POWER LIFTING TOILET CHAIR

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ABSTRACT
The power lifting toilet chair is a toilet chair which provides 100% lifting capability for up to a 500-pound obese or elderly or disabled person or recovering hospital patient to sit down on a toilet unaided and to rise unaided after using the toilet. The power lifting toilet chair, which stands over and around an existing toilet bowl, can be used without removal of the existing toilet seat. However, for semi-permanent applications, the existing toilet seat would best be removed.

The power lifting toilet chair was designed to be powered either by two electrically-powered actuators (12) or by two manually-operated non-electric actuators (46). The non-electric embodiment of the power lifting toilet chair will allow production and use of this invention by elderly, obese or disabled persons or patients in remote or underdeveloped regions without access to electrical power.
FIG 1

Pivot points A, B, C, and D are secured with .250 in. dia. steel bolts with washers and lock nuts.

FIG 2

Pivot points E and F are secured with .375 in. dia. steel bolts with washers and lock nuts.
FIG 3

NOTE - POWER LIFTING ACTUATORS, LINKAGES, SUPPORT FRAMES AND BRACKETS ARE SHOWN MOUNTED ON A COMMERCIALLY AVAILABLE PRE-WELED METAL TOILET CHAIR, SEE FIG 4.

ATTACHING HARDWARE CONSISTS OF .190 IN. DIA. STEEL BOLTS WITH LOCKNUTS.

ENGLISH METRIC

.190 IN. .487 CM.
.250 IN. .641 CM.
.375 IN. .961 CM.
POWER LIFTING TOILET CHAIR
CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of provisional patent application Serial Numbers U.S. 60/606,712, and U.S. 60/606,713, filed Sep. 2, 2004 by Dan Cary Johnson.

STATEMENT REGARDING FEDERALLY-SPONSORED RESEARCH OR DEVELOPMENT

This invention was conceived, designed and constructed without any federally sponsored research and development funds of any kind.

REFERENCE TO SEQUENCE LISTING, A TABLE OR A COMPUTER PROGRAM

Not applicable.

BACKGROUND OF THE INVENTION

1. Field of Invention

This invention relates to toilet chairs, specifically to power lifting toilet chairs for elderly, disabled or obese persons and recovering hospital patients who lack the strength to sit down or to rise unaided from a toilet seat.

2. Prior Art

Currently, the above mentioned persons, whether at home, in a rest home or in a hospital, require considerable daily man-hours by caregivers, nurses, or attendants, assisting them with toilet visits. The search of prior art has revealed only assisted-lift toilet chairs, using spring-loaded devices, which can only offer partial assistance to a person attempting to rise from a toilet seat. None of the prior art devices offers 100% lifting capability.

3. Objects and Advantages

The objects of the power lifting toilet chair are:

(a) to provide 100% load capability to gently lower an elderly, disabled or obese person weighing up to 500 pounds into position over a toilet,

(b) to provide 100% lifting capability for an elderly, disabled or obese person, weighing up to 500 pounds to arise unaided from the toilet,

(c) to provide a reliable, easy to use, low maintenance power lifting toilet device,

(d) to free elderly, disabled or obese persons and hospital patients from having to depend on others for toilet visits,

(e) to restore self reliance and dignity to persons accustomed to dependence on others for toilet visits,

(f) to free nurses and caregivers from possible back injuries due to lifting heavy patients or elderly persons,

(g) to free nurses and caregivers from having to be continually on call to assist heavy patients or elderly persons and to clean toilet receptacles,

(h) to reduce liability risks in hospitals, rest homes and retirement homes due to back injuries of caregivers, nurses and attendants, incurred lifting heavy patients onto and off of toilets,

(i) to reduce hospital and rest home employee absences and lost worker hours due to back injuries from lifting heavy patients onto and off of toilets,

(j) with wheels attached to the chair legs, the patient or disabled person can be rolled from the bed to the toilet and back,

(k) by installing wheels and adding seat cushions, the power lifting toilet chair can be rolled into a bedroom, living room or dining room and used as an occasional chair.

The advantages of the power lifting toilet chair include:

(a) Ease of production—all required parts and materials are readily available. Design is simple and straightforward.

