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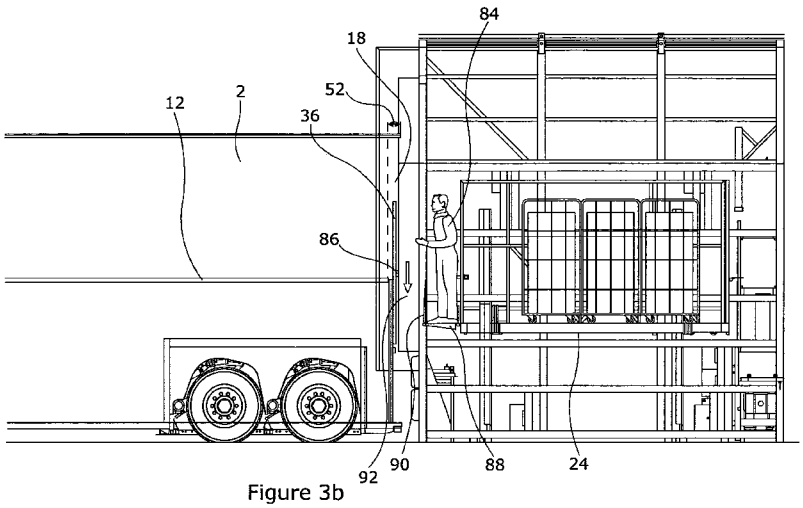


Figure 3b

(57) Abstract: The invention relates to apparatus and a method for the movement of goods between a platform of lifting apparatus and one or more floors of a movable goods storage area such as a vehicle trailer. A bridging assembly is typically located at an edge of the said platform adjacent the opening of the movable goods storage area and the bridging assembly can be moved between a withdrawn storage position to an extended in use position, and an intermediate position which is provided to allow operation of a door assembly provided for the said opening to be selectively closed and opened for access to the interior of the good storage area, said intermediate position allowing a gap to be provided between the bridging assembly and the opening which is sufficient to allow movement of the door assembly between open and closed positions whilst allowing an operator to reach the door assembly to operate the same whilst standing on the bridge assembly..

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Goods Movement Apparatus

The invention to which this application relates is in relation to apparatus for use in the movement of goods. In particular, although not necessarily exclusively, the invention is for use in the movement of goods between storage areas, such as a first storage area in the form of a warehouse and a second, movable goods storage area in the form of, for example, a vehicle trailer provided as part of, or in connection with, a vehicle.

The movement of goods between different locations is most commonly achieved by vehicles which have a trailer either as an integral part of the same or which is attachable to a drive unit which includes the drivers cab and engine. The goods which are moved are stored in the trailer as the same are moved between the locations. The goods may be separate items, such as parcels or the like, or may be grouped together and moved on pallets, trolleys, wheeled cages, or the like. At the location there is a need for the goods to be unloaded from, and/or loaded onto, the trailer, most typically at a location at which there is provided a warehouse and a loading bay provided as part of the same.

The apparatus of the type to which the application relates includes a lifting platform which is vertically movable with respect a support frame. The goods which are to be loaded or unloaded are moved onto the platform and the platform is then lifted or lowered on the platform as required with respect to the support frame. This allows the platform to be brought to the desired floor height of an adjacent goods storage area. These floors are often provided at different heights at different locations.

Once the platform is at the appropriate height, the goods can be moved to and from the adjacent floor which is at the same height. Typically the support frame is located with respect to the first goods storage area such as a warehouse or building

such that one end of the platform is locatable adjacent an edge of a floor of the same and the opposing end of the platform is locatable adjacent an edge of a floor of the second of the goods storage areas which, most typically, will be the opening into a transportable storage area in the form of a trailer of a vehicle which has been reversed into position. The applicant's co-pending application number EP1775246 discloses apparatus of this type.

A problem which is experienced with apparatus of this type is how to bridge a gap which exists between the edge of the platform of the lifting apparatus and the edge of the adjacent floor, and, in particular, the floor of the transportable storage area. It should be appreciated that typically the goods are moved through an opening at an end of the transportable goods storage area and that typically the opening is relatively narrow and confined, which is especially the case if there is provided a tail lift assembly and/or door assembly at the opening. When a tail lift assembly is provided, a portion of the same can be moved to an extended position outwardly from and externally of the opening and into a horizontal plane so that the portion provides a limited floor space to allow goods to be moved onto the same and then be moved to ground level, typically at a location for delivery of the goods such as to a retail unit.

The doors which are provided to selectively open and close the opening can take several forms but one possible form is the form in which the door is linearly movable and provided as a shutter or in the form defined in the applicant's co-pending application number EP2732999 in which there are provided first and second door panels which are linearly movable to allow selective access to portions of the opening into the trailer and typically to allow access to a floor of the trailer at a first height and, by movement of the door panels, to allow access to a floor at a spaced height above the first floor in the trailer.

The provision of this door apparatus at the opening and positioned between the end of the storage area frame and the end of at least the raised floor of the trailer,

and the confined size of the opening, means that the bridging of the gap between the respective edges of the floor of the storage area and platform of the lifting apparatus is difficult to achieve and is currently not safely possible in a manner which allows a secure and sufficiently supported access path, especially when one considers the weight of the goods which may be moved across the same and the requirement to allow safe passage of personnel across the same. A further problem is that the operator of the apparatus will typically be standing on the platform of the lifting apparatus and when the have oved the platform to the required height they are required to lean out from the edge of the platform, typically over a safety barrier, in order to try and reach the door, or handle for the same, of the transportable goods storage area, in order to be able to move the door to gain access to the interior of the goods storage area. This can be hazardous to the operator where there is a risk of falling from the platform and/or not being able to reach the door to operate the same.

An aim of the invention is therefore to provide apparatus and a method which allows the said gap to be bridged safety and repeatedly and a further aim of the invention is to provide a means of allowing improved access to the door to operate the same whilst minimising the risk to the operator. A further aim is to provide the apparatus at the opening of the transportable storage area in a manner which minimises the impact on access through the opening.

In a first aspect of the invention there is provided apparatus for the movement of goods, said apparatus including at least one movable goods storage area formed by at least one floor, side walls, end walls and a roof and an opening through which goods can be moved into and from the goods storage area, said opening selectively closed by a door assembly, and lifting apparatus including a frame and a platform on which goods can be located, said platform movable in relation to the frame, said movable goods storage area selectively movable to a position in which the said opening is positioned adjacent the lifting apparatus to allow goods to be moved between the platform and the goods storage area and characterised in that at an edge of the said platform there is provided a bridging assembly, said bridging

assembly movable between a withdrawn, storage, position and an extended, in-use, position to bridge a gap between the platform and said goods storage area and the bridging assembly is formed with a first portion and a second portion, said portions relatively movable to allow the bridging assembly to be moved to a position intermediate the said in-use and storage positions.

