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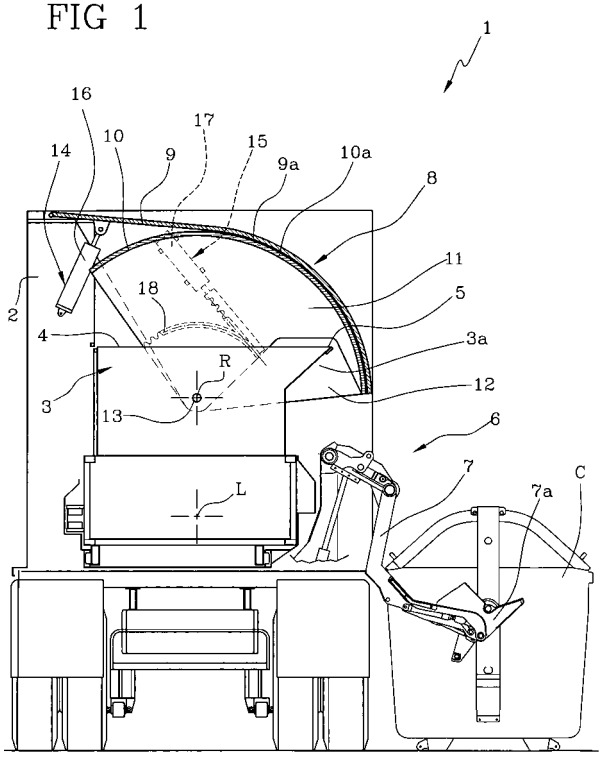
(54) A motor vehicle for collecting rubbish

(57) A motor vehicle for collecting rubbish comprises a loading hopper (3) communicating with a holding compartment (2a) and having an opening (4) at the upper part thereof which is accessible through a loading inlet (5); loading means (6) movable astride the loading inlet (5) between a position at which said means grasps a skip (C) externally of the holding compartment (2a) and a position at which it transfers the rubbish contained in a skip (C) into the hopper (3). A soundproofing device (8) operates on the opening (4) to mitigate the emission of noise during rubbish transfer into the loading hopper (3). This soundproofing device (8) comprises a lid (9) for said opening (4), said lid (9) being movable away from the loading inlet (5) to enable access of the skip (C) to the hopper (3); and a cap (10) rotatably associated with the lid (9) to cover the skip (C) at least partly during rubbish transfer into the holding compartment (2a).

FIG 1



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Description

[0001] The present invention relates to a motor vehicle for collecting rubbish.

[0002] It is known that collection of municipal solid rubbish is usually carried out with the aid of suitable "rubbish skips" that are positioned along the streets in order to be emptied onto appropriate lorries intended for rubbish collection and transport to the rubbish dumps or other places suitable for disposal of same. These motor vehicles are currently provided with a container having a wide opening that, through a loading inlet, enables access to a hopper communicating with a holding compartment extending in the container itself.

[0003] In detail, the rubbish skip is transferred from the roadway on which it lies towards the loading inlet through suitable actuating means hooking the rubbish skip and lifting it above the hopper. This actuating means further causes a rotation of the skip to produce emptying of same into the container.

[0004] An important disadvantage concerning use of motor vehicles of the above described type is represented by the significant emission of noise taking place during the step of emptying the skip into the container. In fact, when the skip is rotated, the rubbish falls down freely hitting the hopper and the container walls, thus generating a great noise. This problem is still more marked when the rubbish partly consists of particularly stiff materials such as glass or metal, for example.

[0005] Due to the great inconvenience thus caused, the operators may be forced to restrain the rubbish collecting operations to the central hours of the day, which will give rise to further problems of the logistic type for management of the rubbish collection, above all in the town centres of average and big sizes with a high population density and an important road traffic.

[0006] The present invention aims at overcoming the above mentioned drawbacks.

[0007] In particular, it is an aim of the present invention to propose a motor vehicle for rubbish collection in which emission of noise during the step of emptying a skip is drastically limited.

