(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 116 502 A1

# (12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
**11.11.2009 Bulletin 2009/46**

(51) Int Cl.:
***B66F 7/08*** *(2006.01)* ***B66F 7/28*** *(2006.01)*

(21) Application number: **09251270.6**

(22) Date of filing: **07.05.2009**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR**

(30) Priority: **07.05.2008 GB 0808233**

(71) Applicant: **Adams, William Mark**
**Retford,**
**Nottinghamshire DN22 8PT (GB)**

(72) Inventor: **Adams, William Mark**
**Retford,**
**Nottinghamshire DN22 8PT (GB)**

(74) Representative: **Wood, Graham**
**Bailey Walsh & Co LLP**
**5 York Place,**
**Leeds LS1 2SD (GB)**

## (54) Lifting apparatus

(57) The invention relates to the provision of lifting apparatus (2) for use in movement of goods between goods storage areas. The lifting apparatus includes at least a body module (6) including a frame (4) which supports scissor lift apparatus (18) and a platform (16) connected thereto. The module is formed under factory conditions and then transported to site which means that the conditions for forming the apparatus are improved in comparison to assembling the same on site and when the module are delivered to site the installation work is significantly reduced as the scissor lift is already installed with respect to the frame. The frame may also include a gangway (22) to allow access along and past the platform.

EP 2 116 502 A1

## Description

**[0001]** The invention to which this application relates is apparatus which can be used for lifting goods between different levels, particularly, although not necessarily exclusively, apparatus for use in the transfer of goods between first and second good storage areas such as, for example, a first goods storage area in the form of a warehouse and a second goods storage area in the form of a trailer with two or more spaced floors thereon.

**[0002]** Typically, when moving goods between vehicle trailers having a plurality of floors, referred to as multi-deck or double deck trailers, there is a need to provide civil engineering works in which a loading deck is installed at the opening into a goods warehouse and up to which, the rear of the vehicle trailer is moved and opened. The lifting apparatus conventionally will comprise a scissor lift fixed to a support surface such as a concrete ground base. Once the scissor lift has been installed, an external housing can be formed around the same to protect it from the weather. Typically this installation process can take a considerable period of time, such as 2-3 weeks, due to the extent of construction work which is required to be performed to prepare the site, secure the scissor lift apparatus to the ground surface. The base and fixings for the scissor lift is required to be sufficiently robust so that the apparatus can act against the ground surface when moving the platform connected to the top of the scissor lift between raised and lowered positions. Further construction time is then required to form the housing around the scissor lift so as to protect the scissor lift apparatus, goods held on the platform and employees working on the same in often inclement weather conditions.

**[0003]** A further problem with this form of apparatus is that if there is a problem with the scissor lift which renders the same inoperable, it is often required to at least partially dismantle the surrounding construction to be able to remove the scissor lift to allow repairs to be performed off site and, during this time, the lifting apparatus is out of use.

**[0004]** The aim of the present invention is therefore to provide lifting apparatus which incorporates a scissor lift means and to provide the same so it can be used externally, with the lifting apparatus being protected from weather conditions and, at the same time, to provide the same in a form which allows the apparatus to be installed quickly and efficiently on site.

**[0005]** In a first aspect of the invention, there is provided lifting apparatus for use to move goods between first and second, spaced, goods storage locations, said apparatus provided to act to bridge the gap between said first and second storage locations and said lifting apparatus including a platform which can be moved, if required, to different height levels of the respective storage areas, said platform moved under the influence of interconnected members forming a scissor lift apparatus and wherein said platform and scissor lift apparatus is substantially supported by, and located on, a frame having a base which is located on a ground or support surface.

**[0006]** In one embodiment the said scissor lift apparatus and platform is located on the said frame prior to the apparatus being installed at the support surface for use.

**[0007]** In one embodiment the scissor lift apparatus comprises a series of members pivotally connected intermediate their ends so as to form an X shaped configuration under the platform, and said members are constrained such that movement actuation on at least one of said members causes the platform to be moved up and down. In one embodiment an X shaped configuration is provided under the platform at or near the opposing edges thereof.

