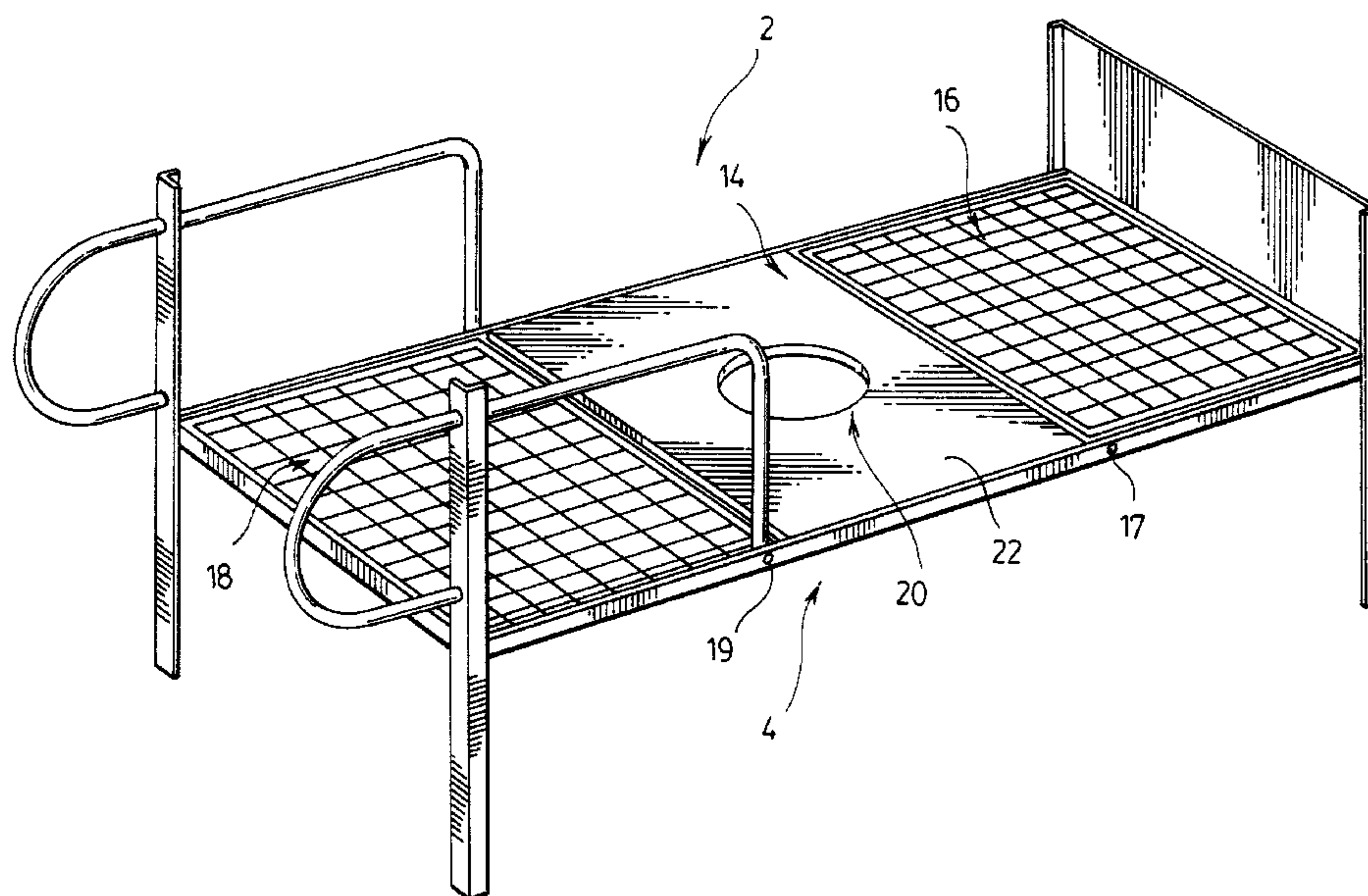


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(54) LIT D'INVALIDE A ACCES FACILE
(54) EASY ACCESS INVALID BED



(57) An invalid bed of the present invention allows convenient ingress and egress therefrom promoting safe transfer to a standing position. The bed is movable to a chair like configuration and extended handrails for walking practice exercise are provided in front of the chair configuration.

