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(54) **Refuse truck hopper**

(57) Hopper provided at the top with a cover (16) for sealing the hopper, at the front with protection doors (17) for the lifting and tipping means, and at the sides with cavities or inspection ports (12) accessible from the outside, where all the connections and means required for the proper working of the hopper are housed, which is beneficial for the maintenance and repair of said hopper, while above this inspection port there is a window (6)

along which there runs a guide (7) attached to the compacting unit (1) and which is so designed to prevent refuse from entering this inspection port through the window, being further provided with a drill hole (9) in this guide that enables the hydraulic system line to be run in from the inspection port to the compactor unit, wherein it is distributed to the different rams (3,4).

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Description**OBJECT OF THE INVENTION**

[0001] The object of the present invention is a refuse truck hopper from amongst the truck hoppers provided with means for collecting and compacting the garbage dumped into the hopper.

[0002] The present invention is characterised in that the special layout and design of the hopper make this an innovative system, for easy repair and maintenance, through being fitted with inspection means accessible from the outside, while said inspection means also contain all the control means for the operation, regulation and hydraulic distribution of the assembly.

[0003] The present invention therefore lies within the sphere of refuse trucks and in particular the means used for compacting the rubbish dumped in the bottom of the truck.

BACKGROUND OF THE INVENTION

[0004] Hitherto the hoppers of refuse trucks have had a number of drawbacks in that they are provided with all the inspection ports where all the control and distribution means are housed accessible from the inside of the actual hopper.

[0005] This arrangement represents an evident complication, as on the one hand it means that the compactor assembly, consisting of a blade responsible for sweeping the rubbish poured onto the bottom of the hopper in a backward direction in order to proceed to carry out the maintenance operations afterwards.

[0006] It also turns out that the whole set of hydraulic system components is only accessible from the inside, with the resultant drawbacks for the maintenance involved.

[0007] Another common disadvantage in refuse truck hoppers is the fact of not having any means to seal the hopper, so that the smells and dust originating from the rubbish in the hopper cannot escape.

[0008] It is therefore an aim of the present invention to overcome the foregoing drawbacks by developing for this purpose a hopper that has all the inspection ports unified and accessible from the outside and not from the inside, so that the interior components do not have to be removed. It also has a cover which, when closed, prevents bad smells from issuing, while when open, apart from offering the necessary space for emptying the refuse containers, it is equipped with the necessary systems for support and opening the bin lids.

[0009] Successfully overcoming the foregoing problems or technical difficulties is the aim of the present invention, which involves a series of technical construction difficulties which we will now describe.

DESCRIPTION OF THE INVENTION

[0010] The refuse truck hopper basically consists of a new structure of the same, designed so that it houses at the sides all the inspection ports for the different equipment and systems needed for the proper operation of the hopper.

[0011] Besides unifying all the previous interior ports, these inspection ports have the special feature of being accessible from the exterior.

[0012] On the other hand, the side windows along which the hopper assembly guides run, being in connection with the interior of the inspection ports, could be filled continuously with refuse, so that the actual guide is designed in order to act as a means for preventing the entry of rubbish through the window.

[0013] The access of the hydraulic lines to the inside of the hopper from the inspection ports takes place via a drill hole in the compactor assembly guide, and once inside this assembly has an inspection port in which the hydraulic means are distributed and branched to all the ram cylinders.

[0014] Furthermore, the hopper has an automatic opening cover or lid in combination with doors that protect the lifter-tipper assembly.

[0015] When closed, this cover that seals off the hopper prevents the issue of unpleasant smells and the dust caused by the rubbish in the hopper, but still keeping the maximum height of vehicle low. On the other hand, when the hopper cover is open, which is the case when the dustbin compacting and emptying operations are being carried out, it makes it possible not only to provide the necessary space for the dustbins to be emptied, but it also accommodates the necessary dustbin support and lid opening systems.

[0016] After the doors that protect the lifting and tipping assembly open, the hopper cover is automatically lifted by hydraulic means. Furthermore, thanks to the positioning of the operating means, i.e. the button panel by which the lifting and tipping unit is operated, it is possible to operate them with a higher degree of safety, as the operating button panel is on a side and access to the lifting and tipping area is impeded by means of the opening and closing doors.

[0017] As a result of the above-mentioned features relating to the hopper and to the fact of having an oil reservoir located on the truck body, a compact small-sized vehicle is successfully achieved.

DESCRIPTION OF THE DRAWINGS

[0018] To supplement the description that will be given below and in order to assist a clearer understanding of its features, the present descriptive report is accompanied by a set of drawings containing figures that represent the most significant details of the invention, for purely informative but not restrictive purposes.