**[0008]** In one embodiment the movement force is achieved via a powered ram acting on the X shaped member configuration.

**[0009]** Preferably, the scissor lift is entirely supported by the frame and therefore need not be connected to the ground or support surface or any other structure.

**[0010]** Typically, the frame and scissor lift apparatus are formed and connected to each other under factory conditions and then transported as a modular unit to the location for use at which only the modular unit is required to be installed as all the components are already connected and functioning.

**[0011]** In one embodiment, the lifting apparatus and frame form a body module and an additional roof module is also formed under factory conditions and transported to site at which the respective modules can be connected together to form the apparatus.

**[0012]** In one embodiment, a plurality of body modules and roof modules can be transported to the location and connected together such as to provide a lifting apparatus in a required configuration for that location of use.

**[0013]** Typically, the first goods storage area is a vehicle transportable storage area which can be moved into position at one edge of the lifting apparatus. Typically, the second good storage area is a warehouse, or a loading bay for the same.

**[0014]** Typically, the vehicle goods storage area will have a plurality of spaced floors at different heights and the platform is moveable so as to allow goods to be moved to and from each of said floors of the vehicle goods storage area and also to the height of the loading bay of the warehouse. In one embodiment, the frame includes at least one gangway formed to one side of the platform so as to allow operators to move along adjacent to and past the platform and thereby access the platform to arrange or move goods to and from the same. Typically the gangway is provided at a fixed height, typically as part of the frame.

**[0015]** In one embodiment, the goods are held in cages which can be wheeled to and from a platform and said platform typically includes fixed or moveable portions which can form ramps to provide a continuous movement path between the platform and the particular floor of the goods storage area.

**[0016]** In one embodiment, the platform itself may be

tilt-able.

**[0017]** Typically therefore the scissor lift actuation means act against the frame to which the scissor lift is connected to provide the movement force on the scissor lift apparatus and hence allow the controlled movement of the platform connected thereto.

**[0018]** The provision of the construction of the frame and scissor lift apparatus as a single body module under factory conditions means that firstly, the conditions for assembling the apparatus are improved in comparison to assembling the same on site. Secondly, when the modules are delivered to site the installation work which is required on site is significantly reduced as the scissor lift is already installed with respect to the frame to which the same is connected and therefore it is only the module unit which is required to be connected to the support surface and any other modular units connected thereto. This therefore makes the difference between several weeks installation as required with the conventional apparatus and a few number of days for installation of the apparatus in accordance with the invention.

**[0019]** In a further aspect of the invention there is provided a method of forming lifting means apparatus for use to allow goods to be transported between a first goods storage area, and a second goods storage area, a gap being provided between the first and second goods storage areas, said gap receiving the lifting means apparatus, said lifting means apparatus including a platform movable to different heights under the influence of scissor lift apparatus, and a frame supporting said scissor lift apparatus and platform and having openings to allow access to be gained to the first and second goods storage areas wherein said method includes the steps of forming the scissor lift apparatus, forming the frame and connecting the scissor lift apparatus to said frame under factory conditions to form a body module, transporting the body module to the location of use and installing the same on a support surface in said gap.

**[0020]** In one embodiment the first or second goods storage area is in the form of a vehicle trailer which can be moved into a loading and unloading position and the other of the goods storage areas is in the form of a warehouse.

**[0021]** In one embodiment, additional body modules and/or roof modules can also be transported to the location and connected to the said body module to provide the lifting apparatus in the required configuration for that location.

**[0022]** Specific embodiments of the invention are now described with reference to the accompanying drawings wherein

Figures 1a-c illustrate various views of lifting apparatus in accordance with one embodiment of the invention;

Figures 2a-c illustrate embodiments of use of the lifting apparatus in accordance with the invention; and

Figure 3 illustrates a further schematic view of apparatus in accordance with one embodiment of the invention.

