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(54) **ARRANGEMENT AND METHOD FOR COMPACTING WASTE**

(57) The present invention pertains to a device and a method for waste compression for use especially in a compactor (5) arranged at a collection container (4) for waste. This compactor (5) features a compacting compartment (6) with a loading aperture (7) through which the waste in a container (11) is arranged to be emptied and then moved with a pendulum (13) via a compacting aperture (15) to the collection container for further storage. The collection container (4) according to the invention features a primary press (16), with two positions, a first position substantially closing the compacting aperture (15) and a second position substantially freeing the compacting aperture (15). Wherein the primary press, it is closing position, makes it possible to compact voluminous waste.

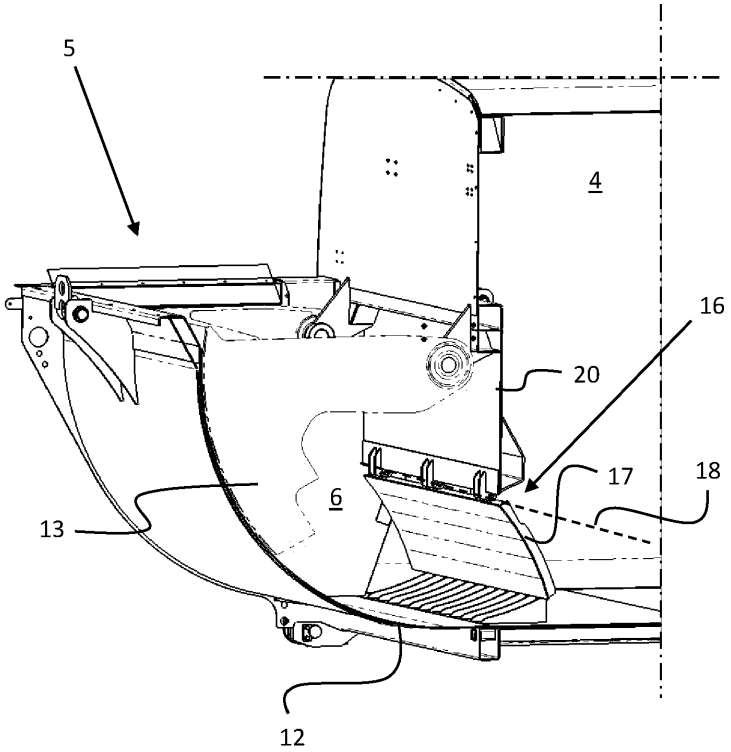

FIG. 8

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Description

Technical area

[0001] The present invention relates to a waste compression device of the type stated in the preamble to patent claim 1.

[0002] The present invention also relates to a waste-compression method using said device as per the preamble to patent claim 5.

Prior art

[0003] The use of top-fed collection containers when emptying waste containers or bins is prior art. However, in recent times, problems have arisen when compacting the waste from these containers. In particular, problems arise when the waste contains voluminous paper or plastic packaging that takes up a lot of space in the collection container.

Presentation of the problem

[0004] Using the present invention, the problems afflicting known solutions are essentially avoided. In this connection, the role of the invention is to provide an easy-to-handle and operationally reliable waste compression device and method.

[0005] The invention fulfils this task thanks to a waste compression device as per the invention with the characteristics stated in patent claim 1. Furthermore, this device is used in accordance with a method that, as per the invention, is given the characteristics stated in patent claim 5. The respective subsequent dependent claims provide for appropriate developments and variants of the invention that further improve its function.

[0006] With the arrangement and method described in the present invention, a plurality of significant advantages are achieved over the prior art. Thus, in particular a good filling degree of the collection container is achieved. This makes waste collection more productive while the invention also contributes to a streamlining of collection logistics.

[0007] Further advantages and details of the invention are more closely set out in the description below.

Summary of drawing figures

[0008] In the following, the invention is described more closely with reference to the drawings, in which

Figure 1 shows a side-loading refuse collection vehicle with a compactor arranged in front of a collection container for waste, seen from the side,
Figure 2 shows a refuse collection vehicle as per figure 1, seen from the rear with the side-loader in operation.
Figure 3 shows a front-loading refuse collection vehicle with a compactor arranged in front of a collection container for waste, seen from the side,
Figure 4 shows a rear-loading refuse collection vehicle with a compactor arranged in front of a collection container for waste, seen from the side,
Figure 5 shows, schematically, the function of a compactor according to prior art,
Figure 6 shows, schematically, the function of a primary press interacting with the compactor according to the present invention, with the primary press in active position,
Figure 7 shows, schematically, the function of a primary press interacting with the compactor according to the present invention, with the primary press in passive position,
Figure 8 shows a detail drawing of the compactor and the primary press according to Figure 6, and
Figure 9 shows a detail drawing of the compactor and the primary press according to Figure 7.

