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(54) **Device to pick up and empty rubbish skips onto a motor-vehicle designed to collect refuse**

Vorrichtung zum Aufnehmen und Entleeren von Müllbehältern in einem Müllsammelfahrzeug

Dispositif pour ramasser et vider des conteneurs à ordures dans un véhicule à ordures

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IT-B- 1 194 971 **US-A- 4 422 814**
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Description

The present invention relates to a device to pick up and empty rubbish skips onto a motor-vehicle designed to collect refuse, comprising: a bearing framework fastened to a lateral side of said motor-vehicle; a guide structure in engagement with the bearing framework in an oscillatable manner and according to a horizontal rotation axis parallel to the longitudinal axis of the vehicle; a pair of grasping arms supported in cantilevered fashion from the guide structure and selectively movable close to and away from each other along said guide structure; a lifting unit comprising at least one fluid-operated cylinder linked to the bearing framework and acting on the guide structure to move the grasping arms about said rotation axis, between a grasping position in which said arms project sideways from the vehicle to operatively engage respective attachment elements arranged on respectively opposite side walls of the rubbish skip, and a lifting position in which said arms extend upwardly to bring the rubbish skip above a loading hopper arranged on said motor-vehicle. An example of such a device is disclosed in IT 1 194 971 B.

More particularly, the device in question is of the type usually mounted to the side of a motor-vehicle to carry out, in a completely automated manner, the cycle of emptying rubbish skips provided with attachment elements essentially consisting of a pair of pins projecting from the opposite side walls of the skip, at a centered position relative to the vertical centre line of said skip.

It is known that presently there are different devices capable of carrying out the emptying cycle of rubbish skips of the above type, by stopping the motor-vehicle at a position alongside the skip itself.

For example, the cited Italian Patent No. 1 194 971, mentioned as the most pertinent prior art for the present invention, describes a device provided with a pair of grasping arms mounted to a guide structure essentially consisting of two horizontal bars, one of which is disposed rotatably in engagement on a bearing framework located at one side of the motor-vehicle, close to the base of a loading hopper.

The guide structure is submitted to the simultaneous action of a pair of fluid-operated cylinders, upon command of which the grasping arms are movable to raised and lowered positions by a rotation motion about a horizontal rotation axis coinciding with the longitudinal extension of the bar hinged on the bearing framework. Said arms are also movable in a horizontal direction close to and away from each other, upon command of a double actuator fastened to the guide structure.

When the device is at rest, the arms extend upwardly from the guide structure, without overcoming the motor-vehicle overall dimensions, in order to prevent the arms from knocking against any object or obstacle when the motor-vehicle is moving. In the skip-emptying cycle it is provided that, when the motor-vehicle has

been stopped close to the skip, the arms should be lowered, upon command of the fluid-operated cylinders, to a grasping position in which they project sideways from the vehicle, their respective ends being slightly below the attachment pins arranged on the skip. The arms, previously maintained at their maximum spread-apart position, are then moved close to each other by the double actuator so that each of them approaches the corresponding side wall of the skip, the respective extremity being ready for engagement with the attachment pins. Upon the action of the fluid-operated cylinders, the arms are subsequently brought from the grasping position to a lifting position coinciding with said rest position. During this step the skip is picked up by the arms and brought above the loading hopper, by a rotation through about 90° around the rotation axis of the guide structure. Appropriate overturning means operating at the ends of the grasping arms carries out a further rotation of the skip about the attachment pins so that the content thereof is emptied into the loading hopper.

When emptying has been completed, the skip is laid on the ground again by a reverse operating sequence with respect to the above emptying cycle.

While the above described devices are quite efficient and reliable, they have the drawback that a relatively long lapse of time is required for completing the emptying cycle of each skip. In fact the operating speed for carrying out the emptying cycle is greatly conditioned by the necessity to make the grasping arms perform two complete idle strokes, in order to respectively bring them from the rest position to the grasping position before engagement of the skip, and from the grasping position to the rest position, after the emptied skip has been laid on the ground. In addition, at the refuse-collection sites where the arrangement of more than one skip is required, it is necessary for the skips to be disposed a certain distance from one another, which will increase the overall room taken up by the same. This increased bulkiness results from the fact that the grasping arms must be disposed at respectively opposite sides of the skip and they move from top to bottom; it is therefore necessary that sufficient room be left between the ends of the attachment pins of two consecutive skips in order to enable passage of the grasping arms.

