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(54) An invalid hoist

(57) An invalid hoist comprises a mobile chassis 10, a mast 12 upstanding from the chassis, a lifting arm 13 pivotally connected to the upper end of the mast, the lifting arm having a sling hanger 15 or at least one sling attachment point at or adjacent to one end thereof, and a power operated extendible/retractable actuator 16 between the lifting arm and the lower part of the mast. The lifting arm is pivotally connected to the upper end of the mast at a position intermediate its ends and the actuator is connected to the lifting arm on the side of the pivotable connection between the lifting arm remote from said one end of the lifting arm.

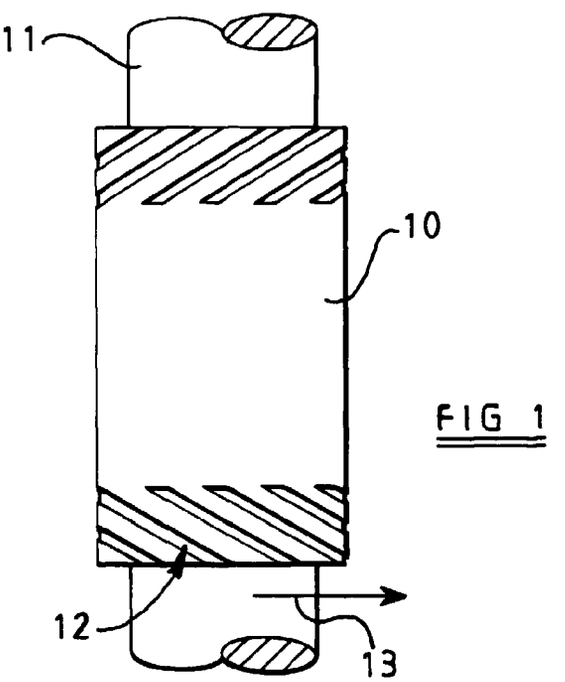


FIG 1

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Description

This invention relates to an invalid hoist.

According to the invention there is provided an invalid hoist comprising a mobile chassis, a mast upstanding from the chassis, a lifting arm pivotably connected to the upper end of the mast, the lifting arm having a sling hanger or at least one sling attachment point at or adjacent to one end thereof, and a power operated extendible/retractable actuator between the lifting arm and a lower part of the mast, the lifting arm being pivotably connected to the upper end of the mast at a position intermediate its ends and the actuator being connected to the lifting arm on the side of the pivotable connection between the lifting arm and the mast remote from said one end of the lifting arm.

When this hoist is in operation to raise or lower a patient, the weight of the patient places the actuator under tension as compared with known invalid hoists in which the weight of the patient places the actuator under compression.

Preferably, a link is pivotably connected between one end of the actuator and either the lifting arm or the mast so that if the lifting arm meets with an obstruction during a lowering operation, the actuator and link will pivot relative to one another so that the actuator can continue to extend without applying a force to the lifting arm to urge the latter against the obstruction.

Preferably, means are provided to de-energise the actuator in response to a lack of tension applied to the actuator which will occur should the lifting arm meet with an obstruction during a lowering operation. In this case, the actuator can be connected to the mast for limited movement relative thereto between a first position which it occupies when under tension and a second position which is lower than the first position and which it occupies when not under tension and the means could be in the form of a microswitch operable to de-energise the actuator when the actuator moves to said second position.

The invention will now be more particularly described, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 is a side view of one embodiment of an invalid hoist according to the present invention,

Figure 2 is a fragmentary side view showing the connection between the actuator and the lifting arm on an enlarged scale,

Figure 3 is a fragmentary side view showing the connection between the actuator and the mast in one condition, and

Figure 4 is a fragmentary side view showing the connection between the actuator and the mast in another condition.

Referring now to the drawings, the invalid hoist shown therein has a mobile chassis 10 provided with castors 11, a fixed length mast 12 upstanding from the chassis 10 and a lifting arm 13 pivotably connected intermediate its ends to the upper end of the mast 12 about a pivot shaft 14.

A sling hanger 15 is connected to one end of the lifting arm 13 and a motor driven extendible/retractable actuator 16 is connected between the other end of the lifting arm 13 and a bracket 17 secured to a lower end portion of the mast 12. The sling hanger has a plurality of sling attachment points (not shown) for supporting a full body sling in known manner (see, for example, GB2184706). The actuator 16 is powered by a rechargeable battery 18.

The length of the lifting arm 13 between the sling hanger 15 and the mast 12 is greater than the length of the lifting arm between the mast 12 and the actuator 16.