[0008] It is a further aim of the present invention to propose a motor vehicle for rubbish collection having a limited bulkiness and at all events overall dimensions falling within the present regulations for road traffic.

[0009] In accordance with the present invention, the above mentioned problems are substantially overcome by a motor vehicle for rubbish collection in accordance with one or more of the appended claims.

[0010] Further features and advantages will become more apparent from the detailed description of a preferred but not exclusive embodiment of a motor vehicle for rubbish collection in accordance with the present invention.

[0011] This description will be set out hereinafter with reference to the accompanying drawings, given by way of non-limiting example, in which:

- Fig. 1 diagrammatically shows a motor vehicle partly in section for rubbish collection in accordance with the present invention, in a first operating configuration;
- Fig. 2 diagrammatically shows the motor vehicle seen in Fig. 1 in a second operating configuration;
- Fig. 3 diagrammatically shows the motor vehicle seen in Fig. 1 in a third operating configuration; and
- Fig. 4 is a diagrammatic side view of the motor vehicle shown in the preceding figures.

[0012] A motor vehicle for rubbish collection in accordance with the present invention has been generally denoted with 1.

[0013] Motor vehicle 1 essentially comprises a driver's cab 1a (Fig. 4) carrying a container 2 of substantially parallelepiped shape having a horizontal extension and internally defining a holding compartment 2a for the rubbish. Interposed between the driver's cab 1a and container 2 is a loading hopper 3 having an opening 4 at the upper part thereof access to which is allowed through a loading inlet 5 extending horizontally close to a side wall 3a of hopper 3, i.e. one of the longitudinal sides of motor vehicle 1.

[0014] Loading means 6 is operatively disposed along said longitudinal side of motor vehicle 1, close to the side wall 3a of hopper 3, which means is disposed astride the loading inlet 5 between a position at which said means grasps a rubbish-containing skip "C" at the outside of the holding compartment 3 (Fig. 1) and a position at which it carries out transfer of the rubbish into hopper 3, wherefrom said rubbish is then transferred in known manner into the holding compartment itself (Fig. 3).

[0015] By a gripping arm 7 carrying one hooking end 7a, said loading means 6 grasps the rubbish-containing skip "C" and lifts it so as to take it, partly rotated, beyond the loading inlet 5 (Fig. 2). In this intermediate position, the skip "C" lies over opening 4 of hopper 3. Subsequently, the loading means 6 causes rotation of the skip "C" in such a manner that the rubbish falls into hopper 3 thus accomplishing the above mentioned transfer operation.

[0016] Motor vehicle 1 further comprises a soundproofing device 8 provided to mitigate emission of noise during rubbish transfer into the holding compartment 3.

[0017] In detail, the soundproofing device 8 comprises a lid 9 hinged on motor vehicle 1. In this way, said lid 9 is movable away from opening 4 so as to enable access to the holding compartment 3.

[0018] The soundproofing device 8 further comprises a cap 10 rotatably associated with lid 9. In particular, cap 10 covers the skip "C" at least partly during transfer of the rubbish into the holding compartment 3.

[0019] The soundproofing device 8 is movable between a rest position, at which cap 10 is retracted to a position under lid 9 and lid 9 is in the closed position, and an operating position at which cap 10 is drawn out relative to lid 9 and lid 9 is in the open position.

[0020] In detail, the soundproofing device 8 takes the

rest position when motor vehicle 1 is running. In fact, when motor vehicle 1 is travelling on the road, it must have no pieces exceeding the maximum permissible overall dimensions defined by the road circulation rules.

[0021] On the contrary, the soundproofing device 8 takes the operating position during the step of emptying the skip "C". In particular, during this step motor vehicle 1 is stationary and the soundproofing device 8 can extend beyond the maximum permissible overall dimensions.

[0022] Cap 10 comprises a panel having a cross section in the form of an arc of a circle and rotates about its own rotation axis "R" disposed parallel to a longitudinal axis "L" of motor vehicle 1.

