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EP 0 359 083 B1

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Description

This invention relates to a motor vehicle for urban refuse collection according to the preamble of the main claim.

DE-A-2558433 describes a motor vehicle for urban refuses comprising a chassis, a collection bin on said chassis divided in at least two chambers separated from each other by a longitudinal wall, said chambers being opened at their rear ends and comprising discharging devices to unload the refuses, a common rear movable door closing simultaneously the openings of said chambers, said door being provided with pushing means positioned at each chamber for pushing the collected refuses.

This known solution has some drawbacks. In fact, to discharge only one of the bin chambers, the rear movable door has to be opened. This causes that not only the refuses of that chamber are discharged, but also at least part of the refuses in the other chamber, so, at least part of the separate refuse batches get mixed. This can cause problems when refuse separation is a need, for example, when the refuses are to be recycled. The above drawback not only occurs when the refuses are unloaded by the discharging device of the particular chamber but even at door opening.

Therefore, if refuse separation is required (i.e. to recycle the refuses) the prior solution does not permit a reliable separation. Then a further refuse processing of is needed.

EP-A-257422 describes a motor vehicle for urban refuse collection comprising a bin divided in at least two different chambers for collecting different kinds of refuse. The bin comprises a longitudinal separating wall dividing it into two chambers. More particularly it refers to a device to lift and rotate (and overturn) refuse containers even those divided into two collecting sections separated by a common wall.

In this prior document there is no description either relating to loading and pushing devices into the chambers of the bin or relating to discharging devices to unload said chambers.

An object of the present invention is therefore to provide a motor vehicle for urban refuse collection which enables the refuse to be sorted in a simple and reliable manner during its collection and to be kept separated even during its discharge.

This and further objects which will be apparent to the expert of the art are attained by a motor vehicle for urban refuse collection of the aforesaid type, whose inventive features are specified in the characterizing clause of the main claim.

The present invention will be more apparent from the accompanying drawing, which is provided for non-limiting indicative purposes only and in

which:

Figure 1 is a side view of the motor vehicle constructed in accordance with the invention;

Figure 2 is a plan view of the vehicle of Figure 1;

Figure 3 is a rear view of the vehicle of Figure 1.

Said figures show a motor vehicle 1 for urban refuse collection.

Said vehicle 1 is provided with a collection bin 2 divided longitudinally into two chambers 3 and 4. Said chambers 3 and 4 are separated from each other by a wall 5 and are each provided with a usual expulsion cylinder 6. Said chambers 3 and 4 can have identical or different volumes.

According to the invention each chamber 3 and 4 is provided with its own door 3A and 4A respectively, the dimensions of which (in terms of width) correspond to those of said chambers. In Figure 1 in particular, one (3A) of the two doors 3A and 4A is shown in its open position for the discharge of the refuse collected in the chamber 3, while in Figures 2 and 3 said doors 3A and 4A are shown in their closed position.

To open each door 3A and 4A, with these latter there are associated hydraulic lifting devices 7 comprising cylinders 8 hinged to fixed parts 9 rigid with an upper part 10 of the collection bin 2, in each of which a piston 11 moves. Each piston 11 is hinged at one end 12 to one end 13 of an arm which is hinged at its other end 15 to a fixed part 16 rigid with the doors 3A and 4A.

Specifically, said fixed parts 9 and 16 are formed respectively from parallel flanges 17 and 18 connected together by pins 19 and 20. In this manner, said cylinders 8 can rotate about the pins 19 of the flanges 17 of the fixed parts 9, and the arms 14 can rotate about the pins 20 of the flanges 18 of the fixed parts 16 during the opening of the doors 3A and 4A.

More particularly, in the embodiment described herein (see Figure 3), two hydraulic lifting devices 7 are provided for the larger-dimension door 3A, whereas only one device 7 is provided for the smaller-dimension door 4A. This however is not binding for the purposes of the invention, as the number (one or two) of lifting devices 7 associated with the doors 3A and 4A can vary as the dimensions of these latter vary.

Finally, to allow the doors 3A and 4A to be opened, these are hinged at 19A to the rear ends 20A of the upper part 10 of the collection bin 2.

With each door 3A and 4A there is also associated a loading and compacting member 21 of known type driven by hydraulic cylinder-piston systems.

When the doors 3A and 4A have been closed onto the bin 2 they are retained and secured in that position by hydraulic locking devices 23 compris-

ing cylinders rigid with the bin 2 or with other fixed parts of the vehicle and housing movable pins which when the doors 3A and 4A are closed cooperate with elements of suitable shape (eg. of sleeve or eyelet form) rigid with the doors.