[0019] Figure 1 shows a representation of the refuse

truck hopper seen from the rear, where the intention is to show the compactor assembly and the jointed blade for collecting refuse from the bottom of the hopper.

[0020] Figure 2 shows a different position in which the collection blade has swept the bottom of the hopper and the compactor blade has moved to the back of the hopper.

[0021] Figure 3 shows a perspective view of the compactor assembly together with the guides used that run along the side windows of the hopper.

[0022] Figure 4 shows a perspective view of the hopper where we see the side cavity that houses the system inspection port accessible from the outside, as well as the compactor assembly guide.

[0023] Figure 5 shows the inside of one of the hopper side inspection ports.

[0024] Figure 6 shows a perspective representation of the hopper together with the sealing cover in its closed position.

[0025] Figure 7 shows the hopper unit, together with the lifting and tipping means, as well as the raised lid and the means for supporting and opening the bin lid.

PREFERRED EMBODIMENT OF THE INVENTION

[0026] In the light of the figures a preferred embodiment of the proposed invention is described below.

[0027] In figure 1 we see the inside of a refuse truck hopper, which houses a compactor assembly (1) operated by rams (4) responsible for compacting the refuse towards the inner end of the truck. Jointed above this compactor unit there is a blade (2) for cleaning and collecting the bottom of the hopper which is operated by means of rams (3). At the side of the hopper body we see the refuse truck lifting and tipping arms.

[0028] In figure 2 we observe how the blade (2) for collecting the refuse dumped in the hopper has done a complete turn, whilst almost at the same time the compactor unit (1) has moved backwards, taking the blade (2) along with it. A noteworthy feature is the side window (6), which is observed. This window is the one along which runs the guides (7) with which the compactor unit is provided.

[0029] Figure 3 shows a detailed view of the compactor unit (1), which presents associated lateral guides (7) that cover the whole side length of the compactor. These guides are the ones that run along the inside of the window (6) and are housed inside the side inspection ports (12) (figure 4).

[0030] The guides are protected with wear-resistant material (8) as a protective element reducing the friction and wear resulting from contact with the materials. These guides (7) contain drill holes (9) through which the hydraulic line runs from the outside of the hopper to the compactor unit (1). At the front end of the compactor unit there are recesses (10) housing supplementary means to achieve the swivelling of the refuse collection blade (2) with the compactor (1).

[0031] On the top of the compactor unit (1) there is an inspection port (11) housing the connections for the distribution of the hydraulic medium to the different rams.

[0032] In figure 4 we can see all the features that we have just described in greater detail, in particular it is shown how the hopper is provided at the sides with inspection cavities (12) housing all the connections and means required for all the systems. These cavities or inspection ports (12) are accessible from the outside. We observe the window (6) along which runs the guide (7), which protects practically the whole of same on account of its length, which prevents any refuse entering the inspection port. It may be seen that there is a hole (9) drilled into the guide (7) through which runs the hydraulic line.

[0033] Figure 5 shows the inside of the inspection port (12) housing the electrical junction box (13), terminal strips, etc., an operating and control button panel; as well as the hydraulic system lines, while the input line to the compactor unit is referenced as line (15). We may observe the guide (7) that runs along the window (6).

[0034] In figure 6 we see the hopper assembly where the hopper sealing cover (16) is shown. In this position this cover prevents the issue of bad smells and the dust from the refuse inside the hopper, while the vehicle's maximum height is kept low.

[0035] Over the front end of the hopper assembly there is a set of doors (17) covering the lifting and tipping unit. Once open, these doors automatically open cover (16). As the button panel (18) is on one of the sides and when the doors (17) are open, access is impeded to the lifting and tipping area, which represents a certain degree of safety for the operators who are engaged in bin handling.

[0036] Figure 7 shows a bin (21) in tipping position. For this purpose the cover (17) is raised automatically by hydraulic means (19) which deploy means for the support and opening (20) of the bin (21) lids (22) as they open, so that every type of bin lid available on the market may be opened and supported.

[0037] This essential nature of this invention is not altered by variations in materials, shape, size and arrangement of the component parts described in a non-restrictive fashion, which is sufficient for them to be reproduced by an expert.

Claims

1. Refuse truck hopper **characterised in that** the hopper is equipped with an automatically opening protection cover for the hopper at the top, at the front with protection doors for the lifting and tipping means, and at the sides with cavities or inspection ports (12) accessible from the outside where all the different system connections are housed, provided with a window (6) along which runs the compactor unit (1) guide (7), a guide that protects the window

along its whole length to prevent the entry of refuse inside the inspection port (12).

