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(54) WHEELCHAIR WITH TOILET, BIDET, WASTE STORAGE TANK AND DISCHARGE

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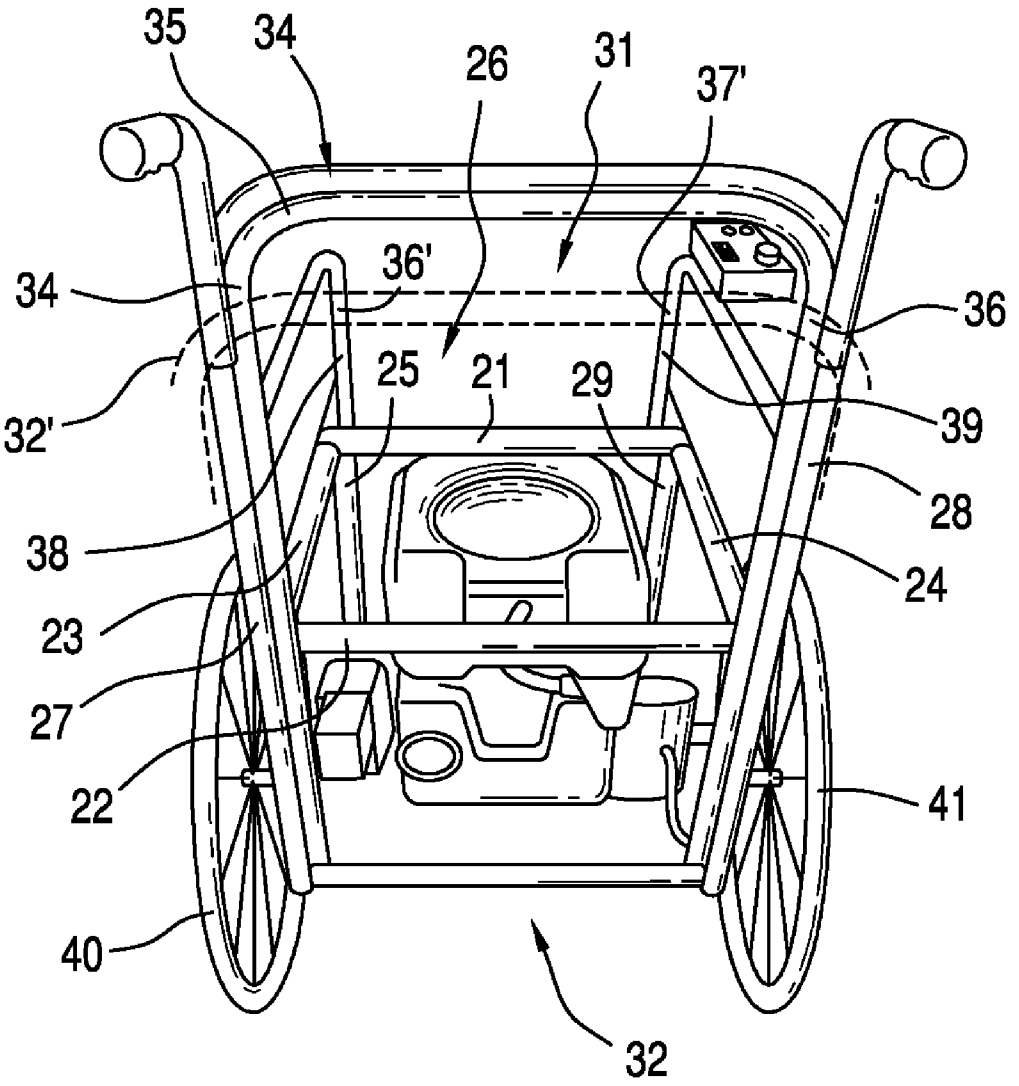
(57) **ABSTRACT**

A wheelchair includes a toilet and bidet disposed within a tubular frame with a lower box shaped section. A U-shaped upper rear frame includes a pair of upperwardly extending steel tubes and an upper cross member and a pair of forwardly extending frame members extend forwardly from the upperwardly extending tubes and a pair of downwardly extending tubular members extend downwardly from forward end portions are welded to form a solid structure. Further, a horizontal support member defines a circular opening. A toilet including a toilet bowl and bidet are disposed in the box shaped section while a waste storage tank is disposed below the toilet bowl and a water reservoir surrounds the toilet bowl. Finally, a pair of relatively large parallel wheels and a pair of relatively small wheels are fixed to the box shaped section of the frame.



