(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 038 579**
B1

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **28.12.83**

(51) Int. Cl.³: **B 65 F 3/20**

(21) Application number: **81200294.7**

(22) Date of filing: **16.03.81**

(54) **Loading mechanism for refuse vehicle.**

(30) Priority: **04.04.80 BE 9775**

(43) Date of publication of application:
28.10.81 Bulletin 81/43

(45) Publication of the grant of the patent:
28.12.83 Bulletin 83/52

(84) Designated Contracting States:
CH DE FR GB IT LI LU NL

(56) References cited:
DE - A - 2 736 572
FR - A - 2 403 954
US - A - 3 615 029

(73) Proprietor: **Constructie Werkhuizen VANDEKERCKHOVE N.V.**
Brugse Steenweg 374
B-8800 Roeselare (BE)

(72) Inventor: **Demeyer, Pieter**
Puitstraat 3
B-8690 Moorslede (BE)

(74) Representative: **Ryckeboer, Leo**
N.V. BEKAERT S.A. Leo Bekaertstraat 1
B-8550 Zwevegem (BE)

EP 0 038 579 B1

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European patent convention).

Courier Press, Leamington Spa, England.

Loading mechanism for refuse vehicle

The invention relates to a loading mechanism for a refuse vehicle whereby the rear opening extends substantially vertically between the floor and the sidewalls of the body of the refuse vehicle. In particular, reference is made to a loading mechanism for a rearloading refuse vehicle, e.g. for removing household waste.

Loading mechanisms for this kind are widely known and are often hingedly mounted on a horizontal spindle at the top of the rear opening of the refuse vehicle body. In the U.S. patent 3,615,029 a loading mechanism is described, having a partition with the uppermost part of the rear opening in the refuse vehicle body, as well as a slide member which can move up and down and at whose bottom, hinges are provided for a pivotable packer blade which, in a known manner, coacts with the, possibly curved, floor of the refuse receiver or hopper for any necessary compressing and dumping of the waste into the refuse vehicle body.

It is also known to guide the up- and down movable slide member carrying the packer blade by sliding it in its tracks near the sidewalls of the hopper. According to U.S. patent 3,615,029 the sliding movement is achieved by driving means, such as hydraulic cylinder-piston combinations attached to the outside of these sidewalls. The driving means are not fixed to the partition.

In order to simplify the construction of these driving means and to increase their efficiency, it is now suggested to mount them between the partition and the slide member and to connect them fixedly to the partition near its bottomside, while the moving element of the driving means is directly connected to the upper end of the slide member.

In so doing, Applicant avoids to have to make large slots in the side walls of the loading mechanism as shown in U.S. patent 3,615,029. By making such slots, the strength of these side walls is substantially weakened. This loss in strength must then be compensated e.g. by an extra reinforcement of these side walls which is generally an expensive additional construction operation on top of the already required work for finishing the slot edges. Furthermore the loading mechanism of U.S. patent 3,615,029 always requires two hydraulic cylinder-piston combinations to reciprocate the slide member.

Further characteristics of the loading mechanism according to the invention will be further clarified hereafter with reference to an embodiment shown in the adjoined figures.

Figure 1 is a cross sectional view of the loading mechanism connected to the refuse vehicle;

Figure 2 is a detailed view of the adjustable guiding means for the slide member in the sidewalls of the loading mechanism.

The rear portion of a refuse vehicle shown in Figure 1 comprises the refuse body 1 with rear opening 2 at the top of which the loading mechanism 4 is pivotably fixed in hinge 3.

When the refuse vehicle 1 is being loaded, the loading mechanism rests with its sidewalls 5 against the rear opening 2 and with its underside or floor 6 against the extension plate 7 which at the bottom of the rear opening 2 is attached to the floor 8 of the refuse vehicle. The sidewalls 5 at both sides of the loading mechanism are connected to each other by a partition 9 which at its horizontal underedge joins a crossbeam 10. On this cross-beam, halfway between the sidewalls, a hydraulic cylinder-piston pressure combination 11, 12 is mounted as driving means, which preferably extends parallel to the slide member 13. In 14 the upperend of the piston rod is connected to the upper end of the slide member. Hence, by means of the hydraulic pressure means 11, 12 the slide member 13 is able to move up and down and in this process it is guided in suitable elongated slots 15 in both sidewalls 5 by means of the guiding means 16 described further on. At the bottom of the slide member the packer blade 17 is pivotably bearing-mounted in a known manner about rod 18. The rotation is also performed by a hydraulic cylinder 19 which has a support 20 in the framework of the slide member and whose piston rod 21 is hingedly attached to an extension piece 22 of the packer blade.