A link 18 is connected between the upper end of the actuator 16 and a lug 19 fixed to said other end of the lifting arm 13. One end of the link 18 is pivotably connected to the upper end of the actuator 16 and the other end of the link 18 is pivotably connected to the lug 19. If the lifting arm 13 meets with an obstruction during a patient lowering operation, the link 18 and actuator 16 will pivot relative to one another, as shown in Figure 2, so that the actuator 16 can continue to extend without applying a force to the lifting arm to urge the latter against the obstruction.

As shown in Figures 3 and 4, the actuator 16 is pivotably connected to the bracket 17 by a pivot pin 20. The pivot pin 20 is fixed relative to the bracket 17 and extends through an elongate slot 21 formed in the lower end of the actuator 16. The actuator 16 is thus connected to the bracket 17 for limited upwards and downwards movement determined by the length of the slot 21 and the diameter of the pivot pin 20. A sensor, typically in the form of a microswitch 22, senses when the actuator 16 is in a lowermost position and de-energises the actuator 16.

The leverage applied by the lifting arm 13 (particularly when the sling hanger 15 supports a patient in a sling) will normally place the actuator 16 under tension and, in this condition, the actuator 16 will adopt in its uppermost position relative to the bracket 17, as shown in Figure 3. However, if the lifting arm 13 meets with an obstruction during a patient lowering operation, the actuator 16 will move to its lowermost position relative to the bracket 17, as shown in Figure 4. The actuator 16 will trip the microswitch 22 and de-energise the actuator.

A handle 23 is connected to an upper part of a mast so that a helper can move the hoist along the ground.

The invalid hoist described above is designed to lift a patient in a full body support sling. It could, however, be modified to serve as a standing aid for raising a patient from a seated to a standing position. In this case, the said one end of the lifting arm can be forked to

provide two laterally spaced sling attachment points for attaching a sling which passes around the back of a patient and below the patient's armpits. The chassis is provided with a footrest and a knee abutment is provided on the mast.

The motor driven actuator 16 could be replaced by a fluid pressure operated actuator. Also, instead of being rigid, the link 18 could be flexible.

Claims

1. An invalid hoist comprising a mobile chassis (10), a mast (12) upstanding from the chassis, a lifting arm (13) pivotably connected to the upper end of the mast, the lifting arm having a sling hanger (15) or at least one sling attachment point at or adjacent to one end thereof, and a power operated extendible/retractable actuator (16) between the lifting arm (13) and a lower part of the mast (12), the lifting arm (13) being pivotably connected to the upper end of the mast (12) at a position (14) intermediate its ends and the actuator (16) being connected to the lifting arm (13) on the side of the pivotable connection between the lifting arm and the mast remote from said one end of the lifting arm.

2. An invalid hoist as claimed in claim 1, wherein a link (18) is pivotably connected between one end of the actuator (16) and either the lifting arm (13) or the mast (12) so that if the lifting arm (13) meets with an obstruction during a lowering operation, the actuator (16) and link (18) will pivot relative to one another so that the actuator (16) can continue to extend without applying a force to the lifting arm (13) to urge the latter against the obstruction.

3. An invalid hoist as claimed in claim 1 or claim 2, wherein means (22) are provided to de-energise the actuator (16) in response to a lack of tension applied to the actuator(16).

4. An invalid hoist as claimed in claim 3, wherein the actuator (16) is connected to the mast (12) for limited movement relative thereto between a first position which it occupies when under tension and a second position which is lower than the first position and which it occupies when not under tension.

5. An invalid hoist as claimed in claim 4, wherein the said de-energising means is in the form of a microswitch (22) operable to de-energise the actuator (16) when the actuator moves to said second position.

