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(54) **BIN TIPPING SYSTEM FOR WASTE COLLECTION VEHICLES**

(57) Bin tipping system (100) for waste collection vehicles comprising at least one cargo bay (101) for residual or recyclable materials having at least a side end (105), and at least one extendable side panel (102) hinged to the at least one side end (105) of the cargo bay (101). The bin tipping system (100) also comprising a handling mechanism (103) for handling the extendable side panel

(102) comprising a manual or electric trigger device for setting the position of the extendable side panel (102) between a vertical and parallel closure position relative to the lateral end (105) of the cargo bay (101), and an opened position at an opening angle between 0° and 90° relative to said lateral end (105).

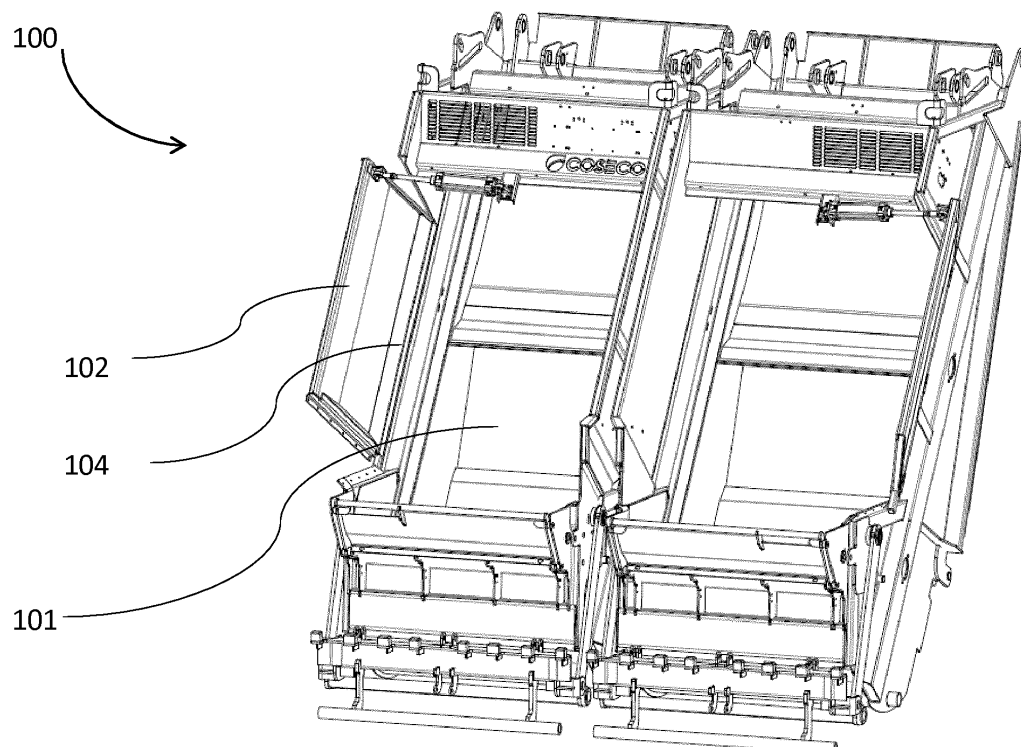


FIG. 1

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Description

[0001] The present invention relates to a bin tipping system for waste collection vehicles.

[0002] As it is known, a vehicle for the collection of waste is a vehicle approved to go on the road and intended for the collection and transport of waste to their place of treatment (treatment center or incinerator). The waste collection vehicles are equipped with a device that allows the waste to be compressed. In general, the means for the collection of waste include a body comprising a front portion for the waste receiving and a rear portion, communicating with the front portion or tipping portion, comprising a system for overturning containers. The rear portion or tailgate is supplied with a packing blade or compression blade and with an associated control apparatus (names according to the rule UNI EN 1501-1).

[0003] The main limit of the known vehicles for the collection of waste is that the system for the tipping of containers of waste from a dumpster to a load compartment of the vehicle. In fact, in the known vehicles, the waste containers, commonly called dumpsters, are anchored and lifted towards an entrance of the tipping system, in which the waste are downloaded. Depending on the width of the entrance, the vehicle can anchor and lift larger or smaller containers. The maximum width is however currently fixed by the width of the roadway on which the vehicle is moving.