**[0023]** Referring firstly to figures 1a-c there is illustrated, in figures 1a and b, perspective views of the apparatus 2 and in figure 1c, a plan view from the base of said apparatus with the platform removed to show the frame 4. In the embodiment shown, the apparatus 2 is formed from the construction of two modules, body module 6 and roof module 8. Both modules are constructed under factory conditions and then delivered to the location of use as separate modules at which the same are joined together and the frame 4 of the body module 6 is positioned, and typically attached to the support surface 10. Due to the provision of the modular unit the same can typically be attached to a support surface at ground level, rather than requiring excavation work to be performed to form a cavity.

**[0024]** The frame 4 can also be used to support sheet material and/or other protective items, not shown, which form an external face of the apparatus and serve to provide an at least partial enclosure to protect the interior of the frame, including the lifting platform, any goods and operators, from inclement weather conditions. The protection materials have been removed in the figures for ease of illustration of the invention.

**[0025]** The apparatus is provided with first and second opposed openings 12, 14 which allow goods to be moved into and from the apparatus from both ends. Within the frame 4 there is provided a lifting platform 16 which in this case is located on lifting means apparatus in the form of a scissor lift apparatus 18. The scissor lift apparatus is in turn attached to the base 20 of the frame 4 and is therefore an integral part of the body module 6 prior to the same leaving the factory with the frame, scissor lift and platform being installed and assembled under factory conditions and then also, typically, tested and commissioned under factory conditions. The performance of all of these actions under factory conditions rather than on site allows a more controlled process to be performed thereby improving the reliability of the apparatus to be improved. It also allows the time spend on installation on site to be greatly reduced in comparison to conventional apparatus of this type. This in turn ensures that the expensive downtime of the goods handling facility is kept to a minimum.

**[0026]** The scissor lift apparatus comprises a series of members 21 provided in an contractable and extendable "X" shape as they are viewed from opposing sides as shown in Figures 2a-c. The members are provided to be pivotable about the connection axis 19 with at least one of the members being driven to be movable. The movement means can, for example, be a hydraulic ram which is fixed to the frame at one end and therefore the movement of the ram acts on the scissor lift apparatus to allow

movement of the platform thereon in a vertical direction.

**[0027]** As shown schematically in Figure 3, to one side of the platform 16 there is provided a gangway 22 which allows operators to walk between the openings 12, 14 and along side the platform 16 and goods held thereon. The gangway is also typically provided as part of the frame and formed under factory conditions. The gangway will typically be provided at a fixed height.

**[0028]** Figures 2a-c illustrate various forms of apparatus for use with first and second goods storage areas. The apparatus, in each case, is located in a gap 24 between the location of the first goods storage area which is a vehicle trailer 26 and the second goods storage area which is a loading bay 28 leading to a warehouse. The vehicle trailer 26 is provided with first and second vertically spaced floors 30,32 and goods, in this case held in cages 34 can be supported on each of floors 30,32. It will therefore be appreciated that in each case, the lifting apparatus includes a scissor lift 18 and a platform 16 mounted thereon to be moveable vertically as indicated by arrow 36 to allow the platform 16 to be brought to the level of the floor 30 to allow goods to move to and from the same, to the level of the loading bay 28 to allow goods to be selectively moved to and from the same and to be moved to the height of the floor 32 to allow goods to be selectively moved to and from the same.

**[0029]** In figures 2b and c, two scissor lift apparatus are provided and this, in one embodiment, can be achieved by providing two body modules 6 and two roof modules 8 to site and then connecting the same together to form the lifting apparatus of the required length. Alternatively two scissor lift apparatus 18, 18' can be connected to the common frame 4 thereby allowing a body module to be created under factory conditions which has one or more scissor lift apparatus connected thereto as required.