In one embodiment in the storage position the portions are provided in a substantially upstanding position with respect to the platform and in an in-use position the said portions of the bridging assembly are substantially in line with the platform and in the intermediate position, the first or inner portion is substantially in line with the platform and the second or outer portion is upstanding so that the positions of the same are substantially perpendicular.

Typically, in the intermediate position, the second portion acts as a barrier to prevent a person from stepping out from the edge of the first portion.

In one embodiment the first portion is pivotally movable with respect to the platform at a first edge of the first portion. In one embodiment the second portion is pivotally movable with respect to the first portion at a second edge of the first portion.

In one embodiment the movement of the said portions is controlled by hydraulic control means so as to be capable of a two stage movement between the storage and in use positions.

Typically when in the in-use position the free end of the second portion of the bridging assembly extends to and over the edge of a floor of the goods storage area to form a continuous goods movement path between the platform and the floor of the goods storage area.

In one embodiment when the bridging assembly is in the intermediate position the gap between the edge of the first portion and the door assembly of the goods storage area is less than the gap between the edge of the platform and the door assembly. In one embodiment the reduced gap is such that access to the door assembly to operate the same can be achieved by a person when standing on the first portion of the bridging assembly.

In one embodiment the door assembly is a sliding door assembly such as a shutter door or the door assembly in the applicant's co pending patent application EP2732999. The door of the assembly is movable in a linear direction to allow the opening to be opened or closed. In one embodiment the door may be formed from a number of portions which can be selectively moved to allow selective access to portions of the opening.

Typically the said goods storage area is a vehicle trailer which can be moved into position such that the opening through which the goods are to be moved is positioned adjacent to the said edge of the platform of the lifting apparatus.

In one embodiment the bridging assembly attached to the platform can be moved into the intermediate position prior to the door assembly of the goods storage area being moved to an open position. Typically, once the door assembly is open to allow access to the floor of the goods storage area, the second portion of the bridging assembly can be moved into the goods storage area to contact with the floor of the same.

In one embodiment the gap between the edge of the platform and the edge of the floor of the goods storage area, when the goods storage area and movement apparatus are in an abutting position, is of a distance to allow the door assembly of

the goods storage area and/or a shutter assembly of the lifting apparatus to be moved.

In a further aspect of the invention there is provided lifting apparatus for the movement of goods, said apparatus including a frame and a platform on which goods can be located, said platform movable in relation to the frame and characterised in that at an edge of the said platform there is provided a bridging assembly, said bridging assembly movable between a withdrawn, storage, position and an extended, in use, position extending beyond the edge of the platform and the bridging assembly is formed with first and second portions, said portions relatively movable to allow the bridging assembly to be provided in a position intermediate the in use and storage positions.

In a further aspect of the invention there is provided a bridging assembly, said assembly including location means to locate the same in position, drive means to allow the bridging assembly to be moved between storage and in-use positions, wherein said assembly includes first and second moveable portions, said first and second portions located so as to be upstanding with respect to the platform when the assembly is in the said storage position, angularly offset when the assembly is in the intermediate position and substantially in line to form a movement path from the location means to the distal end of the second portion when the assembly is in the in-use position.

In a yet further aspect of the invention there is provided a method of moving goods between lifting apparatus and a floor of a goods storage area, said method comprising the steps of: moving the goods storage area such that an opening of the same is positioned adjacent an edge of a platform of the lifting apparatus, said opening closed by a door assembly, said goods storage area formed by at least one floor, side walls, end walls and a roof and characterised by moving a bridging assembly located at an edge of the said platform from a storage position to an intermediate position such that first and second portions of the bridging assembly

extend from the platform edge with the first portion substantially in line with the platform, using the first portion to allow access to operate the door assembly of the goods storage area to allow access to the at least one floor of the goods storage area and moving the second portion of the bridging assembly to lie substantially in line with the first portion and said at least one floor so as to form a path for the movement of goods between the platform and the said at least one floor of the goods storage area.

In one embodiment the goods storage area includes first and second vertically spaced floors and the method includes the steps of moving the second portion to the intermediate position once the requirement for access to the first floor is completed, moving the door assembly to a position to allow access to the second floor of the goods storage area, moving the platform to the height of the second floor and moving the second portion of the bridging assembly to lie substantially in line with the first portion and said second floor so as to form a path for movement of goods between the platform and the said second floor.

Specific embodiments of the invention are now described with reference to the accompanying drawings; wherein

Figure 1 illustrates a goods storage area and lifting apparatus in a schematic manner in accordance with one embodiment of the invention;

Figures 2a and b illustrate first and second embodiments of door assemblies of the type which can be used with the current invention;

Figure 3a –f illustrates an elevation of the apparatus in accordance with one embodiment of the invention in operation; and

Figures 4a-c illustrate in a schematic manner the bridging assembly in accordance with one embodiment of the invention.

Referring firstly to Figure 1 there is illustrated a movable goods storage area in the form of a vehicle trailer 2 which is located on and movable by a vehicle 4 in a conventional manner. The goods storage area, in this embodiment, is defined by side walls 6,8 a floor 10, a raised floor 12, roof 15, a first end wall 14 and an opposing end 16 in which there is provided an opening 18. The opening, when open, allows the movement of goods into and from the goods storage area 2 and the goods are moved onto and from lifting apparatus 20. The lifting apparatus includes a frame 22 which is provided in a fixed position and on which is mounted a platform 24 and which is movable in the vertical direction indicated by arrow 26 to bring the platform to the height of one of the floors 10,12 as required. A first edge 28 of the frame 22 is positioned such that the end 16 of the trailer 2 can be brought adjacent to the same. At the opposite edge 30 of the frame there is typically provided a second goods storage area in the form of a warehouse 32 such that the lifting apparatus allows the movement of goods between the first and second goods storage areas 2 and 32.

The trailer opening end 16 is provided with a door assembly 34 to allow the selective opening and closing of the opening 18 and two examples of this are provided in Figures 2a and b. In Figure 2a there is provided an assembly in accordance with the applicant's copending application EP2732999. In this case there are provided two door portions 36,38, which are independently movable so that the assembly can be provided in a position to fully close the opening as shown in (i), a first open position as shown in (ii) to allow access to a lower floor 10 of the trailer and goods thereon and a second opened position as shown in (iii) to allow access to the higher floor 12 of the trailer and goods thereon.

A second form of door assembly is shown in Figure 2b in which the door assembly is a shutter door 40 which has a free end 42 which can be moved from the open

position adjacent the top of the opening as shown at (i) to the closed position at the floor 10 of the opening as shown at (ii).

In each case it will be appreciated that linear movement of the door assembly 34 is required to be possible in order to allow the same to be moved between open and closed positions and access to be gained to the goods storage area 2 through the opening 18 by at least partially opening the door assembly. In order for this to be possible there is required to be a gap 52 between the edge 44 of the upper floor 12 of the goods storage area trailer 2, and the end 16 of the trailer as shown in Figure 3a.. The gap 52 is necessary to accommodate the rear frame of the trailer 2 at the end 16 and, inwardly of the same, the door assembly 34 and provide movement space therefore which, in this embodiment, includes two movement channels 54,56 for movement of the door portions 36,38 of the door assembly 34 shown in Figure 2a. There is also required to be a gap 70 between the edge 28 of the platform and the edge 74 of the lifting apparatus which extends beyond the edge 72 of the frame frame 22 of the lifting apparatus to accommodate a shutter assembly which is provided to be movable along the axis 80 as indicated by arrow 78.