[0023] Lid 9 has a partly curvilinear cross-section. In detail, the curvilinear portion of the lid section has a shape matching that of the cap section, so that cap 10 through rotation can keep a position alongside said lid 9.

[0024] Cap 10 comprises two wings 11 connected to respective opposite ends 10a of the cap 10 itself. In more detail, the wings 11 are connected to the longitudinal curvilinear ends of cap 10. In the embodiment herein described, the wings 10 comprise respective flat panels substantially in the form of a circle sector, disposed parallel to each other and extending towards the rotation axis "R" of the cap 10_itself.

[0025] Wings 11 perform the task of connecting the cap 10 to the lid 9, as it will be more apparent in the following. In addition, wings 11 advantageously help in shielding the noise produced during the rubbish emptying step, impeding noise spreading from the sides of cap 10.

[0026] Lid 9 comprises two shoulders 12 disposed along respective opposite ends 9a of the lid 9 itself.

[0027] Shoulders 12, substantially in the form of a circle sector, extend towards the rotation axis "R" of the cap 10 and, at least in the preferred embodiment, consist of respective flat panels disposed parallel to each other.

[0028] Each wing 11 at least partly overlaps a respective shoulder 12 and is connected to the respective shoulder 12 through a hinge 13 disposed along said rotation axis "R" of the cap 10.

[0029] In this way, connection between cap 10 and lid 9 is carried out. The cap 10 can therefore rotate relative to lid 9 so that it takes an extended configuration setting the soundproofing device 8 to the operating position.

[0030] In the same manner as described in respect of the wings 11 of cap 10, the shoulders 12 of lid 9 in addition to ensuring connection between the cap 10 and lid 9, advantageously prevent lateral escape of noise when the cap 10 is extended during the rubbish emptying step.

[0031] Motor vehicle 1 further comprises first 14 and second 15 actuators to move the soundproofing device 8. The first actuators 14 are connected to lid 9 and cause movement of the latter close to and away from the opening 4 of the holding compartment 3. In the embodiment herein described, the first actuators 14 comprise a hydraulic cylinder 16.

[0032] The second actuators 15 can be for example secured to the lid 9 or the loading means 6, or to another vehicle part, and act on cap 10 for drawing it out or retracting it relative to lid 9. In this embodiment the second actuators 15 comprise a further hydraulic cylinder 17 that, fastened to lid 9, acts on a rack 18, a linkage, or other suitable device fastened to the cap 10.

[0033] Advantageously, lid 9 and cap 10 are at least partly made of deadening material to increase efficiency of the soundproofing device 8.

[0034] In use, when the motor vehicle 1 moves along the road network, the soundproofing device 8 keeps its rest position. In other words, lid 9 lies upon the opening 4 of the holding compartment 3 and cap 10 is retracted and lies under lid 9. In this way, the motor vehicle 1 does not exceed said maximum permissible overall dimensions (Fig. 1).

[0035] When the motor vehicle 1 is close to a skip "C" that must be emptied, lid 9 is lifted to enable access to the holding compartment. The loading means 6 grasps the skip "C", lifts it so as to bring it at least partly beyond said loading inlet 5 and imparts a partial rotation to the same so that the skip opening completely faces the opening 4 of hopper 3 (Fig. 2).

[0036] Concurrently with or subsequently to the skip lifting and/or overturning operation, cap 10 rotates relative to lid 9 until it fully surrounds skip "C". At this point, the loading means 6 imparts a further rotation to the skip "C", which will enable full emptying of the rubbish contained therein into the hopper 3 (Fig. 3).

[0037] The invention achieves the intended purposes.

[0038] In fact, the soundproofing device 8 mitigates the emission of noise produced during emptying of the rubbish skip "C" without too much increasing the overall dimensions of the motor vehicle 1. In fact, the soundproofing device 8 of the above described type projects from the maximum admissible shape defined by the present regulations on road circulation only during the emptying step, i.e, when the motor vehicle 1 is stationary close to a rubbish skip "C".