ABSTRACT OF THE DISCLOSURE

An invalid bed of the present invention allows convenient ingress and egress therefrom promoting safe transfer to a standing position. The bed is movable to a chair like configuration and extended handrails for walking practice exercise are provided in front of the chair configuration.

TITLE: EASY ACCESS INVALID BEDFIELD OF THE INVENTION

5 The present invention relates is directed to a bed which is adjustable to allow convenient ingress and egress therefrom.

10 BACKGROUND OF THE INVENTION

A number of different types of beds have been proposed, however, the designs are complicated and the beds are expensive to manufacture. One such bed is disclosed in United States Patent 5,577,279.

15 There are a number of health conditions which render a conventional bed difficult to use. The action of getting in and out of a conventional bed requires a combination of bending and rotation. This is a painful
20 manoeuvre for those with arthritis and for recent surgical patients. It is also difficult and unaided, for persons weakened by acute or chronic disorders.

 Various arrangements have been provided for bars
25 over a bed to allow the patient to pull themselves to a sitting position and then rotate to the side of the bed. Although these systems are helpful, the action remains difficult for many patients.

30 Moving from bedside to wheelchair requires ability to stand and turn while maintaining balance. Even with assistance of competent caregivers, patient falls are frequent and caregivers often sustain lifting injuries.

35 Many persons who need regular, supported, walking practice are helped by parallel bar equipment. These are not available in private homes, and not more than once daily in institutions.

Another problem associated with hospital beds, and certainly home care beds, is the use of bed pans. If a person is confined to the bed, the action of lifting his body to allow positioning of a bed pan between himself and the bed is difficult and painful. Also, the semi horizontal position for elimination is unnatural and for many persons, inhibits the act. Furthermore, the removal of the bed pan also presents problems.

United States Patent 5,685,034 discloses a hospital bed with a integrated toilet facility. This bed allows conversion to a sitting position and movement of a toilet type module to the appropriate location.

There remains the need for a hospital or home care style bed which is of a simpler construction and has improved features with respect to ingress and egress, and supportive devices for standing and walking practice.

20

SUMMARY OF THE INVENTION

A bed according to the present invention comprises a main frame supporting a convertible patient support arrangement in a raised position. The patient support arrangement is divided into an adjustable upper body portion, a middle seat portion, and an adjustable lower body portion. The adjustable upper body portion is pivotally connected to the main frame adjacent the middle seat portion and is movable between a horizontal position and an angled back rest position. The adjustable lower portion is pivotally connected to the frame adjacent the middle seat portion and is movable between a horizontal position and a downwardly angled position.

The main frame, at the foot of the bed, defines an open "U" which allows good access to the middle portion when the lower body portion is in a downwardly angled position. Its vertical bars provide stable hand-holds to

the person changing position from standing to sitting, and vice-versa. The main frame at the foot of the bed adjacent the open "U", and above the middle seat portion, includes horizontal hand rails. The bed defines a chair like
5 configuration when the adjustable upper body portion is in the angled back rest position and the lower body portion is in the downwardly angled position.

The handrails are positioned in front of the chair
10 configuration and allow the user to support himself by pulling up on the handrails and pushing down on the handrails to partially support the patient's weight during ingress and egress from the chair of configuration. The vertical bars of the open "U" shape at the foot of the bed
15 provide additional hand supports at a higher level. The open "U" shape at the foot of the bed allows the patient to be supported within this "U" with the handrails either side thereof, and allows easy transfer to a wheelchair or walker which can be positioned adjacent the foot of the bed. With
20 this arrangement, the patient can actuate a control to automatically move the bed to the chair position and the patient can exit the bed at the foot thereof.