2. Refuse truck hopper, as defined in claim 1, **characterised in that** the guide (7) is attached to the compactor unit (1), said guide (7) being provided with side protection (8) of wear-resistant material besides a drill hole (9) through which there runs a hydraulic system line from the inside of the inspection port to the inside of the compactor unit (1). 5 10
3. Refuse truck hopper, as defined in claim 1, **characterised in that** the compactor unit has an inspection port (11) where the hydraulic input line is distributed and branched to the operating rams. 15
4. Refuse truck hopper, as defined in claim 1, **characterised in that** the hopper opening and closing cover (16) is operated automatically by hydraulic means; in the closed position it prevents bad smells from issuing but keeping the maximum height of the vehicle low, while in the open position it is provided with space for emptying the necessary refuse containers and for deploying the required systems for supporting and opening the lids (22) of the bins (21). 20 25
5. Refuse truck hopper, as defined in claim 1, **characterised in that** the doors (17) protecting the lifting and tipping means protect them while the doors are closed, and when they open, they force the lifting and tipping unit to be operated from outside the lifting and tipping area.. 30

Amended claims in accordance with Rule 86(2) EPC. 35

1. Refuse truck hopper equipped with an automatically opening protection cover for the hopper at the top, at the top with protection doors for the lifting and tipping means, **characterized in that** the hopper is provided with: 40

- At the sides with cavities or inspection ports (12) accessible from the outside where all the different connection systems are housed. 45
- At the sides with a window (6) which defines a track which is in the outside of the hopper, along which runs a compactor unit guide (7) that protects the window along its whole length to prevent the entry of refuse inside the inspection port (12). 50

2. Refuse truck hopper, as defined in claim 1, **characterised in that** the guide (7) is attached to the compactor unit (1), said guide (7) being provided with side protection (8) of wear-resistant material besides a drill hole (9) through which there runs a hydraulic system line from the inside of the inspec- 55

tion port to the inside of the compactor unit (1).

3. Refuse truck hopper, as defined in claim 1, **characterised in that** the compactor unit has an inspection port (12) where the hydraulic input line is distributed and branched to the operating rams.

4. Refuse truck hopper, as defined in claim 1, **characterised in that** the hopper opening and closing cover (16) is operated automatically by hydraulic means; in the closed position it prevents bad smells from issuing but keeping the maximum height of the vehicle low, while in the open position it is provided with space for emptying the necessary refuse containers and for deploying the required systems for supporting and opening the lids (22) of the bins (21).

5. Refuse truck hopper, as defined in claim 1, **characterised in that** the doors (17) protecting the lifting and tipping means protect them while the doors are closed, and when they open, they force the lifting and tipping unit to be operated from outside the lifting and tipping area..