[0039] At the end of the emptying step, when the skip is moved back to the ground, the soundproofing device 8 is brought back to the rest condition, so as to enable running of the vehicle in the observance of the regulations in force. In addition, in the rest position the soundproofing device also lends itself to mitigate the noise produced when the rubbish is transferred from the loading hopper 3 to the holding compartment 2a.

Claims

1. A motor vehicle for collecting the rubbish contained in rubbish skips (C), comprising:

   - a rubbish-holding compartment (2a);
   - a loading hopper (3) communicating with the holding compartment (2a) and having an opening (4) at the upper part thereof which is accessible through a loading inlet (5);

- loading means (6) movable astride the loading inlet (5), between a position at which a skip (C) is grasped at the outside of the holding compartment (2a) and a position at which the rubbish contained in the skip (C) is transferred into the hopper (3);

characterised in that it further comprises a soundproofing device (8) operating at said opening (4) to mitigate the emission of noise during transfer of the rubbish into the loading hopper (3), wherein said soundproofing device (8) comprises:

- a lid (9) for said opening (4), which is movable away from the loading inlet (5) to enable access to the hopper (3); and
- a cap (10) rotatably associated with the lid (9), to cover the skip (C) at least partly during transfer of the rubbish into the holding compartment (2a).

2. A motor vehicle as claimed in claim 1, wherein the soundproofing device (8) is movable between a rest position at which the cap (10) is retracted to a position under the lid (9) and the lid (9) is in the closed position, and an operating position at which the cap (10) is drawn out relative to the lid (9) and the lid (9) is in the open position.

3. A motor vehicle as claimed in claim 1 or 2, wherein the cap (10) has a rotation axis (R) parallel to a longitudinal axis (L) of the motor vehicle (1).

4. A motor vehicle as claimed in anyone of the preceding claims, wherein the cap (10) comprises a panel having a cross section in the form of an arc of a circle.

5. A motor vehicle as claimed in anyone of the preceding claims, wherein the lid (9) has a cross section at least partly arched so as to match the shape of the cap (10).

6. A motor vehicle as claimed in claim 3, wherein the cap (10) comprises two wings (11), each of them being connected to a respective end (10a) of the cap (10); the wings (11) extending towards the rotation axis (R) of the cap (10) and being in the shape of a circle sector.

7. A motor vehicle as claimed in claim 6, wherein the lid (9) comprises two shoulders (12), each of them being connected to a respective end (9a) of the lid (9) ; each shoulder (12) being in the shape of a circle sector and being hinged on a respective wing (11).

8. A motor vehicle as claimed in claim 1, further comprising first actuators (14) for movement of the lid (9) and second actuators (15) for movement of the cap (10) relative to the lid (9).

9. A motor vehicle as claimed in anyone of the preceding claims, wherein the loading inlet (5) is formed along a longitudinal side of the motor vehicle (1).

10. A motor vehicle as claimed in anyone of the preceding claims, wherein the lid (9) and the cap (10) are at least partly made of deadening material.

