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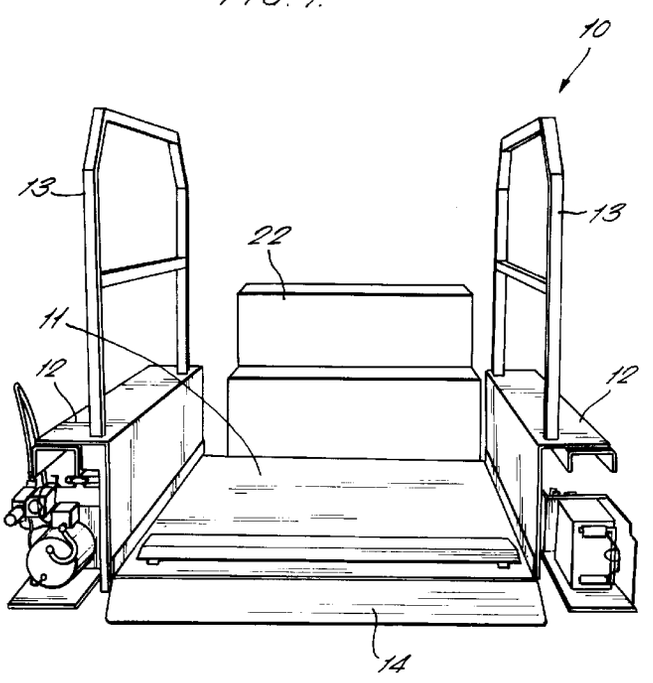
(54) Platform lift

(57) The invention relates to improvements in platform lifts which can be used to raise a load, such as a handicapped person in a wheelchair, to a higher level.

The invention therefore provides a platform lift comprising a base, a substantially horizontal platform, said platform being located above and attached to said base by means of an operating mechanism comprising a radial linkage and associated drive means, which platform is movable from a first position to a second position in a substantially arcuate path by means of said operating mechanism, the first and second positions being vertically separated characterised in that the platform extends forwardly from the base as it is raised from the first to the second position and further in that the platform provides a through path for both vehicles and pedestrians.

FIG. 1.



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Description

The invention relates to improvements in platform lifts which can be used to raise a load, such as a handicapped person in a wheelchair, to a higher level.

For handicapped persons of limited mobility or those confined to wheelchairs, it is particularly difficult to climb steps or to be carried up steps. In some cases it is possible to install a lift at a site separate from the steps, but in other cases this may not be convenient or possible. In such cases, the lift must be readily available for use by the disabled person, but in its stowed position the lift must not obstruct normal use of the steps.

A number of lifts have been devised which lift passengers or loads through changes in level to avoid the need to mount steps. These generally comprise low rise vertical lifting platforms. The main problem with such lifts is the need to bridge the horizontal gap between the edges of the platform and the top step. This can be done with a hinged bridge plate, but such a plate tends to obstruct normal use of the steps. Alternatively, a series of lifting bridge plates can be installed, with one on each step. The plates are picked up by the platform as it rises. These lifts have the disadvantage that they have to be specially made and installed for each application, which tends to expensive.

Another alternative solution is the use of a lift mounted on rails fixed to a support structure at the side of the staircase. Such lifts have a platform which can be pivoted to an upright position and parked vertically at the top or bottom of the stairs awaiting use. For use, the platform is pivoted to a horizontal position. However, this arrangement tends to be expensive and requires too much space to operate. For just a few steps such an arrangement is impractical.

It is therefore an object of the present invention to provide a platform lift which overcomes these disadvantages.

According to the invention there is provided a platform lift comprising a base, a substantially horizontal platform, said platform providing a through path for both vehicles and pedestrians, said platform being located above and attached to said base by means of an operating mechanism comprising a radial linkage and associated drive means, which platform is movable from a first position to a second position in a substantially arcuate path by means of said operating mechanism, the first and second positions being vertically separated and the platform extending forwardly from the base as it is raised from the first to the second position.

Preferably the radial linkage comprises at least one deformable parallelogram comprising a base, a pair of side arms each of which is pivotally connected at one end to the base and at another end to a fourth arm attached to the platform, in which drive means comprise extensible actuator means which are pivotally connected at one end to a moveable part of the lift and at another end to a fixed point, such that as the actuator means extends or contracts the parallelogram is caused to deform to raise or lower the platform.