This means, and as shown in Figure 3a, that when the edge 44 of the floor 12 of the trailer 2 is positioned as close to the edge 28 of the platform 24 as is possible there is still a combined gap 52, 70 between the edge 44 and edge 52 of the platform . The gap 52,70 is such that, if not bridged, access is not possible to the door assembly to operate the same from the platform which is what is required and as a result movement of goods and/or personnel between the platform 24 and storage area floor 12 is not possible.

This problem is solved by the provision of apparatus as now described with reference to Figures 3a-f and 4a-c which illustrate one embodiment of the invention.

In Figures 4a-c there is illustrated in a schematic manner the bridging assembly 82 which includes a pivot mounting location on the platform 24, part of which is shown and drive means to allow the movement of the bridging assembly. Although not shown the drive means will typically be a hydraulic system with operator control means to allow the selective movement of the bridging assembly.

To move the bridging assembly from the withdrawn storage position shown in Figure 4a then at the edge 28 of the platform 24 the bridging assembly first portion 88 is pivotally moved about pivot 100 downwardly as indicated by arrow 102 in Figure 4a to lie substantially in line with the platform 24 as shown in Figure 4b, while the second portion 90 is moved about pivot 104 so as to still be angularly offset to the first portion and be upstanding as shown in Figure 4b so as to provide the bridging assembly in the intermediate position and to allow the gap 52 between the edge of the bridging assembly at pivot location 104 and the floor 12 of the goods storage area to be provided to allow for the movement of the door assembly portion therethrough whilst allowing the operator to stand on the first portion and thereby reach across the reduced gap 52 width and reach the door assembly of the trailer in order to operate the same. In Figure 4c the second portion 90 is pivotally moved as indicated by arrow 106 so that the second portion 90 lies in line with the first portion 88, platform 24 and floor 12 so as to form a continuous path between the platform 24 and floor 12.

The use of the bridging assembly with the lifting apparatus and goods storage area is illustrated in more detail in the Figures 3a-f. In Figure 3a there is shown the goods storage area trailer 2 having been moved so that the rear end 16 of the same abuts the padded receivers 80 of the lifting apparatus. It is also shown that in accordance with the invention, the platform is provided with a bridging assembly 82 at the edge 28. The bridging assembly is shown in a storage upstanding position with respect to the platform and therefore acts as a barrier at the edge 28 for the operator 84. It will be appreciated from this Figure that the operator is unable to safely reach out from the platform edge 28 across the gap 70 to try and reach the door assembly to operate the same.

Once the platform 24 has been moved to the height so as to be able to be at the same height required to operate the door release 86 of the door assembly, they move the bridging assembly to the intermediate position shown in Figure 3b in which the first portion 88 is moved downwardly to lie substantially in line with the platform 24, while the second portion 90 is still upstanding to allow the gap 52 to be maintained for the movement of the door assembly. The operator 84 can then move onto the first portion 88 of the bridging assembly as shown and is then able to reach the door release 86 safely as the gap is significantly reduced and this allows the upper door portion 36 to be moved downwardly as indicated by arrow 92 to allow the opening 18 to be open sufficiently to allow access to the floor 12 of the trailer 2.

When this has been achieved, the operator can move the platform 24 to the height of the floor 12 of the goods storage area 2 and move the second portion 90 of the bridging assembly to lie in line with the first portion 88 and the platform 24. The free end 94 of the bridging assembly contacts with the floor 12 to a sufficient extent to form a bridge across the gap 70, 52 and so the operator 84 can then start to move the goods trolleys 96, in this case from the platform 24 onto the floor 12 as shown to load the floor 12 as is shown in Figure 3d.

When the floor 12 is loaded, the operator can move the second portion 90 of the bridging assembly to the intermediate position shown in Figure 3d and then lowers the platform 24 to reach the top door release 86 and return it to its closed position as indicated by arrow 96. The operator can then move the platform 24 to operate the door release 98 of the lower door and move that upwardly as indicated by arrow 100 as shown in Figure 3e and hence open the opening 18 to allow access to the lower floor 10 of the trailer.

As shown in Figure 3f, the operator 84 can then move the second portion 90 of the bridging assembly to be in line with the first portion 88 and hence bridge the

gap and allow the goods trolleys 96 to be moved from the platform 24 across the bridging assembly and onto the floor 10 of the trailer 2.

It should be appreciated that although the bridging assembly and the use of the same is described in Figures 3a-f with regard to the door assembly shown in Figure 2a the same can be used to advantage with other door assemblies such as that shown in Figure 2b and further assemblies, as the gap which exists between the edge of the platform 24 and the floors of the goods storage area 2 can now be bridged partially to allow operation of the door assembly safely, and completely to allow the safe movement of the goods.

Claims

1. Apparatus for the movement of goods, said apparatus including at least one movable goods storage area formed by at least one floor, side walls, end walls and a roof and an opening through which goods can be moved into and from the goods storage area, said opening selectively closed by a door assembly, and lifting apparatus including a frame and a platform on which goods can be located, said platform movable in relation to the frame, said movable goods storage area selectively movable to a position in which the said opening is positioned adjacent the lifting apparatus to allow goods to be moved between the platform and the goods storage area and characterised in that at an edge of the said platform there is provided a bridging assembly, said bridging assembly movable between a withdrawn, storage, position and an extended, in-use, position to bridge a gap between the platform and said goods storage area and the bridging assembly is formed with a first portion and a second portion, said portions relatively movable to allow the bridging assembly to be moved to a position intermediate the said in-use and storage positions.

2. Apparatus according to claim 1 wherein in the storage position the first and second portions are provided in an upstanding position with respect to the platform, in the in-use position, the said first and second portions of the bridging assembly are substantially in line with the platform and, in the intermediate position, the first portion is substantially in line with the platform and the second portion is upstanding.

3. Apparatus according to claim 1 wherein in the intermediate position, the second portion is substantially perpendicular to the first portion and acts as a barrier.

4. Apparatus according to claim 1 wherein a first edge of the first portion is pivotally located with the edge of the platform.

5. Apparatus according to claim 4 wherein the said second portion is pivotally connected to a second edge of the first portion.

6. Apparatus according to claim 1 wherein the movement of the said portions is controlled by hydraulic control means so as to be capable of the two stage movement between the storage, intermediate and in use positions.

7. Apparatus according to claim 1 wherein, when in the in use position, the free end of the second portion of the bridging assembly extends beyond the edge of the floor of the goods storage area so as to form a continuous goods movement path between the platform and the floor of the goods storage area.