The working cycle of the loading mechanism is as follows. We assume that the slide member is in its upper position and the packer blade is in open position 23 (dotted line). The refuse to be loaded is dumped into space 24 on floor 6 of the hopper and the slide member with opened packer blade 23 is slid downwards under the influence of the hydraulic pressure means 11, 12 until the packer blade reaches position 17. The cylinder 19 is now brought into operation and the plate 17 pivots around the rod 18 into its position 25. During this pivoting movement the plate 17 coacts with the floor 6 for compressing the dumped material and shoves it further on towards the rear opening 2. The cylinder 19 keeps its position and the slide member 13 is in coupling 14 again pushed upwards into its upper position 26 by pressure means 11—12. The packer blade so pushes the dumped material further upwards into the rear opening between the slide member wall 28 and the extension plate 7 towards its position 27.

The operation of this loading mechanism permits the use of but one hydraulic pressure cylinder 11 or a similar driving means for the slide member. This simplifies the hydraulic pressure circuit, lowers the weight and the cost of the loading mechanism, as well as the risk of defect of the hydraulic circuit or the pressure cylinders. The position of cylinder 11 with fixed support 10 at the bottom also raises the pressure efficiency since the cylinder must exert most force exactly when it must push the slide

member and the packer blade (traject from positions 25 to 27) carrying the material to be moved upwards. The entire piston surface 29 is used for this upward movement (without reduction of the piston rod cross section). Moreover, with the position of cylinder 11 between the partition 9 and the slide member 13 there is less wear of the guiding slots 15 when the slide member is moved upwards than when the cylinder would have been located on the other side of the slide member. Indeed a smaller couple is formed by the guiding means 16 in the slots 15.

In order, on the one hand, to further reduce the frictional wear of the means 16 in the slots, and, on the other hand, to avoid extremely strict and hardly applicable construction tolerances for the slots 15, the invention suggests as an additional measure to make the guiding means 16 horizontally adjustable. Moreover, these guiding means preferably comprise friction blocks in combination with roller guides as sliding mechanisms as will be described further on with reference to the detailed drawing in Figure 2.

Said figure shows one of the upper corners of the slide member 13 as viewed from the rear side of the refuse vehicle and moving up and down along the inner side 31 of the sidewall 5 of the loading mechanism. The movement of the slide member in slot 15 is guided by guiding means 16 fixed to the upper edge 32 of the slide member. These guiding means 16 essentially comprise a bearing block 33 to whose end, extending in the slot 15, a rectangular friction block 34 is fixed and which comprises a sliding plate 35 e.g. made of bronze. The friction block 34—35 preferably slides against the walls 37 and 30 of the slot 15. A roller guide 36 is bearing mounted on this shaft end and normally rolls against the bottom transverse surface 30 of the slot 15. The bearing block 33 together with this guiding combination 34, 35, 36 is now preferably horizontally movable in the direction from and towards the sidewall 5. This offers the exceptional advantage that in case of frictional wear, particularly on the inner side 37 of the sidewall 5, the resulting play between the guiding means and wall 37 can be reduced. This is important since it is known by experience that increasing play in the slide member guiding slots leads to faster wear therein and on an average also requires more sliding energy. Moreover, chances increase that the guiding means 16 blocks in case of unequal loading on the packer blade across the width of the loading mechanism.

The bearing block 33 is fixed to the upper side 32 of the slide member by means of bolt-nut connections 38 thereby using an intermediate clamping plate 39 and through suitable bores 40 in block 33. The bores have a elongated cross section with the greater transverse dimension in the direction perpendicular to the sidewall 5 so that a displacement of the bearing block in that direction becomes possible after that the bolts 38 have been slightly released. The displacement distance can be set by means of the nuts 41 against the stop 42 fixed to the upperside of the slide member.

