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(54) **MINIHOIST**

MINIHEBEZEUG

MINI-MONTE-CHARGE

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US-A- 2 535 221 **US-A- 4 026 387**
US-A- 4 457 402 **US-A- 5 461 736**

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Description

Background of the technology

[0001] The invention relates to construction technology and concerns a minihoist.

[0002] Apartments often have thresholds or differences in levels which make moving more difficult from one room to another. Such hindrances can make it very difficult or even impossible for old or disabled people to move.

[0003] Usually, different ramps have been provided to make the crossing of thresholds easier. The ramp must not be too steep (according to recommendations, the inclination may be 5 % at the most); therefore, it must be made fairly long. However, then it is difficult to accommodate it in the available space. It is also often necessary to move large ramps to provide space for other purposes. It is obvious that those who need the ramps are not able to move them. When wet, the ramps can also be dangerously slippery.

[0004] Various hoists are known which are installed on a floor and used to move a wheel chair from one level to another, for example. In the known hoists, the distance of the jack plane from the floor in its lower position is fairly high. Publication GB 2 136 396, for example, discloses a hoist of this type.

[0005] US 2 535 221 discloses a lift comprising a hydraulic cylinder attached to a special kind of an articulated jack. The jack is used for moving a platform between a lower and an upper level. The structure is quite complicated and requires a relatively big room below the floor plane.

[0006] US 5 461 736 discloses a portable step stool for handicapped patients. The stool comprises an upper base which can be raised by means of a manually operated hydraulic jack. The stool is provided with wheels for moving the stool on the floor.

Description of the invention

[0007] A minihoist according to Claim 1 has now been invented. Preferred embodiments of the invention are described in the other claims.

[0008] The invention comprises a hoisting device which is flush with the floor, and a lift plane which is moved by the hoisting device. The lift plane can be lowered as low as possible in its lower position, so the ramp to the plane can be as short possible, or sometimes no ramp is even needed. The distance of the lift plane from the floor in its lower position is preferably about 2 cm at the most.

[0009] The hoist can be hydraulically or electrically driven, for example. One advantage of a hydraulic hoist is that the portion which is flush with the floor is generally relatively small. The hydraulic hoist can also easily be made suitable for outdoor use.

[0010] Another object of the invention is a handle at-

tached to a wall which can be used as a support by a person who is moved by the hoist.

[0011] In the following, some preferred applications of the invention are presented by way of example. In the drawings of the description:

Fig. 1 shows a minihoist according to the invention in its upper position, installed in front of a door,
 Fig. 2 shows the hoist in its lower position,
 Fig. 3 is a sectional side view of the hoist, and
 Fig. 4 is a side view of another hoist.

[0012] The minihoist according to the figures comprises lift member 1 placed in front of a threshold on a floor. Lift member 1 comprises vertical hydraulic cylinder 1a and piston 1b. Piston 1b comprises upper arm 1c. Cylinder 1a is submerged in the floor so that only its upper end is above the floor level. The upper end of cylinder 1a is provided with a flange-like fastening part 2 by which the cylinder is attached to the floor. In addition, channels required by hydraulic and control cables are made in the floor. The hydraulic machinery is placed in a suitable location, apart from the hoist. The same machinery can be used to drive several hoists. Control of the hoist can be implemented, for example, pneumatically or by low-voltage electricity. If the hoist is used outdoors, for example, on a balcony; naturally, a proper cold resistant hydraulic oil is used.

[0013] Hydraulic cylinder 1a according to Fig. 3 comprises one piston 1b. Cylinder 1a according to Fig. 4 comprises two nested telescopic pistons 1b, of which the innermost one can be lifted above the outer piston. The solution according to Fig. 4 provides higher lift height by cylinder 1a of the same length.

[0014] Supporting part 3 is attached to the upper end of the innermost piston rod 1c. The upper surface of supporting part 3 is provided with lift plane 4. The front edge of supporting part 3 comprises ramp 5 which is attached to the supporting part to be pivoted on hinge 6 in the vertical direction.