[0004] A first solution is described in the German patent application DE102009056077 which describes a disposal means having a receiving container, for residual or recyclable materials, and a feeding device. The feeding device is provided with two devices each having a lifting unit for handling and emptying waste containers. The common movement of the two lifting devices is performed by an electronic controller.

[0005] Furthermore, the American patent application US3941263 describes a method for controlling the action of packaging of a means for the collection of waste of the rear-charge type, which includes a body provided with an opening for receiving the load and a system of mobile engagement of the blade. The method also provides that a main system let move the blade.

[0006] However, these known systems are not suitable for loading bins of variable dimensions and, therefore, they are not adaptable to different loading conditions.

[0007] The object of the present invention is to provide a bin tipping system for waste collection vehicles which is simple and flexible in use, therefore which overcomes the limitations of known technical solutions.

[0008] According to the present invention, a bin tipping system for waste collection vehicles, as defined in claim 1.

[0009] For a better understanding of the present invention, a preferred embodiment is now described, purely by way of non-limiting example, with reference to the attached drawings, in which:

- figure 1 shows a bin tipping system for waste collection vehicles, according to the invention;
- figure 2 shows a detailed view of the bin tipping system for waste collection vehicles, according to the invention;
- figure 3 shows a front view of the bin tipping system for waste collection vehicles, according to the invention;
- figure 4 shows a three-dimensional view of the bin tipping system for waste collection vehicles in open position, according to the invention;
- figure 5 shows a three - dimensional view of the bin tipping system for waste collection vehicles in closed position, according to the invention.

[0010] With reference to figure 1, a bin tipping system for waste collection vehicles is provided, according to the invention.

[0011] In detail, the bin tipping system 100 for waste collection vehicles comprises at least one cargo bay 101 for residual or recyclable materials, at least one expandable side panel 102 which allows the cargo bay 101 for residual or recyclable materials to modify its width and adapt to load containers of different dimensions.

[0012] As best shown in Figure 2, according to an aspect of the invention the side panel 102 is hinged, by means of a hinge 104, at a side end 105 of the cargo bay 101.

[0013] According to an aspect of the invention, the bin tipping system for waste collection vehicles 100 comprises a handling mechanism 103 for moving the expandable side panel 102.

[0014] This mechanism 103 is preferably a pneumatic piston installed on the cargo bay 101.

[0015] According to another aspect of the invention, the handling mechanism 103 is a hydraulic piston.

[0016] According to another aspect of the invention, the handling mechanism 103 is a manually operated device using handles, ropes, chains, winches, sticks of any type of material.

[0017] According to another aspect of the invention, the movement mechanism 103 is an electric piston driven by an electric motor.

[0018] The expandable side panel 102 assumes a variable position between a vertical and parallel closing position with respect to the side end 105 of the cargo bay 101 on which it is hinged, as shown in Figure 5, and an open position, shown in Figure 4 and in Figure 2, at an angle comprised between 0° and 90° with respect to the side end.

[0019] The handling mechanism 103 keeps the expandable side panel 102 in the closed position, and if necessary moves the latter towards the outside, in the open position, thus increasing the width of the side panel 102 and allowing loading containers of variable size.

[0020] According to an aspect of the invention, the bin tipping system for waste collection vehicles 100 through the opening of the expandable side panel 102 reaches

a width of the loading opening such as to exceed the width of the roadway on which the waste collection vehicle moves. In particular, the expandable side panel 102 according to the invention allows to hook and unload at the same time the waste from two containers having a maximum overall dimension exceeding the width of the roadway.

[0021] According to another aspect of the invention, the bin tipping system 100 can comprise several expandable side panels 102.

[0022] The bin tipping system for waste collection vehicles bin tipping system for waste collection vehicles 100 is advantageously applicable to the rear portion or unloading door of vehicles for collecting solid urban waste.

[0023] Therefore, the bin tipping system for waste collection vehicles according to the invention is efficient.

[0024] Another advantage of the tilting system for waste collection means according to the invention is that it is compatible with containers of different dimensions.

[0025] Advantageously according to the invention, the bin tipping system for waste collection vehicles is able to simultaneously load two containers of the maximum size, for example a bin of 1100 liters, thus avoiding the need for two separate loads and saving time. This simultaneous loading implies to exceed the maximum width compatible with the carriageway, thanks to the extendable side panels.

[0026] A further advantage of the bin tipping system for waste collection vehicles according to the invention is to be low cost.