According to a preferred embodiment, the upper
25 adjustable body portion and the adjustable lower body portion include hydraulic actuators for controlling the position thereof.

According to yet a further aspect of the invention,
30 the middle portion includes a removable central portion, which when moved to a clear position, defines a port through the middle portion. This port forms part of a toilet module having a movable waste container inline and below the port.

35

According to yet a further aspect of the invention, the bed includes an inverted "U" shaped vertical frame connected to the main frame at the foot of the bed and extending above the support arrangement. This inverted "U"

shaped frame allows suspension of hand bars or grasp bars from the inverted "U" shaped frame and provides additional support for the patient moving from a wheelchair or from the standing position to and from the bed.

5

The inverted "U" shaped frame extends sufficiently above the bed such that the patient can easily pass therethrough during egress or ingress to the bed.

10

According to yet a further preferred aspect of the invention, the movement of the bed to the chair configuration automatically causes the movable central portion of the middle portion to move to a clear position and position the waste container below the port.

15

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the invention are shown in the drawings, wherein:

20

Figure 1 is a partial perspective view of the bed with the mattress removed;

Figure 2 is a perspective view similar to Figure 1 with the bed moved to the chair like configuration and showing an overhead rail support structure;

25

Figure 3 is a side view of the bed and various linkages used to adjust the movable portions thereof;

Figure 4 is a side view of the bed moved to the chair configuration;

30

Figure 5 is a partial perspective view showing linkages used to automatically open a port through the bed and reposition of the waste container; and

Figure 6 is a side view showing the linkages for this automatic feature.

35

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The bed as shown in Figure 1 is without a mattress, however, the mattress has sufficient flexibility to fold as

necessary, to accommodate movement of the chair configuration of Figure 2. In addition, the middle portion of the mattress preferably, will have a removable plug to form an aperture through the mattress for use in the toilet
5 mode.

The convertible bed 2 of Figure 1 has a main frame 4 which comprises the side rails 6, the headboard 10, the front legs 10 and the legs 12 provided at the foot of the
10 bed. The raised patient support arrangement 14 includes the adjustable upper body portion 16 which has a pivot axis 17, the adjustable lower portion 18 having a pivot axis 19, and the middle portion 22. The middle portion 22 is fixed, however, it does include a large port 20 centrally located
15 which allows conversion of the bed to the toilet mode.

Figure 2 shows movement of the bed to a chair like configuration with the upper body portion 16 angled upwardly and the lower body portion 18 moved downwardly.
20 These portions in combination with the middle portion 22 define a chair like configuration and the hand rails 24 are provided in front of the chair configuration and provide positive support to allow a patient to pull himself to a standing position within the open "U" shaped end portion 28
25 of the main frame. It can be seen that the foot of the bed is clear, and a user can grip the bars of the open "U" 12 and the hand rails 24, and assume a standing position, and then move to a transfer position adjacent the end of the hand rails. A walker or wheelchair could be provided at
30 this point, allowing the patient to transfer. In the case of a wheelchair, the patient would use the handrails to rotate 180 degrees and then sit in the wheelchair which has been positioned within or adjacent to the free end of the hand rails. This transfers is more easily accomplished due
35 to the hand rails acting as parallel bars either side of the bed and extending outwardly from what has now become the chair like configuration. The handrails are at a suitable height and can be adjustable.

The movement of the upper adjustable portion and the lower adjustable portion is powered by the actuators shown in Figures 3 and 4. These could be hydraulic
5 cylinders or electric actuators. Linkages could be provided to allow a single actuator to control both portions. A suitable control terminal can be provided. Thus, a patient who has difficulty in standing and/or assuming a sitting position, or rotating all of which acts are required for
10 egress or ingress to a conventional bed, is assisted by the present structure as the bed is moved to the chair configuration. The extended handrails can function as "mini-parallel bars" to allow the user to practice balance and walking exercises.