(b) Low cost—all required parts and materials are relatively low cost. Electric actuators can be procured for under $100 U.S. Hydraulic jacks can be procured for under $10 U.S.

(c) Manufacturing flexibility—the power lifting toilet chair design permits a manufacturer to either add power lifting hardware to an existing toilet chair or to manufacture the complete power lifting toilet chair.

(d) No sophisticated manufacturing processes are required to produce the power lifting toilet chair. The prototype power lifting toilet chairs included two welded steel frame models and one all-wood model, all constructed and tested in a home workshop.

(e) The power lifting toilet chair will have tremendous market appeal worldwide because it provides a first-time capability for completely lifting elderly, disabled or obese persons and recovering hospital patients off toilets. Market potential for the invention will exist in every hospital, rehabilitation center, nursing home, retirement home, and elderly person’s home world-wide.

(f) Further growth of markets for the power lifting toilet chair will result from the fact that the elderly population of the world is steadily growing in numbers.

(g) This invention solves a long-felt, long-existing, but unsolved need.

(h) The non-electric embodiment of the power lifting toilet chair will allow production and use of this invention by elderly, disabled, or obese persons, or recovering hospital patients in remote or under-developed regions without access to electrical power.

Still further objects and advantages will become apparent from a consideration of the ensuing description and drawings.

BRIEF SUMMARY OF THE INVENTION

This invention, designed for elderly, disabled or obese persons and recovering hospital patients, is placed
over and around a standard toilet bowl. It can lower a person onto a toilet then gently lift ALL of a person’s weight to a position 30 inches above the floor and translated 6 inches forward to place the occupant’s center of body mass at or near his or her center of balance as he or she stands up after using a toilet.

This invention, which has been demonstrated in three prototype power lifting toilet chairs, can lift 100% of a 500-pound occupant’s weight and place him or her in a near-standing position. This invention restores self-reliance and dignity to a person who lacks strength in his or her legs to rise unaided from a toilet seat or toilet chair. And, this invention reduces or eliminates caregiver, hospital assistant or rest home nurse man-hours spent assisting patients with their toilet visits or emptying and cleaning toilet chair receptacles.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

FIG. 1 shows the side view of the power lifting toilet chair seat in its lowest position as it would be used over a standard toilet bowl. The chair legs can be extended to also accommodate a raised hospital type toilet bowl.

FIG. 2 shows the side view of the power lifting toilet chair seat in its fully-raised position. This view shows how the toilet seat is translated and tilted forward as it is being raised.

FIG. 3 shows the front view of the power lifting toilet chair in its raised position. This view shows the open-bottom construction which allows the chair to be placed over and around a toilet bowl.

FIG. 4, a three-quarter front perspective photograph, shows the arrangement of the actuators, the lifting mechanisms and the lifting seat frame, driven by the actuators, which lift the frame and the attached toilet chair seat approximately 10 inches and translate it forward approximately 6 inches. The uppermost position of the toilet seat positions the occupant in a near-standing position, with his or her body center of mass almost directly over his or her feet.

FIG. 5 shows the added jacks, manual lever, cross shaft and jack drive linkages required for the manually-powered hydraulic jack version of the power lifting toilet chair, built around a welded steel chair frame. On the manually-powered chair, two hydraulic jacks replace the two electrically-powered actuators.

FIG. 6 contains photographs of a manually-operated embodiment of the power lifting toilet chair, constructed almost completely of wood.

DETAIL DESCRIPTION OF THE INVENTION

Preferred Embodiment FIGS. 1, 2, 3, 4

The search of prior art revealed only spring-assisted toilet chairs, which provide only partial lifting assistance when a person attempts to arise from the seated position on a toilet. We found no toilet chair in existence which could lift 100% of a 500-pound person’s weight to a near-standing position. This invention, which is powered by two electrically-powered actuators, permits an elderly, disabled or obese person to sit down and arise from a toilet seat by simply moving the electric switch to the UP or DOWN positions. The toilet seat of the power lifting toilet chair is mounted on top of a power lifting seat frame, which is lifted upward and tilted forward by two actuators attached to each side. The actuators and lifting linkages are positioned such that the power lifting toilet chair can be placed over and around a toilet bowl and operated without touching the toilet bowl. The actuators are suspended by brackets from the main chair cross members so that the chair legs can be extended or shortened without affecting actuator operation.