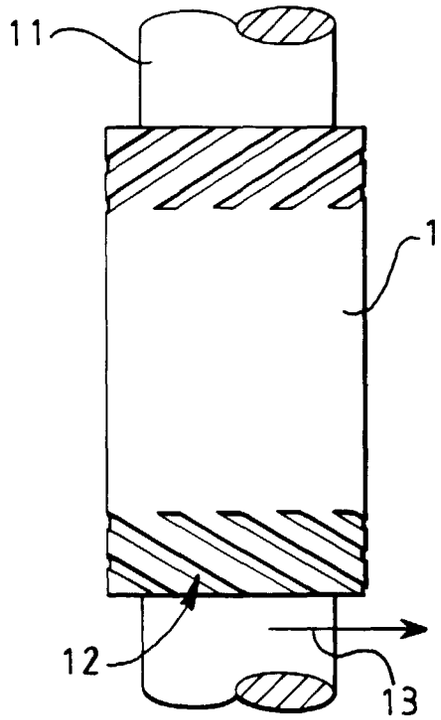

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FIG 1

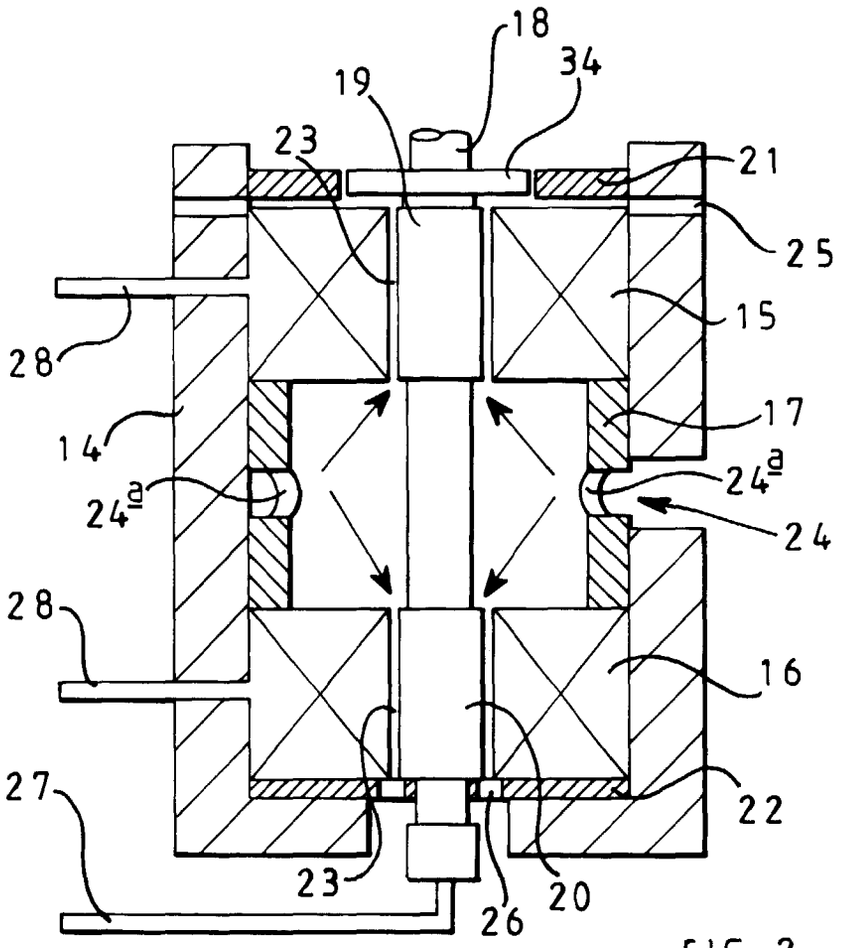

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FIG 2

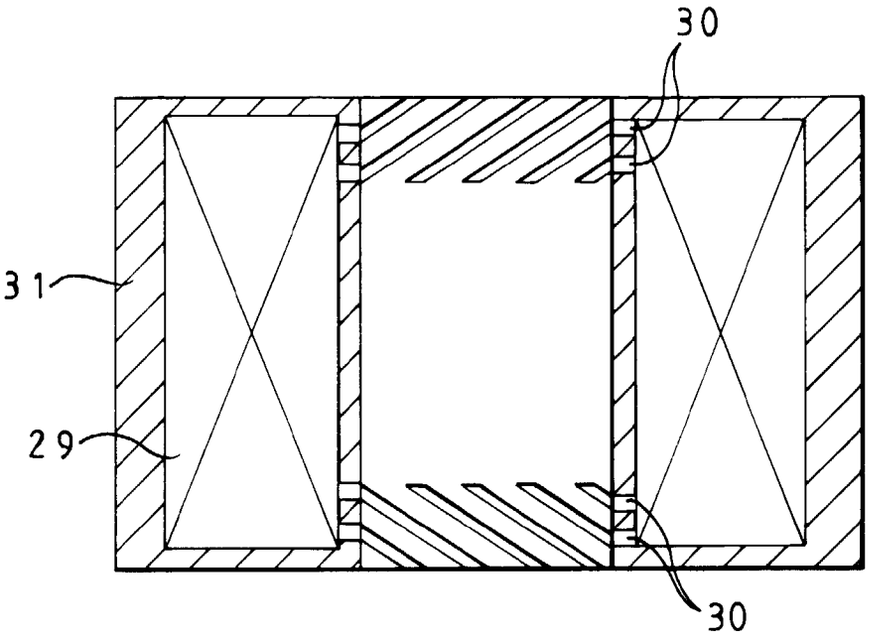


FIG 3

FIG 4