FIG 1

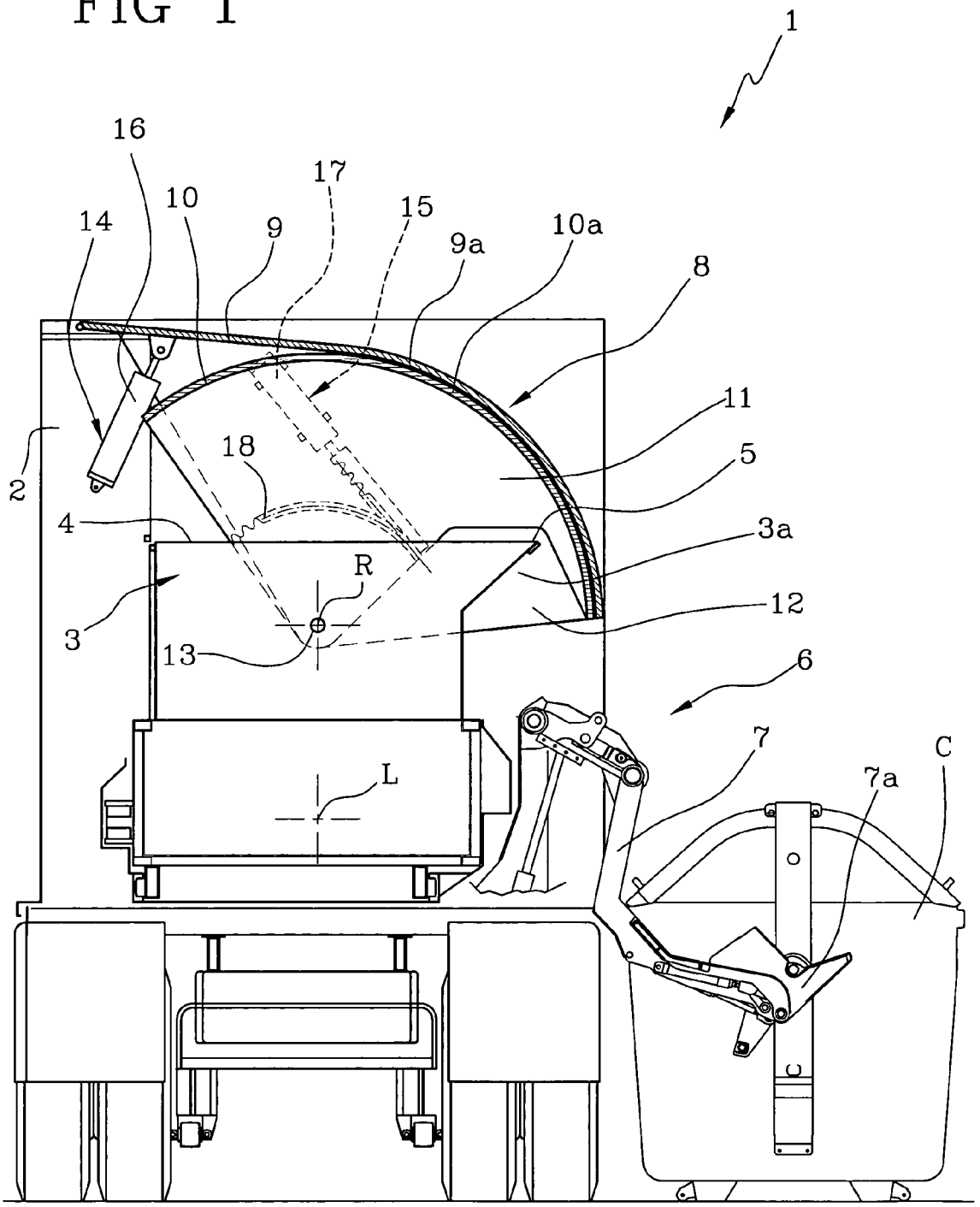