15

Figure 2 shows the vertical inverted "U" shaped support structure 25 supporting one end of the horizontal rail 27, extending the length of the bed. The height of the inverted "U" shaped support structure easily allows the
20 patient to pass therethrough.

A further feature of the bed is shown in the side view of Figure 4 where an adjustable foot platform 30 is shown attached at either side of the movable lower body
25 portion 18. A series of ports are provided in the side rails of the lower body portion and the foot rest can be appropriately positioned according to the height of the patient. The platform 30 extends across the width of the bed and the patient can stand on this platform to move to a
30 standing position. The vertical bars of the "U" and the handrails afford additional stability. Once this standing position has been attained, the patient can step off the platform 30 onto the horizontal surface. When returning to the bed from the standing position, the above procedures
35 are reversed.

The side view of Figure 3 illustrates the adjustable link 50 used to control the position of the

lower body portion 18 and the adjustable actuator 52 used to control the position of the upper body portion. The various positions of these links are shown in Figure 3 and Figure 4.

5

Figure 5 illustrates how movement of the lower body portion 18 to the position of Figure 6 or the chair configuration of Figure 4 causes the waste container 70 to pivot from a clear position shown in dotted lines in Figure 10 5 to an aligned position beneath the aperture 30. A plug member 80 has been removed from the centre port 20 due to movement of the upper body portions 16. The actuators 50 and 52 are coordinated such that they move together. With this arrangement, the bed is converted to the toilet mode 15 automatically with movement of the bed to the chair configuration of Figure 2. The plug member 80 includes a portion of the mattress which will also move and be fixed on this member.

20

One feature of the invention is the movement of the waste container to a side portion of the bed as indicated in Figure 5. Thus, when the bed returns to the horizontal configuration of Figure 1, the waste container is moved to be easily accessible adjacent one side of the bed. This 25 allows for convenient removal of the container.

The linkages used to control the toilet mode application can be deactivated by the user. In this way, the toilet mode function is only used when selected by the 30 user. A solenoid controlled lock pin could control the engagement or release of the linkage.

Although various preferred embodiments of the present invention have been described herein in detail, it 35 will be appreciated by those skilled in the art, that variations may be made thereto without departing from the spirit of the invention or the scope of the appended claims.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A bed comprising a main frame supporting a convertible patient support arrangement at a raised position; said patient support arrangement being divided into an adjustable upper body portion, middle seat portion and an adjustable lower body portion; said adjustable upper body portion being pivotally connected to said main frame adjacent said middle seat portion and movable between a horizontal position and an angled backrest position, said adjustable lower body portion being pivotally connected to said frame adjacent said middle seat portion and movable between a horizontal position and a downwardly angled position; said main frame defining an open 'U' at a foot of the bed allowing free access to said patient support arrangement with said lower body portion in a downwardly angled position, said main frame at the foot of the bed and on opposite sides thereof and above said middle seat portion including horizontal handrails; said bed defining a chair like configuration with said adjustable upper body portion in said angled backrest position and said lower body portion in said downwardly angled position, with said bars of the "U" and said handrails in front of said chair configuration, allowing a convenient ingress and egress from said chair configuration.

2. A bed as claimed in claim 1 wherein said upper adjustable upper body portion and said lower body portion include power actuators for controlling the position thereof.

