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(54) **DUSTBIN HOIST ARRANGEMENT**

(57) The present invention relates to a dustbin hoist arrangement (6) used in a refuse collection vehicle (1). Such a dustbin hoist (6) comprises a dustbin holder (7), regulated with a lifting mechanism (8). The dustbin holder comprising a frame (9) and a comb (10) fitted thereto and being provided with protruding gripping units (11). The innovative dustbin hoist (6) also features at least one

widening unit (13), which can be manoeuvred between a transport position beside the frame of the dustbin holder and a lifting position in a vertical place defined by the comb and the gripping units thereof. This widening unit comprises secondary gripping units (16) that are arranged, in the widening unit's lifting position, to be in line with the comb's (10) gripping units (11).

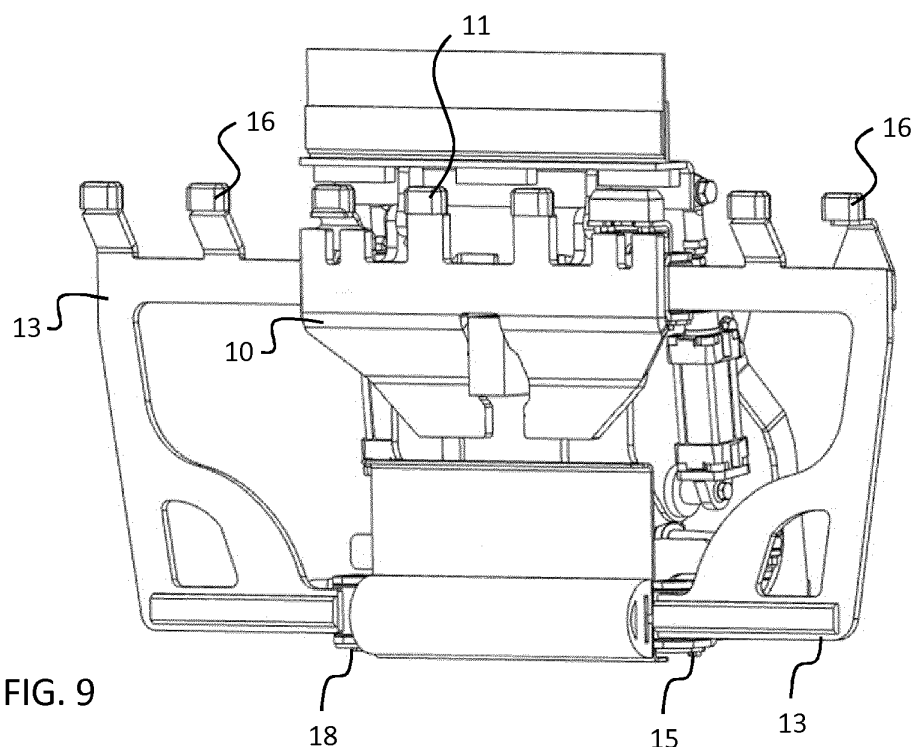


FIG. 9

Description

Technical area

[0001] The present invention pertains to a dustbin hoist in a refuse collection vehicle, in particular a side-loading refuse collection vehicle, according to the preamble in patent claim 1.

Prior art

[0002] With increased environmental awareness and a more versatile collection of household waste the task is subject to new requirements. One of the problems encountered in this new situation, is increased variation in the size of vessels to be handled during collection.

[0003] The current dustbin hoists assume that both small and large vessels are balanced in a dustbin hoist dimensioned to handle the dustbin with the narrowest construction. The load on both the dustbin hoists and the dustbin is therefore substantial, which may lead to damage in either or both. Alternatively, it is conceivable that different dustbins could be emptied with different dustbin hoists in different positions around the collection container of the refuse collection vehicle. Apart from the fact that a solution with several dustbin hoists would be expensive, it is also work-intensive to coordinate the mutual positions of the refuse collection vehicle and the dustbins.

The problem

[0004] With the present invention, the problems with which prior art solutions are associated can be substantially avoided. The task of the invention is to provide a simple and easy-to-use dustbin hoist arrangement, which offers considerable reliability and durability.

[0005] This task is solved in accordance with the invention by way of a dustbin hoist arrangement according to the invention given the characteristics specified in the patent claim 1. The subsequent dependent patent claims specify suitable developments and variants, respectively, of the invention, which further improve its function.