All the hydraulic devices provided on the vehicle form part of a hydraulic circuit comprising known members such as pumps and valves, together with bypass lines to enable the devices associated with each chamber 3 and 4 to be operated at different times, and in particular enable the two doors 3A and 4A to be opened (or closed) independently. Alternatively, two parallel hydraulic circuits can be provided, acting on each group of devices (door raising-closing; expulsion cylinder; locking device) associated with each chamber 3 and 4 of the bin 2.

It will be assumed that the motor vehicle 1 is now to be discharged, having collected the refuse. This collection has been carried out with the refuse undergoing sorting, for example glass having been placed in the chamber 4 of the bin 2 and combustible refuse in the chamber 3.

The door 3A is firstly opened to discharge the chamber 3. This is done by operating a suitable control such as a lever, which acts on the hydraulic circuit to release the pressure of the fluid present in the locking device 23 securing the door 3A to the bin 2, so making it possible to open it. The lifting devices 7 associated with the door 3A in question now begin to operate, this operation being such as to initially lift the arms 14 so rotating them about the pins 20 of the fixed parts 16. The pistons 11 of the devices 7 then begin to retract into their respective cylinders 8 to exert a pulling action on the door 3A, which rises from the bin 2 by rotating about the hinges 19A by which the door 3A is fixed to the upper ends 20A of the bin.

As the door 3A rises, the cylinders 8 rotate about the pins 19, this rotation continuing until the door 3A is completely open. At this point the hydraulic circuit, which is specifically constructed to be able to operate in cascade on the locking devices 23, on the lifting devices 7 and on the expulsion cylinders 6, now operates the expulsion cylinder 6 of the chamber 3 and expel the refuse collected in said chamber.

When this first discharge stage has been completed, the chamber 4 of the bin 2 is discharged in the same manner after opening the door 4A, this discharge taking place either automatically following the first discharge or on receipt of a manual command.

Alternatively the expulsion cylinders 6 can be controlled manually, to allow possible compacting.

When the refuse has been totally discharged in its sorted batches, the refuse collection operator reoperates the pumps of the hydraulic circuit to

return the expulsion cylinders to their rest state and reclose the doors 3A and 4A. At this point, by means of known devices provided in the hydraulic circuit, the pressure is discharged from the lifting devices 7 and cylinders 6 towards the locking devices 23 for the doors 3A and 4A, which now operate to secure these latter to the bin 2.

A refuse collection vehicle constructed in accordance with the present invention enables refuse to be stored during said collection and to be kept separated during discharge.

Claims

1. Motor vehicle for differentiated urban refuse collection comprising a chassis, a collection bin (2) on said chassis divided in at least two chambers (3,4) separated from each other by a vertical longitudinal wall (5), the vehicle comprising refuse loading and unloading openings and comprising discharging means (6) located and operating in said chambers (3,4) for unloading said refuse, characterized in that doors (3A,4A) for each opening are provided on the rear of the vehicle, each comprising compacting means (21) and at least one hydraulic lifting device for opening or closing the same, and at least one hydraulic locking device.
2. A motor vehicle as claimed in claim 1, characterised in that the hydraulic locking device (23) comprises at least one cylinder in which a pin rigid with the bin (2) or with a fixed part of the motor vehicle (1) moves, and a member cooperating with said pin to secure it rigid with the door (3A,4A).
3. A motor vehicle as claims in claim 2, characterised in that the cylinders are two or four in number.