[0015] The sides of supporting part 3 comprise side shields 7 attached to the floor.

[0016] Supporting handle 8 is attached to a wall at a suitable height on the side of the opening edge of door 9. Handle 8 protrudes vertically from the wall. Handle 8 comprises a ring attached to the wall and a rod extending straight down from its lowermost point, the lower end of the rod being bent against the wall. A person can grip the handle firmly with either hand. When desired, one can also push his or her arm through the ring. The hoist is particularly intended to be used so that the person places him or herself on it sideways. In this case, it is as easy as possible to get support from the handle and move through the door.

[0017] Lift plane 4 comprises operating switches 10 of the hoist which are operated by foot. When one of the switches is pressed, the lift plane ascends and when the other one is pressed, it descends. The switches are

placed side by side on the edge on the side of supporting handle 8 of lift plane 4. In this way, the user naturally finds the best possible position on the lift plane.

[0018] Supporting member 3 is as low as possible. Therefore, the distance of lift plane 4 from the floor is preferably about 2 cm at the most in its lower position. In this case, the length of ramp 5 is about 16 cm, for example. A suitable length for hoisting a standing person and a suitable length of lift plane 4 (perpendicular to the wall) is, for example, about 30 to 35 cm. The length of a plane suitable for hoisting a wheelchair, for example, is 70 to 100 cm. It is easy to move onto low lift plane 4 which is in its lower position, and away from it. Low-gradient ramp 5 makes moving even easier. Operating switches 10 can be used to cause lift member 1 to move the lift plane to the desired direction in the vertical direction. In this way, ascending from the floor to the level of the threshold and, correspondingly, descending back can be carried out. The sufficient maximum lift height in normal apartments is generally about 20 cm which can be accomplished by the above-described telescopic, hydraulic cylinder which is flush with the floor. A lift height of about 10 to 15 cm is easily achieved by a simple cylinder.

[0019] When needed, there can be several cylinders, particularly for firmness when larger lift planes are used.

[0020] The operating switches can be placed at a suitable height on the wall when desired.

[0021] Side shields 7 and ramp 5 prevent items from going under supporting plate 3. However, when the supporting plate is up, the bottom of the plate can be cleaned from the front.

[0022] The edges of side shields 7 are rounded so that they do not hurt the user if he or she falls. The location of hinges between lift plane 4 and ramp 5 and the gaps between side shields 7 and the lift plane and the ramp are constructed so that fingers or toes cannot get caught between them and that they will not pinch the skin. A suitable distance of side shields 7 from lift plane 4 and ramp 5 is about 5 mm. The gap between lift plane 4 and ramp 5 is covered by the back part of the hinge.

[0023] The minihoist makes it possible for disabled persons to safely move from one plane to another. During the transfer, the person can hold handle 8. The hoist is small in size and it can be accommodated easily in the rooms of normal apartments. Because of its small size, the hoist hardly disturbs other activities.

[0024] When moving by a vehicle, such as a rollator or a wheelchair, the vehicle can be left on lift plane 4 and the user can move forward with the aid of rails 10 and other supports that are properly installed. In this way, it is not necessary to take the vehicle to a wash-room where there often is very little room to move. In this case, the wash-room must be provided with suitable supports which make it possible for the person to move.

[0025] One special use of the minihoist is the fronts of the doors of wash-rooms built of prefabricated structures. Typically in apartments there is a step of about 80

to 140 mm at the door of such a wash-room. Other objects include balconies, porches, and the fairly small differences in levels typical for detached houses built on a slope.

[0026] Lift plane 4 and ramp 5 can be coated with suitable material which prevents slipping.

[0027] The materials and colours of the hoist and the handle can be selected according to the interior decoration.

[0028] The structure of the hoist is fairly simple and it is easy to put in place.