[0006] With the arrangement described in the present invention, several significant advantages are achieved in relation to prior art. Thus, it is possible to handle dustbins of various sizes more flexibly.

[0007] Since it is foldable, the mechanism according to the present invention only takes up the smallest space possible and thereby it does not affect any other construction of the refuse collection vehicle. Therefore, it is even possible to fit the arrangement on existing dustbin hoists in active operation.

[0008] A dustbin hoist according to the present invention also facilitates collection and gripping of dustbins in narrow spaces with the dustbin hoist's widening units in their transport position.

[0009] Additional advantages and details in the invention are set out in more detail in the description below.

List of drawing figures

[0010] The invention is described in more detail below with reference to the drawing, where

figure 1 shows a refuse collection vehicle and a dustbin,
figure 2 shows the dustbin on the way to be lifted towards the refuse collection vehicle's emptying container,
figure 3 shows the dustbin emptied in the refuse collection vehicle's emptying container,
figure 4 shows the refuse collection vehicle's lifting mechanism,
figure 5 shows a dustbin holder according to the invention with the widening units in transport position seen from the front,
figure 6 shows a dustbin holder according to figure 5 with the widening units in transport position seen from the rear,
figure 7 shows a dustbin holder according to figure 5 with the widening units in transport position seen from above,
figure 8 shows a dustbin holder according to figure 5 with the widening units in a lifting position seen from the rear,
figure 9 shows a dustbin holder according to figure 5 with the widening units in a lifting position seen from the front, and
figure 10 shows a dustbin holder according to figure 5 with the widening units in a lifting position seen from the above.

Preferred embodiment

[0011] The above figures do not show a dustbin hoist arrangement in scale, but their only task is to illustrate the constructive solutions of the preferred embodiments and the function of the embodiments. Herewith, the respective constructive parts displayed in the figures and marked with reference numbers correspond to the construction solutions presented in the description below and also simultaneously specified with a reference number.

[0012] Figures 1 and 2 show a schematic illustration of a refuse collection vehicle 1, comprising a not-displayed chassis and a driver cabin 2. The figure also shows a part of the collection container 3, in which the refuse is transported from the collection place to a treatment facility. The collection container may be divided into one or several chambers with partition walls. The collection container also has an feed opening 4 in which the contents of a dustbin 5 to be emptied is tipped.

[0013] In order to feed the emptied refuse in the collection container 3 the refuse collection vehicle 1 is equipped with at least one compactor. The collection container is equipped with an emptying container, for each of the chambers in the collection container. Each of the collection container, the emptying container and the com-

pactor have a conventional structure, and for this reason they are not described in more detail in this context.

[0014] To supply the collection container 3 with refuse, the refuse collection vehicle 1 is provided with a dustbin hoist 6 with which dustbins 5 can be tipped in the emptying container. Such a dustbin hoist comprises a dustbin holder 7 advantageously connected to the refuse collection vehicle's collection container. See for example figures 2 and 3.

[0015] As illustrated in figures 2, 3 and 4, the dustbin hoist 6 is arranged next to the refuse collection vehicle 1. The dustbin hoist can thus be moved outwards in the vehicle's side directions as well as away from the vehicle through a lifting mechanism 8 provided by the dustbin hoist, the lifting mechanism being arranged between the refuse collection vehicle 1 and the dustbin holder 7.

[0016] The dustbin holder 7 herewith comprises a frame 9 on which a comb 10 is fitted. The comb will lie in a substantially vertical position in the refuse collection vehicle's operational position. The comb is equipped with gripping units 11 protruding therefrom in a substantially vertical direction. With these gripping units, the dustbin holder is arranged to interact with lifting fittings provided by the dustbin 5 brought next to the refuse collection vehicle 1. When the gripping units have been manoeuvred in the lifting fittings, the dustbin may be lifted and/or swayed with the lifting mechanism in relation to the collection container 3 in a substantially vertical direction and subsequently emptied in the respective emptying container. Herewith, the lifting mechanism is manoeuvred with at least one shifting device 12, which may comprise a pneumatic or hydraulic cylinder, for example.