There will now be described, by way of example only, a preferred embodiment of the invention, with reference to the accompanying drawings in which:-

Fig. 1 is a front perspective view of a platform lift in its lowered position;

Fig. 2 is a side elevation of the platform lift of Figure 1;

Fig. 3 is a side elevation of the platform lift of Fig. 1 in a partially raised position; and

Fig. 4 is a side elevation of the platform lift of Fig. 1 in a fully raised position.

The lift 10 is located adjacent a step or set of steps 22. The lift 10 comprises a platform 11 which is sufficiently wide to receive a wheelchair or any other load to be raised. The platform 11 may have side walls 12 to guide the wheelchair into position and hand rails 13 for the wheelchair or other user to hold on to during the lifting operation.

The side walls 12 may also act as load supporting shear panels.

The lift 10 is provided with a ramp 14 attached to the platform 11 on an opposite side of the platform 11 to the steps 22 to enable a smooth entry and exit from the platform 11 at ground level.

The lift 10 is mounted on a base 15. The base 15 is affixed to the ground adjacent the steps 22. The platform 11 is attached to the base 15 by means of at least one deformable parallelogram arrangement. The parallelogram comprises a lower arm 18 which is affixed to or forms part of the base 15 and a pair of pivoting side arms 19 attached at one of their ends to the lower arm 18 and at their other ends to the platform 11. A section of the platform 11 itself may constitute the fourth arm of the parallelogram or a separate arm may be attached to the platform 11. The connections between the arms 18, 19 and the platform 11 is pivotal. In a preferred embodiment of the invention a parallelogram is provided on opposite sides of the platform.

Connected between the base 15 and one of the side arms 19 is an extendible hydraulic actuator 20. Actuators 20 may be provided on just one or both sides of the platform 11. Power means are provided which cause the actuator 20 to extend and contract.

The term actuators is intended to cover hydraulic jacks, electric actuators or any other powered means capable of extending and contracting.

A synchronising link may be provided between one or both pairs of side arms of the parallelogram.

When the lift 10 is in its lowered position, the actuator 20 is contracted and the parallelogram is in a flattened or obtuse angled state. The platform 11 is thus

positioned at ground level. A wheelchair user can roll himself up the ramp 14 onto the platform 11 or any other type of load placed on the platform 11. The power means are operable either by the lift user which actuates the actuator 20 so that it extends. As it extends, it pushes the side arm 19 to which it is attached from a substantially horizontal position through approximately 90° to a substantially vertical position as shown in Figure 4. The parallelogram moves from its obtuse angled state to a generally right angled state, without the need for the side arms 19 to pass the vertical position. The platform 11 thus swings in a continuous arc from its ground level position at the foot of the steps 22 to a raised position adjacent the top of the steps 22 so that the wheelchair user or load can roll or be rolled/lifted off the platform 11 onto the top of the steps 22.

To lower a wheelchair user or load, entry is effected onto the platform 11 from the top of the steps 22. The power means are actuated which cause the hydraulic actuator 20 to contract. The parallelogram is pulled sideways into an obtuse or flattened state and the platform 11 is lowered. The wheelchair user or load can roll or be rolled/lifted off the platform 11 at ground level.

Although the actuator 20 is described as being attached between a side arm of the parallelogram and the base plate 15, it may be attached at any other points such that the parallelogram can be caused to deform in the required manner e.g. to the base plate and the platform, to a side arm and a step etc. As the side arms do not need to pass through the vertical position, the use of a single acting hydraulic actuator means that the lift can be lowered, under gravity in the case of power failure.

The platform 11 may be attached to the side arms 1a by means of fixed or removable pins or other suitable fixing means. The fourth arm or sides of the platform 11 maybe provided with a series of vertical holes so that the side arms 19 may be attached with removable fixings or spigots located on the side arms at different vertical positions. This means that the platform 11 height may be varied to suit different applications without having to change the stroke of the actuator.

Claims

1. A platform lift (10) comprising a base (15), a substantially horizontal platform (11), said platform being located above and attached to said base by means of an operating mechanism comprising a radial linkage (18, 19) and associated drive means (20), which platform is movable from a first position to a second position in a substantially arcuate path by means of said operating mechanism, the first and second positions being vertically separated characterised in that the platform extends forwardly from the base as it is raised from the first to the second position and further in that the platform provides a through path for both vehicles and pedestrians.