FIG 2

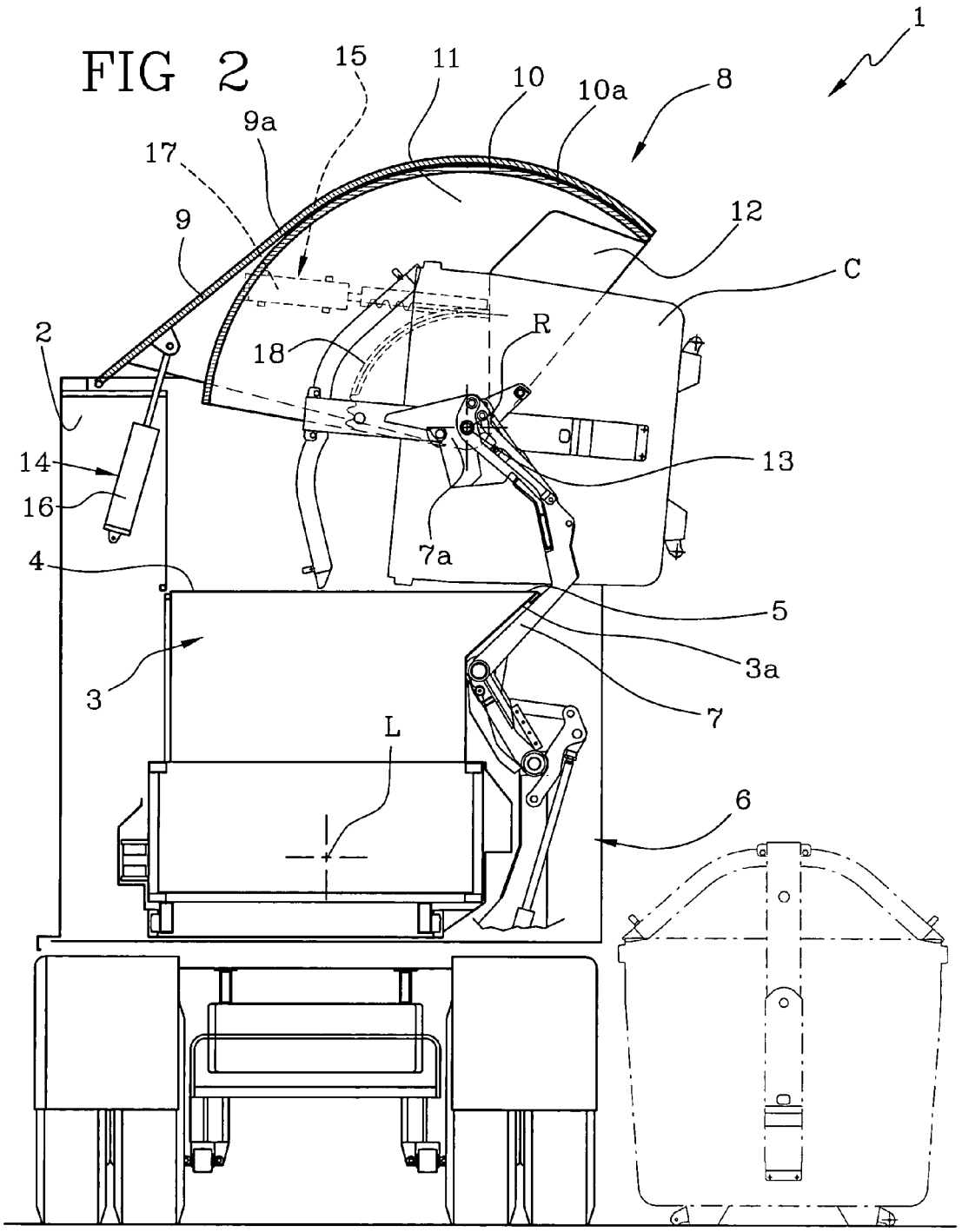