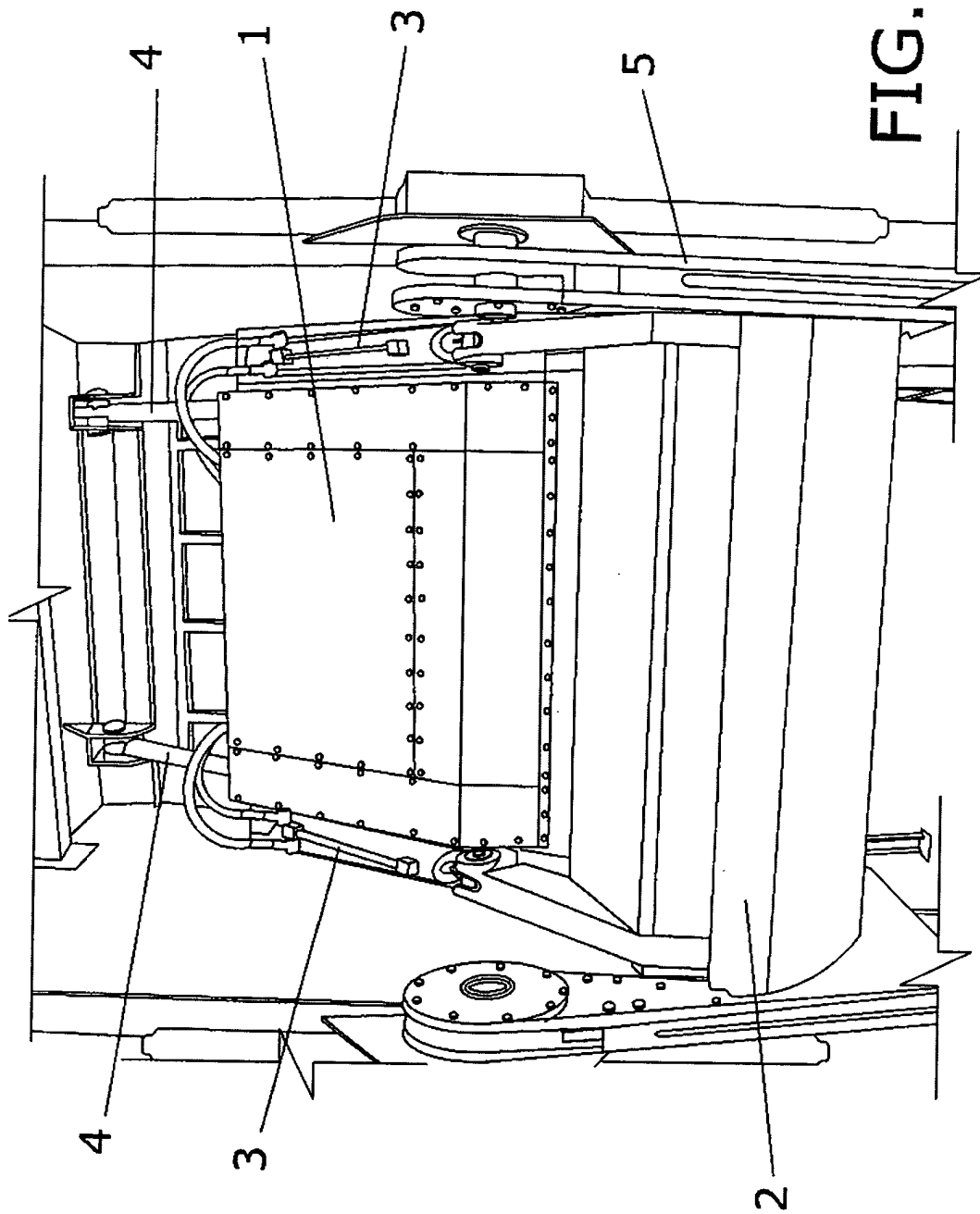


FIG. 1