Patentansprüche

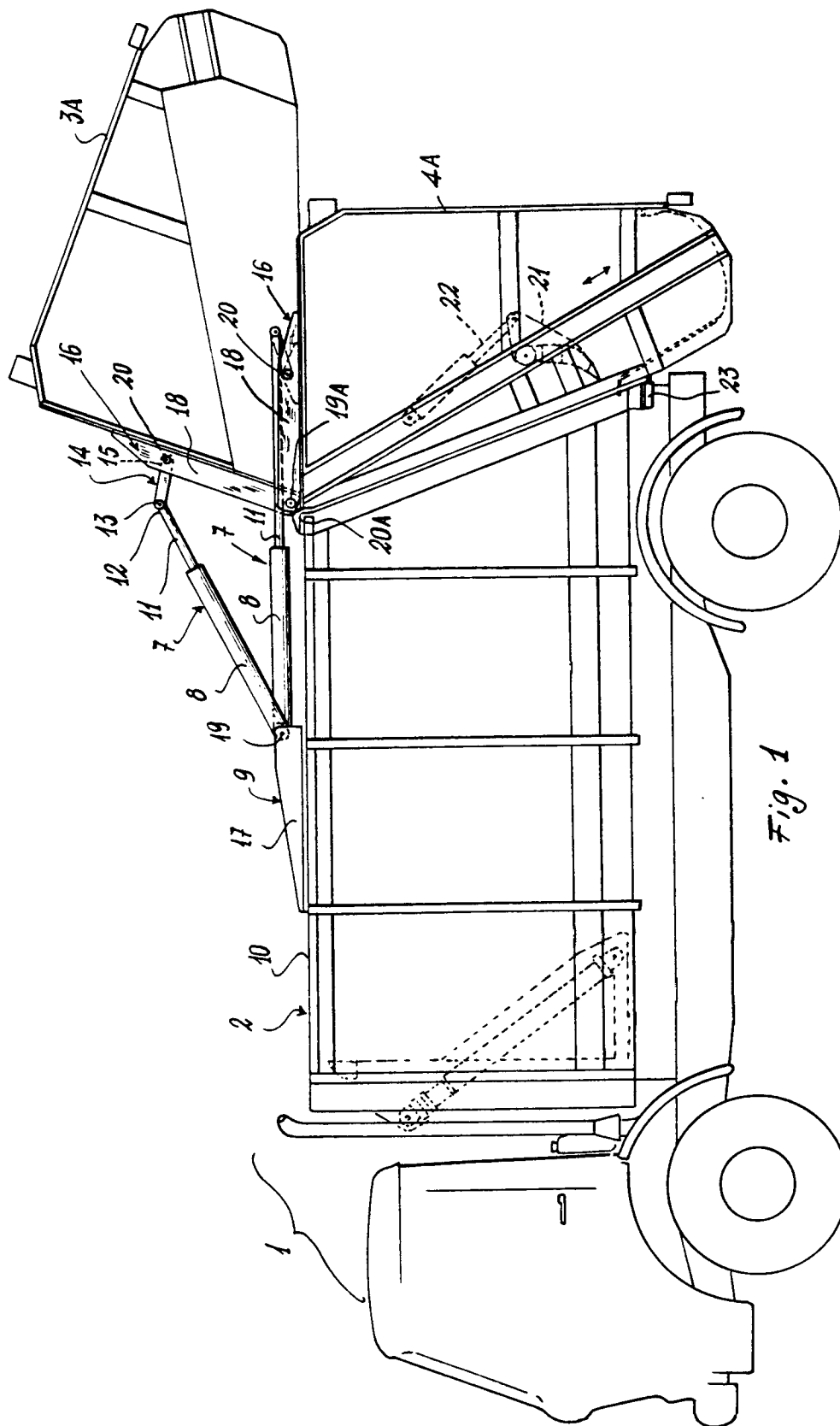
1. Kraftfahrzeug für das differenzierte Einsammeln von Stadtmüll, mit einem Fahrgestell, einem Sammelbehälter (2) auf dem genannten Fahrgestell, der in mindestens zwei Kammern (3, 4) unterteilt ist, die voneinander durch eine vertikale Längswand (5) getrennt sind, wobei das Fahrzeug Öffnungen zum Be- und Entladen von Müll aufweist und eine Abgabeeinrichtung (6) aufweist, die in den Kammern (3, 4) angeordnet und wirksam ist, um den genannten Müll zu entladen, dadurch **gekennzeichnet**, daß Türen (3A, 4A) für jede Öffnung an der Rückseite des Fahrzeuges vorgesehen sind, von denen jede eine Verdichtungsseinrichtung (21) und mindestens eine hydraulische

