltable commode in accordance with an embodiment of this invention;

Figure 7 illustrating a perspective view of a tiltable assembly of the tiltable commode in the tilted position in accordance with embodiment of this invention;

Figure 7a illustrating a perspective view of a tiltable assembly of the tiltable commode in the upright position in accordance with an embodiment of this invention;

25 Figure 8 illustrating an exploded view of a frictional pivot support of the tiltable commode when the tiltable commode is in the tilted position in accordance with an embodiment of this invention;

Figure 8a illustrating an exploded view of a frictional pivot support of the tiltable commode when the tiltable commode is in the upright position in accordance with an embodiment of this invention;

Figure 9 illustrating a perspective view of a rotatory base and a rotatory block of the frictional pivot support when the tiltable commode is in the tilted position in accordance with an embodiment of this invention;

Figure 9a illustrating a side view of the rotatory base and the rotatory block of the frictional pivot support when the tiltable commode is in the upright position in accordance with an embodiment of this invention;

Figure 10 illustrating a perspective view of a pair of double rail sliding mechanism when the tiltable commode is in the tilted position in accordance with an embodiment of this invention;

Figure 10a illustrating a perspective view of the pair of double rail sliding mechanism when the tiltable commode is in the upright position in accordance with an embodiment of this invention;

Figure 11 illustrating an exploded view of a front and rear brackets in accordance with an embodiment of this invention;

Figure 12 illustrating a front view of the front and rear brackets in accordance with an embodiment of this invention;

Figure 13 illustrating a perspective view of a guide when the tiltable commode is in the tilted position in accordance with an embodiment of this invention;

Figure 13a illustrating a perspective view of a guide when the tiltable commode is in the upright position in accordance with an embodiment of this invention;

Figure 14 illustrating a perspective exploded view of the guide when the tiltable commode is in the tilted position in accordance with an embodiment of this invention;

Figure 15 illustrating an exploded view from the top of the guide when the tiltable commode is in the upright position in accordance with an embodiment of this invention;

Figure 16 illustrating a perspective view of a leg rest in accordance with an embodiment of this invention;

Figure 17 illustrating a plane view of the foot rest in accordance with an embodiment of this invention;

5 Figure 18 illustrating a side view of the tiltable commode in the upright position showing the movement of various parts of the tiltable commode in accordance with an embodiment of this invention;

10 Figure 19 illustrating a side view of the tiltable commode in the tilted position showing the movement of various parts of the tiltable commode in accordance with an embodiment of this invention;

Figure 20 illustrating a side view of the tiltable commode in the tilted position showing the movement of various parts of the tiltable commode in accordance with an embodiment of this invention; and

15 Figure 21 illustrating a side view of the tiltable commode in the upright position showing the movement of various parts of the tiltable commode in accordance with an embodiment of this invention.

Detailed Description

20 This invention relates to a commode for an infirm. More particularly, this invention relates to a tiltable commode for an infirm. Still more particularly, this invention relates to a tiltable commode with tiltable mechanism to tilt the commode with ease.

25 Figure 1 shows a side view of a tiltable commode 100 in a tilted position in accordance with an embodiment of this invention. Figure 1a shows a side view of the tiltable commode 100 in an upright position in accordance with an embodiment of this invention. Figure 2 shows a perspective view of tiltable commode 100 in a tilted position in accordance with an embodiment of this invention. Figure 2a shows a perspective view of

tiltable commode 100 in an upright position in accordance with an embodiment of this invention. Tiltable commode 100 includes a bottom assembly 110, a top assembly 120, a tiltable assembly 130, and a leg rest assembly 140.

5 Figure 3 shows bottom assembly 110. Bottom assembly 110 includes a bottom frame 310 and four wheels 320-323. Bottom frame 310 includes a first side bar 311, a second side bar 312, a front bar 313, and a back bar 314. . First side bar 311, second side bar 312, front bar 313 and back bar 314 are connected via joints 330-333 forming a quadrilateral. Each of the wheels 320-323 is connected to bottom frame 310 via joints 330-333. Each of
10 the wheels includes a wheel lock to prevent tiltable commode 100 from moving. One skilled in the art will recognise that the tiltable commode 100 may be configured without the wheels without departing from the invention. A first upright 315 extends from joint 333 which connects back bar 314 and first side bar 311. A second upright 316 extends from joint 330 which connects top bar 317 and second side bar 312.