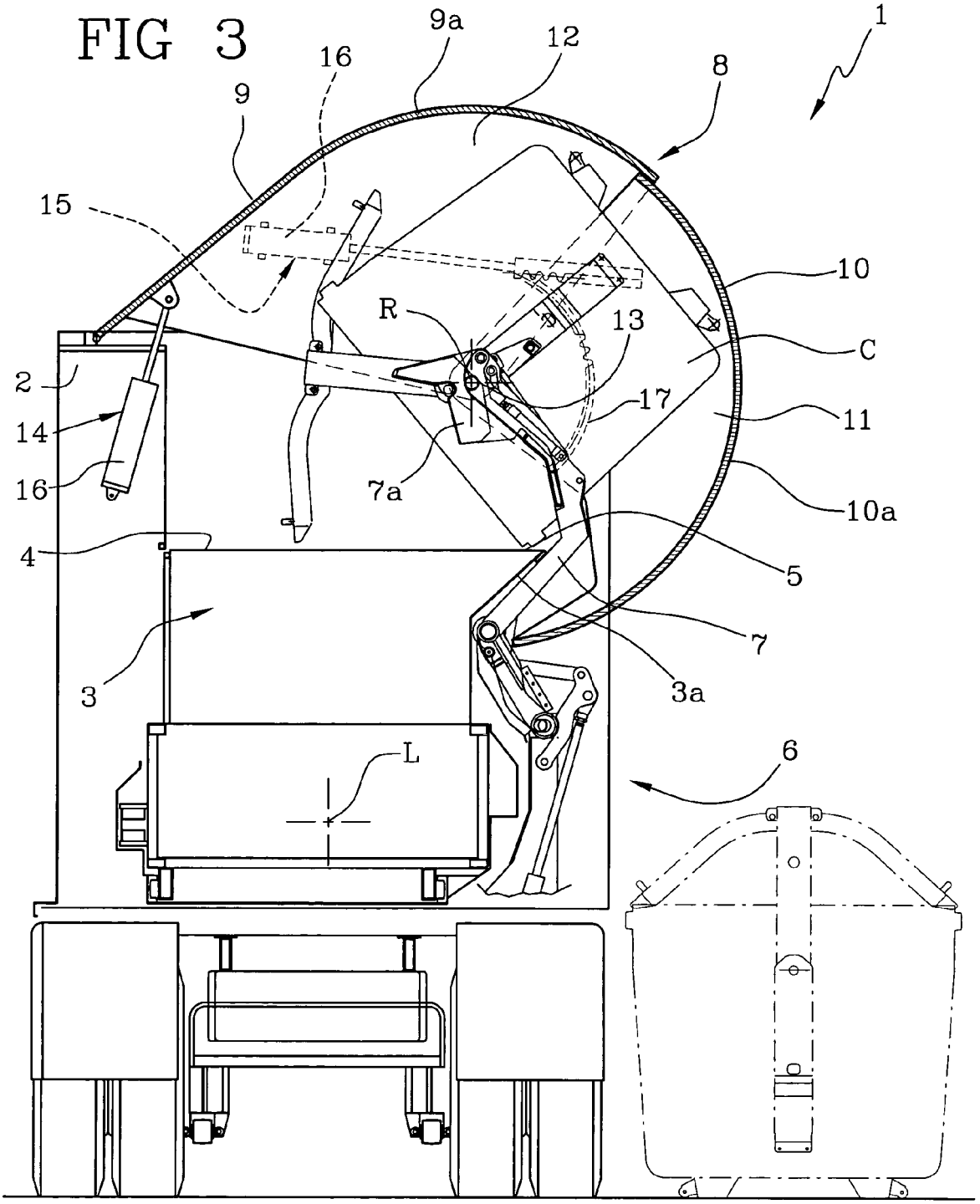