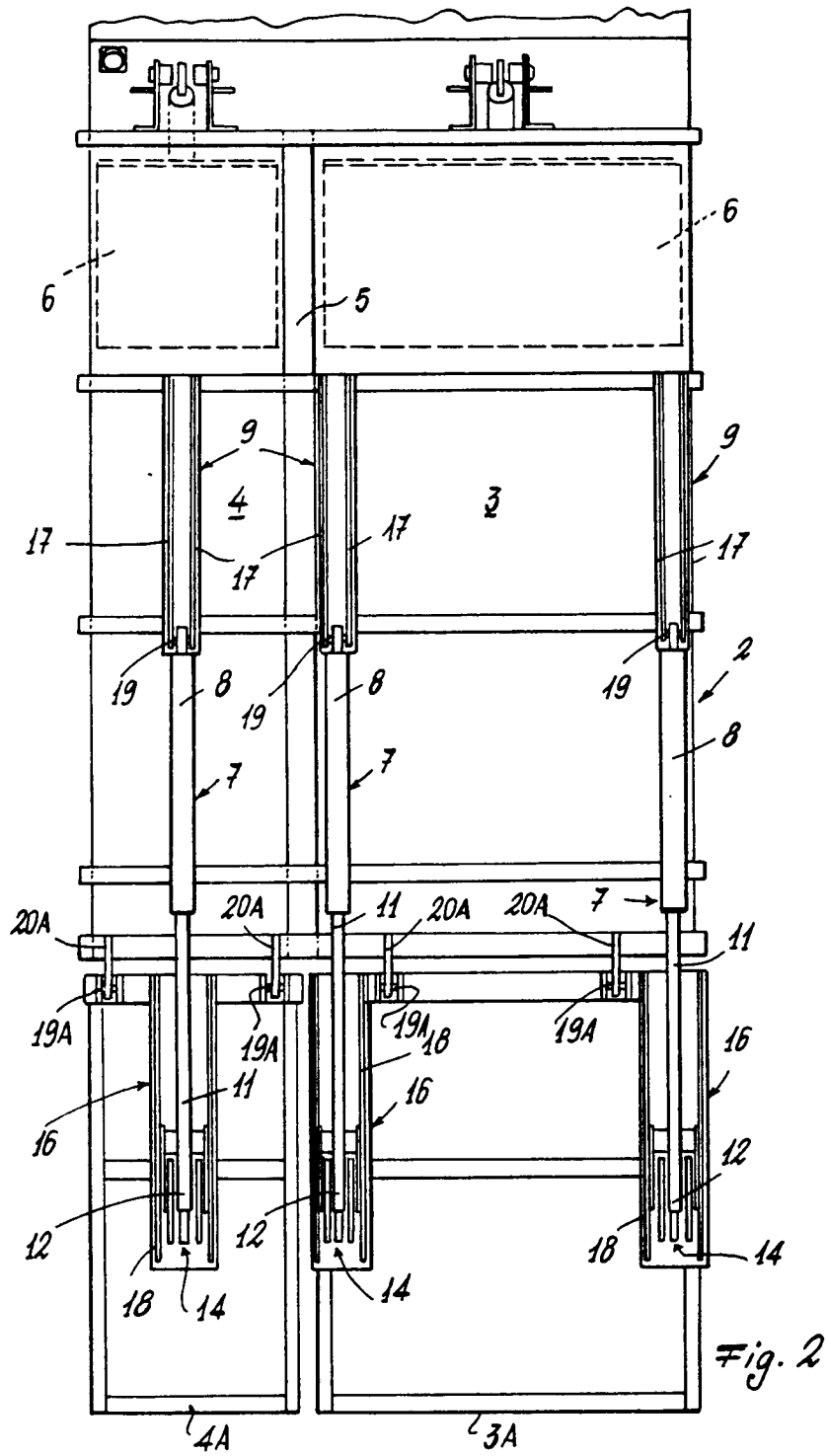
Hubvorrichtung aufweist, um dieselbe zu öffnen und zu schließen, sowie mindestens eine hydraulische Verriegelungsvorrichtung.

2. Kraftfahrzeug nach Anspruch 1, dadurch gekennzeichnet, daß die hydraulische Verriegelungsvorrichtung (23) mindestens einen Zylinder aufweist, in dem sich ein starr mit dem Behälter (2) oder einem festen Teil des Kraftfahrzeuges (1) verbundener Bolzen bewegt, sowie ein Teil, das mit dem genannten Bolzen zusammenwirkt, um ihn starr mit der Tür (3A, 4A) zu verbinden. 5
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3. Kraftfahrzeug nach Anspruch 2, dadurch gekennzeichnet, daß die Zylinder zwei oder vier an der Zahl sind. 15

