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Angel

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[54] **INVALID LIFT**

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[52] **U.S. Cl.** ..... **5/81 R;** 5/86; 297/DIG. 10

[51] **Int. Cl.** **A61g 1/02**

[58] **Field of Search** 5/63, 64, 66, 81, 86, 88; 280/43.19; 214/100; 297/DIG. 10; 312/321; 108/144, 147

[56] **References Cited**

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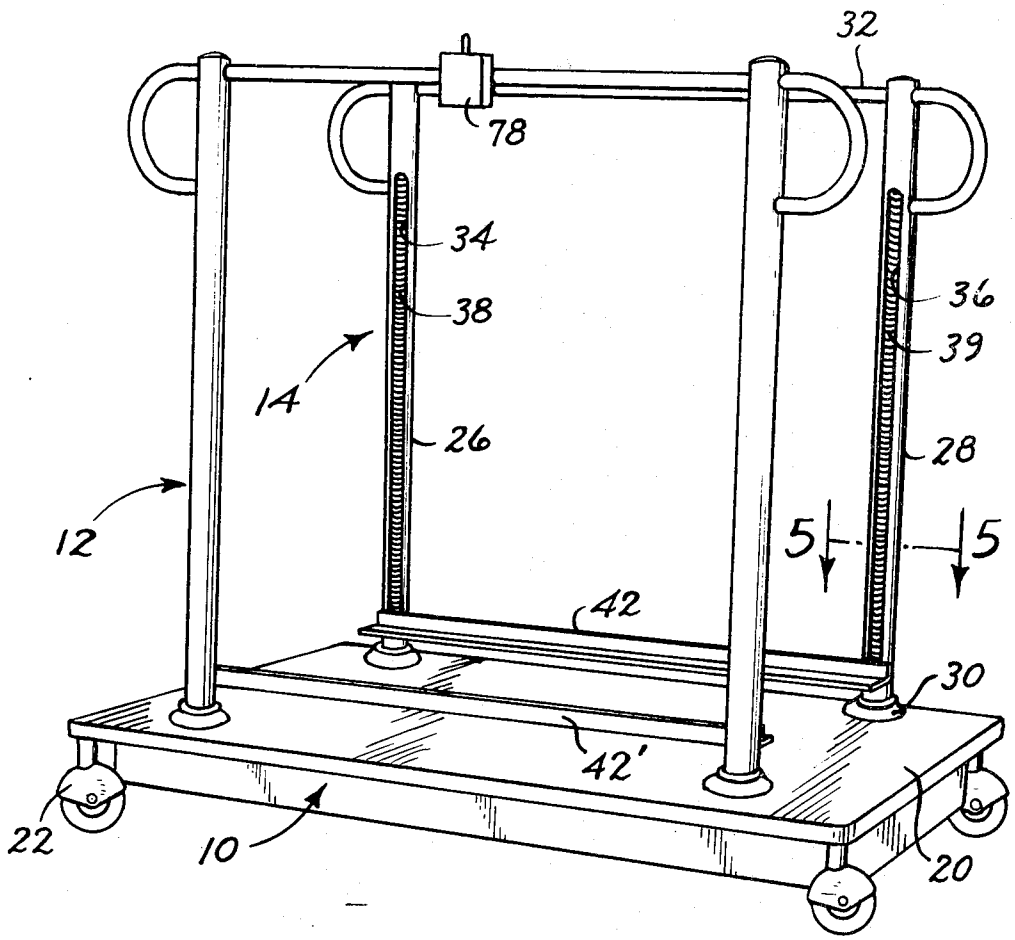
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[57] **ABSTRACT**

An invalid lift is disclosed usable in lifting an invalid from a lowered position. The invalid lift includes a wheel-supported undercarriage adapted to rest on the floor, and opposed spaced-apart post structures mounted on the undercarriage and projecting upwardly therefrom, each post structure including handlebar means adjacent the top thereof. An elongate body support frame is disposed between the post structures in a position overlying the undercarriage. The body support frame is moved up and down with actuation of elevator means comprising a pair of threaded shafts associated with each post structure having followers on the shaft which move axially of the shafts with rotation of the shafts. Power-operated means is provided for rotating the shafts in the post structures in unison.