FIG 3



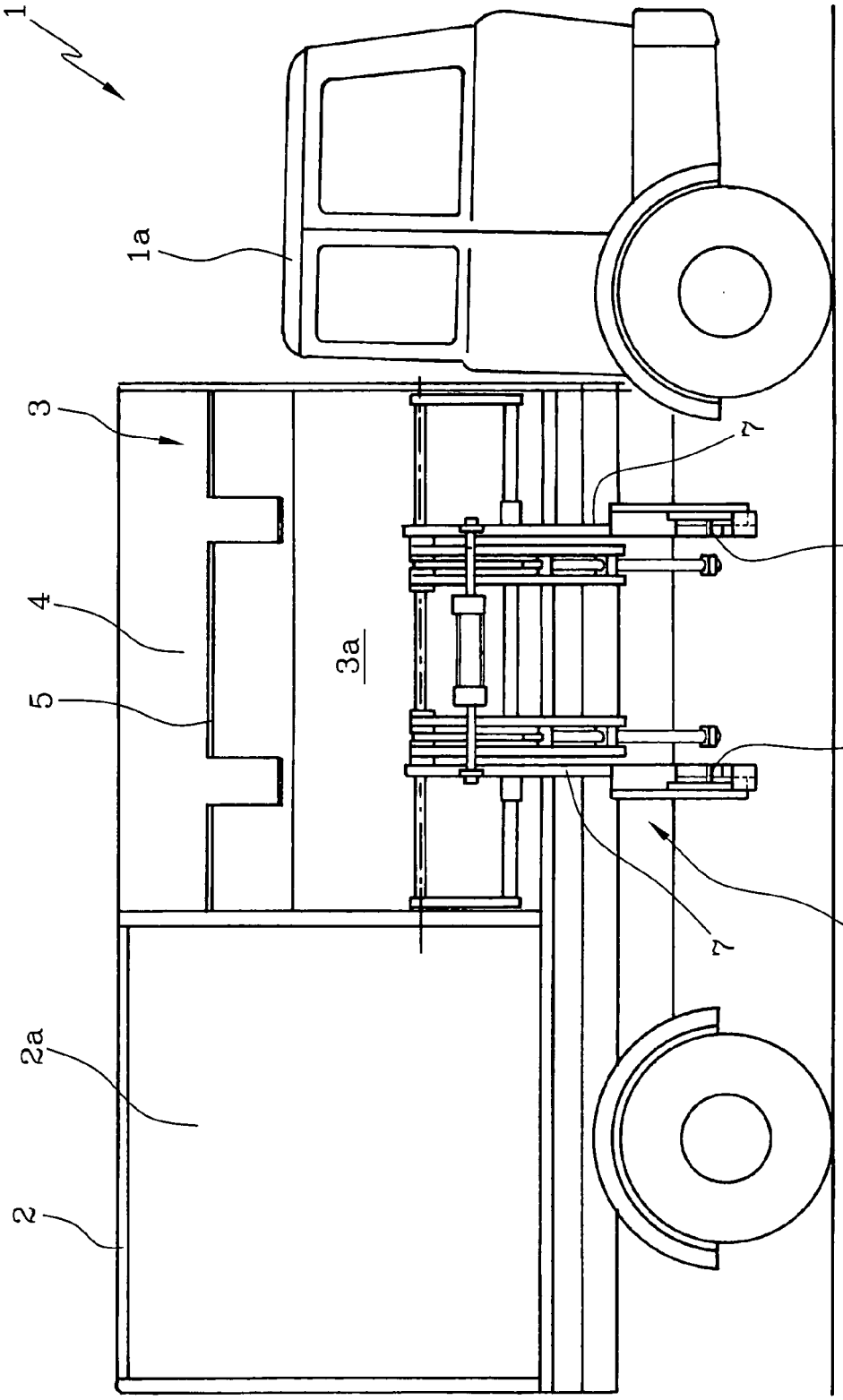


FIG 4

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EUROPEAN SEARCH REPORT

Application Number
EP 06 42 5773

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 0 278 307 A (ZÖLLER-KIPPER GMBH) 17 August 1988 (1988-08-17) * column 5, line 11 - column 7, line 20 * * figures 1-3 *	1	INV. B65F3/00 B65F3/12
A	US 3 152 707 A (F. REY) 13 October 1964 (1964-10-13) * column 2, line 6 - line 64 * * figures 1,2 *	1	
A	DE 25 17 912 A (HAUHINCO MASCHINENFABRIK G. HAUSHERR, JOCHÛMS & CO. KG) 28 October 1976 (1976-10-28) * page 6, line 18 - page 7, line 12 * * figure 1 *	1	
A	DE 447 898 C (HERM. FRANKEN AG) 3 August 1927 (1927-08-03) * the whole document *	1	

TECHNICAL FIELDS SEARCHED (IPC)

B65F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16 March 2007	Smolders, Rob

CATEGORY OF CITED DOCUMENTS

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16-03-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0278307 A	17-08-1988	CA 1292205 C	19-11-1991
		DE 3703795 A1	18-08-1988
		ES 2030771 T3	16-11-1992
		US 4886411 A	12-12-1989
US 3152707 A	13-10-1964	BE 623879 A	
		CH 383876 A	31-10-1964
		DE 1184697 B	31-12-1964
		FR 1313818 A	04-01-1963
		GB 955376 A	15-04-1964
DE 2517912 A	28-10-1976	NONE	
DE 447898 C	03-08-1927	DE 479590 C	18-07-1929

EPO FORM P0459

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