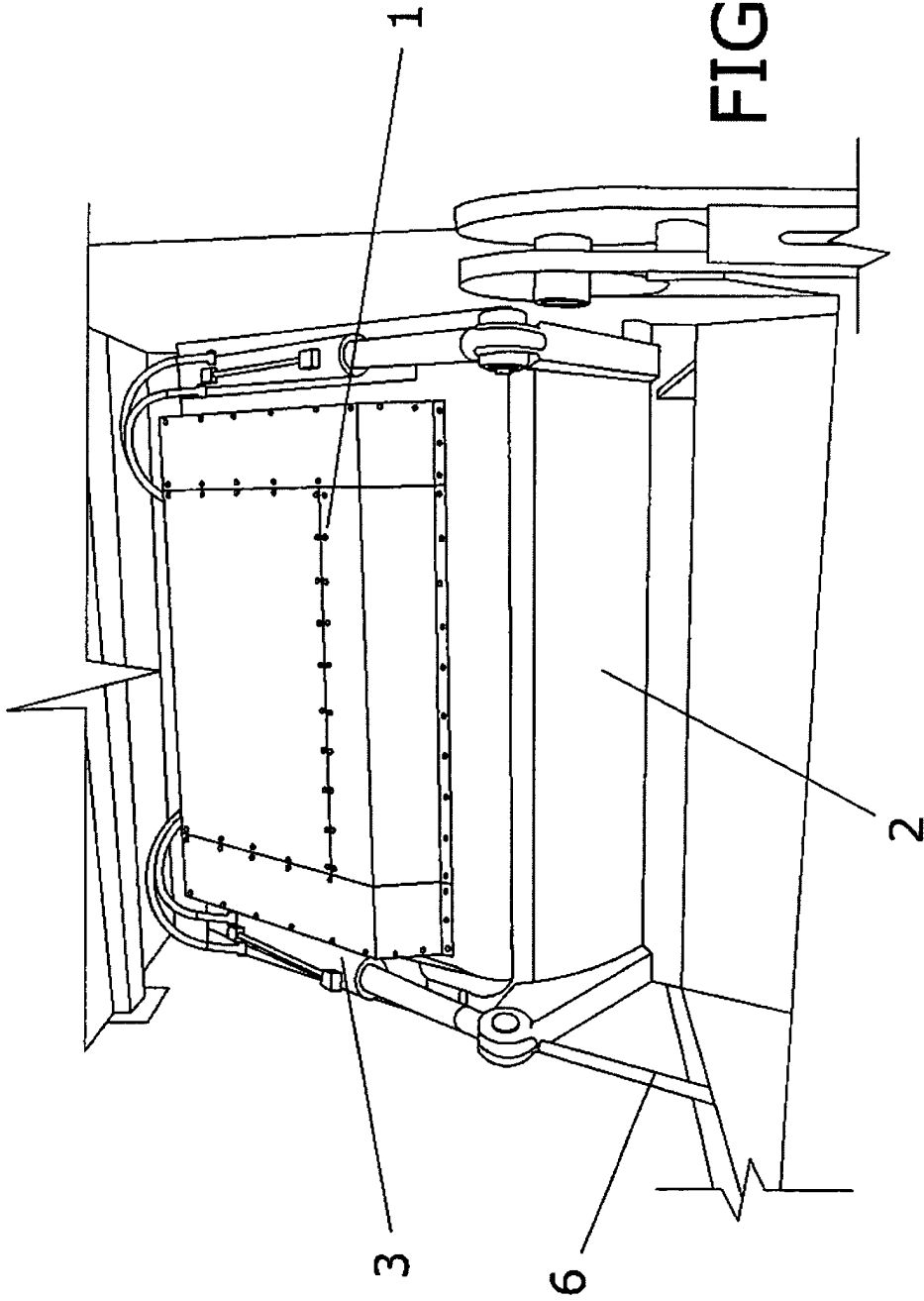
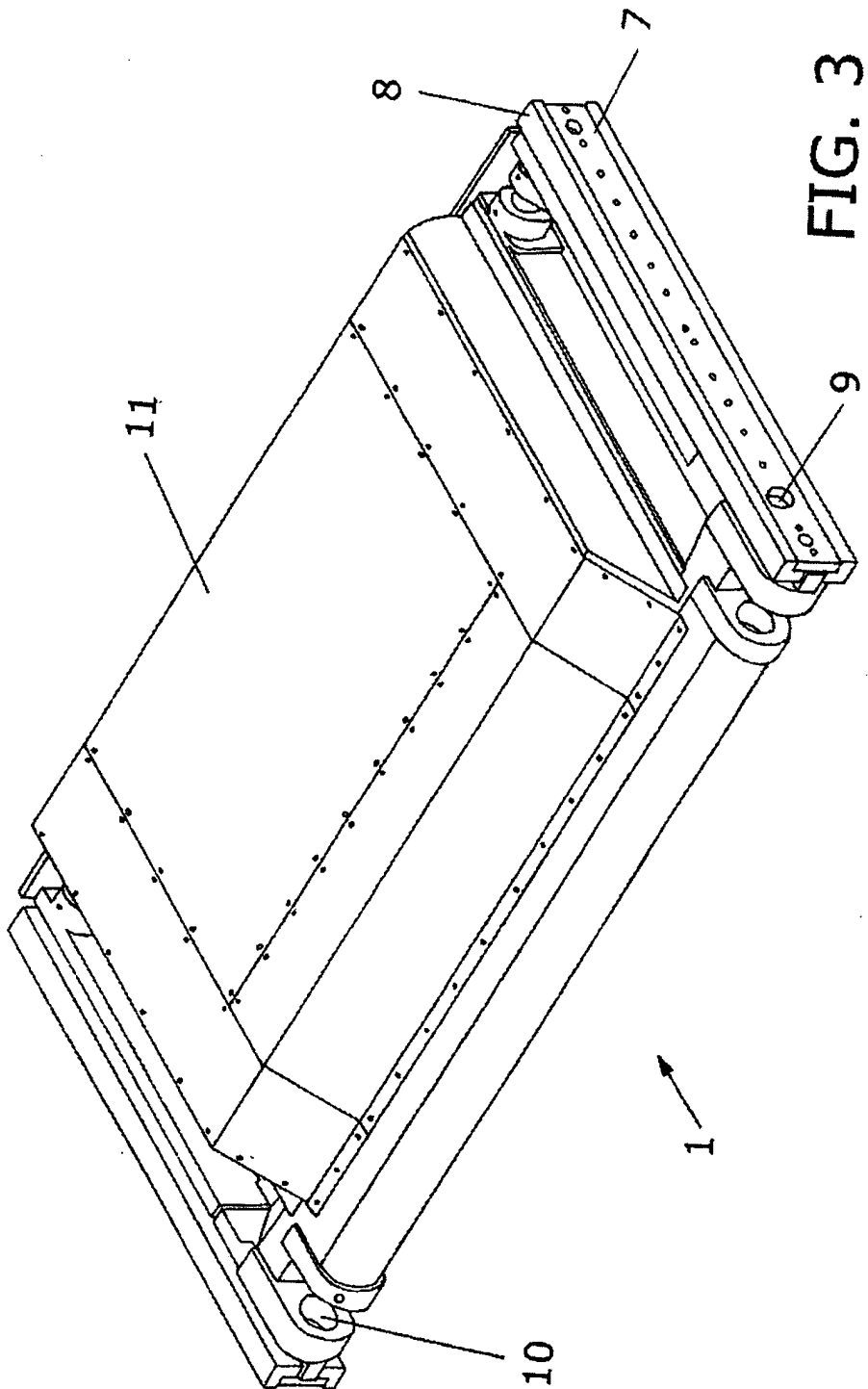