[0017] To be able to handle different sizes of dustbins 5 the present dustbin hoist 6 is provided with at least one widening unit 13, advantageously articulately mounted to the dustbin holder 7 via at least one joint arranged in between. In one embodiment according to figure 5, the dustbin holder features two joints 14 and 15 arranged above each other. To these joints, the widening unit 13 is fitted so that it is rotatable between a transport position next to the frame of the dustbin holder and a lifting position in a vertical plane substantially defined by the comb and its gripping units. The transport position and the lifting position are displayed for example at figure 5 and figure 8, respectively. The widening unit comprises secondary gripping units 16, which in the lifting position of the widening unit will be in line with the gripping units 11 of the comb.

[0018] As illustrated by figures 8 and 9, for example, the dustbin holder 7 may be equipped with two widening units 13 that are articulately fitted thereto, one on each side of the comb 10. Thus, the second widening unit 13 is articulately fitted to the dustbin holder 7 via two joints 17 and 18 arranged above each other.

[0019] Figures 6 and 8 show that the widening units are manoeuvred between their respective transport- and lifting positions, with at least one shifting device 12, which may consist of a pneumatic or hydraulic cylinder, for ex-

ample.

[0020] The above description and the figures referred to therein are only intended to illustrate the present solution for the construction of a dustbin hoist arrangement.

Thus, the solution is not limited only to the above embodiment or those described in the enclosed patent claims, but numerous variations or alternative embodiments are possible within the idea described in the enclosed patent claims.

Claims

1. Dustbin hoist arrangement (6) to be used in a refuse collection vehicle (1), which dustbin hoist (6) comprises a dustbin holder (7) advantageously articulately connected to the refuse collection vehicle, the dustbin holder comprising a frame (9) to which a comb (10) is fitted, gripping units (11) protruding from the comb, a lifting mechanism (8) arranged between the refuse collection vehicle (1) and the dustbin holder (7), at least one shifting device (12) to manoeuvre said lifting mechanism, **characterised in that** the dustbin hoists (6) further comprises at least one widening unit (13), manoeuvrable between a transport position at the dustbin holder's (7) frame (9) and a lifting position in a vertical plane substantially defined by the comb (10) and its gripping units (11), which widening unit comprises secondary gripping units (16), which in the lifting position of the widening unit are arranged to be in line with the comb's (10) gripping units (11).
2. Dustbin hoist arrangement (6) according to claim 1, **characterised in that** the widening unit (13) is articulately fitted to the dustbin holder (7) via at least one joint arranged in between.
3. Dustbin hoist arrangement (6) according to claim 2, **characterised in that** the dustbin holder (7) has two joints (14) and (15) arranged above each other.
4. Dustbin hoist arrangement (6) according to a previous claim, **characterised in that** the dustbin holder (7) is equipped with two widening units (13), arranged to assume a position on each side of the comb (10).
5. Dustbin hoist arrangement (6) according to a previous claim, **characterised in that** the widening unit (13) is arranged to be manoeuvred between its transport and lifting position, respectively, with at least one shifting device 12.

6. Dustbin hoist arrangement (6) according to claim 5,
characterised in that
the shifting device 12 comprises a pneumatic or a
hydraulic cylinder.