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 Figure 4 shows a perspective view of the top assembly 120. Figure 5 shows an exploded view of top assembly 120. Top assembly 120 includes a chair frame 410, a seat 420, a back rest 430, a first side armrest 440 and a second side armrest 450. Top assembly 120 may also include a head rest 460. First side armrest 440 and second side
20 armrest 450 are detachable from the tiltable commode 100. This allows a user to be transferred in and out of tiltable commode 100 from either sides of the tiltable commode 100. Further description of the armrests 440 and 450 will be described below with reference to figures 6a and 6b. Seat 420 may include a container 421 that is detachably connected to seat 420.

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 Figure 6 shows a perspective view of chair frame 410. Chair frame 410 includes a back support 630, a front support 640, and a chair support 650. Front support 640 includes

a top rod 641, a bottom rod 642, a first side rod 643 and a second side rod 644. Leg rest assembly 140 is connected to front support 640. Further details of leg rest assembly 140 will be described further with reference to figures 16 and 17 below.

5 Back support 630 includes a first upright 631, a second upright 632, a first handle 633 extending from an end of first upright 631, a second handle 634 extending from an end of second upright 632, a first back rest support 635, a second back rest support 636 and a connecting bar 636. First back rest support 635 and second back rest support 636 extends between first upright 631 and second upright 632. One skilled in the art will recognise that
10 only one back rest support is required and that other number of back rest support may be implemented without departing from the invention. Back rest 430 is coupled to the first and second back rest supports 635 and 636.

Chair support 650 extends between connecting bar 636 and top rod 641 to form a
15 seat frame. Seat 420 rests on top of seat frame and may be detachably connected to the seat frame. Back support 630 is connected to front support 640 by a first top rail 610, a second top rail 620. First and second top rails 610 and 620 are part of double rail sliding mechanism 720 that will be described below with reference to figures 7, 7a, 10, 10a, 11 and
20 12. First top rail 610 and second top rail 620 are parallel to chair support 650.

Figure 6a shows a side view of chair frame 420 with one of the two armrests 440 and 450. Figure 6b shows a top view of chair frame 420 and first side and second side armrests 440 and 450. As shown in figure 6, extensions 611 and 621 extend from a rear of first top rail 610 and second top rail 620 respectively. Top ends of extensions 611 and 621 are level
25 with the top surface of seat 420. The first side rod 643 has a slot 643a to receive a front end 440a of first side armrest 440 and the second side rod 644 has a slot 644a to receive a front end 450a of second side armrest 450. Extensions 611 and 621 include an aperture

configured to receive rear ends 440b of first side armrest 440 and 450b of second side armrest 450. As shown in figure 6b, first side and second side armrests 440 and 450 are rotatable about extensions 611 and 621 respectively by an angle Z which is about 150-160 degrees in the directions shown in arrows 210 and 220. One skilled in the art will recognise that angle Z may be increased by having the extensions 611 and 621 positioned away from first and second uprights 631 and 632 and the exact angle Z is left to those skilled in the art. Extensions 611 and 621 may include a locking mechanism to lock the first and second side armrests 400 and 450.

Figure 7 shows a perspective view of tiltable assembly 130 when tiltable commode 100 is in the tilted position. Figure 7a shows a perspective view of tiltable assembly 130 when tiltable commode 100 is in the upright position. Tiltable assembly 130 includes frictional pivot support 710, double rail sliding mechanism 720 and guide 730.

Figure 8 shows an exploded view of frictional pivot support 710 when tiltable commode 100 is in the tilted position. Figure 8a shows an exploded view of frictional pivot support 710 when tiltable commode 100 is in the upright position. Figure 9 shows a perspective view of rotatory base 830 and rotatory block 840 when tiltable commode 100 is in the tilted position. Figure 9a shows a side view of rotatory base 830 and rotatory block 840 when tiltable commode 100 is in the upright position.

Frictional pivot support 710 includes a first plate 810, a second plate 820, a rotatory base 830 and a rotatory block 840. First plate 810 includes six through openings 811-816. Second plate 820 includes six through openings 821-826. Rotatory base 830 includes five through openings 831-835, a bottom surface 837 and a top surface 838. The bottom surface 837 is being secured to first side bar 311 and second side bar 312. The top surface 838 is concaved and being configured to receive a convex surface 841 of rotatory block 840.