Preferred embodiment

[0009] The above figures do not show a waste compression device in scale but only serve to illustrate structural solutions of the preferred embodiment and the operation of the embodiment. Herein, the respective structural parts shown in the figures and denoted with reference numerals correspond to the structural solutions presented in the description below and which are hereby given their reference numbers.

[0010] The present waste compression device and its operation are described below together with a top-fed waste collection vehicle exemplified by Figures 1 - 3. However, this does not limit the use of the device to this embodiment only, rather the present waste compression device can be used by both rear-loading waste collection vehicles exemplified by Figure 4 and by other mobile and various stationary waste management solutions that use a pendulum for feeding waste.

[0011] Thus, figure 1 is a schematic depiction of a refuse collection vehicle 1 comprising a chassis 2 and a driver's cab 3. The figure also shows a collecting container 4, in which refuse is transported from one or more collection sites to one or more processing plants. To feed the waste into the collection container, the refuse collection vehicle is furnished with a compactor 5, which is schematically illustrated at Figure 5. This compactor has a compacting compartment 6, into which the waste is fed via a feeding aperture 7, see for example Figure 6.

[0012] To supply the collection container 4 with waste, the refuse collection vehicle 1 features a lifting device, which may, for example, consist of a side-loader 8 according to Figure 2, a lift fork 9 according to Figure 3, or a crane 10 according to Figure 4, with which a waste container 11 can be lifted above the loading aperture 7 and be emptied therein. The waste that drops from said container into the compacting compartment then moves along to a bottom part 12 of the compacting compartment.

[0013] In accordance with, for example, Figure 5, the compactor 5 has a pendulum device 13 that, with the help of one or more operating devices 14, executes a pendulum movement to move the waste from the compacting compartment 6 via a compacting aperture 15 to the collection container 4. Figure 5 illustrates the pendulum's movement more closely. Thus, solid lines show that the pendulum device has turned, with a clockwise movement, to its upper position, this simultaneously freeing the compacting compartment's bottom 12. In a subsequent turning movement, the pendulum device is moved anticlockwise to its lower compacting and rest position while it moves the waste dropped into the compacting compartment, via the compacting aperture, into the collection container where the waste is held. This pendulum movement continues until the waste in the compacting compartment has essentially been moved into the container.

[0014] Both the collection container 4 and the compactor 5 are of a conventional design and are thus not described more closely in this context.

[0015] Since problems may arise from time to time because voluminous waste takes up a disproportionately large area in the collection container 4, the present collection container has been equipped with special primary press 16, displayed in more detail in Figures 6 - 9. Such a primary press is advantageously arranged next to the compacting aperture 15 so that it may feature two positions, one first position substantially closing the compacting aperture (Figures 6 and 8) and a second position substantially freeing the compacting aperture (Figures 7 and 9). The primary press thus encompasses at least one hatch 17 arranged to be able to rotate around a shaft that is substantially horizontal in operation 18. The shaft is also arranged to be positioned in a substantially perpendicular position relative to an operating direction of the pendulum 15 when the pendulum moves waste that has dropped into the compacting department towards the collection container.

[0016] To manoeuvre the primary press 16 between its first closing position and its second freeing position, the primary press features at least one actuator 19, for example a hydraulic or a pneumatic cylinder, which is arranged to shift the hatch 17 between the respective first and second positions of the primary press.

[0017] Advantageously, the hatch 17 is arranged with a joint to a dividing wall 20, which separates the collecting container 4 and the compactor 5 from each other. Herewith, the hatch has a construction that may be substantially closed or partly open, for example net- or lattice-shaped.

[0018] The present device for compacting of waste operates as follows.