5 Claims, 5 Drawing Figures



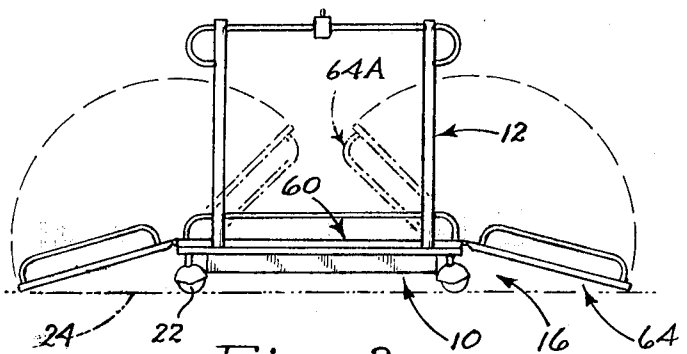


Fig. 3.

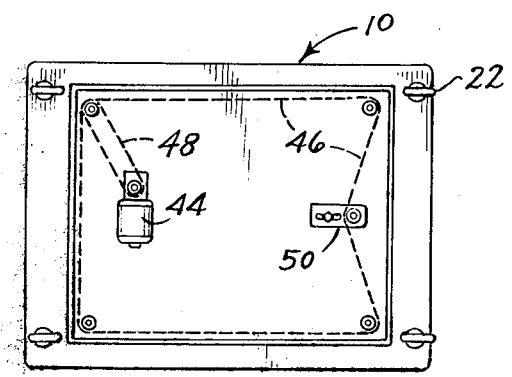


Fig. 4.

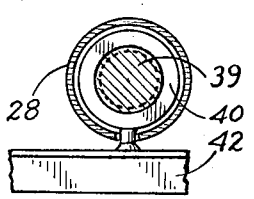


Fig. 5.

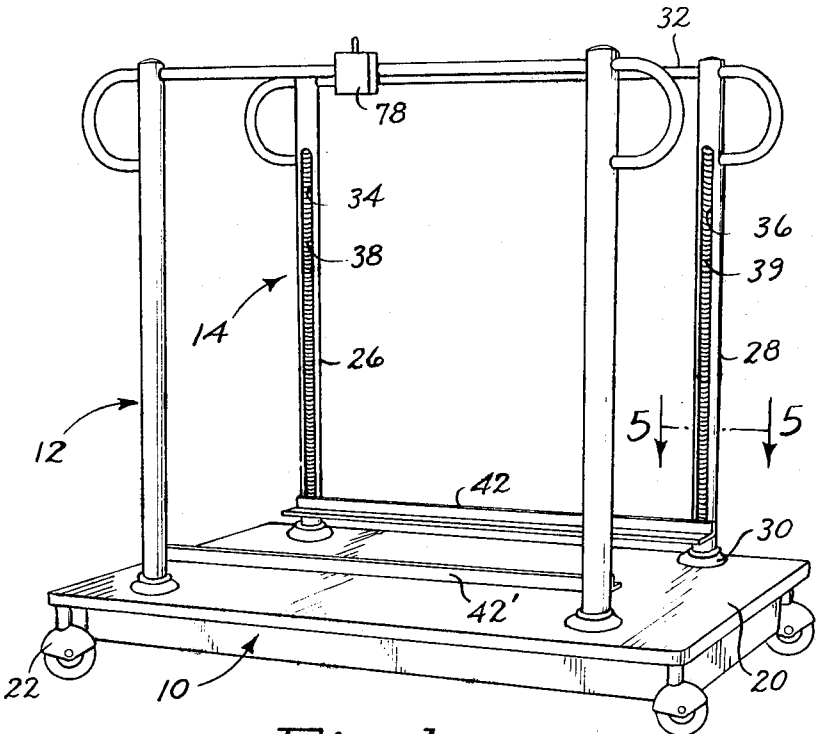
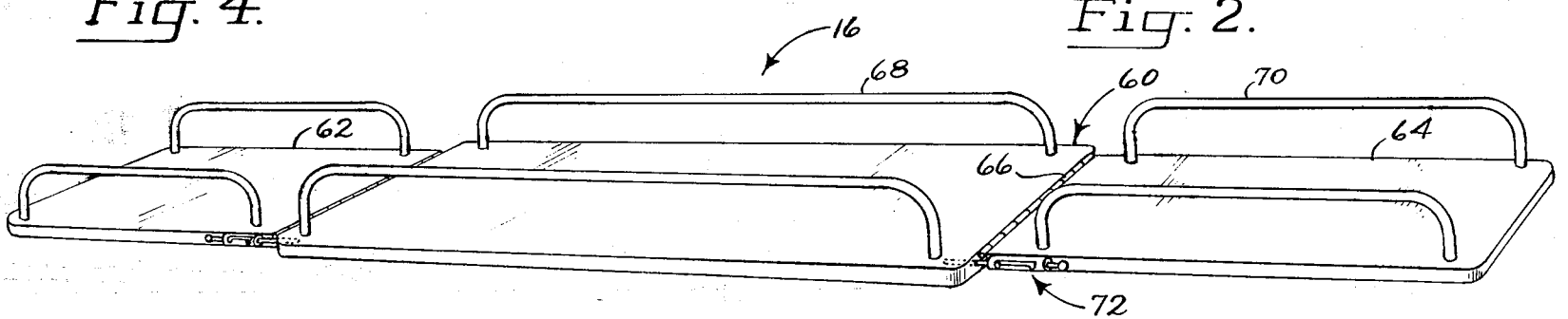