8. Apparatus according to claim 1 wherein when the bridging assembly is located on the platform and in the intermediate position, the size of the gap between the edge of the first portion and the door assembly of the goods storage area is less than the gap between the edge of the platform and the door assembly.

9. Apparatus according to claim 8 wherein the gap between the edge of the first portion and the door assembly is such that access to the door assembly to operate the same can be achieved by a person when standing on the first portion of the bridging assembly.

10. Apparatus according to claim 1 wherein the door assembly is a sliding door assembly.

11. Apparatus according to claim 1 wherein the movable goods storage area is a vehicle trailer.

12. Apparatus according to claim 1 wherein the bridging assembly is moved into the intermediate position prior to the door assembly in the goods storage area being moved to an open position and once the door assembly is open to allow access to the floor of the goods storage area, the second

portion of the bridging assembly is moved to an extended in use position into the goods storage area in contact with the floor of the same.

13. Apparatus according to claim 1 wherein the gap between the edge of the platform and the edge of the floor of the goods storage area, when the goods storage area and movement apparatus are in an adjacent position is of a distance to allow passage of the door assembly as it is moved between open and closed positions.

14. Apparatus according to claim 1 wherein the movable goods trailer has two, vertically spaced apart floors and the platform is provided with drive means to allow the platform and bridging assembly to be selectively moved to the level of each of the floors.

15. Apparatus according to claim 14 wherein the door assembly has a closed position in which access to the opening is prevented, a first open position in which access to the lower floor of the movable goods storage area is possible and a second open position in which access to the higher floor of the movable goods storage area is possible.

16. Lifting apparatus for the movement of goods, said apparatus including a frame and a platform on which goods can be located, said platform movable in relation to the frame and characterised in that at an edge of the said platform there is provided a bridging assembly, said bridging assembly movable between a withdrawn, storage, position and an extended, in use, position extending beyond the edge of the platform and the bridging assembly is formed with first and second portions, said portions relatively movable to allow the bridging assembly to be provided in a position intermediate the in use and storage positions.

17. A bridging assembly, said assembly including location means to locate the same in position, drive means to allow the bridging assembly to be moved between storage and in-use positions, wherein said assembly includes first and second moveable portions, said first and second portions located so as to be upstanding with respect to the platform when the assembly is in the

said storage position, angularly offset when the assembly is in the intermediate position and substantially in line to form a movement path from the location means to the distal end of the second portion when the assembly is in the in-use position.

18. A method of moving goods between lifting apparatus and a floor of a goods storage area, said method comprising the steps of: moving the goods storage area such that an opening of the same is positioned adjacent an edge of a platform of the lifting apparatus, said opening closed by a door assembly, said goods storage area formed by at least one floor, side walls, end walls and a roof and characterised by moving a bridging assembly located at an edge of the said platform from a storage position to an intermediate position such that first and second portions of the bridging assembly extend from the platform edge with the first portion substantially in line with the platform, using the first portion to allow access to operate the door assembly of the goods storage area to allow access to the at least one floor of the goods storage area and moving the second portion of the bridging assembly to lie substantially in line with the first portion and said at least one floor so as to form a path for the movement of goods between the platform and the said at least one floor of the goods storage area.

19. A method according to claim 18 wherein the goods storage area includes first and second vertically spaced floors and the method includes the steps of moving the second portion to the intermediate position once the requirement for access to the first floor is completed, moving the door assembly to a position to allow access to the second floor of the goods storage area, moving the platform to the height of the second floor and moving the second portion of the bridging assembly to lie substantially in line with the first portion and said second floor so as to form a path for movement of goods between the platform and the said second floor.