Top surface 842 of rotatory block 840 is being fixedly secured to bottom rails 1030 and 1031 of double rail sliding mechanism 720. Rotatory block 840 includes a through opening 846.

Rotatory block 840 and rotatory base 830 are being secured between first and second
5 plate 810 and 820. In particular, a first shaft (not shown) is inserted through openings 811, 821 and 831, a second shaft (not shown) is inserted through openings 812, 822 and 832, a third shaft (not shown) is inserted through openings 813, 823 and 833, a fourth shaft (not shown) is inserted through openings 814, 824 and 834, and a fifth shaft (not shown) is inserted through openings 815, 825 and 835. The rotatory block 840 is pivotally connected
10 via an adjustable knob 890 being inserted through openings 816, 846 and 826. The adjustable knob 890 allows a user to adjust the amount of frictional force being applied to the rotatory block 840. Fastening the adjustable knob 890 increases the frictional force applied to the rotatory block 840. This reduces the speed of rotation of the rotatory block 840 so that the tiltable commode tilts in a controlled manner. The use of adjustable knob
15 890 also allows a user to adjust the frictional force being applied to the rotatory block 840 according to the weight of the patient resting on the tiltable commode 100. The rotatory block 840 is configured to rotate about the adjustable knob 890 when the tiltable commode 100 moves between a tilted position and an upright position. One skilled in the art will recognise that any other number of through openings and shafts may be used without
20 departing from the invention. Further, other securing means other than shaft may be used without departing from the invention.

Top surface 838 of rotatory base 830 has a first edge 839a and a second edge 839b. As shown in figures 9 and 9a, second edge 839b is not level with first edge 839a and has a
25 height difference of distance X. The distance X affects the tilting angle of the tiltable commode 100. If X is shorter, tilting angle of tiltable commode 100 decreases. If X is larger,

tilting angle of tiltable commode 100 increases. Preferably, X is maintained at a distance that allows the tiltable commode 100 to tilt between 0-45 degrees.

Rotatory block 840 has a predetermined radius Y. The radius Y is dependent on the amount of frictional force required to ensure the angular displacement of the tiltable commode in a controlled manner. To reduce the amount of frictional force, radius Y is shortened. One skilled in the art will recognise that rotatory base 830 is structured based on the rotatory block 840. Hence, if radius Y increases, the size of rotatory base 830 increases as well. Similarly, if radius Y is reduced, the size of rotatory base 830 reduces as well.

The radius Y is also chosen based on the capacity of the tiltable commode required. As the weight of a patient resting on the tiltable commode is being supported by the frictional pivot support 710, frictional pivot support 710 has to be of certain size in order to support the weight of the patient. The exact radius Y is left to those skilled in the art.

Frictional pivot support 710 is secured to first side bar 311 and second side bar 312. Frictional pivot support 710 may be secured to first side and second side bars 311 and 312 by a quick release securing means. This allows the frictional pivot support 710 to be adjustable along first side and second side bars 311 and 312. One skilled in the art will recognise that as the weight of a patient resting on the tiltable commode is being supported by the frictional pivot support 710, frictional pivot support 710 is positioned along first bar 311 and second side bar 312 such that bottom assembly 110 is able to maintain a balance of the tiltable commode. Essentially, frictional pivot support 710 is positioned substantially at the center of first side and second side bars 311 and 312.

Frictional pivot support 710 is constructed of polyoxymethylene which has characteristic of being high in stiffness, low in friction and excellent dimensional stability. The use of polyoxymethylene prevents the roll back effect of the tiltable commode 100 during tilting.

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Figure 10 shows a perspective view of the pair of double rail sliding mechanism 720 when the tiltable commode 100 is in the tilted position. Figure 10a shows a perspective view of the pair of double rail sliding mechanism 720 when the tiltable commode 100 is in the upright position. Each of the double rail sliding mechanism 720 includes a front bracket 1010 and 1011, a rear bracket 1020 and 1021, and a bottom rail 1030 and 1031. Bottom rail 1030 and top rail 610 forms one of the pair of double rail sliding mechanism 720 while bottom rail 1031 and top rail 620 forms the other pair of double rail sliding mechanism 720. Top surface 842 of rotatory block 840 is being fixedly secured to each of the bottom rails 1030 and 1031. Rear of both bottom rails 1030 and 1031 are connected by connecting bar 1050 and front of both bottom rails 1030 and 1031 are connected by engaging rail 1060. Engaging rail 1060 prevents the tiltable commode 100 from tilting more than allowable tilting angle by acting as a stopper. As shown in figure 10, when the tiltable commode is in the tilted position, engaging rail 1060 prevents front brackets 1010 and 1011 from further sliding forwardly. As shown in figure 10a, when the tiltable commode is in the upright position, connecting bar 1050 prevents rear brackets 1020 and 1021 from further sliding rearwardly.