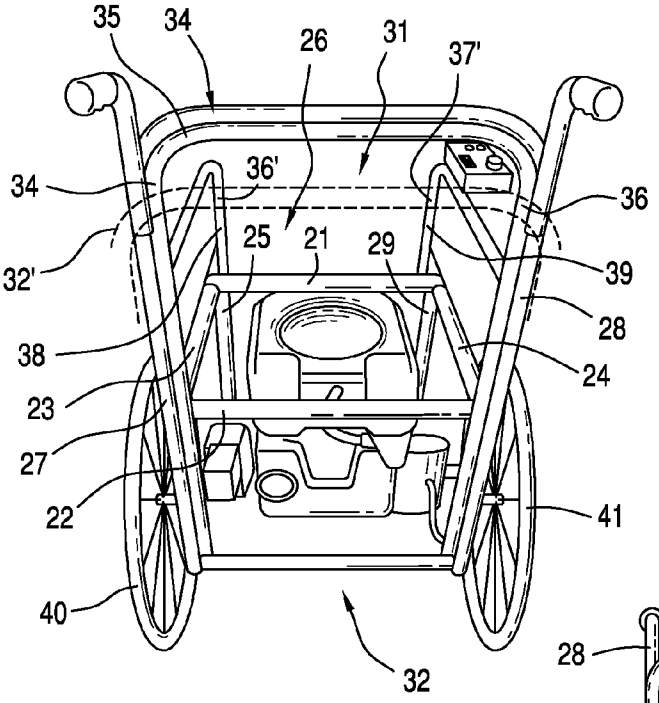


FIG. 1

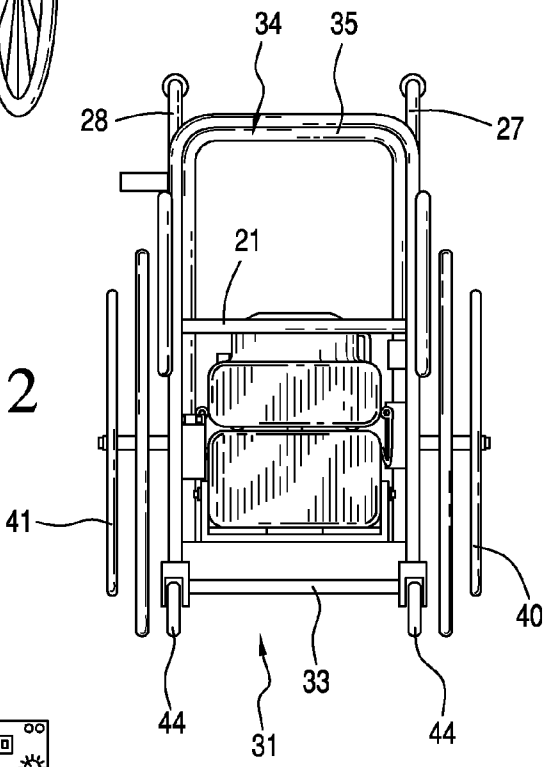


FIG. 2

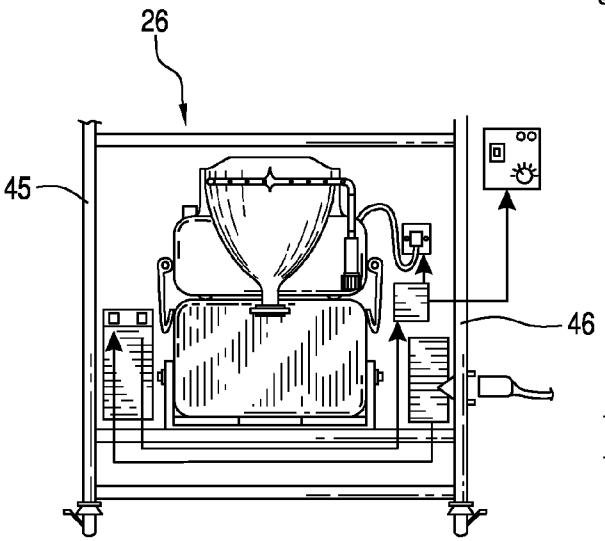


FIG. 3

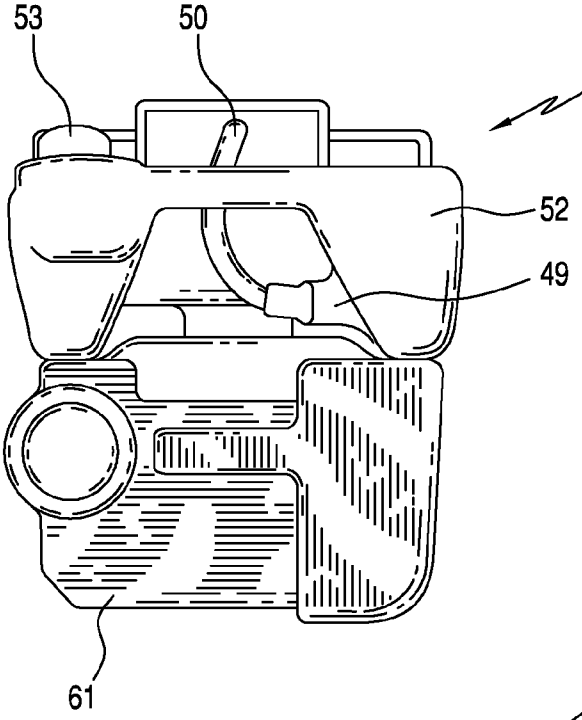


FIG. 4

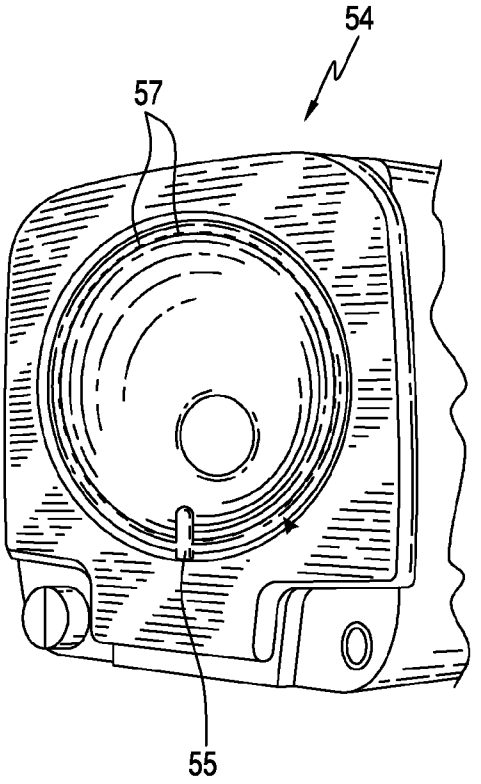


FIG. 5

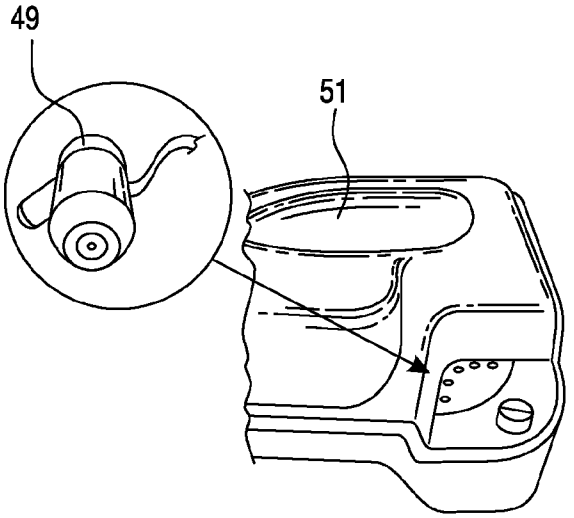


FIG. 6

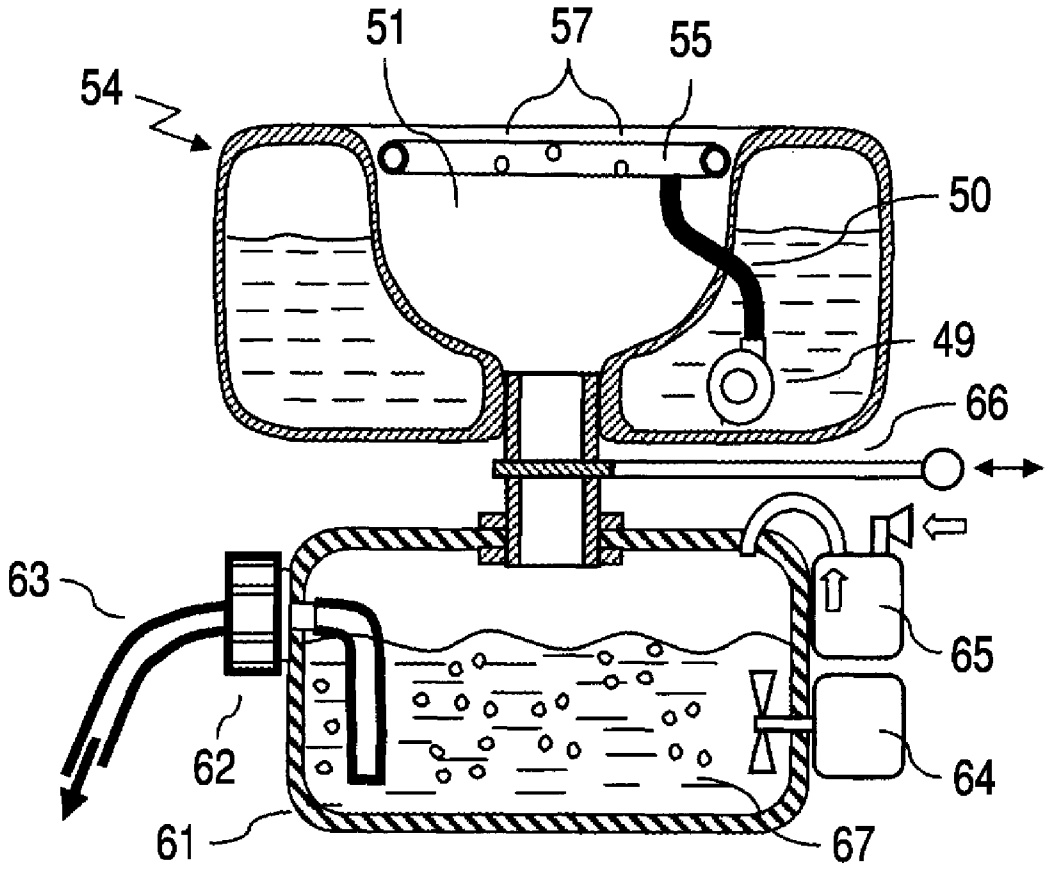


FIG. 7

WHEELCHAIR WITH TOILET, BIDET, WASTE STORAGE TANK AND DISCHARGE

FIELD OF THE INVENTION

[0001] This invention relates to a wheelchair for the disabled and more particularly to a wheelchair for the disabled that includes an integral toilet and bidet, a waste storage tank and a mechanism for discharging waste from the storage tank.

BACKGROUND OF THE INVENTION

[0002] Apparatus and devices for aiding disabled individuals to rid themselves of waste are well known and have been in use for many years. For example, a U.S. Patent of DiMatteo et al., U.S. Pat. No. 4,067,409 discloses a wheel chair arrangement with a seat that may be uncovered to expose an opening that enables a patient to use a toilet while seated in the wheelchair. By actuating a switching arrangement, the patient may raise or lower the back rest to enable the person to be transferred with ease to a bed. A motor operating device may also be actuated by the switching arrangement for uncovering an opening in the seat of the wheelchair and the latter may be wheeled directly over a conventional toilet bowl by motors operated selectively through the switching arrangement actuated by a patient.

[0003] A more recent patent of Trkla, No. U.S. Pat. No. 4,949,408 discloses an all purpose wheelchair. The self-powered wheelchair permits the user to become self-sufficient by permitting the user to move about, relieve themselves of bodily waste, change their own bedpan, exercise, receive intravenous transfer of fluids, change positions and also permits a person to assist the wheelchair user in transferring the wheelchair user from a bed to a wheelchair or from a wheelchair to a bed without the person having to lift the wheelchair user.