[0029] By using the hoists, apartments can be rendered practical for disabled persons without making large reparations. No permits from the authorities are needed. When the hoist is no longer needed in the apartment, it is easy to remove the hoist and restore the location. The removed hoist can be located in another apartment.

Claims

1. A minihoist installed in a floor of an apartment intended to facilitate the movement of a person from a lower floor level to a higher level and back, wherein the hoist comprises a lift plane (4) and a hydraulically driven hoisting device (1) comprising a hydraulic cylinder (1a), which hoisting device is at least partly flush with the lower floor level and which can be used to move the lift plane between a lower and an upper position, and wherein the distance of the upper surface of the lift plane from the lower floor level in its lower position is about 4 cm at the most, **characterised in that** the hydraulic cylinder (1a) is provided with a flange-like fastening part (2) by which the cylinder is attached to the lower floor level.
2. A minihoist according to Claim 1, **characterised in that** a supporting part provided with the lift plane is attached to the upper end of the piston rod (1c) of the hydraulic cylinder (1a).
3. A minihoist according to Claim 2, **characterised in that** the hydraulic cylinder is a telescopic cylinder (1a, 1b, 1c).
4. A minihoist according to any of Claims 1 to 3, **characterised in that** the front edge of the lift plane (4) is provided with a ramp (5) going from the upper surface to the lower floor level.
5. A minihoist according to Claim 4, **characterised in that** the ramp (5) is hinged to the lift plane (4).
6. A minihoist according to any of Claims 1 to 5, **characterised in that** side shields (7) are provided on the sides of the hoist, rising from the lower floor level

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7. A minihoist according to any of Claims 1 to 6, **characterised in that** the distance of the upper surface of lift plane (4) from the lower floor level in its lower position is about 2 cm at the most.
8. A minihoist according to any of Claims 1 to 7, **characterised in that** the distance of the upper surface of the lift plane (4) from the lower floor level in its upper position is about 20 cm at the most.
9. A minihoist according to any of Claims 1 to 8, **characterised in that** a supporting handle (8) attached to a wall is connected with it, enabling a person to get support.
10. A minihoist according to Claim 9, **characterised in that** the supporting handle (8) comprises a ring which is attached to the wall, and a rod which is attached to the wall and extends downwards from the ring.

Patentansprüche

1. Minihebezeug, das im Flur einer Wohnung installiert wird, um die Bewegung einer Person von einem niedrigeren Flurniveau auf ein höheres Flurniveau und zurück zu erleichtern, wobei das Hebezeug eine Hebeebene (4) umfasst und eine hydraulisch angetriebene Hebeeinrichtung (1), die einen Hydraulikzylinder (1a) umfasst, wobei die Hebeeinrichtung mindestens teilweise ausgerichtet mit dem unteren Flurniveau ist und verwendet werden kann, um die Hebeebene zwischen einer unteren und einer oberen Position zu bewegen, und wobei der Abstand der oberen Oberfläche der Hebeebene von dem unteren Flurniveau in ihrer unteren Position höchstens etwa 4 cm ist, **dadurch gekennzeichnet, dass** der Hydraulikzylinder (1a) mit einem flanschartigen Befestigungsteil (2) versehen ist, durch das der Zylinder am unteren Flurniveau angebracht ist.
2. Minihebezeug nach Anspruch 1, **dadurch gekennzeichnet, dass** ein mit der Hebeebene versehenes Stützteil an dem oberen Ende der Kolbenstange (1c) des Hydraulikzylinders (1a) angebracht ist.
3. Minihebezeug nach Anspruch 2, **dadurch gekennzeichnet, dass** der Hydraulikzylinder ein Teleskopzylinder (1, 1b, 1c) ist.
4. Minihebezeug nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** der vordere Rand der Hebeebene (4) mit einer Rampe (5) versehen ist, die von der oberen Oberfläche zum unteren Flurniveau läuft.