Figure 11 shows an exploded view of front brackets 1010 and 1011, and rear brackets 1020 and 1021. Front brackets 1010 and 1011, and rear brackets 1020 and 1021 include a first side 1110, a second side 1120 and a roller 1130. Figure 12 shows a front view of front brackets 1010 and 1011, and rear brackets 1020 and 1021. Roller 1130 is secured between first side 1110 and second side 1120 via a shaft inserted through openings 1111, 1121 and 1131. Top rail 610 and 620 (shown as dotted line in figure 12) is fixedly secured

to front and rear brackets 1010 and 1020 via a first opening 1210 defined between first and second sides 1110 and 1120. A securing means is being inserted through openings 1112 and 1122 and another securing means being inserted through openings 1113 and 1123. The securing means may be a screw, a bolt and nut or the likes. Bottom rail 1030 and 1031 (shown as dotted line in figure 12) is movably inserted through second opening 1220 defined by first side 1110, second side 1120 and roller 1130.

Figure 13 shows a perspective view of one of the pair of guides 730 when the tiltable commode 100 is in the tilted position. Figure 13a shows a perspective view of one of the pair of guides 730 when the tiltable commode 100 is in the upright position. Each of the guide 730 includes a guide rail 1310, locking mechanism 1320, a first clamp 1330, and a second clamp 1340.

Figure 14 shows an exploded view of one of the pair of guides 730 when the tiltable commode 100 is in the tilted position. Figure 15 shows an exploded view from the top of one of the pair of guides 730 when the tiltable commode 100 is in the upright position. As shown in figures 14 and 15, guide rail 1310 is a rod 1311 parallel to first and second uprights 631 and 632. Guide rail 1310 is being connected to first and second uprights 631 and 632 by connecting upper and lower rods 1312 and 1313.

Locking mechanism 1320 includes a first side 1321, a second side 1322 and a knob 1323. First side 1321 is secured to second side 1322 by a securing means being inserted through openings 1321a and 1322a and another securing means being inserted through openings 1321b and 1322b. The securing means may be a screw, a bolt and nut or the likes. Knob 1323 has a threaded shaft 1324 that is inserted through openings 1321c and 1322c. Turning knob 1323 in a first direction brings the first and second sides 1321 and

1322 together, and in a second direction, allows the first and second sides 1321 and 1322 to move apart.

First clamp 1330 includes a first side 1331, a second side 1332, inner roller 1333 and
5 outer roller 1334. Second clamp 1340 includes a first part 1341 and a second part 1342. First clamp 1330 and second clamp 1340 are connected to the guide rail 1310 in the following manner. A first securing means is inserted through openings 1331a, 1333a and 1332a. A second securing means is inserted through openings 1331b, 1341a, 1334a, 1342a and 1332b. A third securing means is inserted through openings 1341b and 1342b.
10 a fourth securing means is inserted through openings 1341c and 1342c. The third and fourth securing means bore through first and second uprights 315 and 316. This secures the bottom frame 310 to chair frame 410.

Essentially, locking mechanism 1320, first clamp 1330 and second clamp 1340 are
15 movable along guide rail 1310. When the tiltable commode 100 is in the tilted position, the first clamp 1330 and second clamp 1340 are proximate top of guide rail 1311, and further fastening of knob 1323 locks the locking mechanism 1320 and prevents first clamp and second clamp from moving towards bottom of guide rail 1310.

20 Figure 16 shows a perspective view of leg rest 140. Leg rest 140 includes a right foot rest 1610, a left foot rest 1620, a right locking bar 1630, a left locking bar 1640, a right bar 1650 and a left bar 1660.