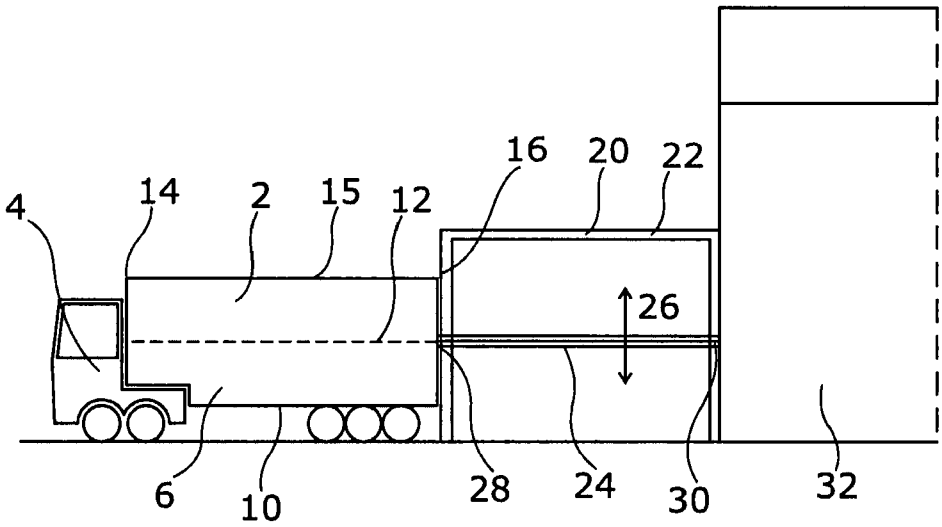


Figure 1

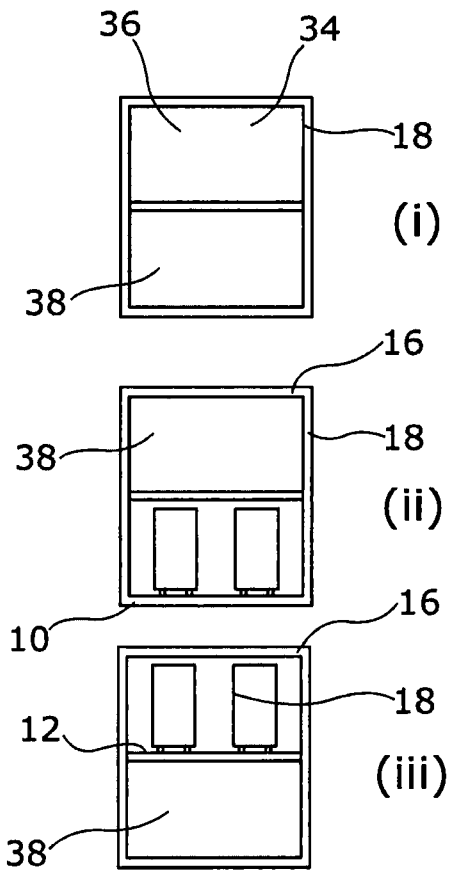


Figure 2a

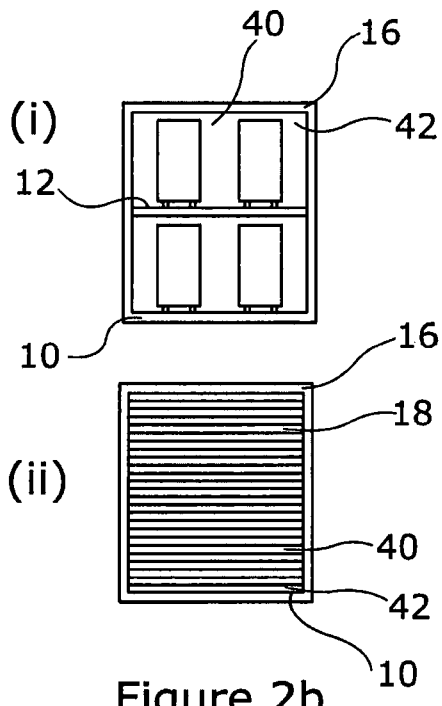


Figure 2b

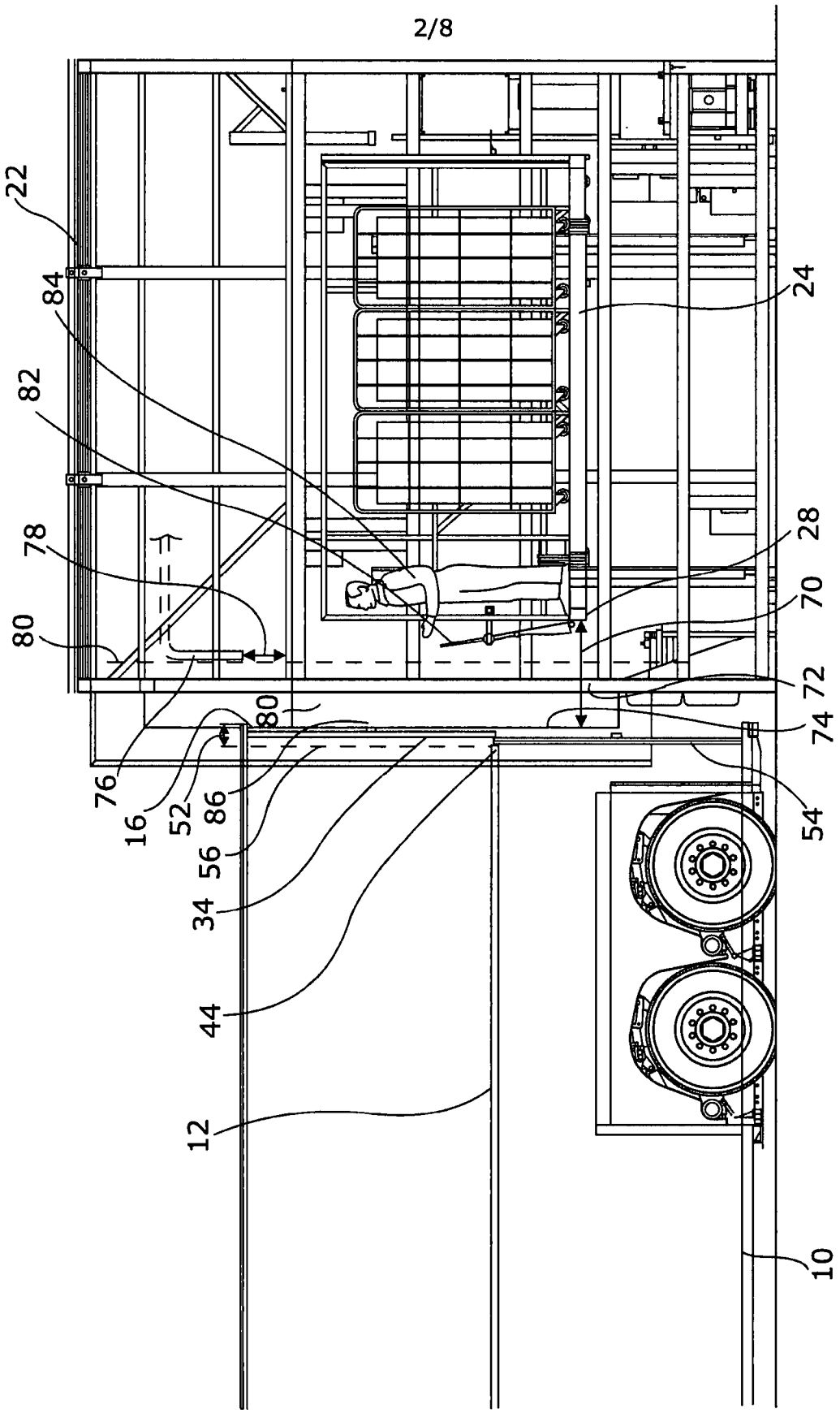


Figure 3a

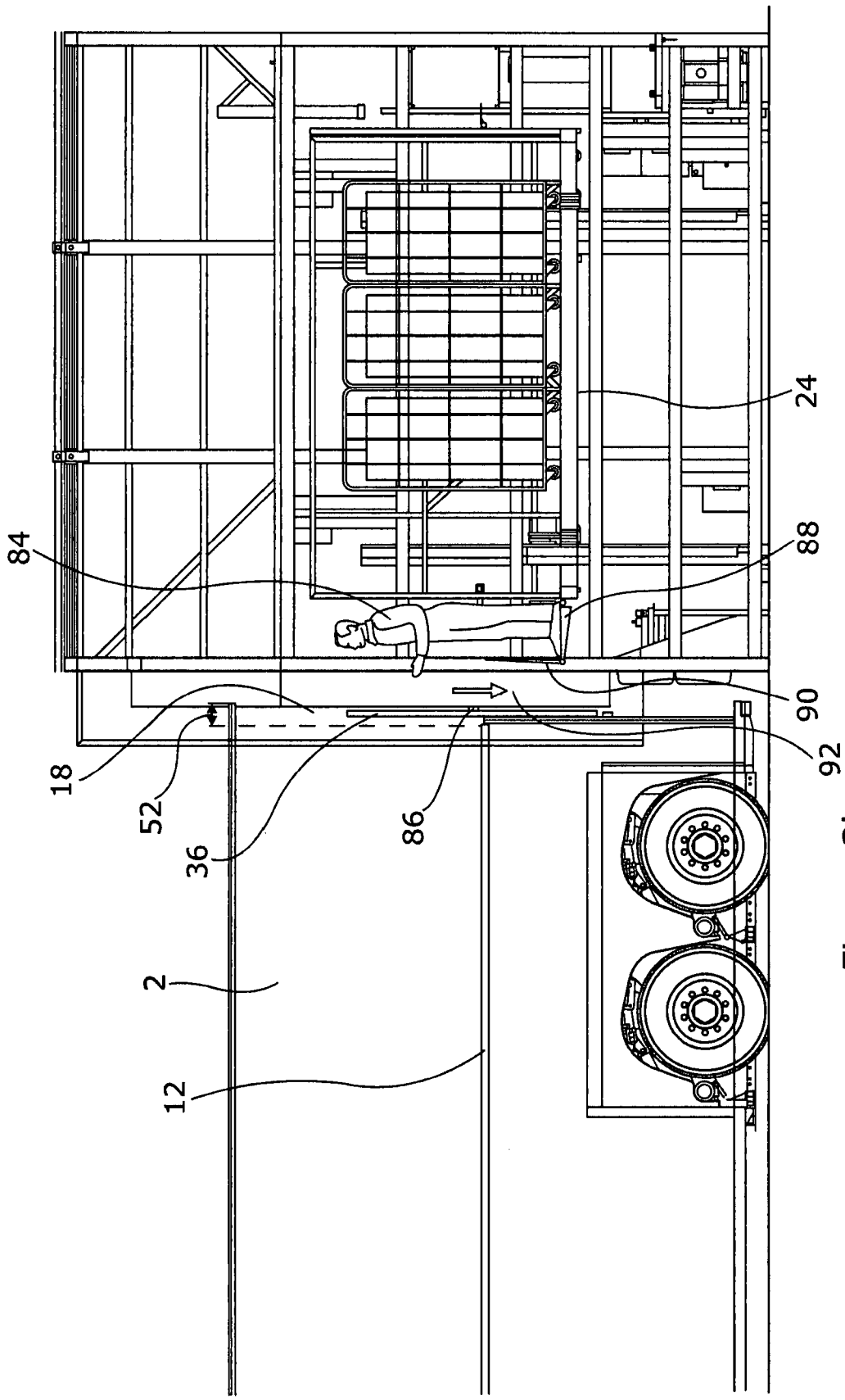


Figure 3b

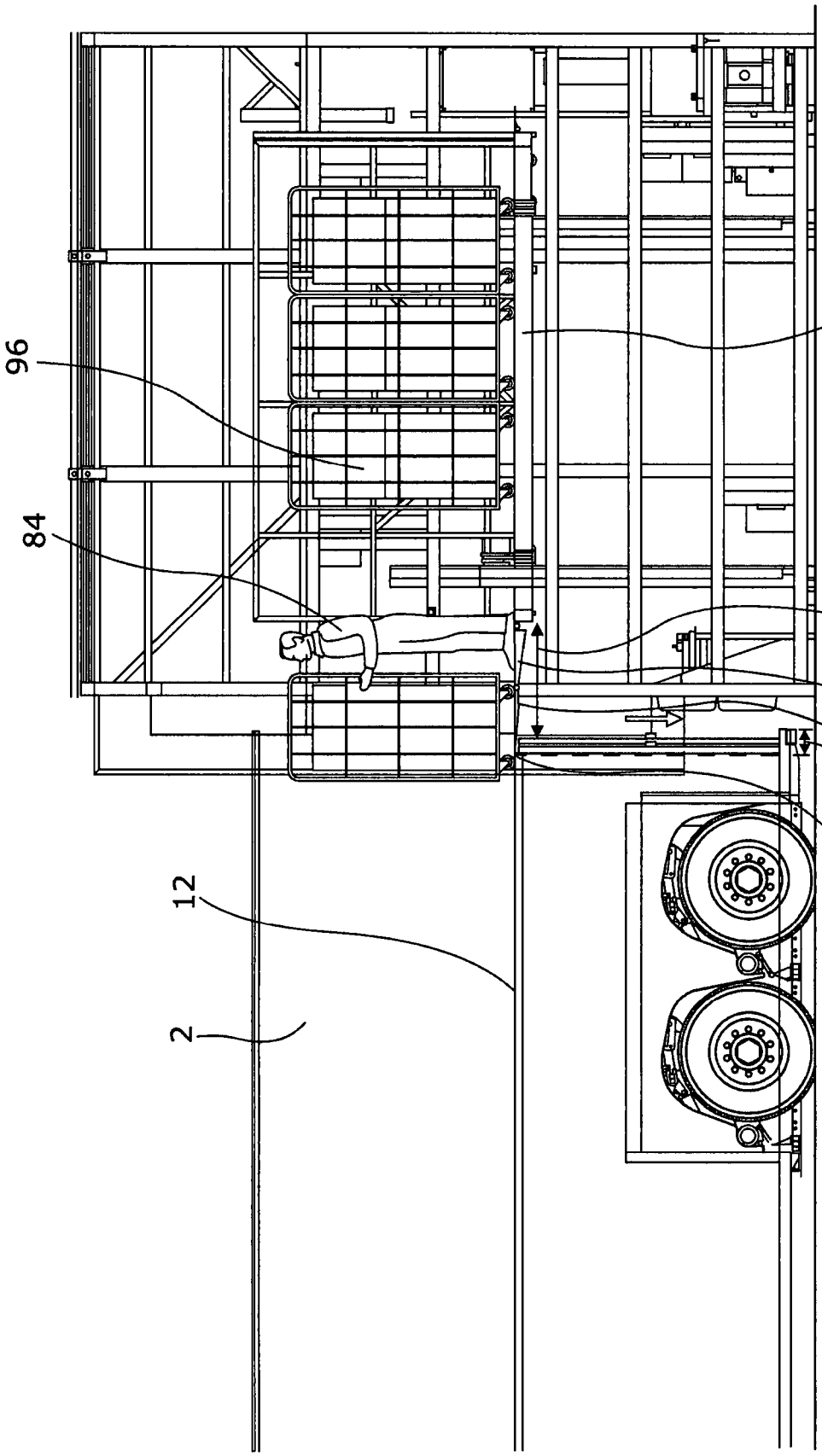


Figure 3c

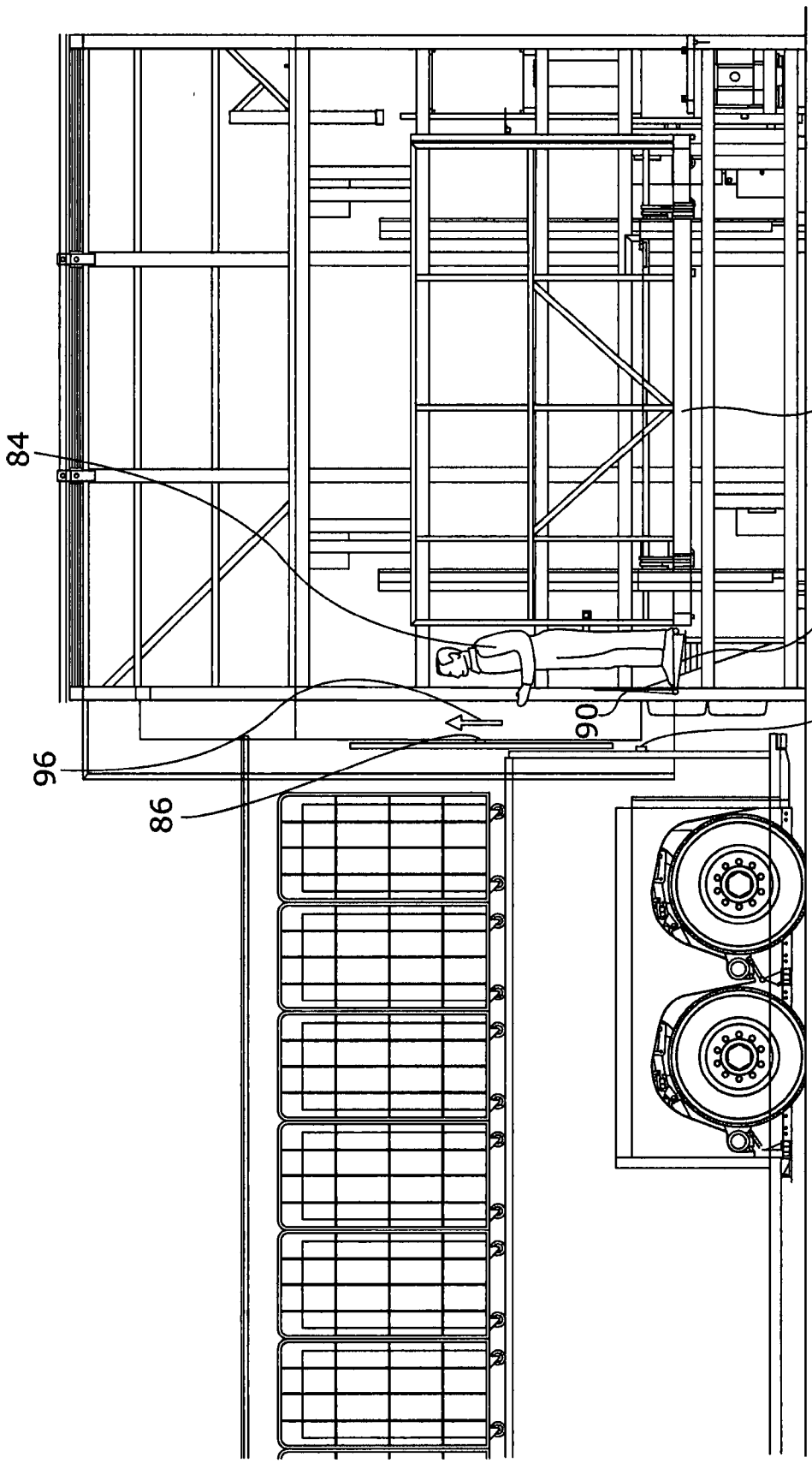


Figure 3d

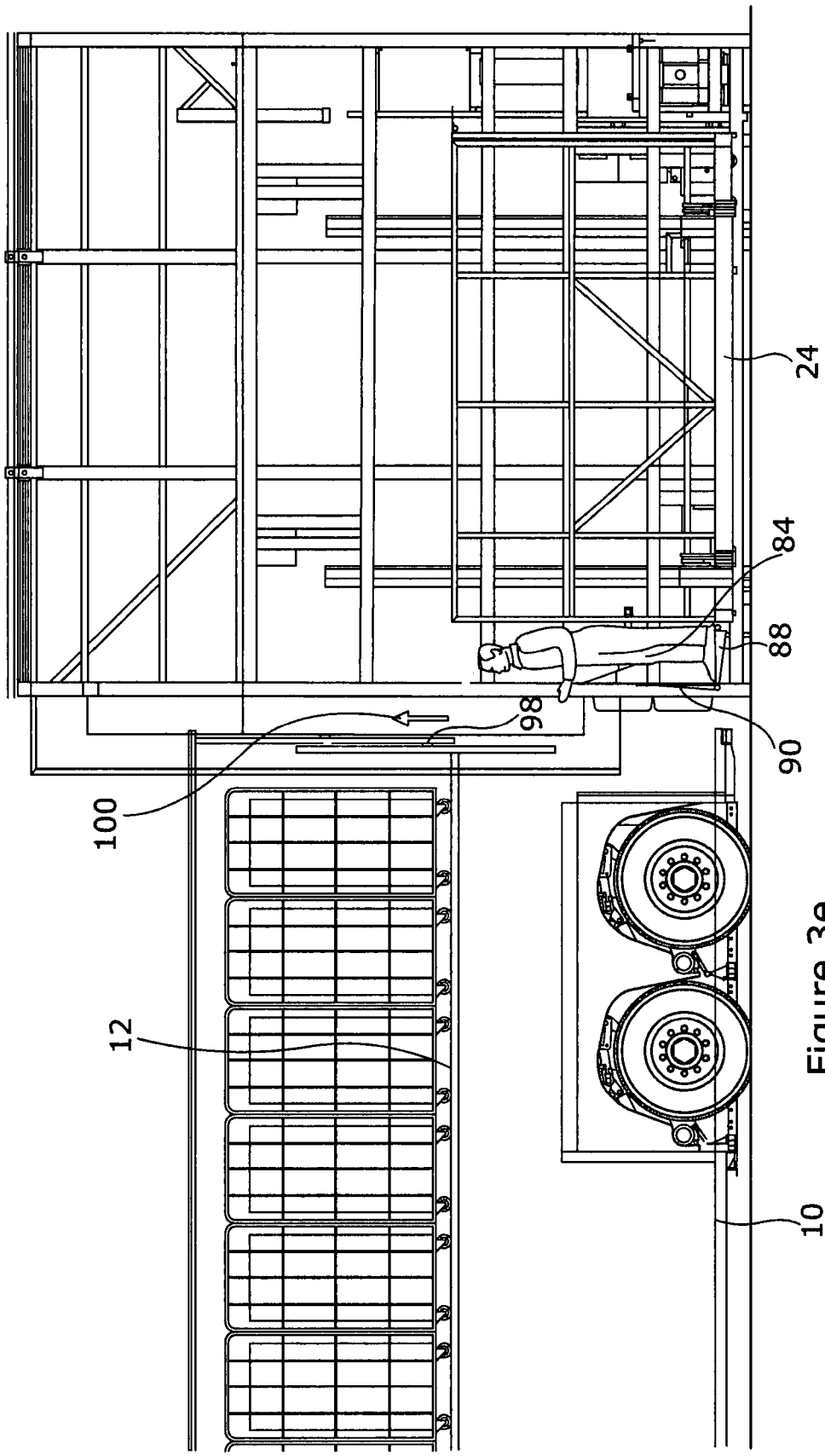