[0019] Waste collected in a waste container 11 with a prior art construction is discharged into a compacting compartment 6 of the compactor 5 via the loading aperture 7 thereof. The waste mainly falls towards a bottom 12 of the compacting compartment. The remaining waste is transported by the pendulum 13 towards the bottom, at the same time as the pendulum moves the waste along from the compacting compartment 6 to the collection container 4 for further storage of the waste. The waste is then moved to the collection container via a compacting aperture 15 in the dividing wall 20, which separates the collecting container 4 from the compactor's compacting compartment.

[0020] If when emptying the waste container 11 it is observed that it contains voluminous material, the primary press 16 featured by the collection container 4 can be activated. The primary press, which can be manoeuvred into a first position substantially closing the compacting aperture 15 and a second position substantially freeing the compacting aperture, is thus manoeuvred to its first closing position. When the pendulum 13 now moves the waste toward the collection container, the waste will be pressed against the hatch 17 of the primary press, whereby the voluminous waste is compacted. See Figures 6 and 8. When the pressure exerted by the pendulum against the primary press eventually increases, the hatch will fold away and the waste can continue its way into the collection container. See Figures 7 and 9. Obviously, the hatch can also be manoeuvred to its freeing position when it is assessed that a sufficient compacting of the waste has taken place.

[0021] The primary press (16) is thus constructed to comprise at least one hatch 17, which is allowed to swing around a shaft 18 that is substantially horizontal in operation. This shaft is fitted in a position where it is substantially perpendicular relative to the operating direction of the pendulum 13. This shaft may be arranged, for example, to the dividing wall 20, which separates the collecting container 4 and the compactor 5 from each other. Since the hatch is intended to constitute a transport obstacle for voluminous material, the construction thereof can be both substantially closed as well as, for example, substantially net-shaped. If the primary press features several hatches, each of them is advantageously arranged to be regulated with an actuator 19, which shifts the hatch 17 between the first and second positions, respectively, of the primary press. If the primary press features one single hatch, it may be advantageous for the position of the hatch to be regulated with several actuators.

[0022] Once the collection container 4 has been well filled, see Figure 7, it is no longer necessary to close the hatch 17, rather the voluminous material may be moved directly to the collection container, where the pendulum 13 will compact it against the waste that is already inside the collection container.

[0023] The description above and the figures cited therein are solely intended to give an overview of the present solution for the design of a feeding arrangement. Thus, the solution is not limited solely to the embodiment described above or in the attached patent claims. Indeed, within the idea described in the attached patent claims, several variations or alternative embodiments are possible.

Claims

1. Waste compressing device for use especially in a compactor (5) arranged at a collection container (4) for waste, which
compactor (5) comprises a compacting compartment (6) with a loading aperture (7) through which the waste inside a waste container (11) is arranged to be emptied and thus transported to a bottom (12) of the compacting compartment (6), and
a pendulum (13) is arranged to move the waste along from the compacting compartment (6) via a compacting aperture (15) to the collection container (4) for further storage of the waste, which
collection container (4) features a primary press (16), which primary press features two positions, one first position where it substantially closes the compacting aperture (15) and a second position where it substantially frees the compacting aperture (15)
characterised by the fact that
the primary press (16) comprises at least one hatch (17) arranged to swing around a shaft (18) which is substantially horizontal in operation arranged in relation to an operating direction of the pendulum (13), and
the primary press comprises at least one actuator (19) arranged to shift the hatch (17) between the first and second respective positions of the primary press.

2. Device for compression of waste according to claim 1, **characterised by** the fact that the hatch (17), in its construction, is substantially closed.

3. Device for compression of waste according to claim 1, **characterised by** the fact that the hatch (17) features a net-shaped construction.

4. Device for compression of waste according to claims 2 or 3, **characterised by** the fact that the hatch (17) is arranged to a dividing wall (20), which separates the collection container (4) and the compactor (5) from each other.

5. Waste compressing method for use especially in a compactor (5) arranged at a collection container (4) for waste, where
the waste in a waste container (11) is emptied in a compacting compartment (6) of the compactor via a loading aperture (7) and thus transported to a bottom (12) featured by the compacting compartment, following which
a pendulum (13) moves the waste along from the compacting compartment (6) via a compacting aperture (15) to the collection container (4) for further storage of the waste,
the collection container (4) is equipped with a primary press (16), which
primary press (16) is manoeuvred to assume one of two different positions, a first position where it substantially closes the compacting aperture (15) and a second position where it substantially frees the compacting aperture (15)
characterised by the fact that
the primary press (16) is equipped with at least one hatch (17) which is allowed to swing around a shaft (18) which is substantially horizontal in operation arranged relative to the operating direction of the pendulum (13), and
the primary press is equipped with at least one actuator (19) which shifts the hatch (17) between the first and second respective positions of the primary press.