Other devices also exist that, while still acting on the sides of a motor-vehicle, are provided with grasping arms that during their operating cycle are capable of engaging the skip by a movement from bottom to top. More particularly, the grasping arms hinged on a framework according to respective oblique axes, are movable from a rest position in which they extend downwardly diverging from each other, to a grasping position in which they extend horizontally in cantilevered fashion from the motor-vehicle side, parallelly to each other, in which position they are ready to engage the skip. The use of these devices enables dead times due to the idle strokes of the arms from the rest to the grasping positions to be greatly reduced. However, the kinematic

mechanisms for lifting the skip above the hopper, which make use of vertical guides, and the driving mechanisms for carrying out overturning of the skip have much slower operating speeds than the device of the previously described type.

As a result, the time necessary for completing the skip-emptying cycle is substantially the same as that of the previously described devices having a guide structure hinged according to a horizontal axis.

In addition, with the use of such devices the motor-vehicle needs to be positioned in a very precise manner relative to the skip for enabling the grasping arms to be disposed symmetrically to the skip itself. In the frequent cases in which positioning of the motor-vehicle is not perfect, the skip is displaced from its original seating upon the action of the arms themselves when they are brought to the grasping position and, when the skip is put down on the ground again, it will occupy this misfit position.

Furthermore, also with the use of these devices a great distance is required between consecutive skips, to enable the side displacement of the grasping arms when they pass from the rest position to the grasping position and vice-versa.

The same Applicant has set up another type of device being the object of the European Patent Document EP 0 709 310 A, in which the grasping arms mounted on a rotatable guide structure carrying out rotation in a horizontal axis upon command of one or more fluid-operated cylinders, pick up the skip starting from a rest position in which said arms are faced downwardly. However, this device is envisaged for picking up skips provided with sleeve-shaped attachment elements disposed on the front wall of the skip. Consequently, the grasping arms have a greatly shorter length than that required by the devices adapted to pick up skips provided with an attachment of the type considered in the present invention. Even if grasping arms of appropriate length should be used, this known device would be unable to give the arms themselves a sufficiently wide rotation so as to bring them to the lifting position starting from a rest position in which said downwardly-facing arms are within the overall dimensions of the motor-vehicle.

The main object of the present invention is substantially to solve the problems of the known art, and more particularly to provide a device capable of performing the emptying cycle of a rubbish skip provided with attachment elements of the above type taking shorter times than those required in the known art, while at the same time enabling a closer spacing between two or more consecutive skips.

The foregoing and further objects that will become more apparent in the course of the following description are substantially achieved by a device for picking up rubbish skips and emptying them onto a motor-vehicle designed to collect refuse, characterized by the features recited in the characterizing portion of claim 1.

Further features and advantages will be best understood from the detailed description of a preferred non-exclusive embodiment of a device to pick up and empty rubbish skips onto a motor-vehicle designed to collect refuse, according to the present invention, given hereinafter by way of non-limiting example with reference to the accompanying drawings, in which:

- Fig. 1 is a side view of a refuse-collecting motor-vehicle equipped with the picking-up and emptying device according to the present invention, arranged to a rest position;
- Fig. 2 is a fragmentary, diagrammatic sectional side view of the device in question at a rest position;
- Fig. 3 is a side sectional view of the device during an operating step at which the device is about to engage a rubbish skip at attachment pins arranged on the skip itself;
- Fig. 4 is a side view of the device during the skip-lifting step;
- Fig. 5 shows the device in a lifting position, the skip being arranged over the motor-vehicle's loading hopper, for emptying of the refuse.

With reference to the drawings, a device for picking up and emptying rubbish skips onto a motor-vehicle designed to collect refuse in accordance with the present invention has been generally identified by reference numeral 1.

In a manner known per se, the device 1 is mounted on a truck 2 or other motor-vehicle used for collecting refuse to be transported to dumps or treatment installations for disposal. More particularly, the device 1 is mounted on the motor-vehicle 2 at a recess 3 formed on one side thereof, and more particularly close to the base of a loading hopper 4 disposed in front of a refuse collector 5 to which, in a known and conventional manner, the rubbish is conveyed and within which it is compacted as it is collected.

The device 5 is adapted to operate on rubbish skips or bins 6, one of which is shown in Figs. 2 to 5, of the type provided with attachment elements substantially consisting of a pair of pins 7 (only one of which is shown in the drawings) projecting from the opposite side walls 6a of the skip itself, either at a centered or an offset position relative to the vertical centre line of same. In the embodiment shown, the skip 6 has a closing cover 8 consisting of two half portions 8a hinged at opposite sides on a bridge element 8b oscillatably linked close to the attachment pin 7 and normally maintained at a centered position with respect to the vertical centre line of the skip upon the action of spring means, not shown as known per se and not of importance to the ends of the invention, housed within box-shaped structures 9 integral with the skip side walls 6a.