2. A platform lift (10) as claimed in claim 1 in which the radial linkage (18, 19) comprises at least one deformable parallelogram comprising the base (15), a pair of side arms (19) each of which is pivotally connected at one end to the base (15) and at another end to a fourth arm attached to the platform, and in which the drive means (20) comprise extensible actuator means which are pivotally connected at one end to a moveable part of the lift and at another end to a fixed point, such that as the actuator means extends or contracts the parallelogram is caused to deform to raise or lower the platform.

3. A platform lift (10) as claimed in claim 2 in which the fourth arm is formed by a section of the platform (11).

4. A platform lift (10) as claimed in claim 2 in which deformable parallelograms are provided on opposite sides of the platform (11).

5. A platform lift (10) as claimed in claim 2 in which the fixed point is located on the parallelogram base, an extension of the parallelogram base, a base (15) on which the lift is mounted, the ground or a step.

6. A platform lift (10) as claimed in any one of claims 2 to 5 in which the moveable part may comprise a side arm (19) or the platform (11).

7. A platform lift (10) as claimed in any one of the preceding claims in which the drive means (20) comprises a hydraulic jack or electronic actuator.

8. A platform lift (10) as claimed in any of the preceding claims further comprising side guards (12) provided on one or both sides of the platform (11) acting as load supporting shear panels and/or guide rails.

9. A platform lift (10) as claimed in any one of the preceding claims further comprising hand rails (13) on one or both sides of the platform (11).

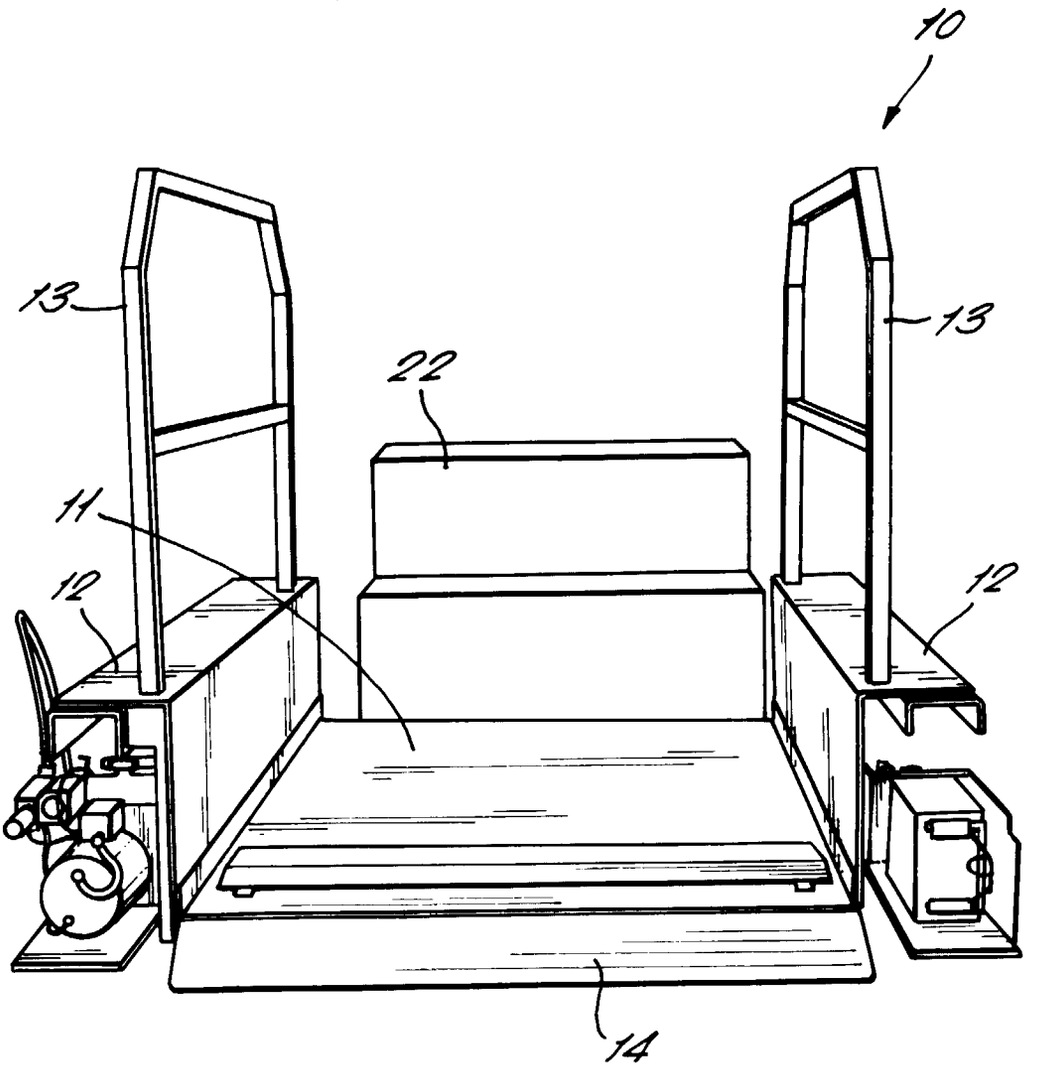
10. A platform lift (10) as claimed in any one of claims 2 to 9 in which a synchronising link is provided between one or both pairs of side arms (19).