Fig. 1.

Fig. 2.



INVALID LIFT

This invention relates generally to an invalid lift. More specifically, the invention concerns such a lift which includes an undercarriage, and a body support frame overlying the undercarriage which is adapted to be raised and lowered under power. In a lowered position the body support frame is closely adjacent the floor, in a position to enable an invalid to move onto the body support frame, either under his own power or with the help of attendants. Raising of the support frame lifts an invalid so positioned.

With certain invalids because of impairment of muscular coordination, or for other reasons, it is difficult if not impossible for the invalid to lift himself from the floor. Even with the assistance of attendants, it may prove difficult to move a person from the floor, particularly if the invalid can give no assistance himself. A need, therefore, exists for an invalid lift which can be used to facilitate the lifting of a person from the floor, as well as in other capacities, such as in the moving of an invalid or patient from one location to another.

A general object of the invention, is to provide a novel invalid lift including an elevatable body support frame which may be employed in lifting an invalid.

Another object is to provide such a lift which includes post structures mounted on an undercarriage, and means associated with said post structures for raising a body support frame.

In a preferred embodiment of the invention, a pair of opposed post structures are provided on the undercarriage, and the body support frame is disposed in a position overlying the undercarriage between the opposed post structures. The post structures on either side of the body support frame serve as a means confining the invalid, and as a means which the invalid may hold onto when able, to steady himself when moving onto the support frame or during vertical movement of the frame.

One feature of the invention is the provision of a body support frame which includes a seat panel section and a ramp panel sectin hinged at one margin to a margin of the seat panel section. The ramp panel section normally extends beyond a side of the undercarriage, and has an opposite margin adapted to rest on the floor with the body support frame in a lowered position. An invalid is enabled through the ramp panel section to move himself along the support frame from the floor to a position between the post structures described.

A further feature of the invention includes the provision of means for elevating the body support frame in the form of vertically disposed threaded shafts associated with the post structure described. Follower means on the various shafts move axially of the shafts with rotation of the shaft. Power-operated means is provided for rotating the shafts in unison. Supports on the follower means have the body support frame detachably resting thereon, and serve to lift the body support frame with rotation of the shaft.

These and various other objects and advantages of the invention will become more fully apparent from a reading of the following description, to be taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a perspective view showing a vehicle unit in the lift;

FIG. 2 is a perspective view showing a removable body support frame in the lift;

FIG. 3 is a side view, on a somewhat smaller scale, showing the lift completely assembled;

FIG. 4 is a view, on a slightly larger scale than FIG. 3, looking upwardly at the underside of the vehicle unit in the lift; and

FIG. 5 is a cross-sectional view, taken along the line 5—5 in FIG. 1, and on a somewhat larger scale.