The invention is not limited to the embodiment of the loading mechanism herein described and illustrated.

For example the partition 9 may be convexed (dotted line 43 in Figure 1) in the direction of the rear opening of the refuse body in order to stimulate the compressing process in the rear opening. The slot walls 30 and 37 may also be covered with a sliding layer. The roller 36 may also be replaced by a sliding block, for example made of bronze. Cylinder 11 can also be positioned not parallel with the slide member 13.

Claims

1. A loading mechanism (4) for a refuse vehicle, said vehicle comprising a body (1) with floor (8), side walls and a rear opening (2) extending substantially vertically between said floor and side walls, whereby the loading mechanism is hingedly connected to the body (1) by means of a horizontal spindle (3) at the top of the rear opening (2) and whereby said loading mechanism comprises a partition (9) adjacent the rear opening, a slide member (13) and driving means (11, 12) for moving said member (13) up and down, and a pivotable packer blade (17) hingedly connected to the bottom edge of the member (13), which blade coacts with the floor (6) of the loading mechanism for compressing and dumping refuse into the vehicle body (1), characterized in that the driving means (11, 12) are located between the slide member (13) and the partition (9) and the fixed element (11) is fixedly connected near the bottom edge of said partition, while the moving element (12) of the driving means is connected to the upper end (14) of the slide member (13).

2. A loading mechanism according to claim 1, characterized in that the driving means (11, 12) consist of one hydraulic pressure cylinder (11) located halfway between the side walls (5) of the loading mechanism and of which the piston rod (12) is connected with its upper end to the upper end (14) of the slide member.

3. A loading mechanism according to claim 2, characterized in that the hydraulic pressure cylinder (11) extends parallel to the slide member (13).

4. A loading mechanism according to claim 1, characterized in that it also comprises adjustable guiding means (16) for the slide member (13) in the sidewalls of the loading mechanism, which guiding means are provided with sliding mechanisms (35, 36).

5. A loading mechanism according to claim 4, characterized in that the guiding means com-

prise as sliding mechanisms friction blocks (34, 35) in combination with roller guides (36).

Revendications

1. Un dispositif de chargement (4) pour un véhicule à ordures, ledit véhicule comprenant un corps (1) avec un sol (8), des flancs de côté et une ouverture arrière (2) qui s'étend d'une façon sensiblement verticale entre ce sol et flancs de côté, dans lequel le dispositif de chargement est fixé pivotant au corps (1) par l'intermédiaire d'un pivot horizontal (3) situé au-dessus de l'ouverture d'arrière (2) et dans lequel ledit dispositif de chargement comprend une cloison de partage (9) à proximité de l'ouverture arrière, une glissière (13) et des actionneurs (11, 12) pour déplacer cette glissière (13) en haut et en bas, et une lame de tassement pivotant (17), fixé en pivot au bord inférieur de membre (13) et qui coopère avec le fond (6) du dispositif de chargement pour comprimer et décharger les ordures dans le corps (1) du véhicule, caractérisé en ce que les actionneurs (11, 12) sont aménagés entre la glissière (13) et la cloison de partage (9) et en ce que l'élément fixe (11) est fixé au bord inférieur de ladite cloison, tandis que l'élément mobile (12) de l'actionneur est fixé au bord supérieur (14) de la glissière (13).

2. Un dispositif de chargement selon la revendication 1, caractérisé en ce que l'actionneur (11, 12) comprend un cylindre à pression hydraulique (11) situé au milieu entre les flancs (5) du dispositif de chargement et dont le tige de piston (12) est fixé avec son extrémité supérieure à l'extrémité supérieure de la glissière.

3. Un dispositif de chargement selon la revendication 2, caractérisé en ce que le cylindre hydraulique (11), s'étend parallèllement à la glissière (13).

4. The dispositif de chargement selon la revendication 1, caractérisé en ce qu'il comprend aussi dans ses flancs des moyens de guidage réglables (16) pour la glissière (13), lesquels moyens sont munis de dispositifs de glissement (35, 36).