[0004] Finally, a Convertible Bed/Chair with Waste Disposal is disclosed in a U.S. Pat. No. 6,009,570 of Hangest et al. As disclosed, a bed for patient care having a waste disposal system includes a setback and two leg sections for supporting a patient. These sections of the bed may be raised, lowered and tilted. The leg sections may be moved independently for use with patients having one leg immobilized. The seat sections include two panels which part to permit a waste canister to be raised to interface with the buttocks of the patient. An audible signal alerts the patient prior to this action. In addition, the waste canister provides a directable bidet wash and air drying feature. Gelling material within the canister swells during the bidet function to cover and seal the waste. The entire canister may be sealed and disposed of.

[0005] Notwithstanding the above, it is presently believed that there is a need and a potential market for an improved wheelchair in accordance with the present invention. There should be a commercial market for such chairs because they aid wheelchair bound individuals to be self-sufficient, to relieve themselves of body waste without the assistance of another individual, to clean themselves and dry themselves independently. Further, such chairs are rugged, easily serviced, maneuverable and can be manufactured at a reasonable cost.

BRIEF SUMMARY OF THE INVENTION

[0006] In essence a wheelchair for the disabled in accordance with a preferred embodiment of the invention includes a toilet and a bidet. The wheelchair comprises: a tubular steel frame including a lower box shaped section having a forward portion and a rear portion and a generally U-shaped upper rear frame including a pair of upperwardly extending steel tubes extending upwardly from the lower portion of the box shaped section. The upperwardly extending frame also includes a cross-member joining the upperwardly extending steel tubes and a pair of generally horizontal forwarding extending frame members extending forwardly from an intermediate portion of the upwardly extending tubes. These forwardly extending portions also join with a pair of downwardly extending tubular members that extend downwardly from the forward end portions to an upper portion of the forward portion of the box shaped section; means supporting the back of an individual extend between the upperwardly extending tubes.

[0007] A generally horizontal support member is disposed on the upper portion of the box shaped section and defines a circular opening extending through a central portion of the support; a toilet including a toilet bowl and a bidet are disposed in the box shaped section below the circular opening; and a removable waste reservoir is disposed below the toilet bowl and a pure water reservoir surrounds the toilet bowl above the waste reservoir. The pure water reservoir includes an electric and/or manual pump disposed in or above the pure water reservoir. Further, the toilet includes a variable speed DC motor and adjustable voltage regulator for controlling the speed of the pump to control water pressure for cleaning and flushing the toilet.

[0008] Further, a battery and battery charger are disposed in the box shaped section for charging the battery and energizing the motor. Also, a closeable opening is provided between the toilet bowl and the waste reservoir. A pair of relatively large parallel wheels with one of said wheels rotatably fixed to each side of the rear portion of the box shaped section of the frame are provided.

[0009] In addition, a pair of relatively small wheels are rotatably fixed to a forward portion of the box shaped section and rotatable about a vertical axis and provide a wheel structure that is generally similar to a conventional wheelchair.

[0010] The invention will now be described in connection with the accompanying figures wherein like reference numerals have been used to indicate like parts.

DESCRIPTION OF THE DRAWINGS

[0011] FIG. **1** is a perspective view of a wheelchair in accordance with a preferred embodiment of the invention viewed from the back of the chair;

[0012] FIG. **2** is a second perspective view of the wheelchair shown in FIG. **1** with its sides covered and viewed from the front of the chair;

[0013] FIG. **3** is a front view of a toilet module as used in the present invention and enclosed in a box shaped section of the frame;

[0014] FIG. **4** is a rear elevational view of the waste reservoir and pure water reservoir;

[0015] FIG. **5** is a top or plan view of a toilet bowl including a bidet in accordance with one embodiment of the invention;

[0016] FIG. **6** is a side view of a toilet with an open portion that includes an electric pump and a potentiometer circuit for pumping clean water out of the bidet and out of a plurality of openings for cleaning the toilet bowl; and,

[0017] FIG. **7** is a cross-sectional view illustrating a blender used to blend waste with bidet discharge water and a source of compressed air.

DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

[0018] As illustrated in FIGS. **1** and **2**, a wheelchair in accordance with a preferred embodiment of the invention comprises a structural frame **20** that includes four generally horizontal tubular metal frame members **21**, **22**, **23**, and **24** and four vertical tubular members **25**, **27**, **28**, and **29** to form a box shaped section **26**. The tubular frame members are preferably steel or aluminum with about a 1 inch diameter and sufficient wall thickness to support up to about 300 pounds in a chair structure. The tubular members are typically welded together to form the box like structure **26** with a forward portion **31** and rear portion **32**.