Referring now to the drawings, the invalid lift pictured comprises what is referred to herein as an undercarriage **10**, and secured to the undercarriage and projecting upwardly therefrom, a pair of post structures **12** and **14**. The undercarriage and post structures together make up what is referred to herein as a vehicle unit in the lift. Adapted for fitting between the post structures is a removable body support frame in the lift, designated at **16**.

Referring to FIGS. **1** and **3**, the undercarriage **10** may take the form of a rectangular platform **20**. The platform is wheel supported to enable it to be moved over the ground. Thus, at each of the four corners of the platform there is provided a caster wheel shown at **22**. With the construction described, platform **20** has a position only slightly elevated above floor **24** (see FIG. **3**) on which the invalid lift rests.

The construction of the two post structures **12, 14** is similar. Thus, and referring to post structure **14** in FIG. **1**, each includes a pair of uprights, or posts, **26, 28** which are hollow tubular members. The two uprights are secured to platform **20** in a suitable manner as through anchor fittings **30**. The uprights are joined adjacent their top ends by an elongate handlebar **32** spanning the top ends of the posts or uprights.

Power-operated elevator means is provided associated with each post structure **12, 14** for supporting body support frame **16**, and utilizable in raising and lowering the frame when the need arises. More specifically, and referring to post structure **14**, it will be noted that the posts **26, 28** have elongated channels **34, 36** extending therealong, from a region adjacent platform **20** to a region adjacent handlebar **32**. Within each of the posts **26, 28** is an elongate threaded shaft, exemplified by shafts **38, 39** shown in FIG. **1**. The shafts are exposed along the inner sides of the posts by channels **34,** 36. The shafts are mounted for rotary movement about their axes in a conventional manner.

Mounted on each shaft is a follower, such as the one pictured at **40** in FIG. **5**. The follower, which includes means engaging the threads of the shaft, moves axially along the shaft with rotation of the shaft, with the direction in which the follower moves depending upon the direction in which the shaft is rotated. An elongate angle iron or support **42** (see FIG. **1**) is secured to the followers on shafts **38, 39.**

Referring now to FIG. **4**, the threaded shafts in the various posts of post structures **12** and **14** are rotated through actuation of a motor **44** which may be an electric motor. The motor is mounted on the underside of rectangular platform **20**. A chain **46** trained over sprockets secured to the bottom ends of the various shafts interconnects the various shafts for simultaneous rotary movement. Drive is transmitted from the motor to chain **46** through chain **48**. Shown at **50** is an adjustable sprocket engaging chain **46**, which is adjusted in position to take up slack in chain **46.**

Angle iron or support **42** of post structure **12**, and corresponding angle iron or support **42'** of post struc-

ture **14,** provide a seat for portions of body support frame **16** as will be described.

In the particular embodiment of the invention disclosed, the body support frame includes a central panel section, referred to herein as a seat panel section **60.** Also part of the body support frame are ramp panel sections **62, 64** joined to the opposed end margins of the seat panel section. Joinder of a ramp section with the seat panel section is through an elongate piano-type hinge **66.** The hinge permits a ramp panel section to be swung over the top of the seat panel section for storage purposes. Such a position is illustrated in FIG. **3** by the dashed outline **64A.** The hinge also permits a ramp panel section to be swung in the opposite direction, to a position whereby it inclines downwardly from the seat panel section, as shown in FIG. **3** by the solid outline **64.**

The seat panel section, and ramp panel sections **62,** 64, may be provided with railing, shown at **68** and **70,** along the side margins thereof. The railing **70** of a ramp panel section has a lateral spacing which is somewhat less than the lateral spacing of the side railing for the seat panel section. This provides clearance when the ramp panel sections are folded over the top of the seat panel section.

The ramp panel sections may be locked in a position where they are in horizontal alignment with the seat panel section, as shown in FIG. **2.** For this purpose, a latch and bolt assembly is provided, such as that shown at **72** in FIG. **2.** With the ramp panel sections so locked in place, the body support frame may function as a stretcher.