**[0030]** Thus, in accordance with the invention, there is provided a lifting means which allows the required scissor lift platform arrangement to be constructed and fitted to the surrounding frame under factory conditions to greatly improve the speed of installation, the accuracy of installation and assembly at the factory and subsequently, reduce the time required for installation of the modules which are formed at the actual location for use.

## Claims

1. Lifting apparatus for use to move goods between first and second, spaced, goods storage locations, said apparatus provided to act to bridge the gap between said first and second storage locations and said lifting apparatus including a platform which can be moved, if required, to different height levels of the respective storage areas, said platform moved under the influence of interconnected members forming a scissor lift apparatus and wherein said platform and scissor lift apparatus is substantially supported by, and located on, a frame having a base which is located on a ground or support surface.

2. Apparatus according to claim 1 wherein the said scissor lift apparatus and platform is located on the said frame prior to the apparatus being installed at the support surface for use.

3. Apparatus according to claim 1 wherein the scissor lift apparatus comprises a series of members pivotally connected intermediate their ends so as to form an X shaped configuration in side elevation under the platform.

4. Apparatus according to claim 3 wherein said members are constrained such that movement actuation on at least one of said members causes movement of the scissor lift apparatus to move the platform up or down.

5. Apparatus according to claim 4 wherein the movement force is achieved via a powered ram acting on at least one of said members.

6. Apparatus according to claim 1 wherein the scissor lift apparatus is entirely supported by the frame.

7. Apparatus according to claim 2 wherein the frame and scissor lift apparatus are formed and connected to each other under factory conditions and then transported as a modular unit to the location for use.

8. Apparatus according to claim 7 wherein the modular unit includes a plurality of scissor lift apparatus.

9. Apparatus according to claim 7 wherein installation work is only required to be performed on the modular unit at the said location.

10. Apparatus according to claim 7 wherein the lifting apparatus and frame form a body module and an additional roof module is also formed under factory conditions and transported to site at which the respective modules are connected together to form the apparatus.

11. Apparatus according to claim 1 wherein the first goods storage area is a vehicle transported storage area which can be moved into position at one edge of the lifting apparatus.

12. Apparatus according to claim 1 wherein the second goods storage area is a warehouse, or a loading bay for the same.

13. Apparatus according to claim 1 wherein the frame includes at least one gangway formed to one side of the platform so as to allow access to and past the

platform.

**14.** Apparatus according to claim 13 wherein said gangway is formed as part of the frame.

**15.** Apparatus according to claim 14 wherein the gangway is provided at a fixed height.

**16.** Apparatus according to claim 1 wherein said platform typically includes fixed or moveable portions which can form ramps to provide a continuous movement path between the platform and the particular floor of the goods storage area.

**17.** A method of forming lifting means apparatus for use to allow goods to be transported between a first goods storage area and a second goods storage area, a gap being provided between the first and second goods storage areas, said gap receiving the lifting means apparatus, said lifting means apparatus including a platform movable to different heights under the influence of scissor lift apparatus, and a frame supporting said scissor lift apparatus and platform and having openings to allow access to be gained to the first and second goods storage areas wherein said method includes the steps of forming the scissor lift apparatus, forming the frame and connecting the scissor lift apparatus to said frame under factory conditions to form a body module, transporting the body module to the location of use and installing the same on a support surface in said gap.

**18.** A method according to claim 17 wherein additional body modules and/or roof modules are transported to the location and connected to the said body module to provide the lifting apparatus in the required configuration for that location.