[0019] The frame **20** also includes an upwardly extending generally inverted U-shaped back support **34** that includes a pair of upwardly extending tubular members **34** and **36** with an upper cross member **35**. In a first embodiment of the invention, the inverted U-shaped body support is in a fixed position as for example by being the upwardly extending tubular member welded to the rear upper portion of the box shaped section **26**. However, in a second embodiment of the invention the back rest is rotatable to provide a semi-reclining position as for example by being rotatable about a reclining mechanism shown schematically at **32'**. In practice any conventional mechanism for a reclining chair may be used.

[0020] In the preferred embodiment of the invention the forwardly extending lower frame member at the bottom of the box shaped section **26** extends forwardly from the box shaped section and forms a base or footrest **33**. The upper horizontal tubular members **23** and **24** terminates in two vertical tubular members **36'** and **37'** in the form of arm rests that include a pair of downwardly extending portions **38** and **39**.

[0021] As shown in FIGS. **2** and **3**, the wheelchair **20** includes a pair of rotatable large wheels **40** and **41** with one wheel rotatably mounted on one side of a rear portion **32** of the box shaped section **26** and the second wheel **41** rotatably mounted on the other side of the rear portion **32** of the box like section **26**. The chair also includes a pair of relatively small rotatable and swivable wheels **44** positioned on the forward extension of the tubular frame member **21** and **22** under the footrest **33**. The swivable wheels **44** are generally swivable about a vertical axis.

[0022] As shown in FIG. **3** the wheel chair **20** includes a pair of side panels **45** and **46** that extend downwardly from the armrest like tubular members **36'** and **37'** to the bottom of the box like section **26**. These side panels **45** and **46** and a rear panel (not shown) provide privacy for a patient plus the use of a sheet or blanket provides privacy for the patient when relieving their self. However, it is also contemplated by the invention that a patient will use the wheelchair **20**, transport ones self to a small bathroom or privacy room equipped with a quick disconnect connection fitting and a convenient electrical outlet to use the privacy room for privacy.

[0023] As illustrated in FIGS. **4** through **6** the wheelchair **20** includes a toilet module **48** disposed within the box shaped section **26** and includes a toilet basin **51**, a bidet **54**, a pure water reservoir **52**, an electric pump **49** disposed inside reservoir **52** and a hose **50** which connects the said pump to the said bidet. The water reservoir **52** has a removable cover **53** to allow filling the reservoir from a primary source of water. A hand operated pump may also be provided for increasing the pressure to exhaust the liquefied waste from the module in the event of power outage.

[0024] As illustrated in FIG. **5** a bidet **54** includes a generally circular ring shaped conduit **55** with an upwardly directed nozzle for cleaning an individual and a plurality of downwardly directed apertures **57** provided for cleaning the toilet bowl and means for closing the upwardly directed nozzle may also be provided for increasing the pressure of the water from the downwardly directed apertures for cleaning the toilet bowl. A tank of cleaning solution may also be provided for cleaning the toilet bowl and regulating means for controlling water pressure from a control panel. A dryer directed upwardly for drying the patient may also be controlled from the control panel.

[0025] As illustrated in FIGS. **4** and **7** a screw cover **62** with a through-hole bushing is used to hold a waste discharge hose **63**. The cover **62** and hose **63** can be removed and replaced by a cover **62'** when it is necessary to temporarily to store waste in the waste storage tank **61**. As illustrated, a blender **64** is used to blend waste with bidet discharged water to produce liquefied waste. The blender may be operated by a **12**V motor. As shown a slide valve **66** is manually operated to open and close the conduit between the toilet bowl **51** and water storage tank **61** but can be replaced by a motor operated valve. As illustrated in FIG. **7** the pump **49** is only used to deliver pure water for the bidet. An air compressor **65** is used to add compressed air to the storage tank in order to discharge the liquefied waste **67** into a sewer outlet.

[0026] While the invention has been described in connection with its preferred embodiments it should be recognized that changes and modifications may be made therein without departing from the scope of the appended claims.