6. Method for compression of waste according to claim 5, **characterised by** the fact that the hatch (17) is built to be substantially closed.

7. Method for compression of waste according to claim 5, **characterised by** the fact that the hatch (17) is built to be substantially net-shaped.

8. Method for compression fo waste according to one of claims 5-7, **characterised by** the fact that the hatch (17) is fitted to a dividing wall (20), separating the collection container (4) and the compactor (5) from each other.

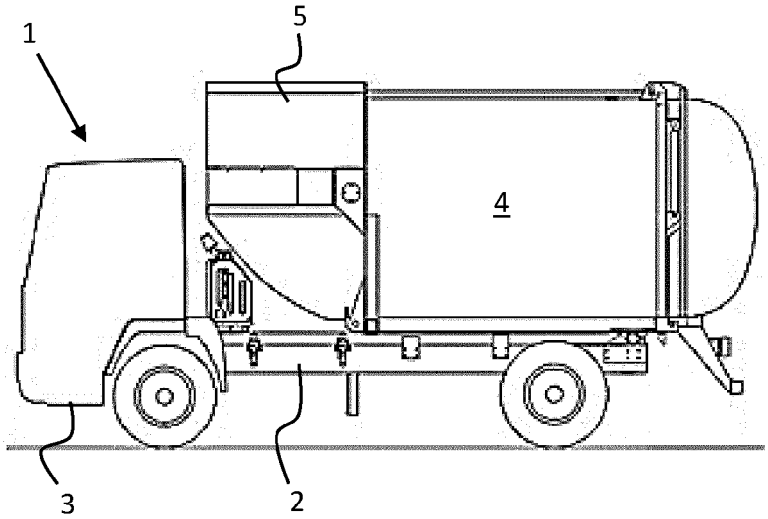

FIG. 1

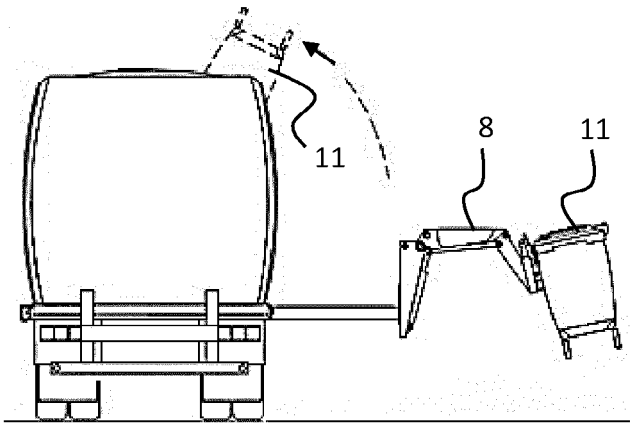

FIG.2

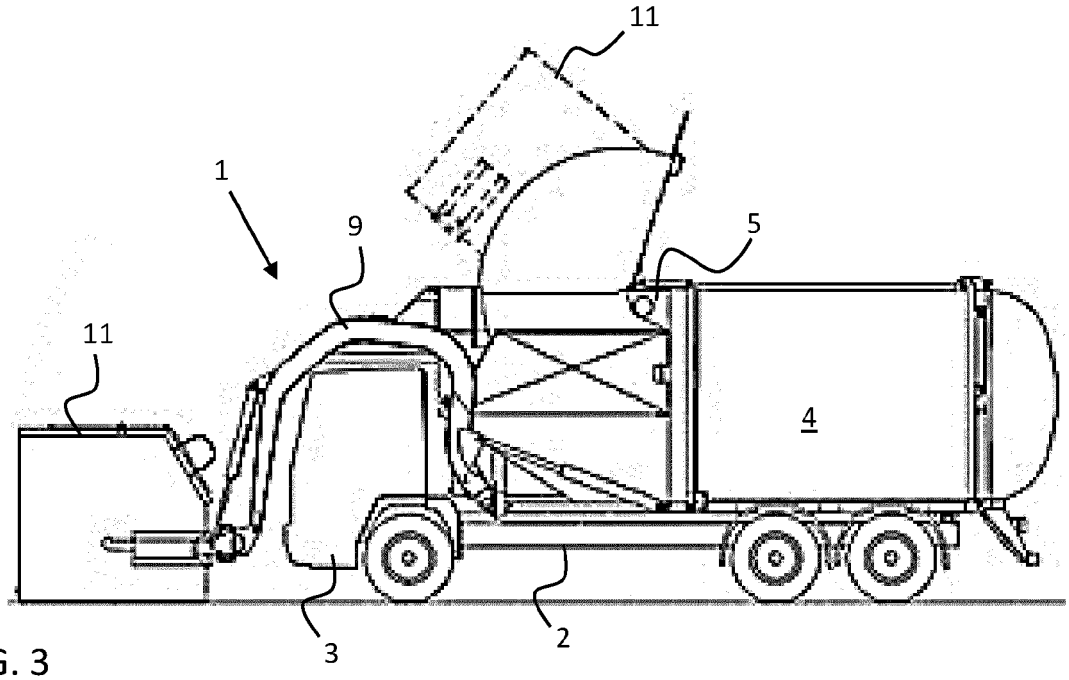

FIG. 3