11. A platform lift (10) as claimed in any one of claims 2 to 10 in which one or more of a series of vertical holes are provided in the fourth arm for attachment of the platform (11) to the side arms (19) at various heights by means of fixed or removable fixing means.

12. A platform lift (10) as claimed in any one of claims 2 to 11 in which the side arms (19) do not pass

through the vertical position.

FIG. 1.



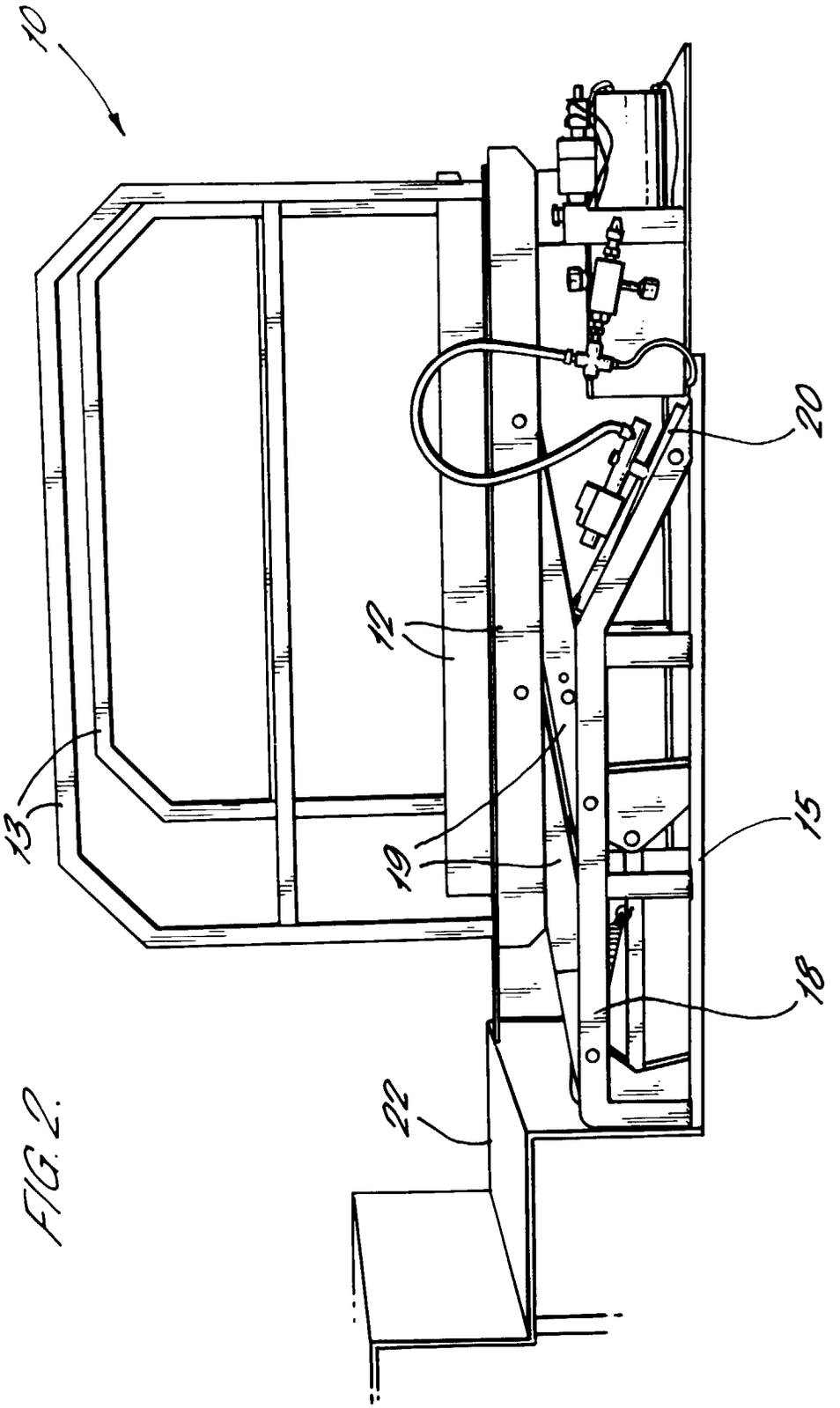


FIG. 2.