Right bar 1650 and left bar 1660 include a top end 1651 and 1661 and a bottom end
25 1652 and 1662. Top end 1651 of right bar 1650 is hingedly connected right end 641a of top rod 641 via a right hinge 1653. Top end 1661 of left bar 1660 is hingedly connected to left end 641b of top rod 641 via a left hinge 1663. Right and left hinges 1653 and 1663 act as a

pivot to allow leg rest 140 to swing inwardly as shown by arrow 1690 or outwardly as shown by arrow 1691.

Figure 17 shows a top view of right and left foot rests 1610 and 1620. As shown in figure 17, right foot rest 1610 includes a platform 1711 defining an aperture 1712, and a right knob 1713. Aperture 1712 is configured such that right bar 1650 can be inserted there through. This means that right foot rest 1610 is adapted to be movable along right bar 1650. This allows a user to adjust the right foot rest 1610 to a suitable height. Right knob 1713 is inserted from a side of the platform 1711 and into aperture 1712. Right knob 1713 acts as a fastener. When the right foot rest 1610 is adjusted to a required position, fastening the right knob 1713 secures the right foot rest and prevents right foot rest 1610 from further movement along right bar 1650. Bottom end 1652 includes a stopper to prevent right foot rest 1610 from escaping from the right bar 1650.

Similarly, left foot rest 1620 includes a platform 1721 defining an aperture 1722, and a left knob 1723. Aperture 1722 is configured such that left bar 1660 can be inserted there through. This means that left foot rest 1620 is adapted to be movable along left bar 1660. This allows a user to adjust the left foot rest 1620 to a suitable height. Left knob 1723 is inserted from a side of the platform 1721 and into aperture 1722. Left knob 1723 acts as a fastener. When the left foot rest 1620 is adjusted to a required position, fastening the left knob 1723 secures the left foot rest 1620 and prevents left foot rest 1620 from further movement along left bar 1660. Bottom end 1662 includes a stopper to prevent left foot rest 1620 from escaping from the right bar 1660.

Right locking bar 1630 includes a holding block 1631, a bar 1632, a hinge 1633 and a knob 1634. Right locking bar 1630 is hingedly connected to right bar 1650 via hinge 1633. Hinge 1633 includes a structure 1635 defining an aperture that allows right bar 1650 to be

inserted there through. Holding block 1631 is secured to right end 642a of bottom rod 642. Holding block defines an aperture configured to allow bar 1632 to be movably inserted there through. Knob 1634 is inserted into another aperture of the holding block 1631. Knob 1634 acts as a fastener. When the right foot rest 1610 is adjusted, either inwardly or outwardly, to a required position, fastening knob 1634 secures the right foot rest 1610 and prevents right foot rest 1610 from further inward or outward movement.

Similarly, left locking bar 1640 includes a holding block 1641, a bar 1642, a hinge 1643 and a knob 1644. Left locking bar 1640 is hingedly connected to left bar 1660 via hinge 1643. Hinge 1643 includes a structure 1645 defining an aperture that allows left bar 1660 to be inserted there through. Holding block 1641 is secured to left end 642b of bottom rod 642. Holding block 1641 defines an aperture configured to allow bar 1642 to be movably inserted there through. Knob 1644 is inserted into another aperture of the holding block 1641. Knob 1644 acts as a fastener. When the left foot rest 1620 is adjusted, either inwardly or outwardly, to a required position, fastening knob 1624 secures the left foot rest 1620 and prevents left foot rest 1620 from further inward or outward movement.

Essentially, right and left locking bars 1630 and 1640 act as a locking mechanism to preventing right and left bars 1650 and 1660 from inward or outward movement after the right and left foot rests 1610 and 1620 have been adjusted to a required position.

Figures 18 and 19 show the movement of various parts of tiltable commode when the tiltable commode moves from an upright position to a tilted position. In the upright position, the top surface of the seat is parallel to the first and second side bars 311 and 312 of bottom frame 310. In the tilted position, the seat is angularly displaced. A force being applied to the handles 633 and 634 in the direction of the arrow 1810 causes a chain to reaction as follows. The guide rail 1310 slides downwardly in the direction of arrow 1820.