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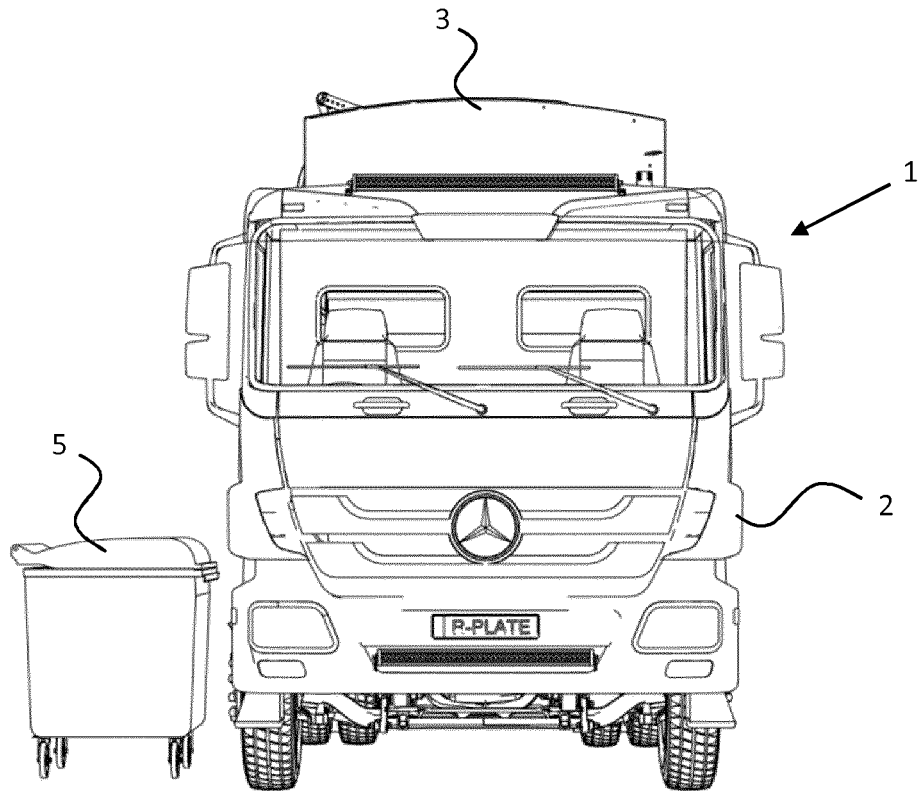