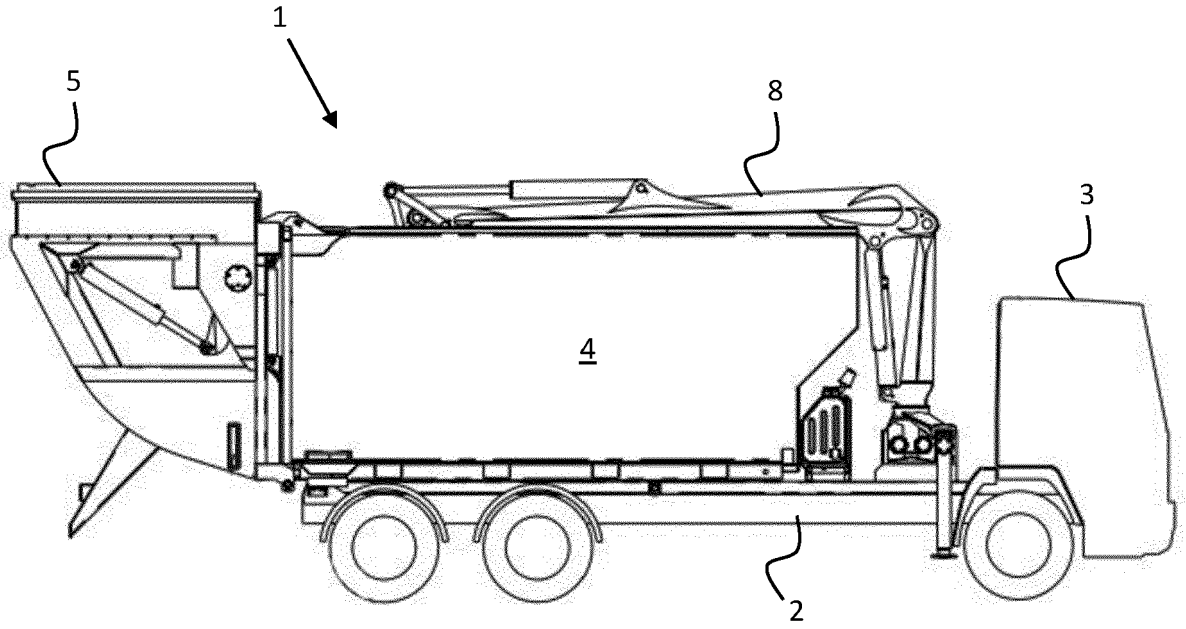

FIG. 4

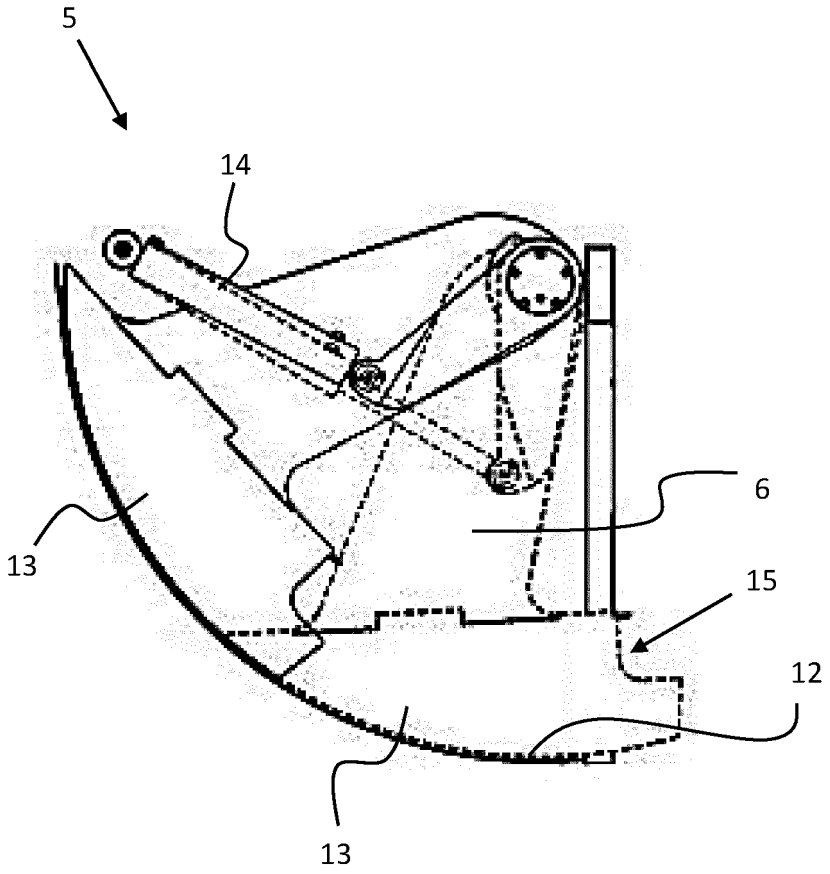

FIG. 5

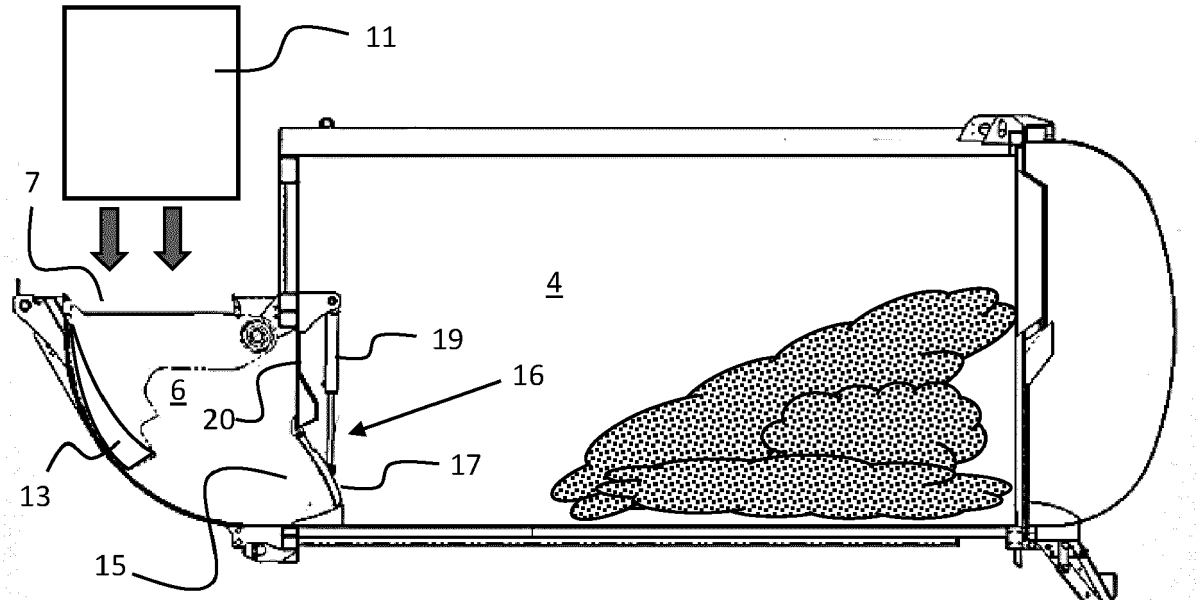

FIG.6

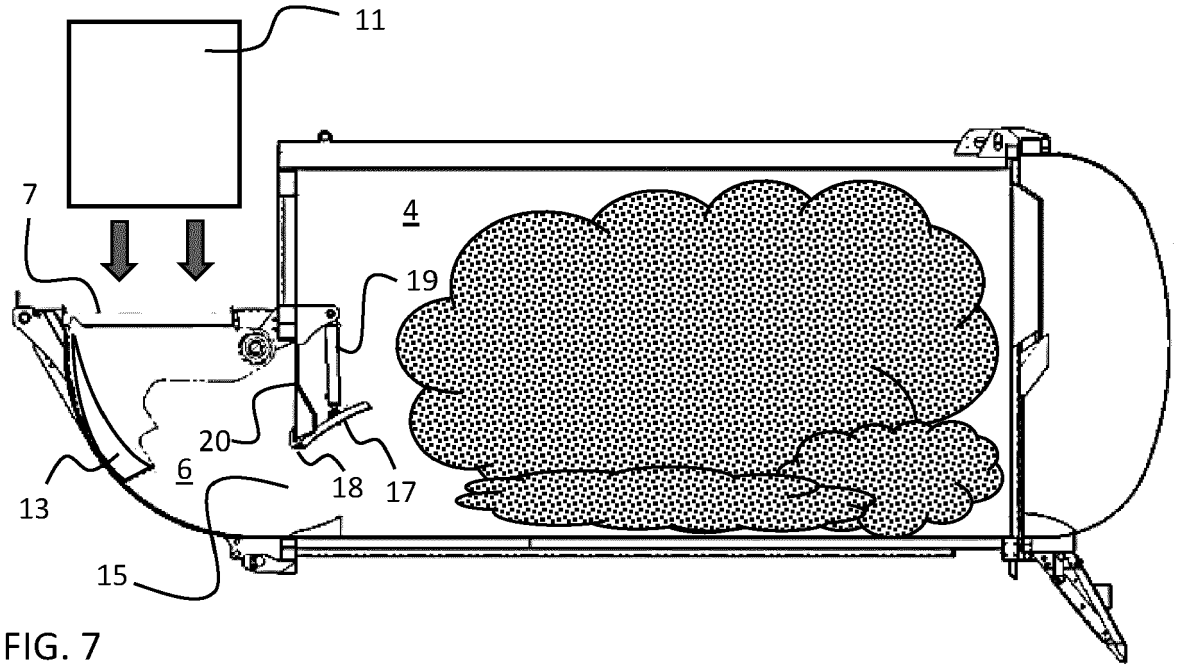

FIG. 7

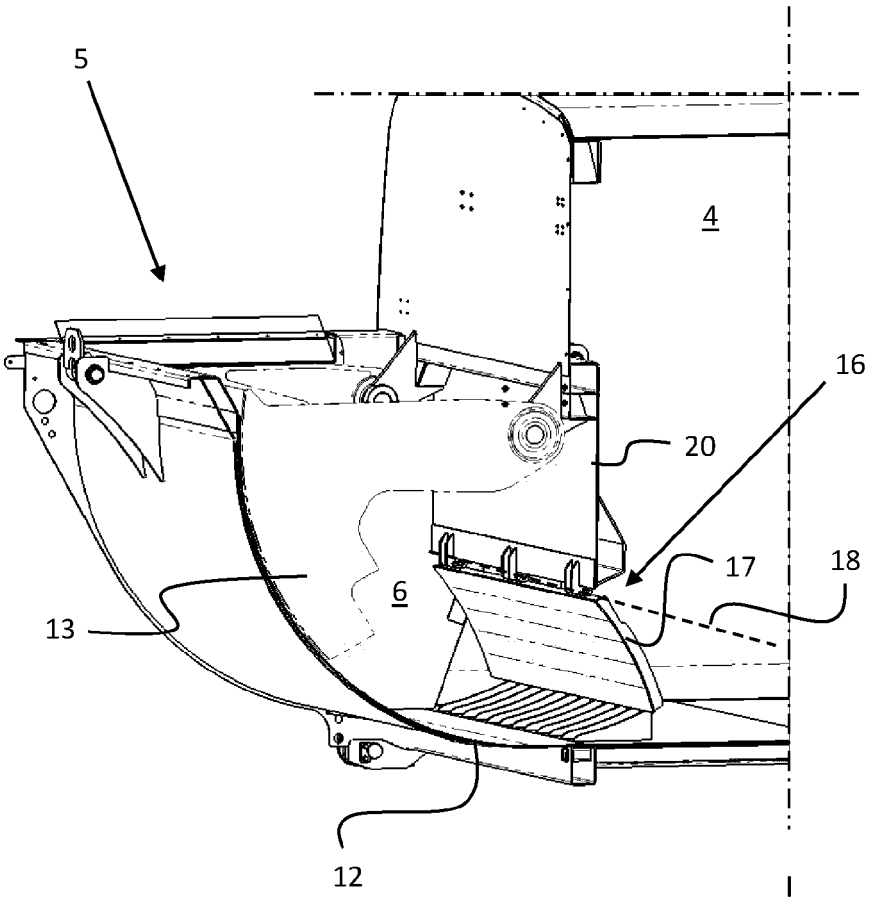

FIG. 8

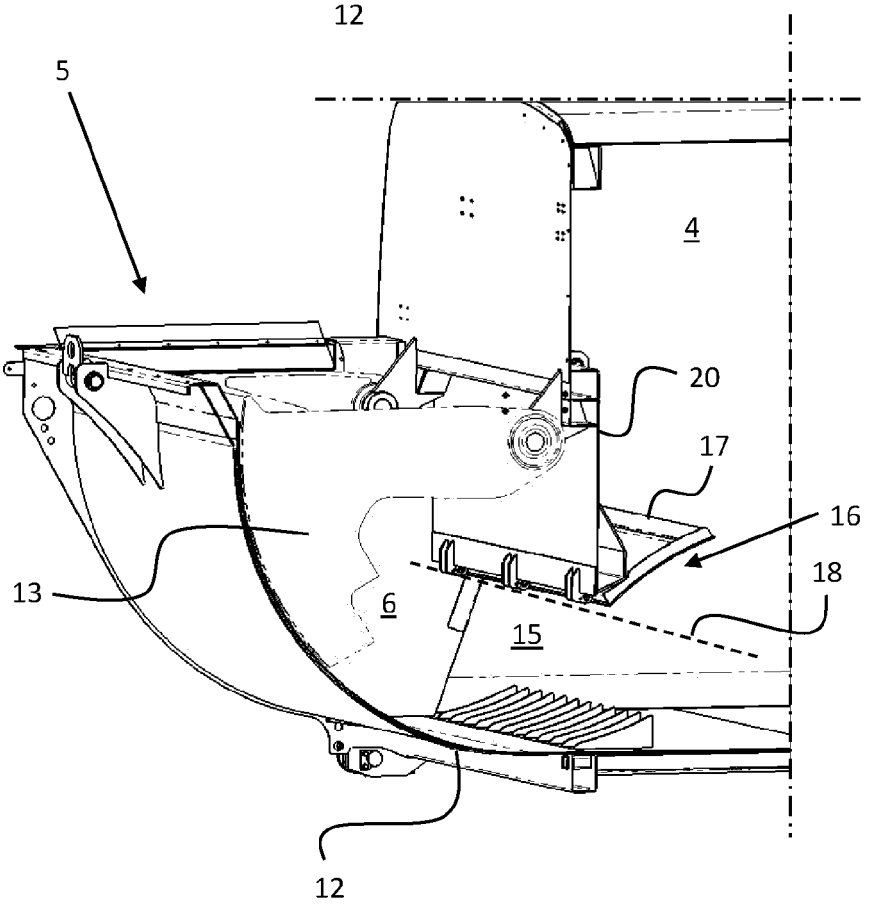

FIG. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 20 15 6313

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	FR 1 502 834 A (FROSSARD JOSEPH-PIERRE) 24 November 1967 (1967-11-24) * page 2, left-hand column, line 43 - right-hand column, line 23; figures 1,2 *	1-8	INV. B65F3/20
Y	BE 1 003 808 A5 (CLERCK WILLY DE) 16 June 1992 (1992-06-16) * page 5, lines 2-15; figures 2-4 *	1-8	
Y	US 4 096 959 A (SCHAFFLER GEORG) 27 June 1978 (1978-06-27) * page 6, lines 6-63; figures 4-7 *	1-8	

TECHNICAL FIELDS SEARCHED (IPC)
B65F
B67C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	3 July 2020	Serrano Galarraga, J

CATEGORY OF CITED DOCUMENTS

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03-07-2020

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