Due to downwardly movement of guide rail 1310, double rail sliding mechanism 720 causes front of chair frame 410 to move upwardly in the direction of arrow 1840 while the rear of the chair frame move downwardly in the direction of arrow 1850. In particular, front and rear brackets 1010 and 1020 slide forwardly in the direction of arrow 1860 towards to the engaging rail 1060. As the front and rear brackets 1010 and 1020 slide forwardly towards to engaging rail, the rotatory block 840 rotates about its pivot point in the direction of arrow 1830 which guides the double rail sliding mechanism 720 to be angularly displaced to the tilted position. This causes the tiltable commode to tilt from zero degree to an angle of shown as Y which is between 20-40 degrees. The use of the double rail sliding mechanism 720 enable the tiltable commode 100 to tilt while maintaining a balance to the centre of gravity of the patient during tilting of the tiltable commode 100. This means that the tiltable commode 100 provides the ability for displacing the chair frame 410 angularly while maintaining the centre of gravity of a patient resting on the tiltable commode 100 proximate to the frictional pivot support 710. This prevents tiltable commode 100 from toppling. As the centre of gravity is dependent on the position of frictional pivot support 710, wheels 320, 321, 322 and 323 are directly below joints 330, 331, 332 and 333 and need not extend outwardly to increase the stability of the tiltable commode. Fastening of knob 1323 prevents the guide rail 1310 from reversing, thus locking the tiltable commode 100 in the tilted position.

Figures 20 and 21 show the movement of various parts of tiltable commode when the tiltable commode moves from a tilted position to an upright position. Loosening of knob 1323 allows the guide rail 1310 to move. Due to the frictional support provided by rotatory block 840 and rotatory base 830, weight of a patient asserts a downwardly force to the tiltable commode in the direction of arrow 2010 in a controlled manner. In the event that a patient is not resting on the tiltable commode 100, a user may apply a force upwardly in the direction of arrow 2020 on the handles 633 and 634. Due to force asserted downwardly by

a patient or a user applying a force upwardly, the guide rail 1310 slides upwardly in the direction of arrow 2030. Due to upwardly movement of guide rail 1310, double rail sliding mechanism 720 causes front of chair frame 410 to move downwardly in the direction of arrow 2010 while the rear of the chair frame move upwardly in the direction of arrow 2030.

5 In particular, front and rear brackets 1010 and 1020 slide rearwardly in the direction of arrow 2050 towards connecting bar 1050. As the front and rear brackets 1010 and 1020 slide rearwardly towards to connecting bar 1050, rotatory block 840 rotates about its pivot point in the direction of arrow 1840 which guides the double rail sliding mechanism 720 back to the level position. This causes the tiltable commode to be to be angularly displaced or tilt back
10 to the upright position.

The above is a description of exemplary embodiments of a tiltable commode in accordance with this invention. It is foreseeable that those skilled in the art can and will design alternative systems based on this disclosure that infringe upon this invention as set
15 forth in the following claims.

Claims:

1. A tiltable commode comprising:

a bottom assembly having a bottom frame, a plurality of wheels supporting said
5 bottom frame, a first upright extending from said bottom frame and a second upright
extending from said bottom frame;

a tiltable assembly connected to said bottom frame and said first and second
uprights of said bottom assembly; and

a top assembly having a chair frame being connected to said tiltable assembly and a
10 seat connected to said chair frame, said tiltable assembly being adapted to move said top
assembly between an upright position in which said seat is parallel to said bottom frame and
a tilted position in which said seat is angularly displaced.

2. The tiltable commode according to claim 1 wherein said bottom frame of said bottom
15 assembly comprises four bars forming a quadrilateral, each of said plurality of wheels being
provided at each vertices of said quadrilateral.

3. The tiltable commode according to claim 2 wherein said chair frame of said top
assembly comprises a back support, a front support and a chair support defining a seat
20 frame, said seat resting on said seat frame.

4. The tiltable commode according to claim 1 wherein said tiltable assembly comprises:
a first guide connecting said first upright of said bottom assembly to a first upright of
said top assembly;
25 a second guide connecting said second upright of said bottom assembly to a second
upright of said top assembly;
a first double rail sliding mechanism connected to a first side of said chair frame;

a second double rail sliding mechanism connected to a second side of said chair frame;

a first frictional pivot support connecting said first double rail sliding mechanism to said bottom frame; and

5 a second frictional pivot support connecting said second double rail sliding mechanism to said bottom frame.