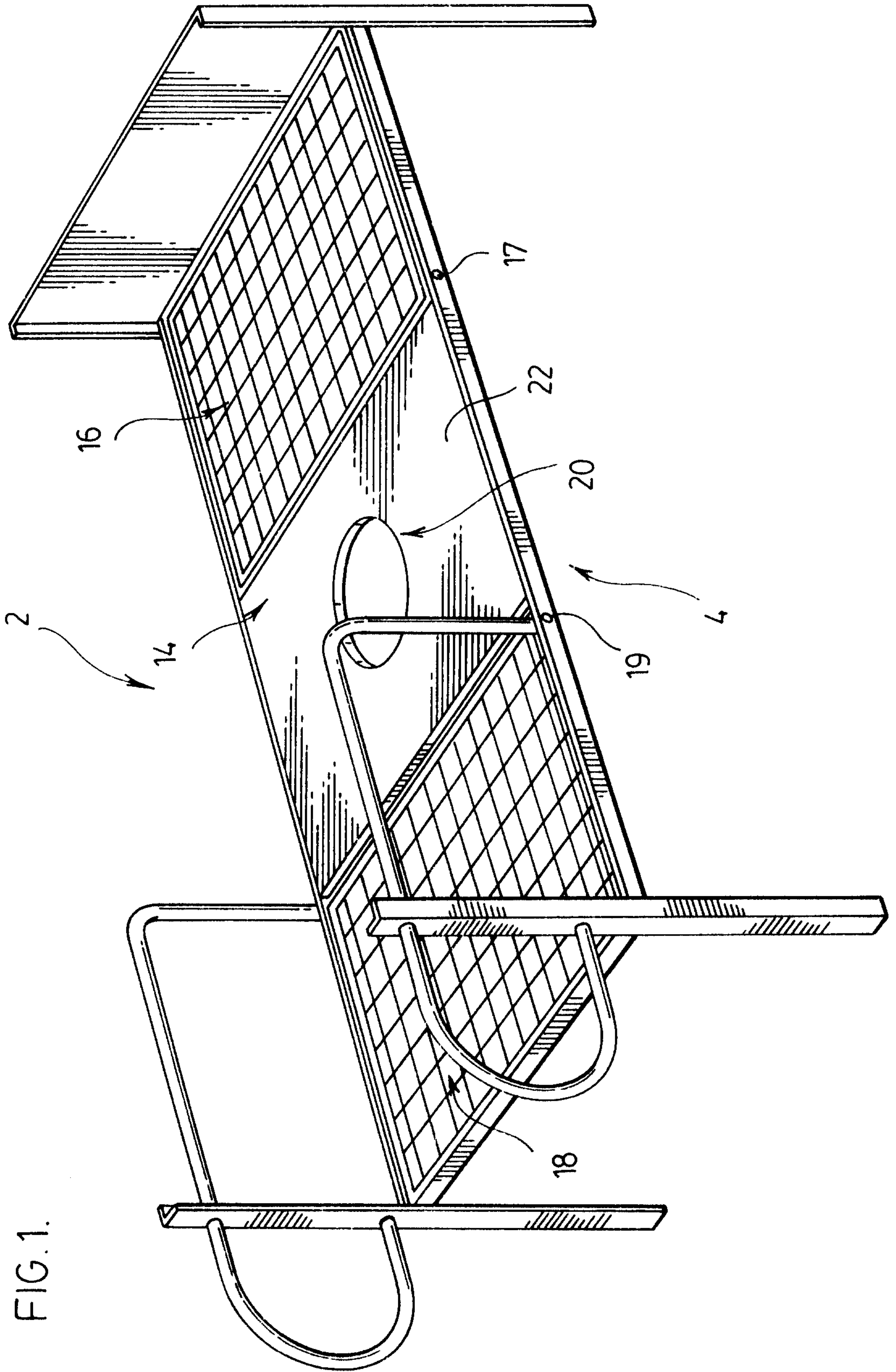
3. A bed as claimed in claim 2 wherein said middle portion includes a movable central portion which when moved to a clear position defines a gap through said middle portion defining a toilet module with a movable waste container positioned in line and below said toilet module.

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4. A bed as claimed in claim 2 including an inverted "U" shaped frame connected to said main frame at the foot of the bed, an overhead rod for attaching support and exercise accessories.

5. A bed as claimed in claim 4 wherein said inverted "U" shaped frame is sized to allow a patient to easily pass therethrough using the vertical bars for balance support during egress or ingress to said chair configuration.

6. A bed as claimed in claim 5 including an overhead rail supported at a head of the bed by a vertical member connected to said main frame and support by said inverted "U" shaped frame at the foot of the bed, said overhead rail being centered above said patient support.