Revendications

1. Véhicule à moteur pour collecte des déchets urbains différenciés comprenant un châssis, une trémie de collecte (2) sur ce châssis divisée en au moins deux chambres (3, 4) séparées l'une de l'autre par une paroi longitudinale verticale (5), le véhicule comprenant des ouvertures de chargement et de déchargement des déchets et comprenant un moyen de déchargement (6) situé et fonctionnant dans ces chambres (3, 4) pour décharger ces déchets, caractérisé en ce que des portes (3A, 4A) pour chaque ouverture sont prévues à l'arrière du véhicule, chacune comprenant un moyen de compactage (21) et au moins un dispositif de levage hydraulique pour leur ouverture ou fermeture, et au moins un dispositif de verrouillage hydraulique. 20
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2. Un véhicule à moteur selon revendication 1, caractérisé en ce que le dispositif de verrouillage hydraulique (23) comprend au moins un vérin dans lequel se déplace une axe solidaire de la trémie (2) ou d'une partie fixe du véhicule à moteur (1), et un élément coopérant avec cet axe pour le rendre solidaire de la porte (3A, 4A). 40
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3. Un véhicule à moteur selon revendication 2, caractérisé en ce que les vérins sont au nombre de deux ou quatre. 50





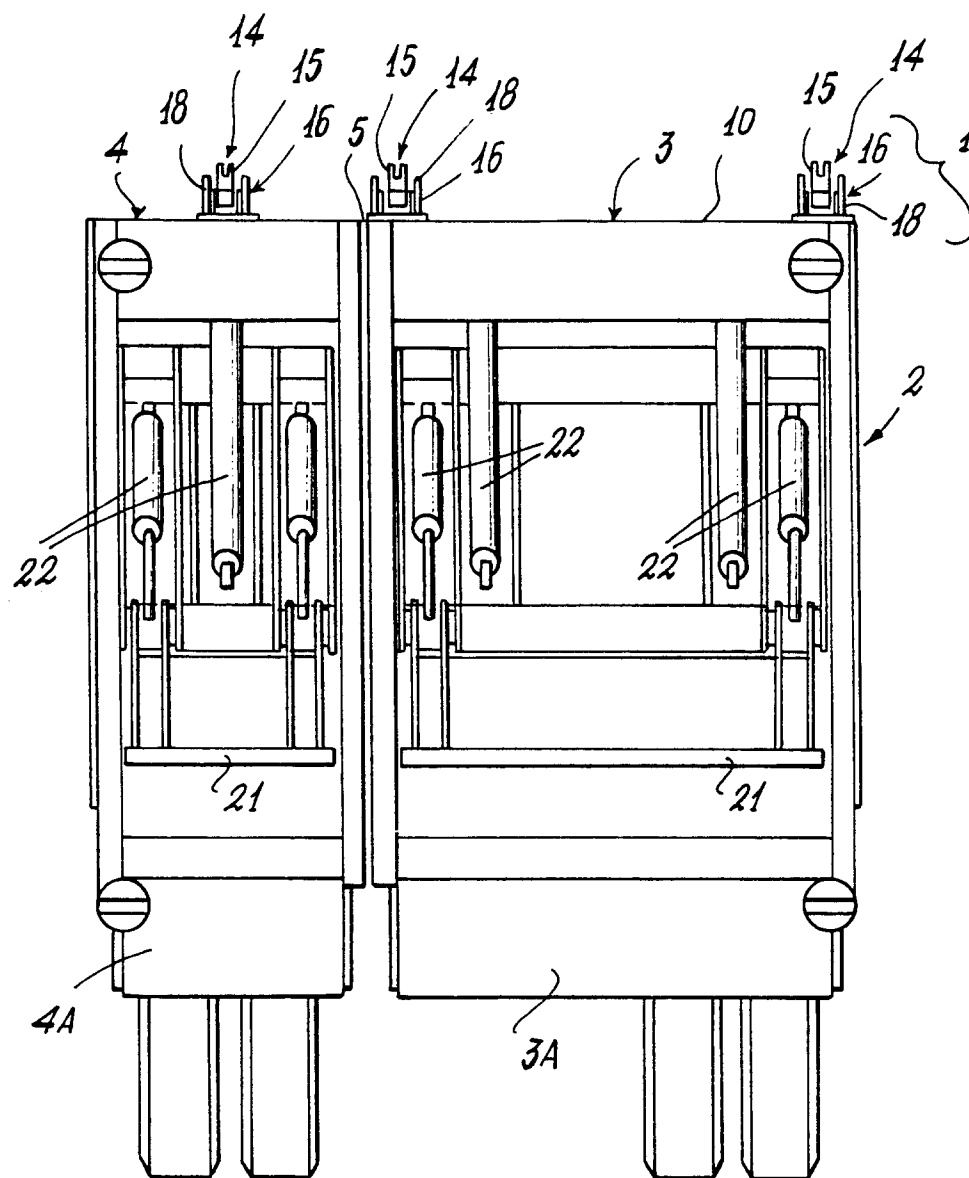


Fig. 3