5. The tiltable commode according to claim 4 wherein said first guide comprises:

a guide rail connected to said first upright of said top assembly, said guide rail being
10 parallel to said first upright of said top assembly;

a first clamp adapted to be movable along said guide rail;

a second clamp connecting said first clamp to said first upright of said bottom assembly; and

a locking mechanism adapted to lock said tiltable commode when in the tilted
15 position by preventing said first clamp from moving along said guide rail.

6. The tiltable commode according to claim 5 wherein said first guide comprises:

a roller adapted to assist movement of said first clamp.

20 7. The tiltable commode according to claim 5 wherein said second guide comprises:

a guide rail connected to said second upright of said top assembly, said guide rail of said second guide being parallel to said second upright of said top assembly;

a first clamp adapted to be movable along said guide rail of said second guide;

a second clamp connecting said first clamp of said second guide to said second
25 upright of said bottom assembly; and

a locking mechanism adapted to lock said tiltable commode when in said tilted position by preventing said first clamp of said second guide from moving along said guide rail of said second guide.

- 5 8. The tiltable commode according to claim 7 wherein said second guide comprises:
a roller adapted to assist movement of said first clamp of said second guide.

9. The tiltable commode according to claim 4 wherein said first double rail sliding mechanism comprises:

- 10 a top rail connected to said chair frame;
a bottom rail parallel to said top rail;
a first bracket and a second bracket, each of said first and second brackets having a first side, a second side, a roller disposed between said first and second sides, said first and second sides defining a first aperture for securing said top rail, said first and second sides
15 and said roller defining a second aperture adapted to allow said bottom rail to be moveably inserted there through.

10. The tiltable commode according to claim 9 wherein said second double rail sliding mechanism comprises:

- 20 a top rail connected to said chair frame;
a bottom rail parallel to said top rail;
a first bracket and a second bracket, each of said first and second brackets having a first side, a second side, a roller disposed between said first and second sides, said first and second sides defining a first aperture for securing said top rail, said first and second sides
25 and said roller defining a second aperture adapted to allow said bottom rail to be moveably inserted there through.

11. The tiltable commode according to claim 10 wherein said first frictional pivot support comprises:

a rotatory base having a bottom surface secured to said bottom frame and a top surface having a concave surface; and

5 a first plate connected to a first side of said rotatory base;

a second plate connected to a second side of said rotatory base; and

a rotatory block between said first plate and said second plate, said rotatory block having a top surface secured to said bottom rail and a bottom surface having a convex surface resting on said concave surface of said rotatory base.

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12. The tiltable commode according to claim 11 wherein said first frictional pivot support further comprises:

a fastening means adapted to adjust the frictional force being applied onto said first rotatory block by said first and second plates.

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13. The tiltable commode according to claim 11 wherein said second frictional pivot support comprises:

a rotatory base having a bottom surface secured to said bottom frame and a top surface having a concave surface; and

20 a first plate connected to a first side of said rotatory base;

a second plate connected to a second side of said rotatory base; and

a rotatory block between said first plate and said second plate, said rotatory block having a top surface secured to said bottom rail and a bottom surface having a convex surface resting on said concave surface of said rotatory base.

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14. The tiltable commode according to claim 13 wherein said second frictional pivot support further comprises:

a fastening means adapted to adjust the frictional force being applied onto said rotatory block by said first and second plates of said second frictional pivot.

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15. The tiltable commode according to claim 13 wherein said first and second rotatory block is made of polyoxymethylene.

16. The tiltable commode according to claim 13 wherein said first and second rotatory
10 base is made of polyoxymethylene.

17. The tiltable commode according to claim 3 further comprising:
an adjustable leg rest connected to said front support.

15 18. The tiltable commode according to claim 17 wherein said adjustable leg rest comprises:

a first bar hingedly connected to said bottom frame;

a second bar hingedly connected to said bottom frame;

a first foot rest moveably connectable to said first bar;

20 a second foot rest moveable connectable to said second bar;

a first locking bar adapted to prevent said first bar from moving when said first bar is in a required position; and

a second locking bar adapted to prevent said second bar from moving when said second bar is in a required position.

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19. The tiltable commode according to claim 1 further comprising:
a first detachable armrest; and

a second detachable armrest.

20. The tiltable commode according to claim 1 further comprising:

a first rotatable armrest; and

5 a second rotatable armrest.