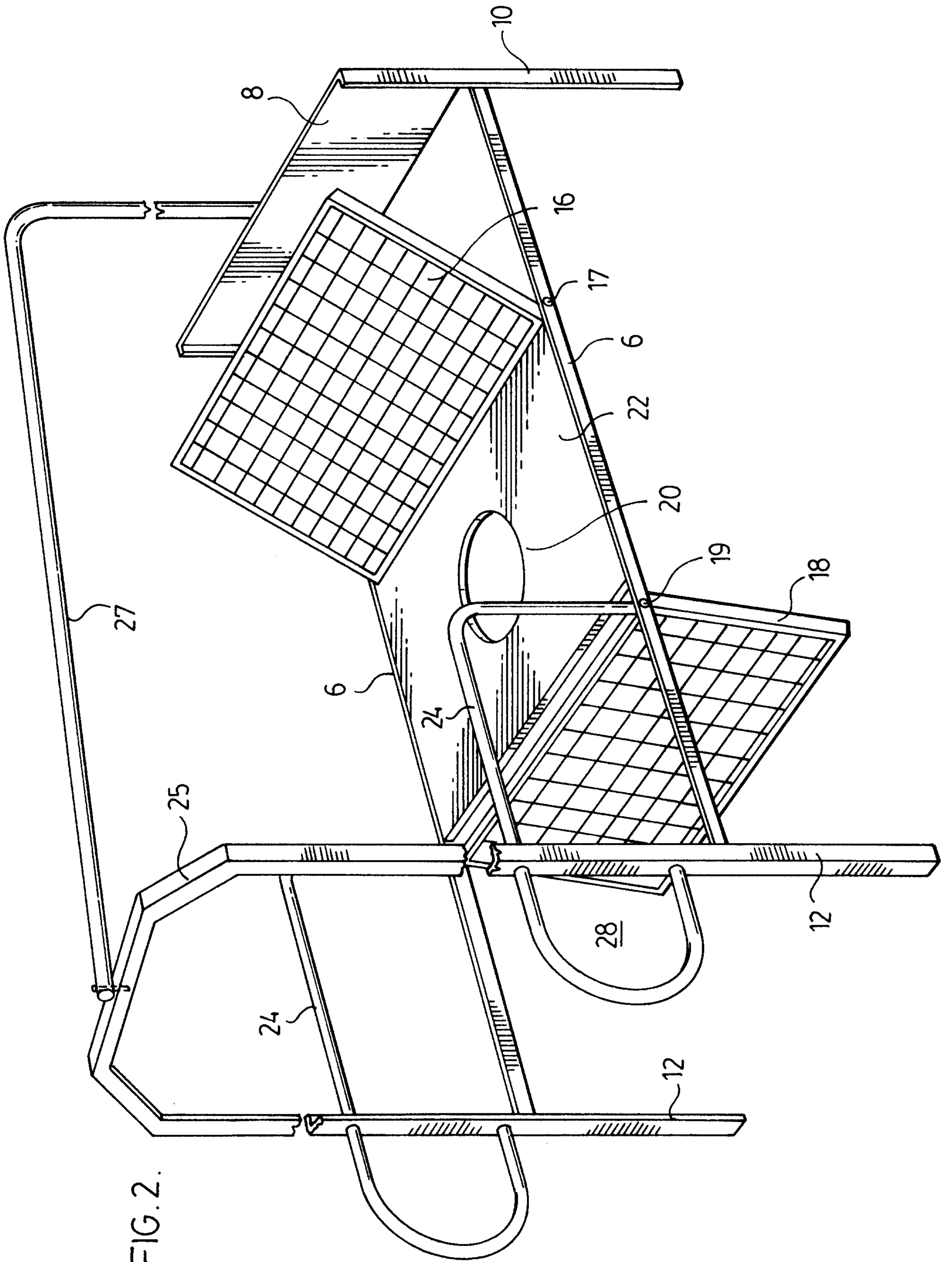


FIG. 2.