5. Minihebezeug nach Anspruch 4, **dadurch gekennzeichnet, dass** die Rampe (5) gelenkig mit der Hebeebene (4) verbunden ist.
6. Minihebezeug nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** Seitenwände (7) an den Seiten des Hebezeugs vorgesehen sind, die sich von dem unteren Flurniveau erheben.
7. Minihebezeug nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** der Abstand der oberen Oberfläche der Hebeebene (4) von dem unteren Flurniveau in ihrer unteren Position höchstens etwa 2 cm ist.
8. Minihebezeug nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, dass** der Abstand der oberen Oberfläche der Hebeebene (4) von dem unteren Flurniveau in ihrer oberen Position höchstens etwa 20 cm ist.
9. Minihebezeug nach einem der Ansprüche 1 bis 8, **dadurch gekennzeichnet, dass** ein an einer Wand angebrachter Haltegriff (8) mit ihm verbunden ist, wodurch eine Person Halt bekommen kann.
10. Minihebezeug nach Anspruch 9, **dadurch gekennzeichnet, dass** der Haltegriff (8) einen an der Wand angebrachten Ring und eine an der Wand angebrachte Stange umfasst, die von dem Ring sich nach unten erstreckt.

Revendications

1. Un mini-monte-charge installé au plancher d'un logement en vue de faciliter l'ascense d'une personne à partir d'un niveau inférieur vers un niveau supérieur et sa descente en sens inverse, le monte-charge comportant un plan ascenseur (4) et un engin de levage (1) mû par des moyens hydrauliques, comportant à son tour un cylindre hydraulique (1a), l'engin de levage étant au moins en partie à fleur du niveau inférieur et susceptible d'être mis en oeuvre pour déplacer le plan ascenseur entre une position basse et une position haute, la distance entre la face supérieure du plan ascenseur et le niveau inférieur en position basse étant d'environ 4 cm au plus, **caractérisé en ce que** le cylindre hydraulique (1a) est muni d'une pièce de fixation (2) sous forme de bride, au moyen de laquelle le cylindre est fixé au niveau inférieur.
2. Un mini-monte-charge selon la revendication 1, **caractérisé en ce qu'**une pièce de support garnissant le plan ascenseur est fixé à l'extrémité supérieure de la tige (1c) du piston du cylindre hydraulique (1a).

3. Un mini-monte-charge selon la revendication 2, **caractérisé en ce que** le cylindre hydraulique est un cylindre télescopique (1a, 1b, 1c).
4. Un mini-monte-charge selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** le bord avant du plan ascenseur (4) est muni d'une rampe (5) allant de la face supérieure jusqu'au niveau inférieur. 5
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5. Un mini-monte-charge selon la revendication 4, **caractérisé en ce que** la rampe (5) est articulée au plan ascenseur (4).
6. Un mini-monte-charge selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** les côtés du monte-charge sont munis d'écrans latéraux (7) montant du niveau inférieur. 15
7. Un mini-monte-charge selon l'une quelconque des revendications 1 à 6, **caractérisé en ce que** la distance entre la face supérieure du plan ascenseur (4) et le niveau inférieur en position basse est d'environ 2 cm au plus. 20
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8. Un mini-monte-charge selon l'une quelconque des revendications 1 à 7, **caractérisé en ce que** la distance entre la face supérieure du plan ascenseur (4) et le niveau inférieur en position haute est d'environ 20 cm au plus. 30
9. Un mini-monte-charge selon l'une quelconque des revendications 1 à 8, **caractérisé en ce qu'il** comprend une barre d'appui (8) fixé au mur pour fournir un appui à la personne qui monte ou descend. 35
10. Un mini-monte-charge selon la revendication 9, **caractérisé en ce que** la barre d'appui (8) comporte un anneau fixé au mur, et une tige fixée au mur et s'étendant vers le bas à partir de l'anneau. 40