FIG. 1

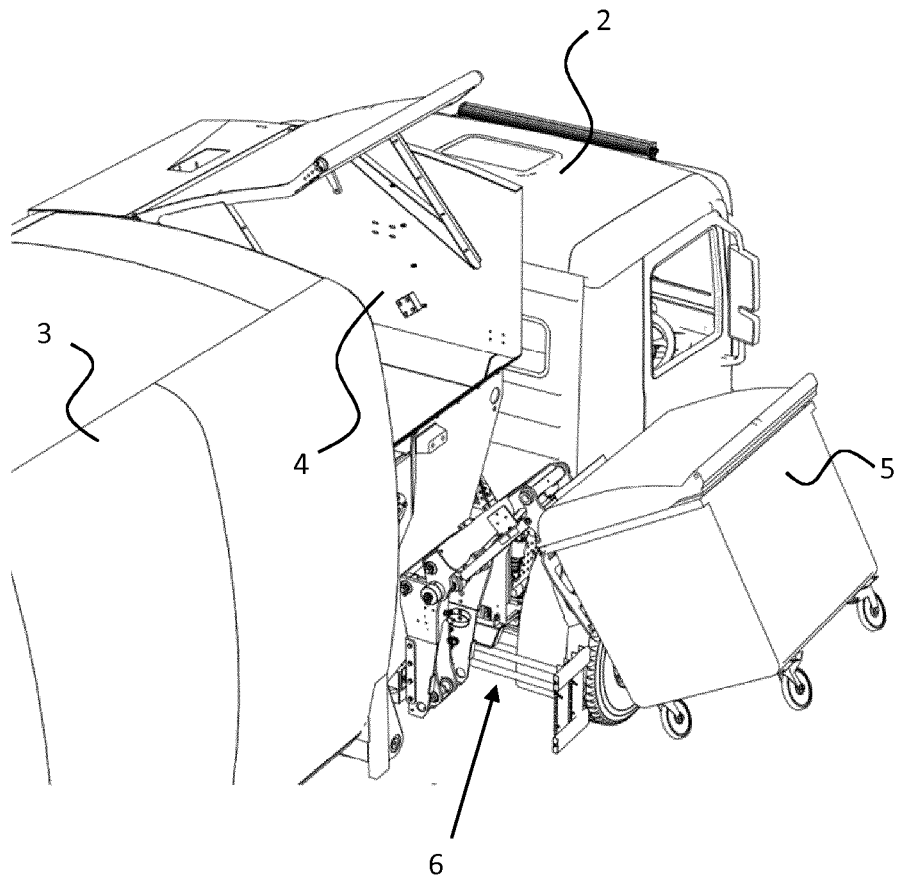


FIG. 2

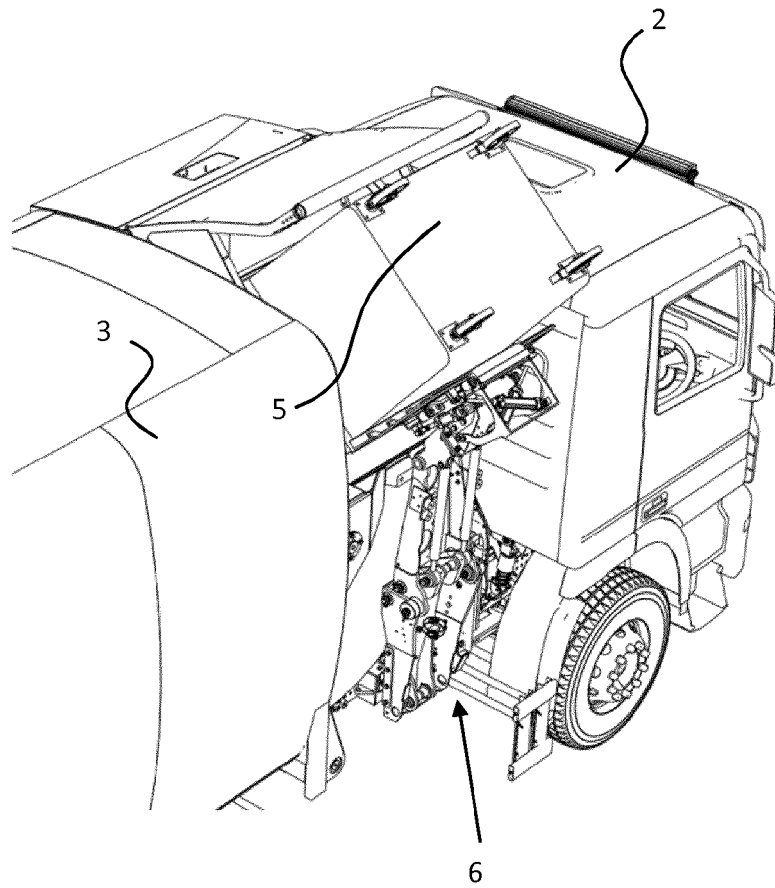


FIG. 3

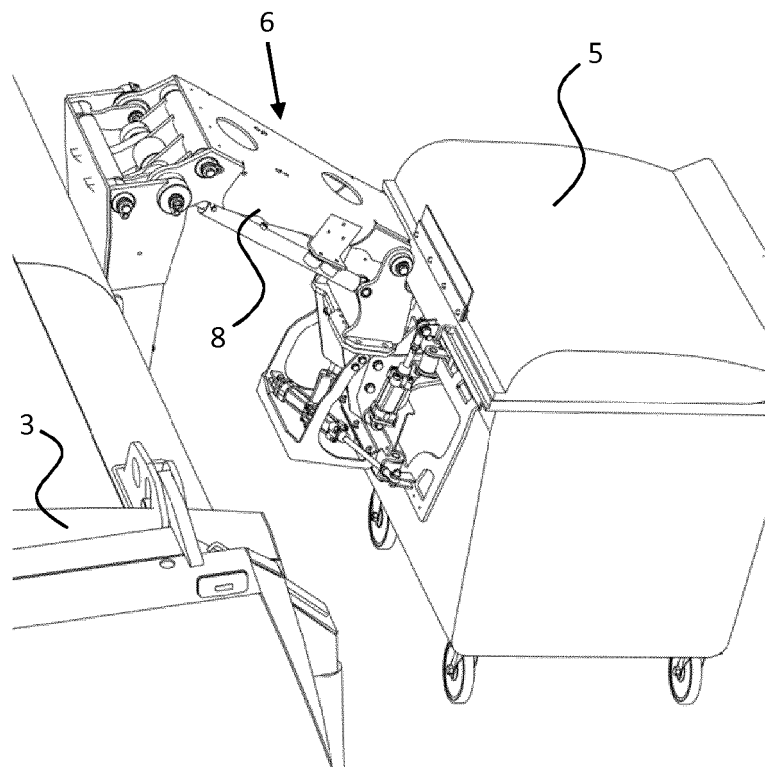