5. Un dispositif de chargement selon la revendication 4, caractérisé en ce que les moyens de guidage comprennent en tant que dispositifs de glissement des blocs à friction (34, 35) en combinaison avec des rouleaux de guide (36).

Patentansprüche:

1. Eine Beladevorrichtung (4) für ein Müllfahrzeug, wobei das Fahrzeug ein Behälter (1) aufweist mit Boden (8) Seitenwänden und hinterer Oeffnung (2) die sich nahezu vertikal erstreckt zwischen dem Boden und Seitenwänden, wobei die Beladevorrichtung gelenkig am Behälter (1) befestigt ist mittels einer horizontalen Welle (3) obenseitig der hinterer Oeffnung un wobei genannte Beladevorrichtung eine Scheidungswand (9) aufweist in der Nähe der hinteren Oeffnung, ein Führungsglied (13) und Antriebmittel (11, 12) für auf- und ab bewegen des Gliedes (13), sowie eine schwenkbare, gelenkig am Unterende des Gliedes (13) befestigte Pressplatte (17), welche Platte mit dem Bodenwand (6) der Beladevorrichtung zusammenwirkt für das Zusammendrücken und Fördern des Mülls in den Fahrzeugbehälter (1) dadurch gekennzeichnet dass die Antriebmittel (11, 12) sich zwischen dem Führungsglied (13) und der scheidungswand (9) befinden und dass das feste Element (11) in der Nähe des Unterendes der Scheidungswand befestigt ist, weil das bewegende Element (12) der Antriebmittel am oberen Ende (14) des Führungsgliedes (13) befestigt ist.

2. Eine Beladevorrichtung gemäss Anspruch 1, dadurch gekennzeichnet dass die Antriebmittel (11, 12) aus einem hydraulischen Presse-Zylinder (11) bestehen, welche sich in der Mitte zwischen den Seitenwanden (5) der Beladevorrichtung befindet, und dessen Kolbenstange (12) mit seinem oberen Ende zum oberen Ende (14) des Führungsgliedes befestigt ist.

3. Eine Beladevorrichtung gemäss Anspruch 2, dadurch gekennzeichnet dass der hydraulische Presse-Zylinder (11) sich parallel zum Führungsglied (13) erstreckt.

4. Eine Beladevorrichtung gemäss Anspruch 1, dadurch gekennzeichnet dass sie ebenfalls für das Führungsglied (13) verstellbare Führungsmittel (16) aufweisen in den Seitenwänden der Beladevorrichtung, welche Führungsmittel von Gleitvorrichtungen (35, 36) versehen sind.

5. Eine Beladevorrichtung gemäss Anspruch 4, dadurch gekennzeichnet dass die Führungsmittel als Gleitvorrichtungen Reibungsblöcke (34, 35) umfassen in Kombination mit Rollführungen (36).