The body support frame in the completely assembled lift is positioned between the post structures, with seat panel section **60** resting through its opposed side margins on supports or angle irons **42, 42'.** With supports **42, 42'** having a lowered position on the post structures, the seat panel section assumes a position directly overlying rectangular platform **20.** With the body support frame in this lowered position, ramp panel sections **62, 64,** if unlocked from the seat panel section and positioned to project outwardly and downwardly from the seat panel section, may be utilized as slides to enable a patient to slide onto the central seat panel section. Thus, and with reference to FIG. **3,** with the ramp sections so positioned, they extend beyond the sides of the undercarriage and have outer margins that rest on the floor. With raising of the seat panel section **60** through elevation of the supports , **42',** the ramp sections gradually drop at their outer margins to assume a more inclined position.

Control of motor **44** is by means of switch **78,** preferably mounted on the post structure to be readily accessible by a person using the invalid lift.

Latch and bolt asemblies **72** have been described for locking the ramp sections in positions aligned with the seat panel section. It has also been pointed out that the seat panel section when assembled with the lift has resting engagement on supports **42, 42'.** Thus, if need be, the body support frame **60** may be used as a stretcher in transporting a patient to or from the vehicle unit comprising the platform **20** and the post structures **12,** 14.

The operation of the invalid lift should be obvious from the above description. To store the lift, the ramp sections are swung upwardly and over the central seat panel section, and the supports **42, 42'** lowered. To ready the apparatus to enable a patient to slide onto the lift, the ramp sections may be swung outwardly and down to place outer margins on the floor. Once a patient has been moved onto the lift, and more particularly to a position over the seat panel section, the patient (or an attendant, if need be) can raise the body support frame through actuation of motor **44.**

While a specific embodiment of the invention has been described, it should be obvious that variations and modifications are possible.

It is claimed and desired to secure by letters patent:

1. An invalid lift comprising

a wheeled undercarriage adapted to rest on the floor,

opposed, spaced-apart, stationary post structures mounted on the undercarriage and projecting upwardly therefrom,

an elongated substantially horizontal body support frame disposed between and below the top extremity of the post structures and overlying said undercarriage, said body support frames comprising an elongated seat panel section and a ramp panel section hinged at one margin to an end margin of the seat panel section, said seat panel section being located above said carriage and said ramp panel section extending beyond the side of said undercarriage to an opposite margin to rest on the floor,

and

power-operated elevator means associated with each post structure supporting said body support frame and operable when actuated to lift the same.

2. An invalid lift comprising

an undercarriage with wheel support adapted to rest on the floor,

opposed, spaced-apart post structures mounted on the undercarriage and projecting upwardly therefrom, each post structure including spaced uprights and said uprights in a post structure being joined adjacent their tops by handlebar means,

a threaded shaft in each upright and means mounted on the undercarriage for rotating said threaded shafts in unison,

follower means mounted on each threaded shaft movable axially on the shaft with rotation of the shaft,

a support mounted on the follower means in the uprights of one post structure and another support mounted on the follower means in the uprights of the opposed post structure, and

an elongate body support frame disposed between the post structures, said body support frame comprising a seat panel section and a ramp panel section hinged at one margin to an end margin of a seat panel section, said seat panel section resting on said first and second supports and said ramp panel section extending beyond a side of said undercarriage to an opposite margin adapted to rest on the floor.

3. The invalid lift of claim **1,** wherein said elevator means associated with a post structure comprises a vertically movable support having a side margin of said seat panel detachably resting thereon.

4. An invalid lift comprising

an elongate substantially horizontal body support frame including a seat panel section and a ramp panel section hinged at one margin to a margin of the seat panel section,

an undercarriage adapted to rest on the floor,

post structure projecting upwardly from said undercarriage,

a power-operated, rotatable, threaded shaft disposed in an upright position in the post structure and a follower mounted on said shaft which moves axially on said shaft with rotation of said shaft, and

vertically movable means mounted on said follower supporting said seat panel section and adapted to raise and lower the same,

said ramp panel section extending beyond a side of said undercarriage to an opposite margin which is adapted to rest on the floor.

5. The invalid lift of claim **4,** wherein said post structure includes handlebar means adjacent the top thereof.

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