[0027] Finally, it is apparent that the bin tipping system for waste collection vehicles here described and illustrated may be subject to modifications and variations without thereby departing from the scope of the present invention, as defined in the appended claims.

tric piston actuated by an electric motor installed on the cargo bay (101).

3. Waste collection vehicle for solid urban waste comprising a tipping system (100) according to one of the claims 1-2.

Claims

1. Bin tipping system (100) for waste collection vehicles comprising at least one cargo bay (101) for residual or recyclable materials having at least a side end (105), and at least one extendable side panel (102) hinged to the at least one side end (105) of the cargo bay (101);

characterized in comprising a handling mechanism (103) for handling the extendable side panel (102) comprising a manual or electric trigger device for setting the position of the extendable side panel (102) between a vertical and parallel closure position relative to the lateral end (105) of the cargo bay (101), and an opened position at an opening angle between 0° and 90° relative to said lateral end (105).

2. Bin tipping system (100) according to claim 1, **characterized in that** said handling mechanism (103) of the extendable side panel (102) comprises an elec-

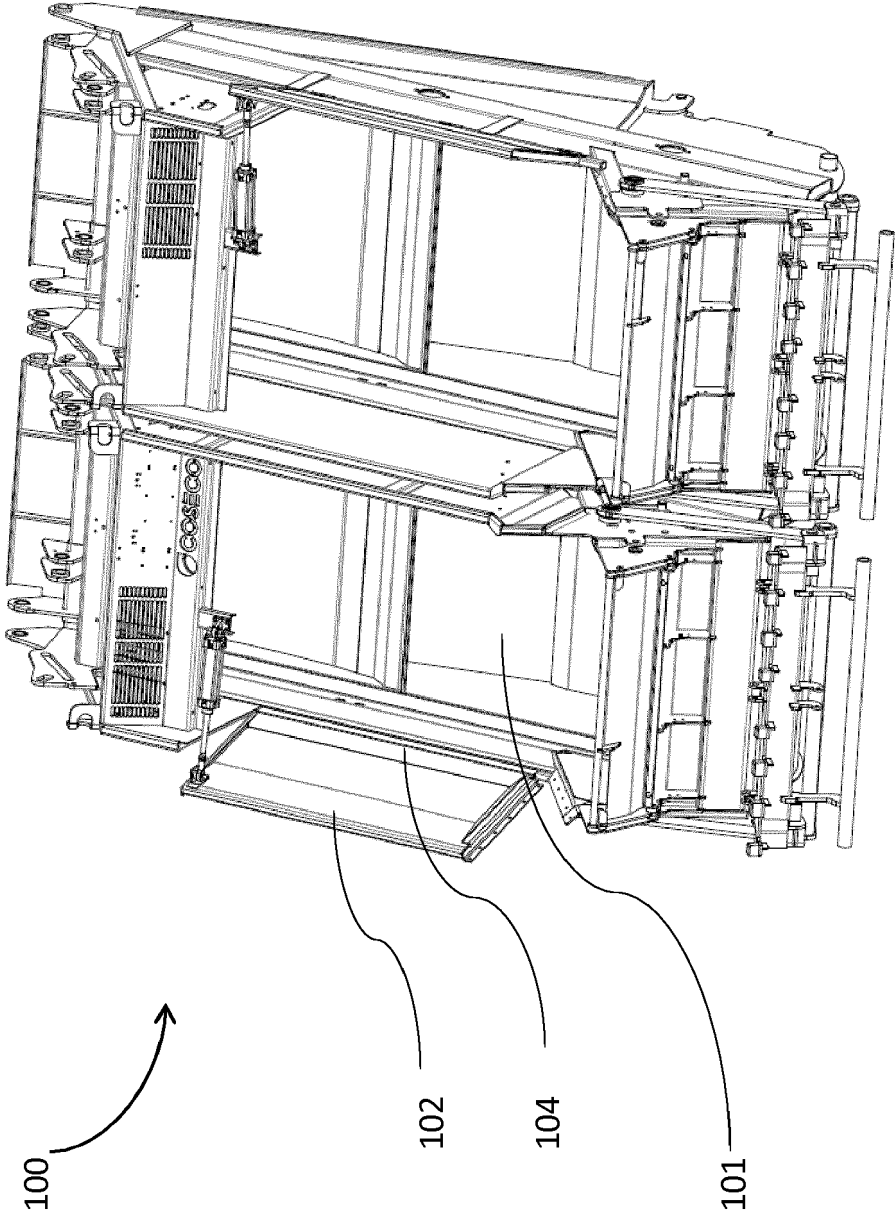


FIG. 1

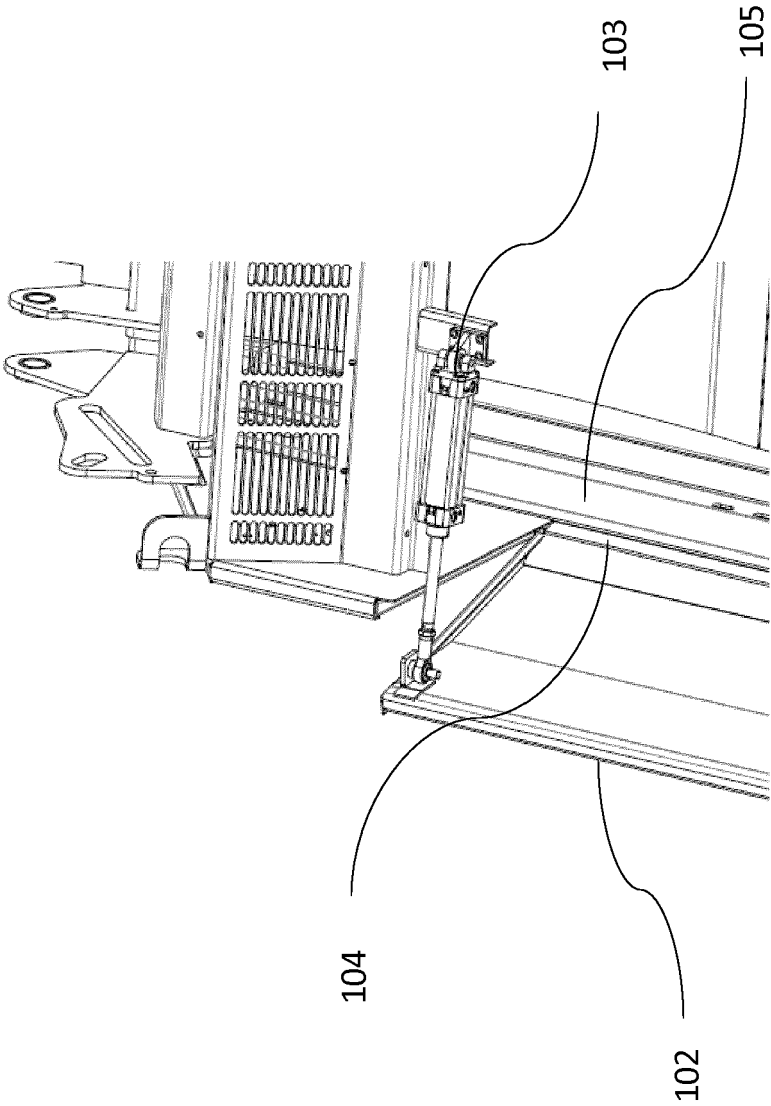


FIG. 2

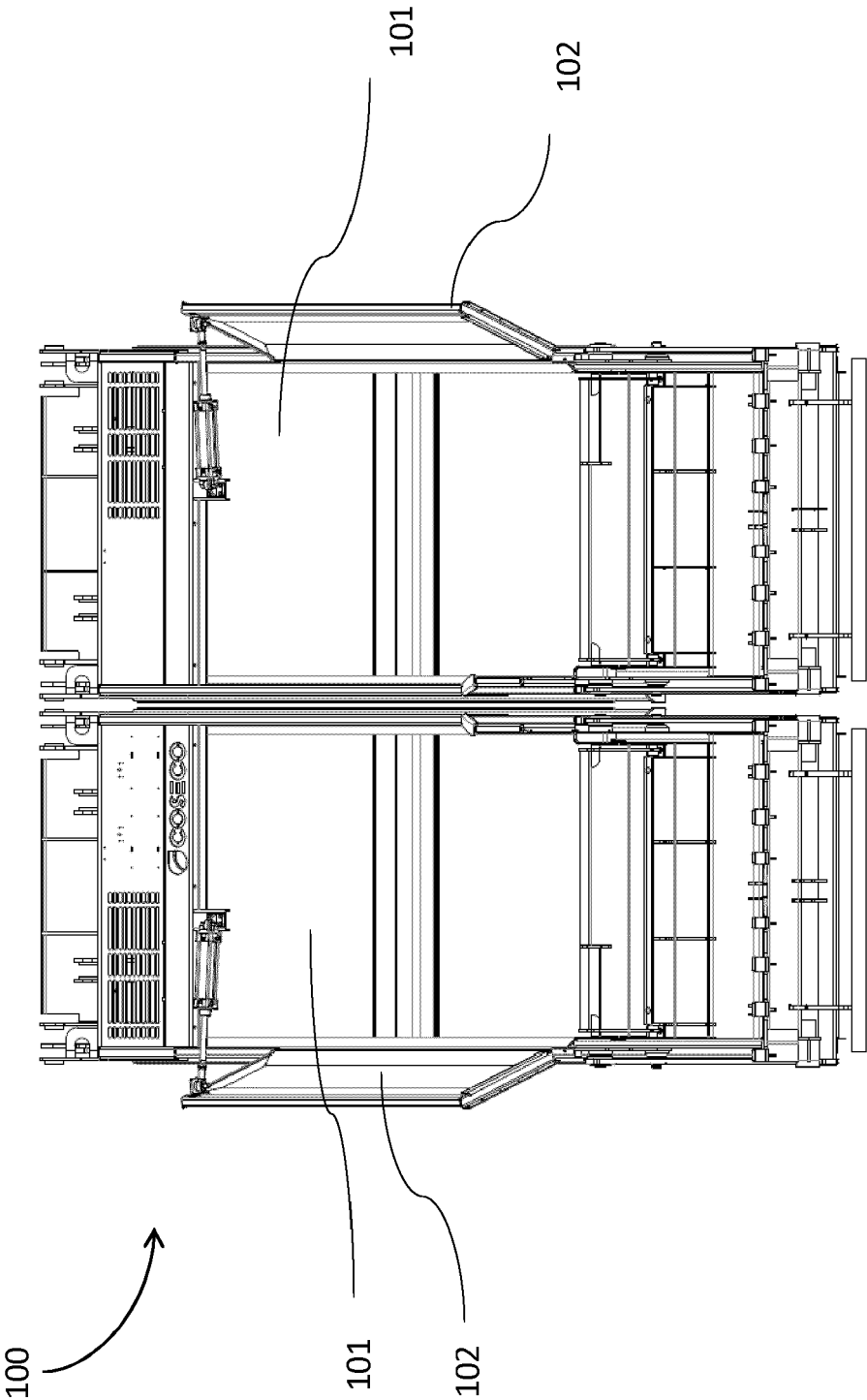


FIG. 3

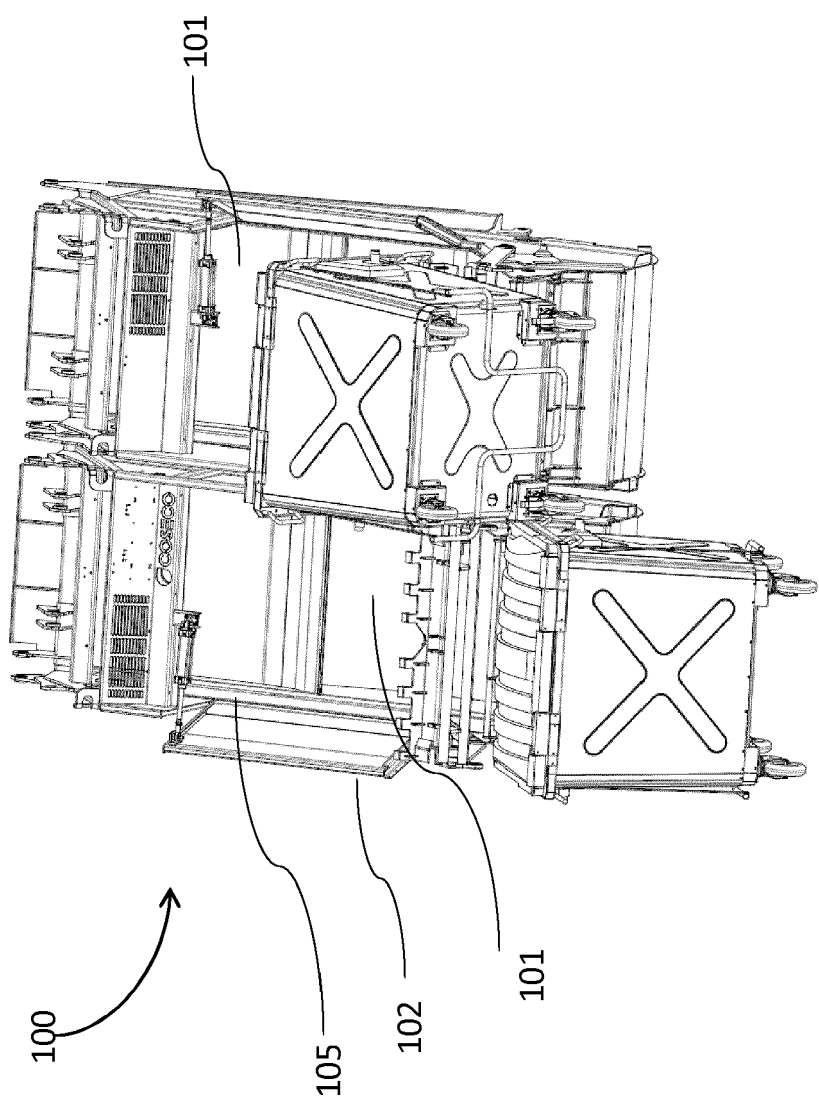


FIG. 4

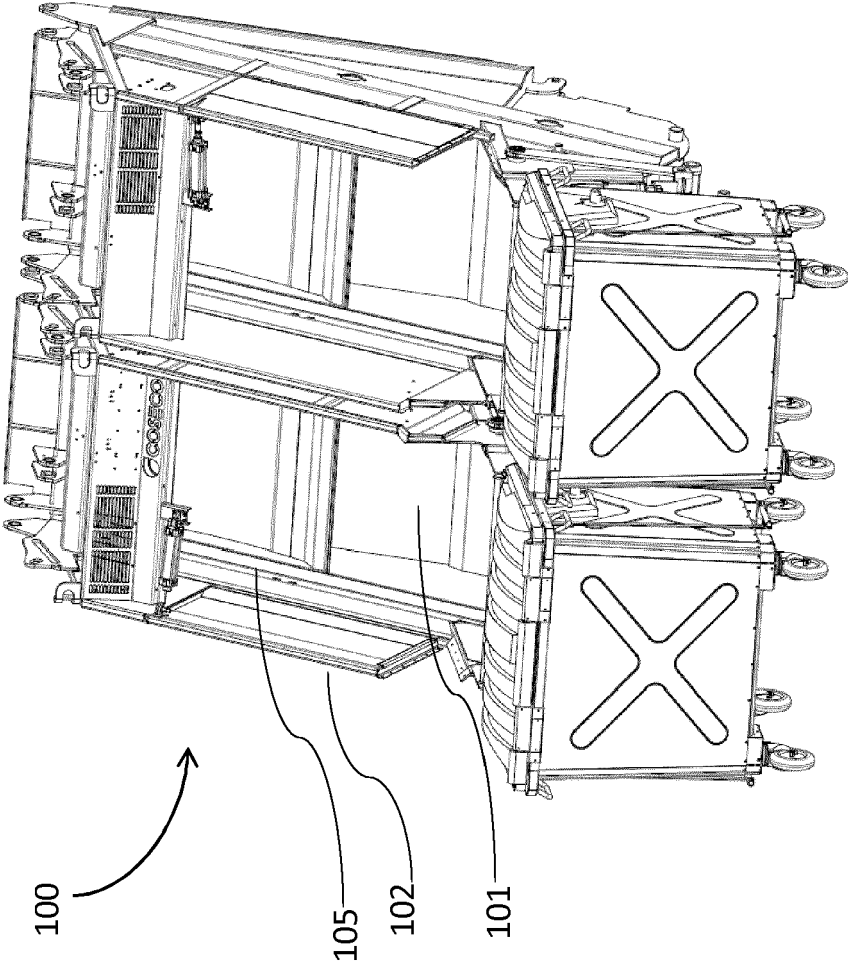


FIG. 5



EUROPEAN SEARCH REPORT

Application Number
EP 19 16 4866

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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	US 3 870 174 A (BRISSON JOHN R) 11 March 1975 (1975-03-11) * column 1, line 66 - column 2, line 6; figures *	1-3	INV. B65F3/04
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			TECHNICAL FIELDS SEARCHED (IPC)
			B65F B67C B65D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 20 August 2019	Examiner Serrano Galarraga, J
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 03/02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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20-08-2019

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- DE 102009056077 [0004]
- US 3941263 A [0005]