FIG.1

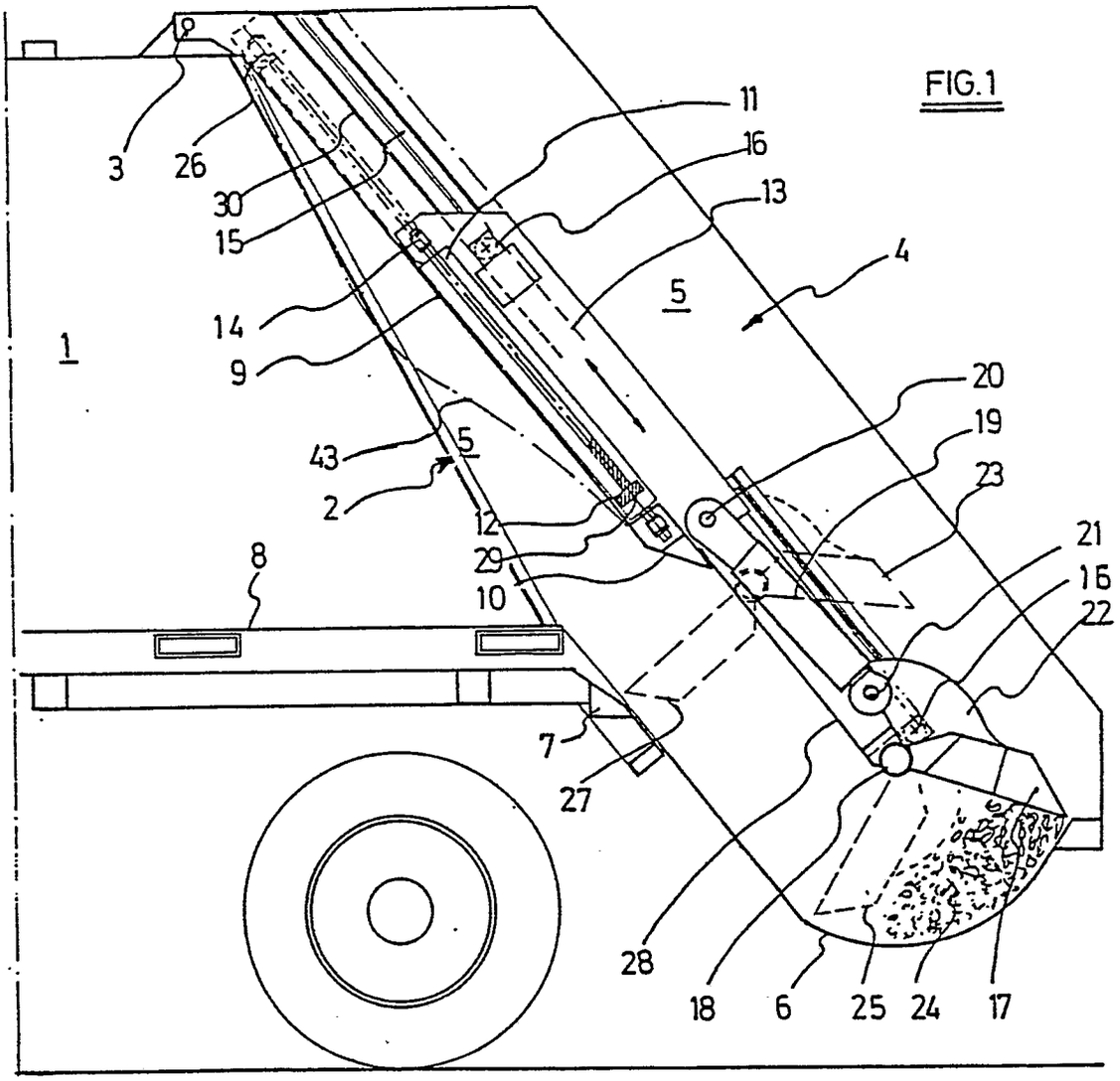
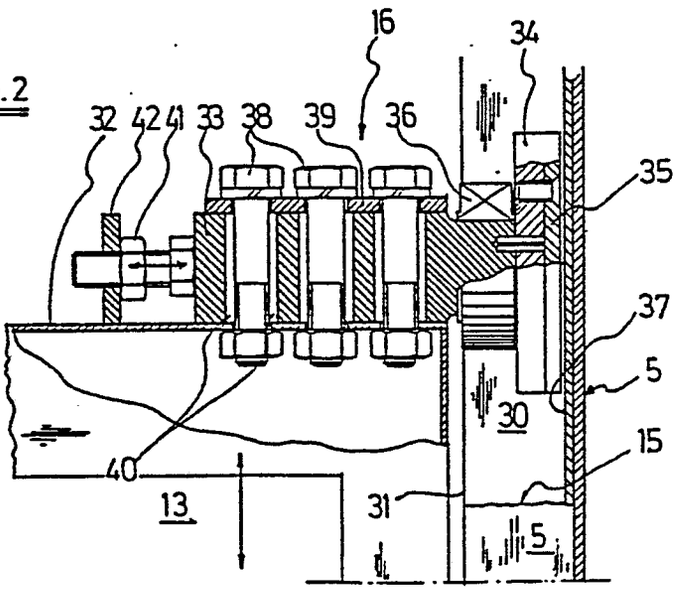

3
26
30
15
14
9
1
11
16
13
4
5
20
19
23
21
16
22
43
5
2
12
29
10
8
7
27
28
18
6
25
24
17

FIG.2


16
34
32
42
41
33
38
39
36
35
37
5
30
15
40
13
31
5