The load limit of the electrically-powered actuators used for the power lifting toilet chair prototype exceeds 500 pounds each.

FIG. 1 (side view of the preferred embodiment) shows the power lifting toilet chair and the toilet seat in its lowest position. For clarity, the parts of the chair are identified in FIG. 2.

FIG. 2 (side view), shows the preferred embodiment of the power lifting toilet chair in its fully raised and extended position. This view shows a commercially available welded metal chair frame 10, toilet seat with cover 28, power lifting seat frame 26, actuators 12, actuator suspension brackets 13, 15, actuator mount brackets 14, 18, lifting member support frames 16, rear lifting members 20, rear member stiffeners 22, front lifting members 24, electric switch 30, 115-volt power cord and actuator wires 32, removable caster wheels 34, and leg adjustment features 36. FIG. 2 also shows the four-bar linkage lifting mechanism 16, 20, 24, 26.

FIG. 3, shows the front view of the power lifting toilet chair in its raised position. All elements are identified by reference number as described above.
The photograph, FIG. 4, shows the arrangement of the actuators and actuator suspension brackets, the lifting members and lifting member support frames, the power lifting seat frame and the chair frame. All elements are identified by reference numbers as described above.

This invention was designed to permit either 100% manufacturing of chair and lifting mechanisms or simply adding bolt-on brackets, actuators and lifting member linkages to a pre-welded toilet chair. FIG. 4, a photograph of the electrically-powered prototype power lifting toilet chair, shows all the power lifting brackets, actuators and lifting member linkages (painted black), which were added to a pre-welded toilet chair (painted cream color). The chair leg height adjustment features shown on FIGS. 1, 2, 3 and 5, depict the leg adjustment features shown on the FIG. 4 welded steel frame prototype. This feature is standard on most steel frame toilet chairs. The welded steel frame toilet chair used for the power lifting toilet chair prototype shown in FIG. 4 does not have casters (which are optional for this invention).

Alternative Embodiments, FIGS. 5, 6

FIG. 5 shows the manually-operated embodiment of the power lifting toilet chair with a welded steel chair frame. This prototype toilet chair uses two non-electric (hydraulic) actuators 46 which permit the toilet seat 28 to be lowered or raised gently off the toilet bowl without the need for electric power. FIG. 5 shows the manual lever 40, cross shaft 42, cross shaft supports 43, jack drive linkages 44 and the manual UP-DOWN position switch 48. To raise the manually-operated toilet seat, the manual UP-DOWN position switch is first pulled up. Then the manual lever 40 is moved back and forth for approximately 25 seconds. To lower the toilet seat, the manual UP-DOWN position switch is pressed down and the toilet seat sinks gently to its lowest position.

FIG. 6 contains photographs of a manually-operated wood embodiment of the power lifting toilet chair. This prototype, constructed almost completely of plywood, nails and glue, could be manufactured anywhere by an ordinary cabinet shop.

CONCLUSIONS AND SCOPE

Although the description above contains many specificities, these should not be construed as limiting the scope of the invention but as merely providing illustrations of three of the embodiments of this invention. For example, the chair frame, legs, and lifting mechanisms can be made from numerous materials, including plywood, as documented in the reference provisional patent applications. Thus, the scope of this invention should be determined by the appended claims and their legal equivalents, rather than by the examples given.

We claim:

1. A power lifting toilet chair which stands over and surrounds a toilet bowl, comprising:

   a. a chair frame made of metal, wood, plastic, fiberglass, vinyl or or composite materials, having removable rotatable wheels mounted thereunder for enabling said chair frame to roll about a surface,

   b. one or more force-generating devices mounted to said chair frame for producing lifting means, and

   c. a plurality of lifting members connecting the force-generating devices to a lifting seat frame, which has a toilet seat mounted on top

whereby said lifting seat frame and said toilet seat with a 500-pound occupant will be lowered gently over said toilet bowl, then lifted gently upward and simultaneously tilted forward from a resting position over said toilet bowl until said occupant arrives at a near-standing position.

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