FIG. 2



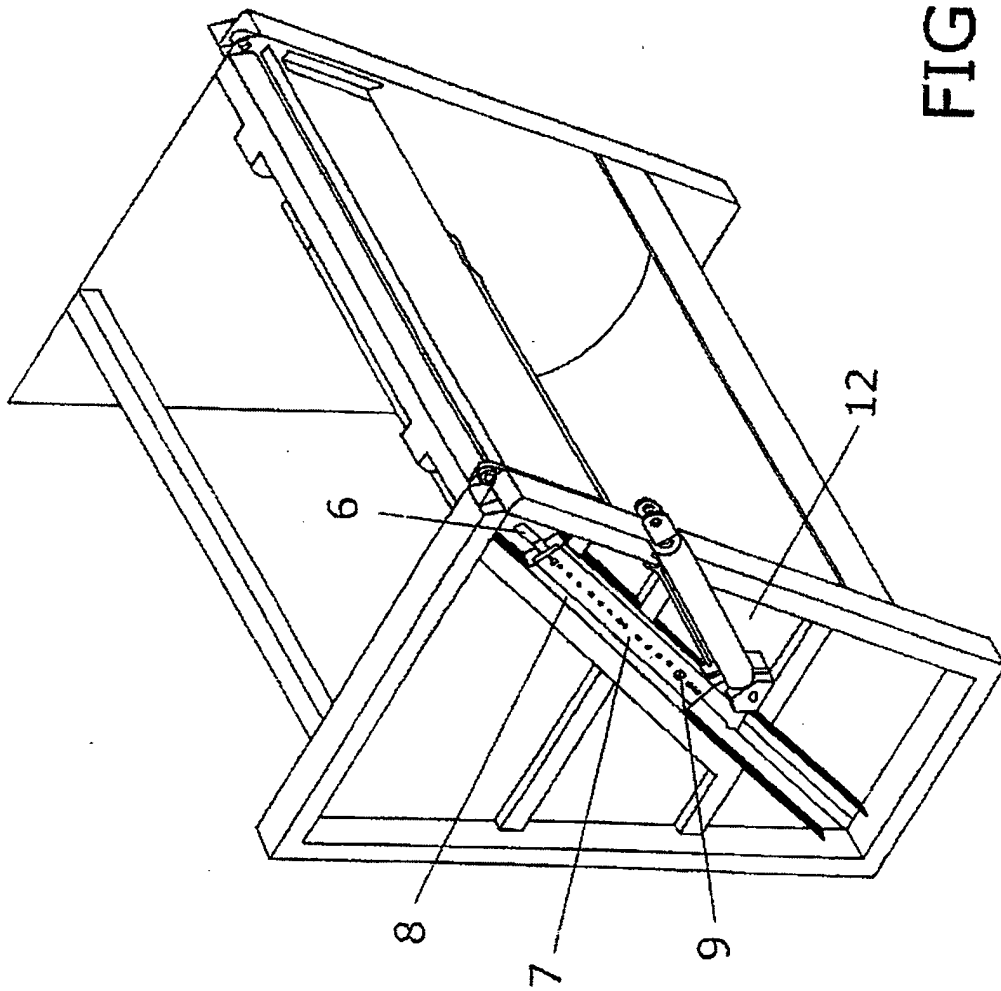


FIG. 4

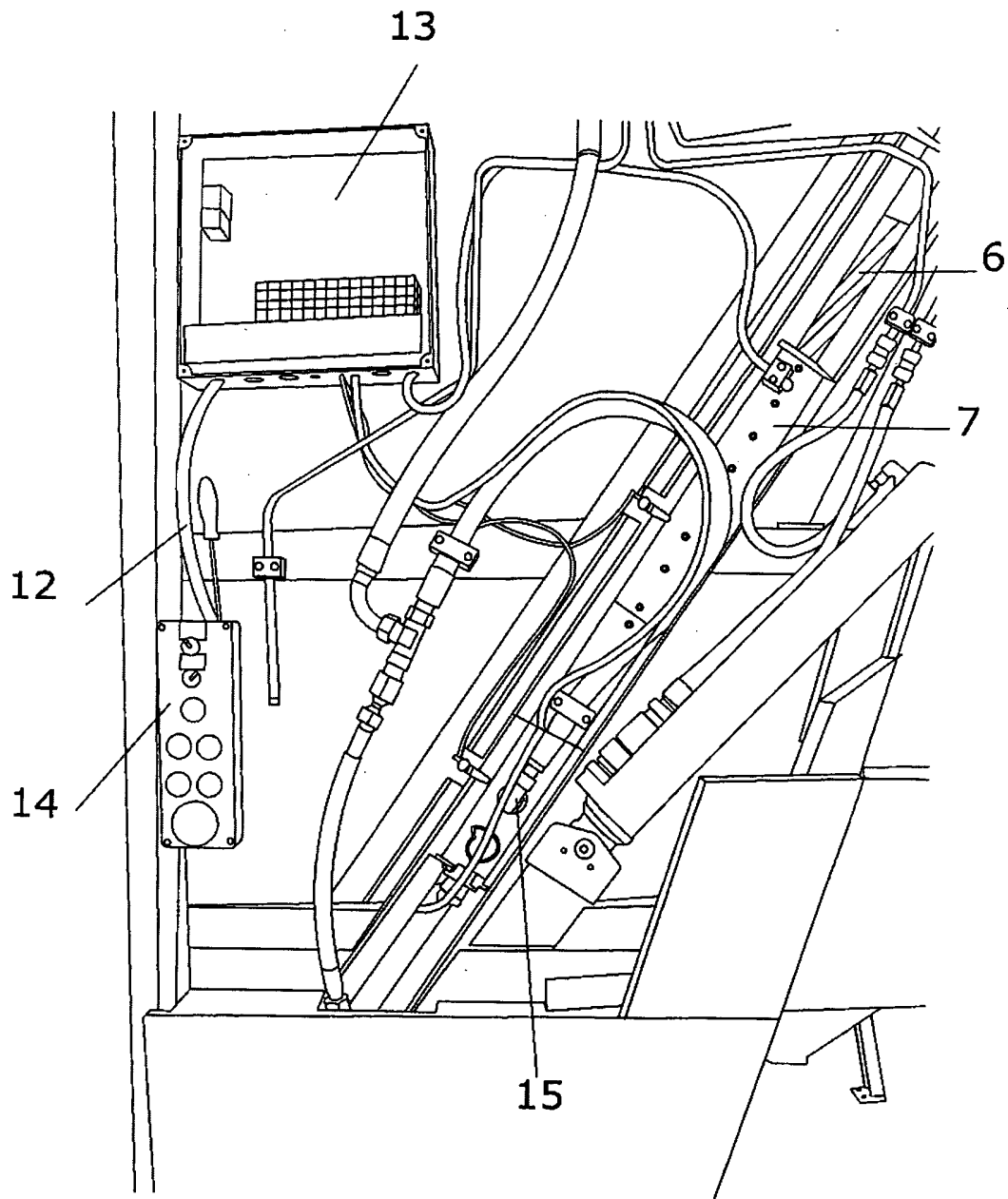


FIG. 5

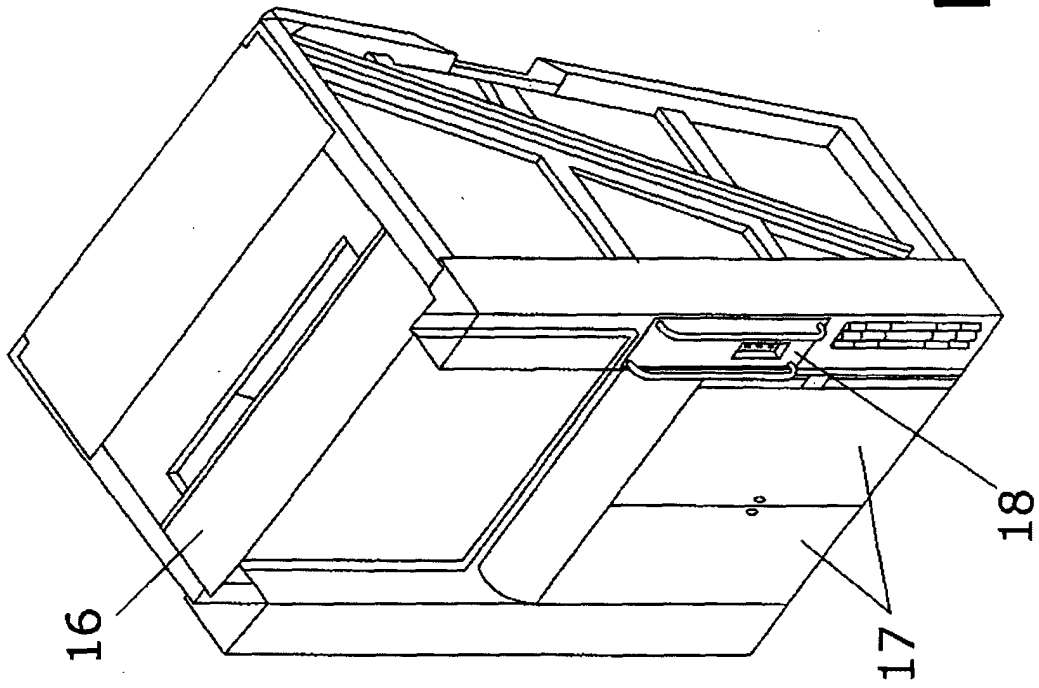


FIG. 6

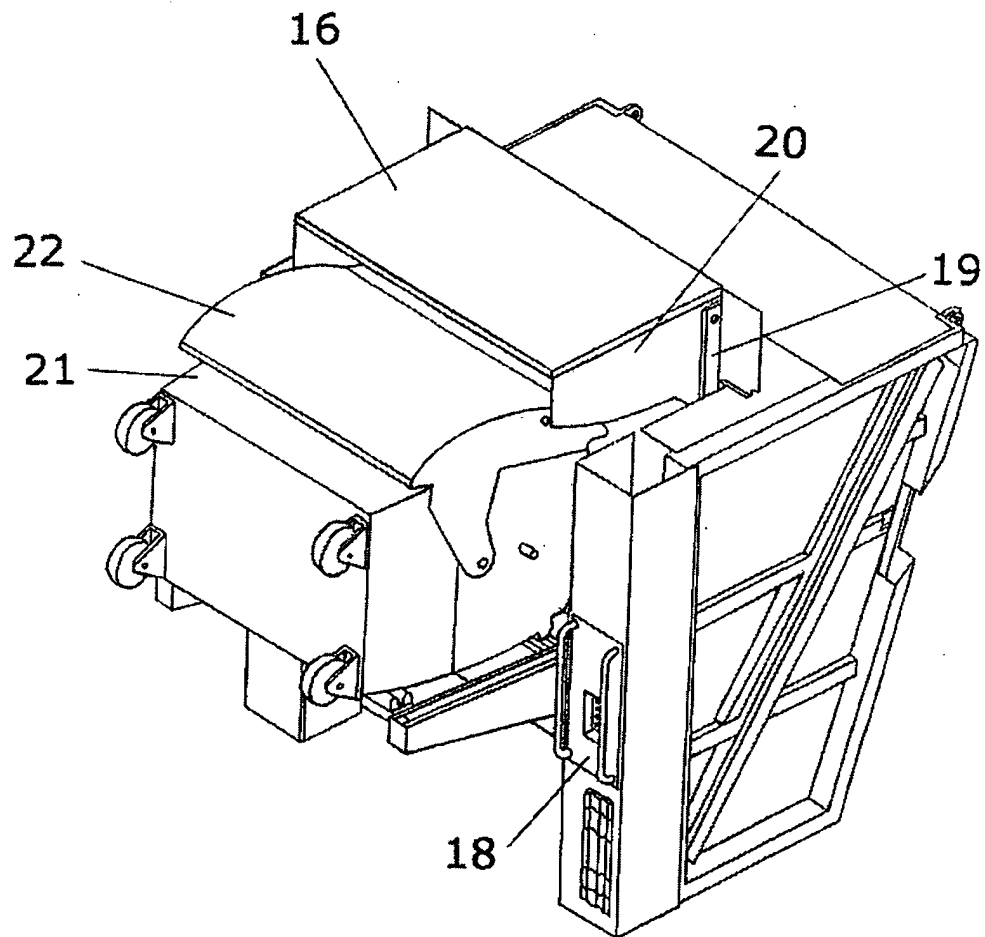


FIG. 7



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EUROPEAN SEARCH REPORT

Application Number
EP 04 38 1018

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 21 February 2005	Examiner Smolders, R
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			

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EPO FORM 1503 03.82 (P4/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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21-02-2005

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