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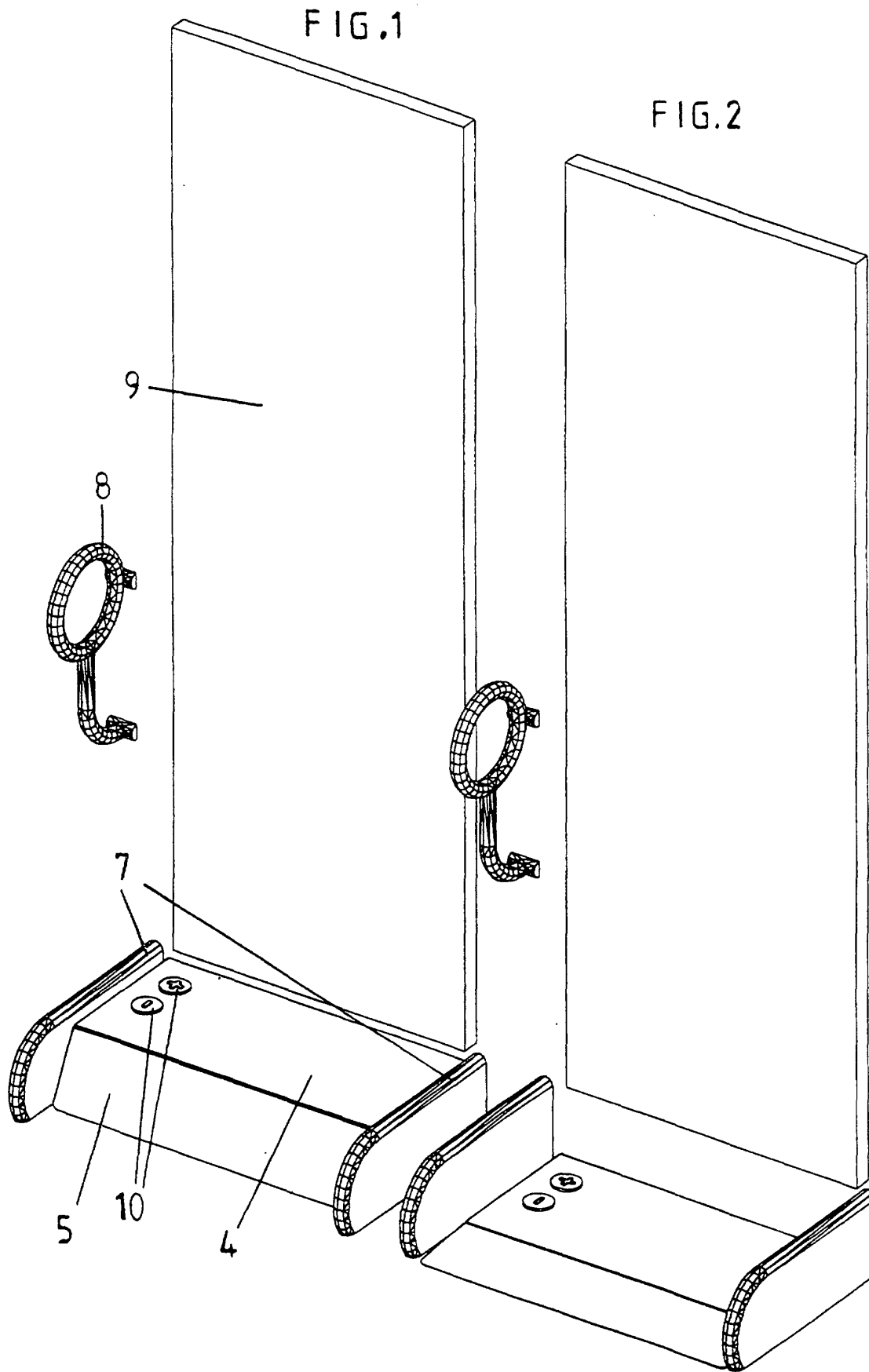


FIG. 3