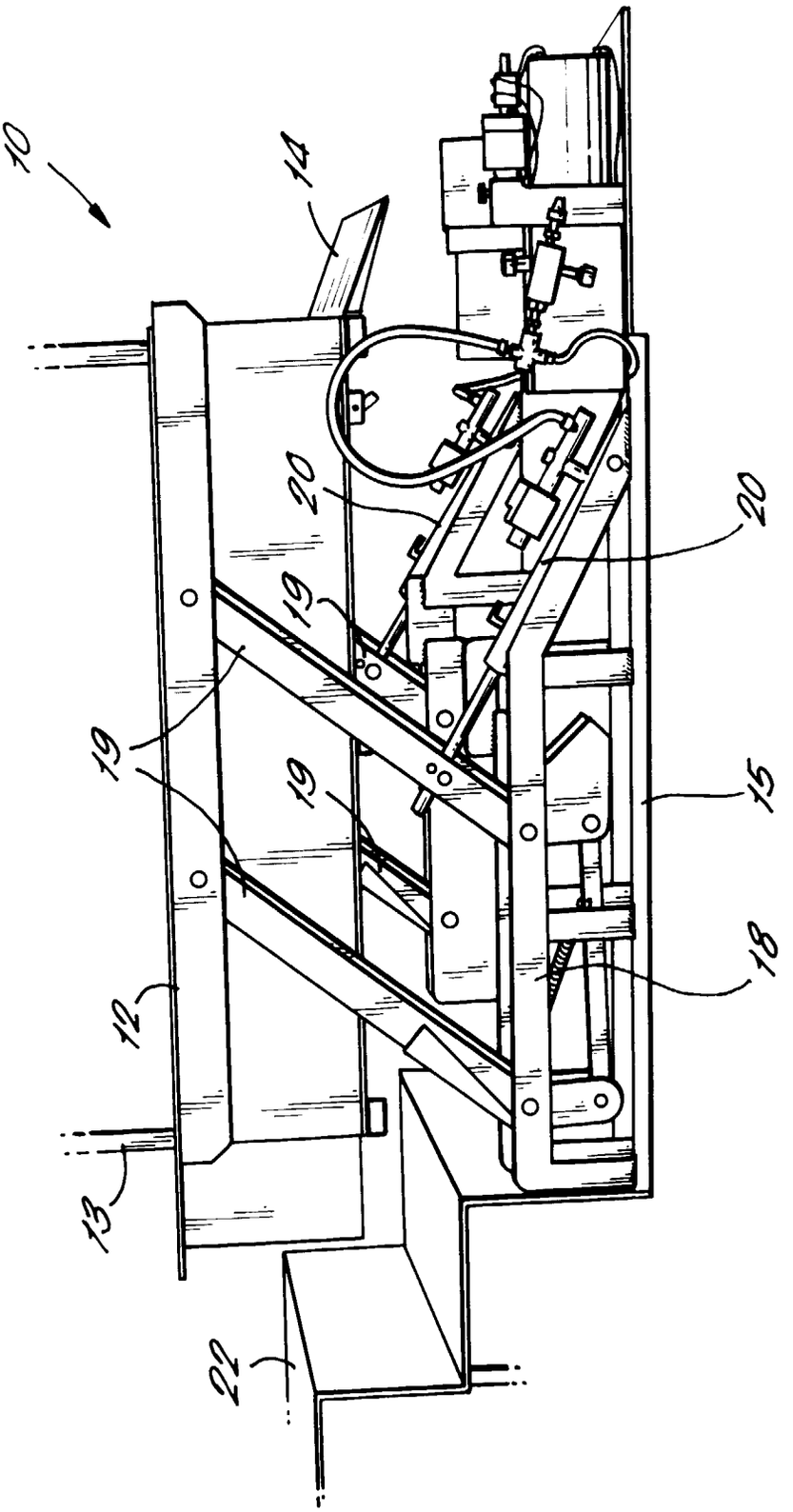


FIG. 3.

FIG. 4.