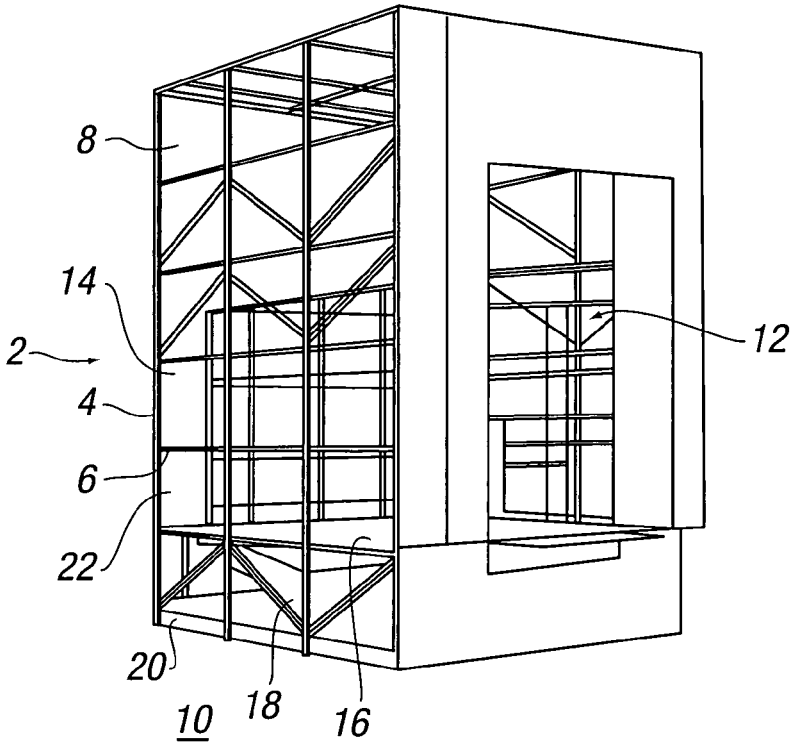


FIG. 1a

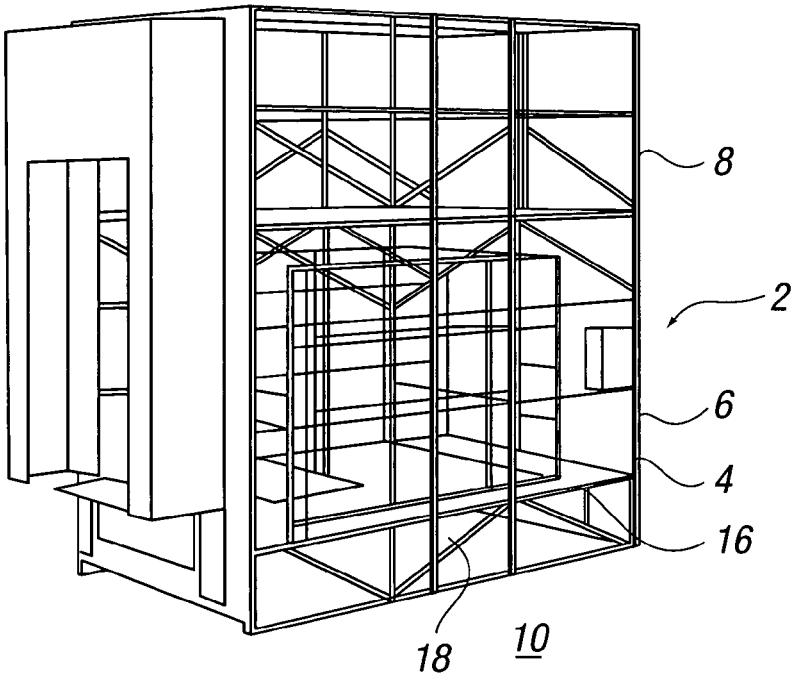


FIG. 1b

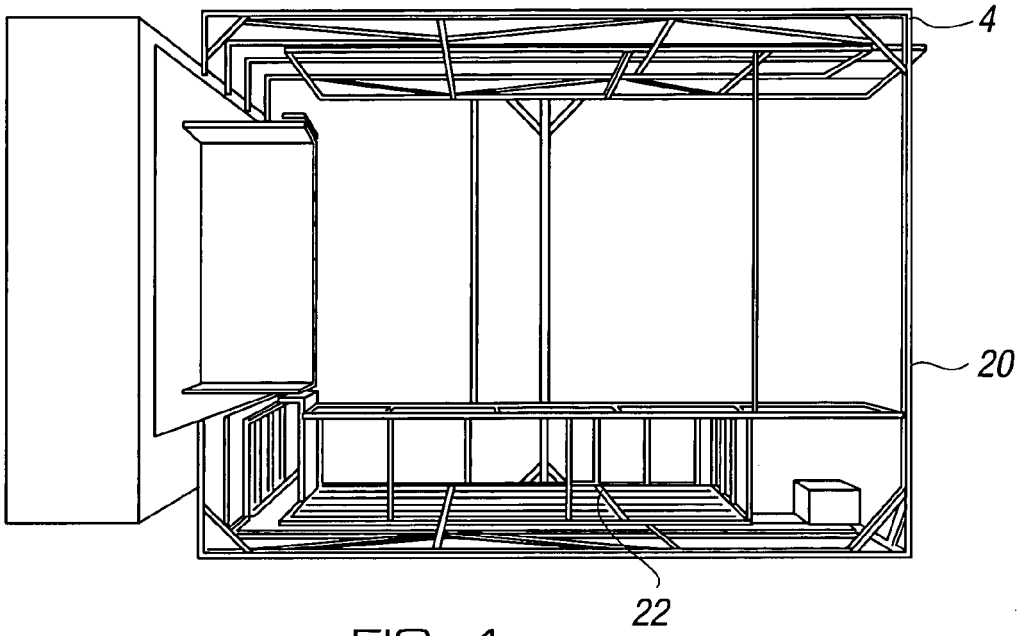