FIG. 3.

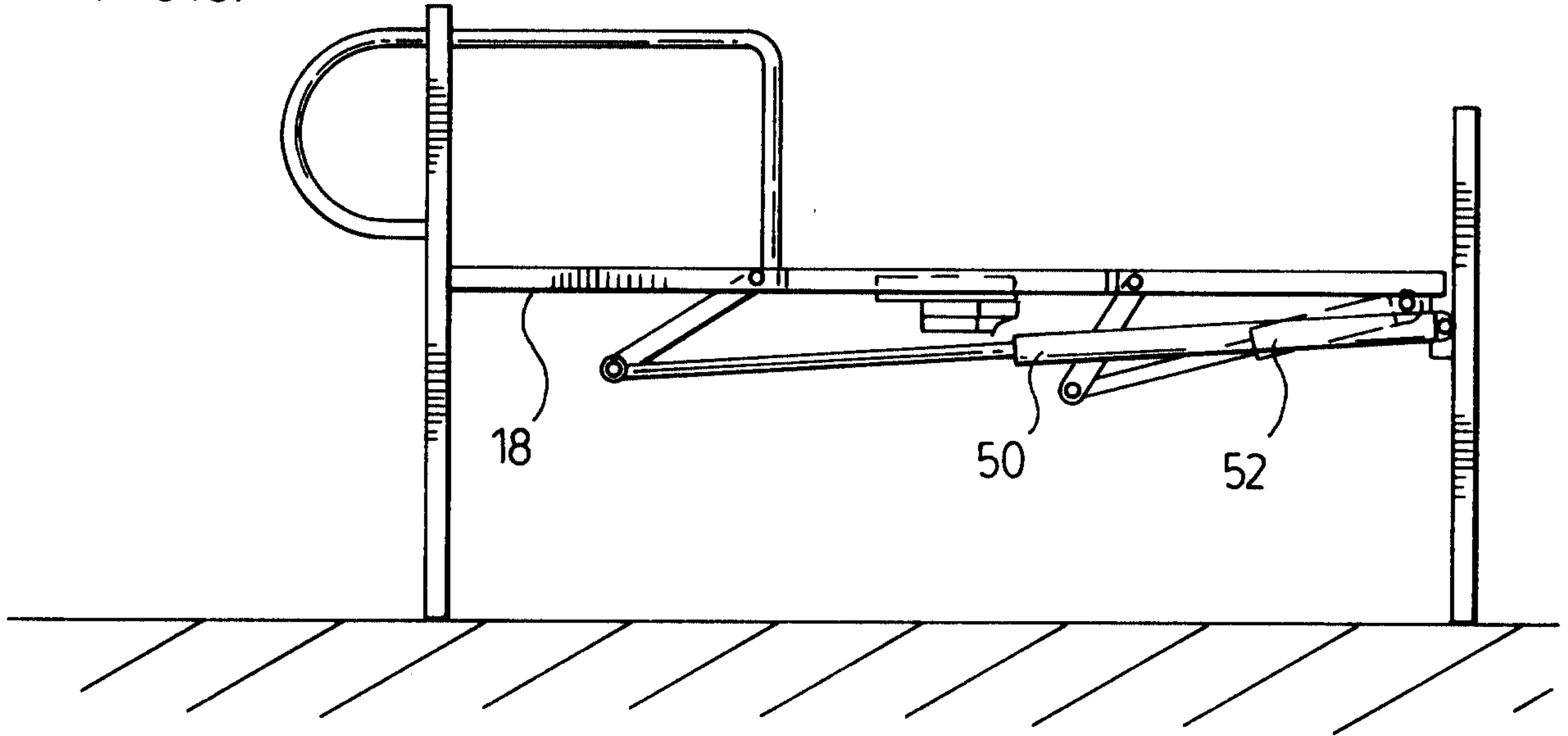


FIG. 4.