What is claimed is:

1. A wheelchair for the disabled including a toilet and a bidet, said wheelchair comprising:

a tubular steel frame including a lower box shaped section having a forward portion and a rear portion and a generally U-shaped upper rear frame including a pair of upperwardly extending steel tubes extending upperwardly from said rear portion of said box shaped section and an upper cross member joining said upperwardly extending steel tubes and a pair of generally horizontal forwardly extending frame members extending forwardly from an intermediate portion of said upperwardly extending tubes and including forward end portions, and a pair of downwardly extending tubular members extending downwardly from said forward end portions to an upper portion of said forward portion of said box shaped section;

means supporting the back of an individual extending between said upperwardly extending tubes; and

a generally horizontal support member disposed on an upper side of said box shaped section and defining a circular opening extending through a central portion of said support member;

a toilet including a toilet bowl and a bidet disposed in said box shaped section below said circular opening, a removeable waste reservoir disposed below said toilet bowl and a pure water reservoir surrounding said toilet bowl above said waster water reservoir, an electric pump disposed in said pure water reservoir and a variable speed DC motor and adjustable voltage regulator for controlling the speed of said pump to control the water pressure of the cleaning and flushing water;

a battery and a battery charger disposed in said box shaped section for charging said battery and energizing said motor; and

a closeable opening between said toilet bowl and said water reservoir;

a pair of relatively large parallel wheels with one of said wheels rotatably fixed to each side of said rear portion of said box shaped section of said frame and a pair of relatively small wheels rotatably fixed to a forward portion of said box shaped section of said frame and rotatable about a vertical axis.

2. A wheelchair for the disabled including a toilet and a bidet according to claim **1** in which said bidet includes a ring shaped water conduit disposed around an upper portion of said toilet bowl and an upwardly directed nozzle in a forward and rear portion of said ring for cleaning an individual and a plurality of perforations in a lower part of said ring for flushing said toilet.

3. A wheelchair for the disabled including a toilet and a bidet according to claim **2** which includes a cushion defining a circular opening therethrough in a central portion thereof disposed on said generally horizontal support member.

4. A wheelchair for the disabled including a toilet and a bidet according to claim **3** which includes means covering two sides and a rear portion of said wheelchair between said horizontal forwardly extending frame members and said lower box shaped section.

5. A wheelchair for the disabled including a toilet and a bidet according to claim **4** which includes a potentiometer circuit for controlling the speed of said pump.

6. A wheelchair for the disabled including a toilet and a bidet according to claim **5** which includes control means disposed on one of said forwardly extending horizontal frame members.

7. A wheelchair for the disabled including a toilet and a bidet, said wheelchair consisting of:

a tubular steel frame including a lower box shaped section having a forward portion and a generally U-shaped upper rear frame including a pair of upperwardly extending steel tubes extending upperwardly from said rear portion of said box shaped section and an upper cross member joining said upperwardly extending steel tubes and a pair of generally horizontal forwardly extending frame members extending forwardly from an intermediate portion of said upperwardly extending tubular frame members and including forward end portions and a pair of downwardly extending tubular members extending downwardly from said forward end portions to an upper portion of said forward portion of said box shaped section;

means supporting the back of an individual extending between said upperwardly extending tubes;

a generally horizontal support member disposed on an upper portion of said box shaped section and defining an arcuate opening extending through a central portion of said support;

a cushion defining a central circular opening extending through a central part thereof resting on said support member;

a toilet including a toilet bowl disposed in said box shaped section below said arcuate opening;

a removeable waste storage tank disposed below said toilet bowl and a pure water reservoir surrounding said toilet bowl;

an electric pump disposed in said pure water reservoir and a variable speed DC motor and adjustable voltage regulator for controlling the speed of said pump to thereby control the water pressure for cleaning and flushing water; and;

wherein a blender and air compressor are disposed in said storage tank for blending waste and discharged water from said bidet in said waste storage tank;

a battery and a battery charger disposed in said box shaped section for charging said battery and energizing said DC motor;

a closeable opening between said toilet bowl and said waste water reservoir; and,

a pair of relatively large parallel wheels with one of said wheels rotatably fixed to each side of said rear portion of said box shaped section of said frame and a pair of relatively small wheels rotatably fixed to a forward portion of said box shaped section of said frame and swivable about a vertical axis.

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