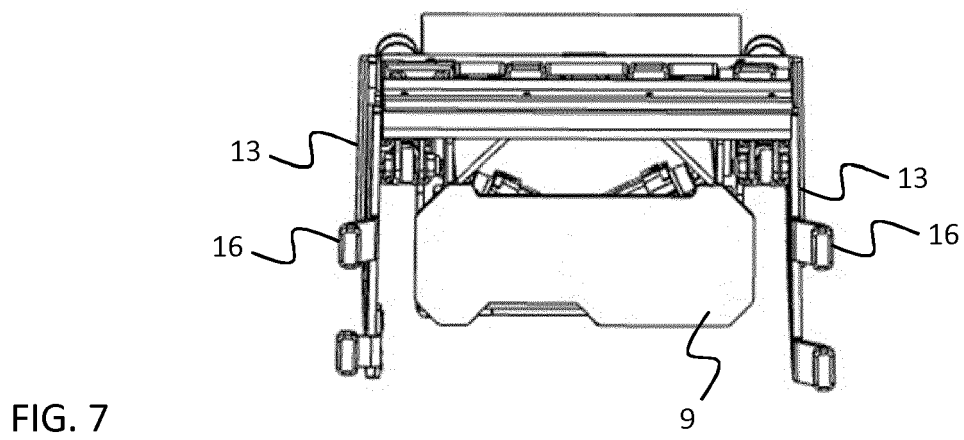
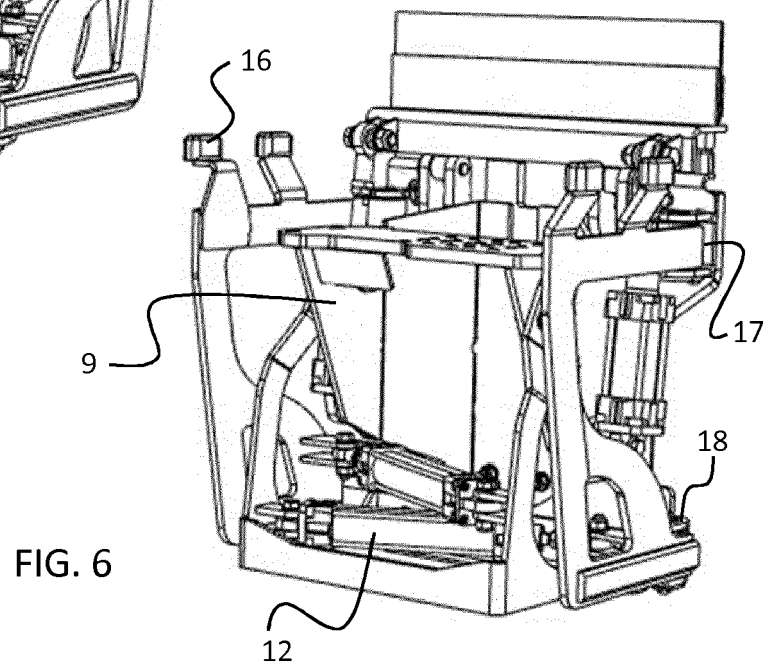
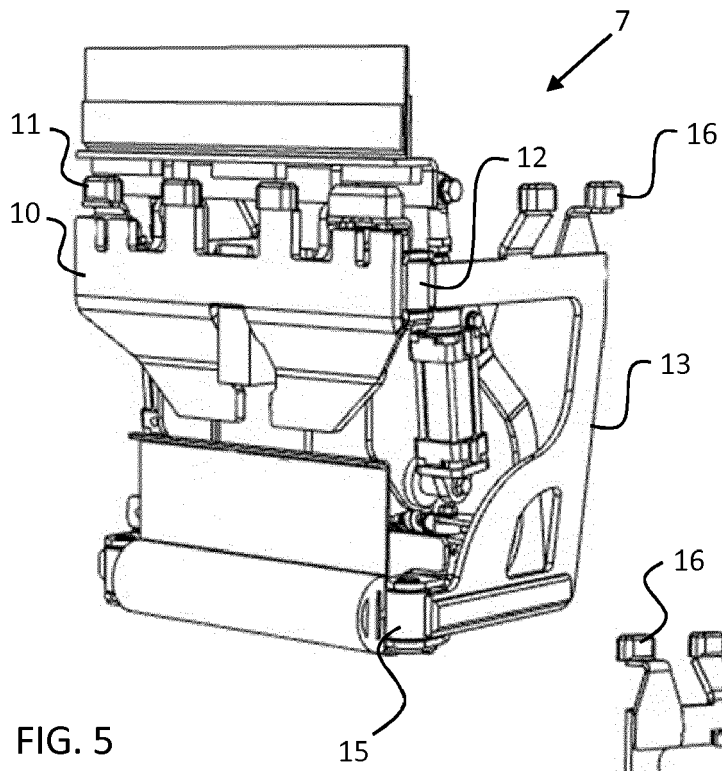