Figure 3e

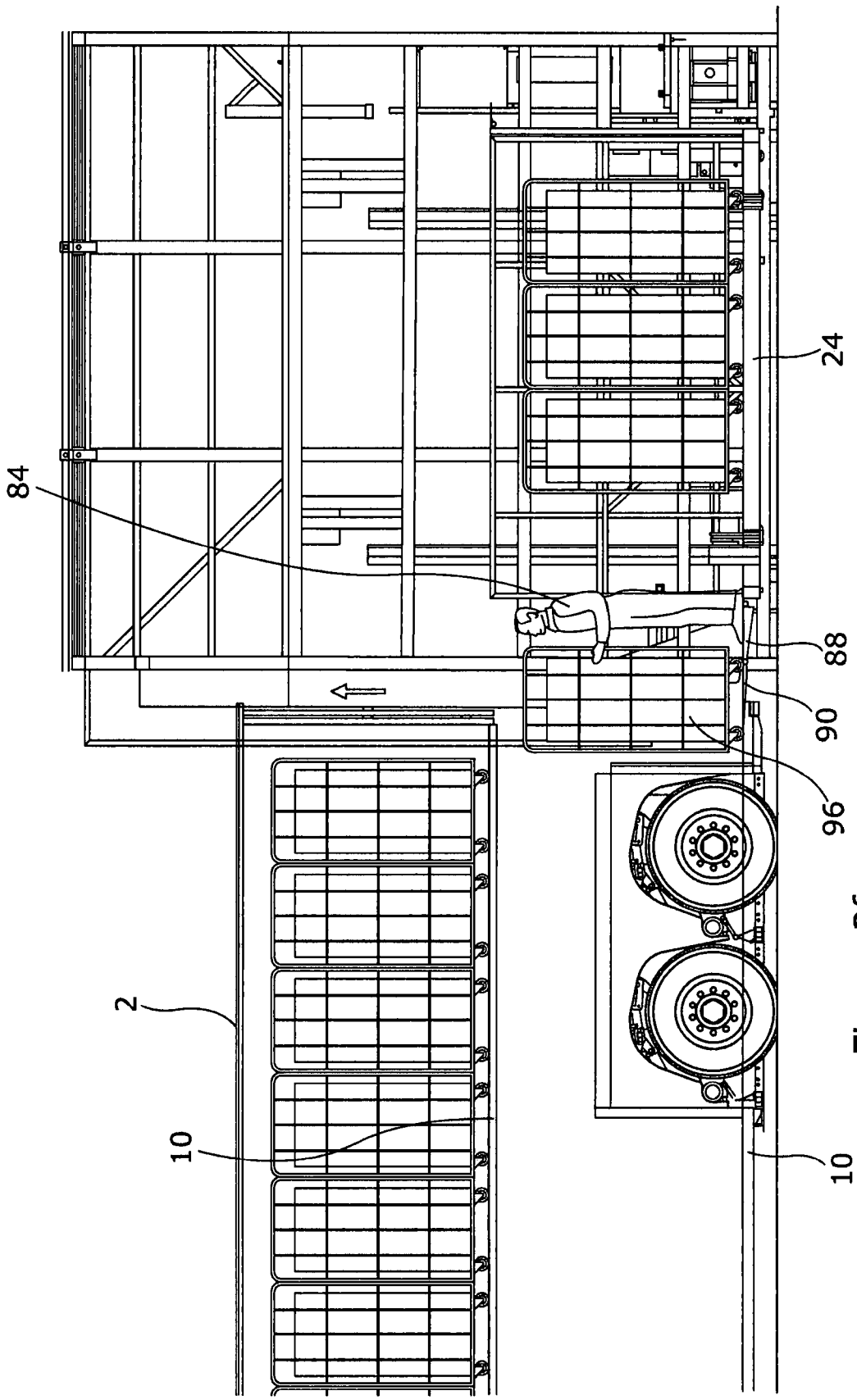


Figure 3f

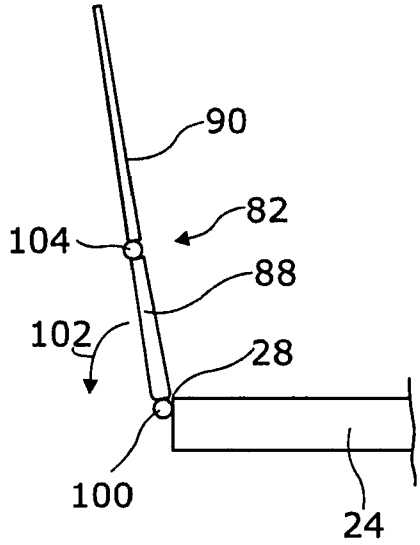


Figure 4a

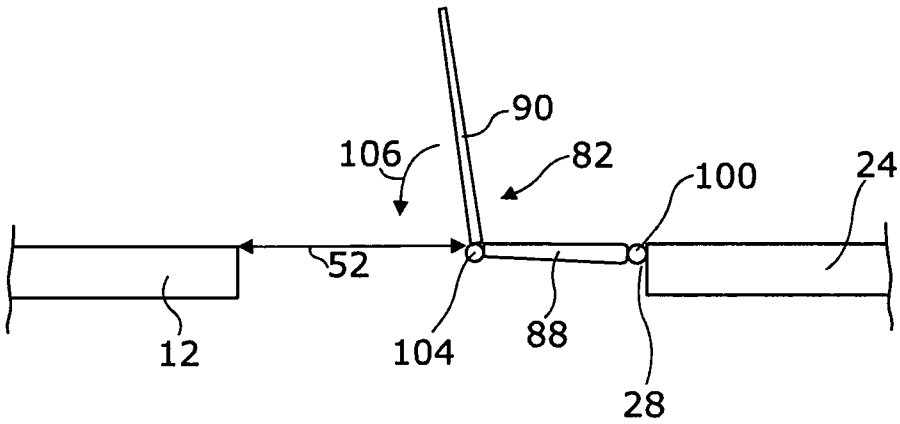


Figure 4b

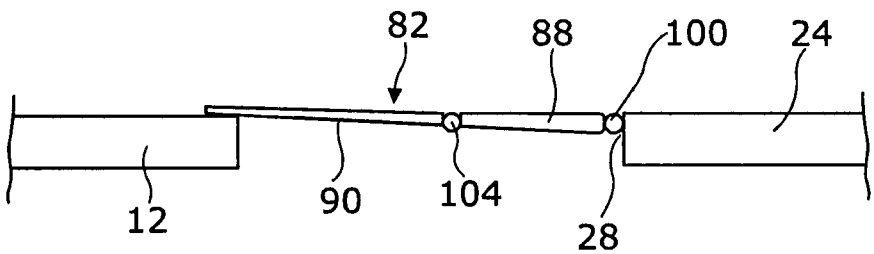


Figure 4c

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2017/050532

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65G69/24 B65G69/28
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 920 101 A (LLOYD S PACKING WAREHOUSES HOL) 6 March 1963 (1963-03-06) page 2, line 9 - page 4, line 29; claims; figures 1-7	1,16,17
Y	EP 2 732 999 A2 (ADAMS WILLIAM MARK [GB]) 21 May 2014 (2014-05-21) cited in the application paragraph [0062] - paragraph [0092]; claims; figures	1-15,18, 19
Y	US 2013/136567 A1 (HAMBARDZUMYAN LEVON [US]) 30 May 2013 (2013-05-30) paragraph [0050] - paragraph [0061]; claims; figures	1-15,18, 19

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 May 2017	23/05/2017

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Hoffert, Rudi

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2017/050532

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		CH 370896 A	31-07-1963
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		US 2016297344 A1	13-10-2016