FIG. 1c

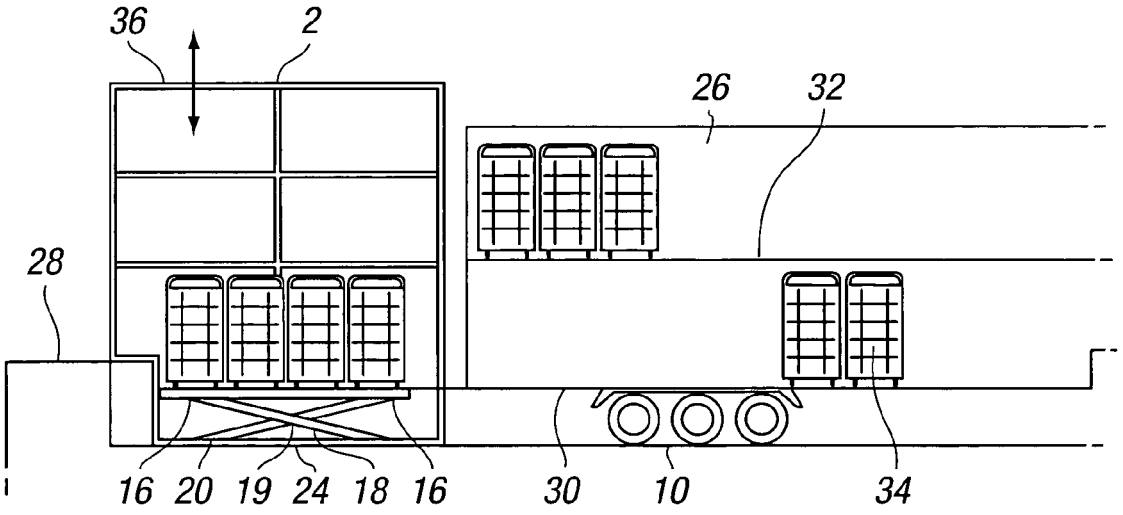


FIG. 2a

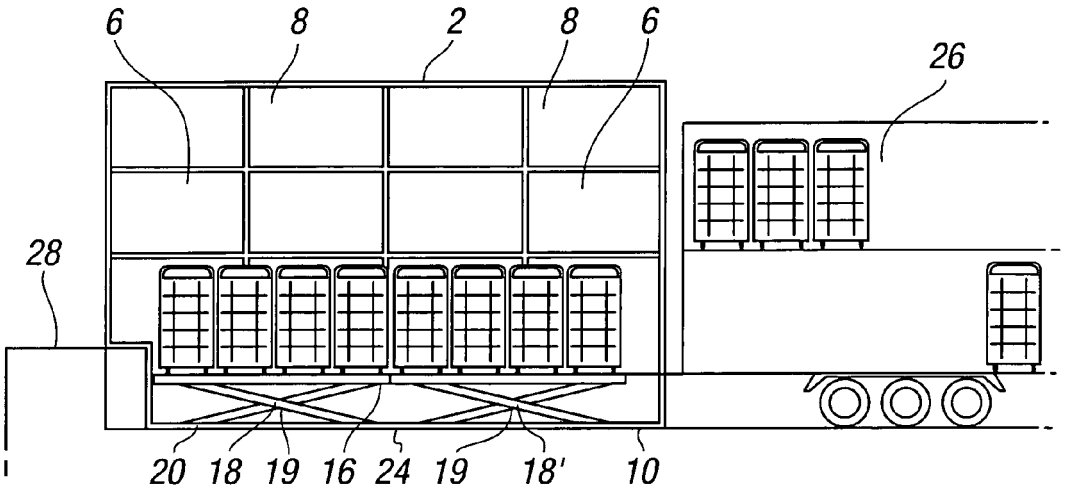
6
8