FIG. 4



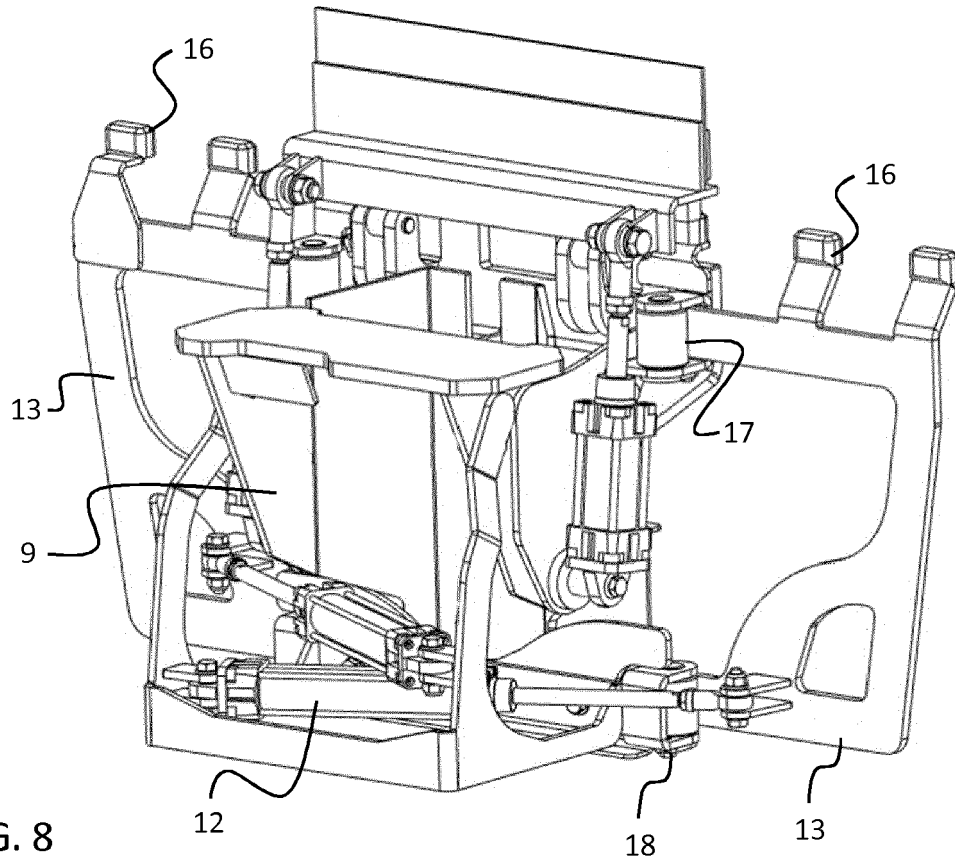


FIG. 8

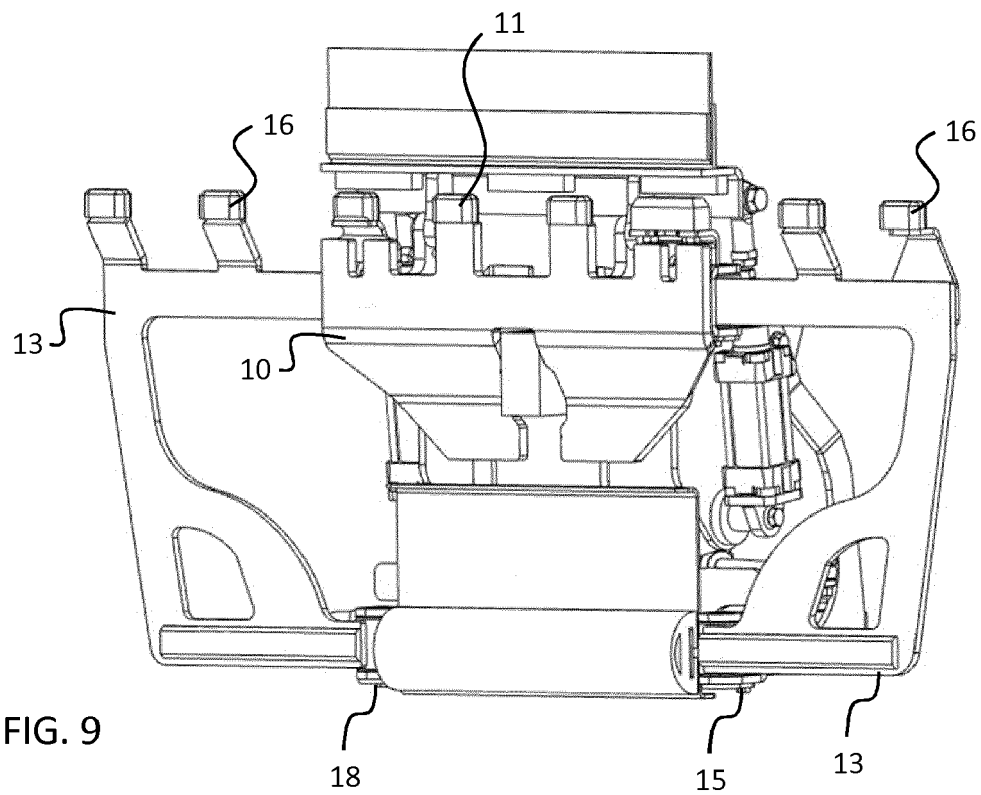


FIG. 9

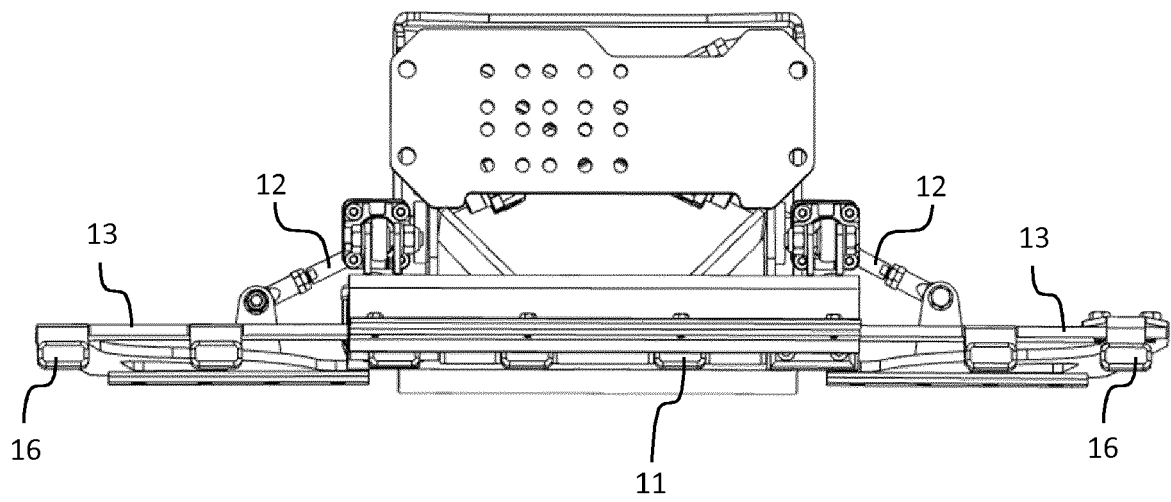


FIG. 10



EUROPEAN SEARCH REPORT

Application Number
EP 18 17 8919

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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	DE 10 2004 049463 A1 (FAUN UMWELTECHNIK GMBH & CO K [DE]) 7 July 2005 (2005-07-07) * paragraph [0023] - paragraph [0026]; figures 1-6 *	1-6	INV. B65F3/04 B65F3/02
A	EP 1 553 030 A1 (HUEFFERMANN ENTSORGUNGSSYSTEME [DE]) 13 July 2005 (2005-07-13) * paragraph [0019] - paragraph [0020]; figures 1, 2, 6, 8 *	1-6	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 15 November 2018	Examiner Luepke, Erik
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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