2
8
6
26
28
20
18
19
16
24
19
18'
10

FIG. 2b

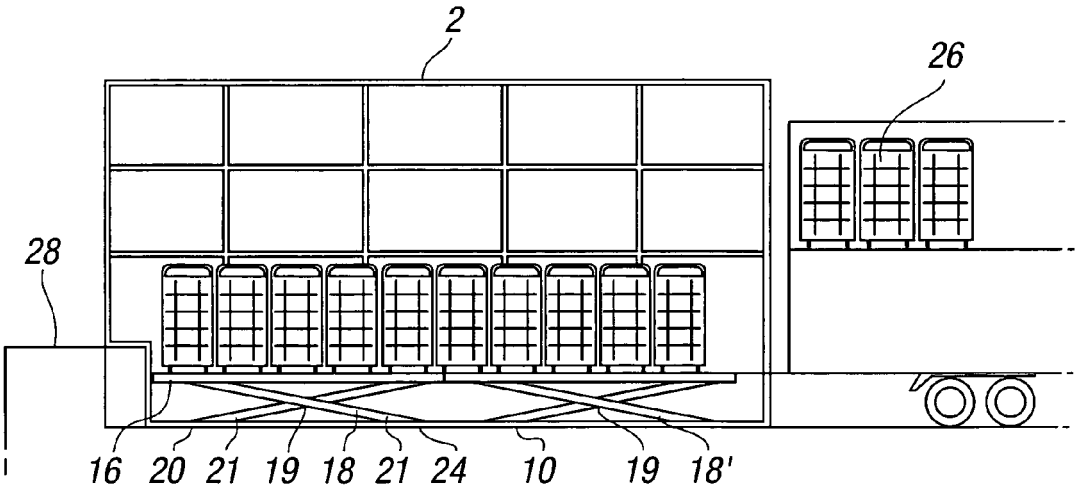
2
26
28
16
20
21
19
18
21
24
10
19
18'

FIG. 2c

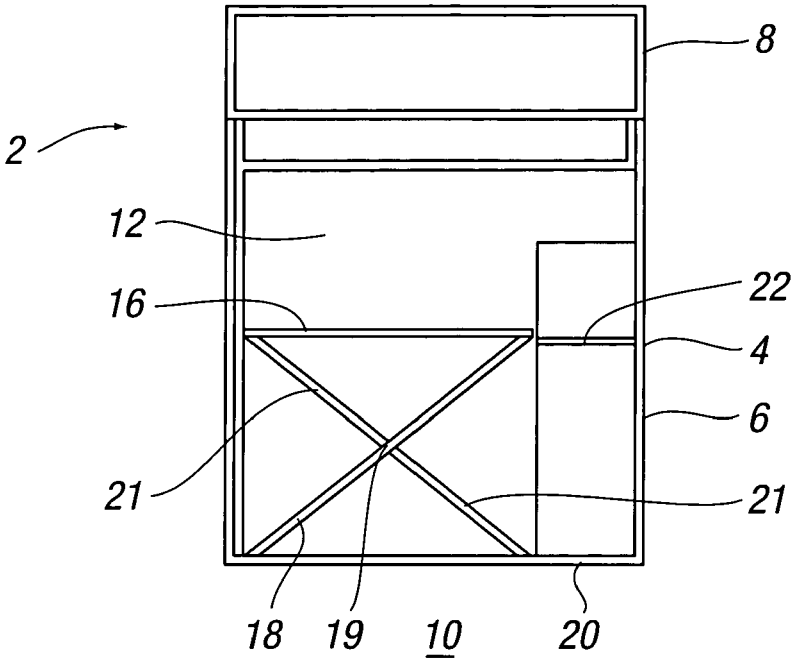


FIG. 3

Europäisches Patentamt
European Patent Office
Office européen des brevets

# EUROPEAN SEARCH REPORT

Application Number
EP 09 25 1270

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
|---|---|---|---|
| X | WO 97/11023 A (ADAMS WILLIAM MARK [GB]) 27 March 1997 (1997-03-27)<br>* page 12, paragraph 2 *<br>* page 13, last paragraph - page 14, paragraph 1 *<br>* figures 6-8,9a,9b,9c,10,11,13 * | 1-6,11, 12 | INV.<br>B66F7/08<br>B66F7/28 |
| Y | | 7,9,10, 13-18 | |
| | ----- | | |
| X | US 4 867 277 A (SLOAN WILLIAM C [US]) 19 September 1989 (1989-09-19)<br>* columns 2-3 *<br>* figures 1-3 * | 1-4,6 | |
| A | | 8 | |
| | ----- | | |
| X | GB 2 311 506 A (RICARDO HITEC LTD [GB] RICARDO HITEC LTD [GB]; INBIS LIMITED [GB]) 1 October 1997 (1997-10-01)<br>* page 6, paragraph 4 - page 7, paragraph 1 *<br>* page 7, paragraph 2 *<br>* page 9, last paragraph - page 10, paragraph 1 *<br>* figure 5 * | 1,3-6,8, 11,12 | TECHNICAL FIELDS SEARCHED (IPC)<br>B66F<br>B64F<br>B65G |
| | ----- | | |
| Y | EP 1 775 246 A (ADAMS WILLIAM MARK [GB]) 18 April 2007 (2007-04-18)<br>* the whole document * | 7,9,10, 13-18 | |
| | ----- | | |
| A | EP 1 277 681 A (TREPEL AIRPORT EQUIPMENT GMBH [DE]) 22 January 2003 (2003-01-22)<br>* the whole document * | 1,2, 10-16 | |
| | ----- | | |
| A | GB 2 423 977 A (ADAMS WILLIAM MARK [GB]) 13 September 2006 (2006-09-13)<br>* the whole document * | 1,11-15 | |
| | ----- | | |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| The Hague | 18 August 2009 | Özsoy, Sevda |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 25 1270

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

18-08-2009

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| WO 9711023 A | 27-03-1997 | AU 7089296 A | 09-04-1997 |
| | | EP 0961750 A1 | 08-12-1999 |
| US 4867277 A | 19-09-1989 | NONE | |
| GB 2311506 A | 01-10-1997 | NONE | |
| EP 1775246 A | 18-04-2007 | NONE | |
| EP 1277681 A | 22-01-2003 | AT 263727 T | 15-04-2004 |
| | | DE 10133815 A1 | 13-02-2003 |
| GB 2423977 A | 13-09-2006 | NONE | |

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82