The foregoing being stated, the device 1 comprises a bearing framework 10 having a pair of brackets 11 that, in a preferential solution, are fastened to lateral

movement means generally denoted by 12. This lateral movement means 12 is comprised of a movable framework 13 that by means of slides 13a known per se and conventional, is slidably connected to the chassis 14 of the motor-vehicle 2. A displacement actuator 15 integral with the motor-vehicle chassis 14 is susceptible of selective attuation, in case of need, to horizontally move the whole device 1 transversely of the motor-vehicle 2, in order to enable the skip 6 to be picked up even when the latter is located a certain distance from the motor-vehicle.

Rotatably linked to the brackets 11 of the bearing framework 10, according to a horizontal axis identified by X in Fig. 1, is a guide structure 16. This guide structure 16 comprises a first bar 17 in rotatable engagement, according to said horizontal axis X, with the brackets 11, and a second bar 18 parallel to the first bar 17 and fastened to the latter by terminal junction elements 19 fastened to the respective bar extremities.

The guide structure 16 slidably carries a pair of grasping arms 20 (only one of which is shown in Figs. 2 to 5) along the bars 17, 18.

Preferably, each grasping arm 20 extends in cantilevered fashion from the guide structure 16 over a first stretch 20a and a second stretch 20b defining, on the opposite side from the motor-vehicle 2, an angle " α " included between 90° and 150° , preferably of 105° , for purposes to be clarified in the following.

Each of the grasping arms 20 further has a handling member 21 at the respective free end opposite to the guide structure 16. Each handling member 21 essentially contemplates the presence of a fitting seat 21a (Fig. 2) arranged to house one of the attachment pins 7 of the skip 6, a closing element 22 for the fitting seat 21a, a locating plate 23 adapted to bear against an abutment element 23a (Figs. 4 and 5) carried at the inside of the bridge element 8b, and an overturning lever 24 arranged to act in thrust relationship on one of the box-shaped structures 9 disposed on the skip side walls 6a. In known manner, said closing element 22, locating plates 23 and overturning lever 24 are oscillatably pivoted on a point close to the respective end of the grasping arm 20. The locating plate 23 and overturning lever 24 are driven by a first and a second actuating cylinders 25, 26, respectively, whereas the closing element 22 usually maintained in a closed condition on the respective fitting seat 21a upon the action of a spring 27, is brought to an open condition by the locating plate 23 when the latter is in a rest position.

The grasping arms 20 are interconnected with each other by a horizontal-movement actuator 28 fastened to the bearing framework 10 and having two drive rods 28a each connected to a corresponding piston located inside the actuator. In known manner, the above pistons define three pressurization chambers within the double actuator 28, two of said chambers located at the actuator ends being brought into fluid communication with each other.

The device 1 further comprises a lifting unit comprising at least one fluid-operated cylinder 29 linked to the bearing framework 10 and acting on the guide structure 16 to move the grasping arms 20 about the horizontal rotation axis X. As clearly shown in Fig. 1, in the depicted embodiment two of said fluid-operated cylinders 29 are provided, each engaged with one of the brackets 11 of the bearing framework 10. Denoted by 30 in Figs. 2 to 5, is the pivot point of the fluid-operated cylinder 29 on the respective bracket 11.

The action of the fluid-operated cylinder 29 on the guide structure 16 enables the grasping arms 20 to be moved from a grasping position in which, as shown in Fig. 3, said arms project laterally from the motor-vehicle 2 to operatively engage the attachment pins 7 carried by the skip 6, to a lifting position in which, as shown in Fig. 5, the arms extend upwardly to bring the skip 6 above the loading hopper 4. Should the fluid-operated cylinders 29 directly act on the guide structure 16, as it happens in the known art, the operating displacement of the grasping arms 20 would be substantially restricted to the two above described positions.

In the device of the invention it is advantageously provided that kinematic amplification means, generally identified by 31, be interposed between the fluid-operated cylinders 29 and guide structure 16. The presence of this means enables an additional stroke to be transmitted to the grasping arms 20, which stroke extends between said grasping position and a rest position in which, as shown in Fig. 2, the arms 20 extend downwardly and are contained within the maximum permissible overall dimensions of the motor-vehicle 2.

As known to a person of ordinary skill in the art, by maximum permissible overall dimensions it is intended the ideal plane, shown by the chain line "Y" in Fig. 2, identified by the maximum permissible side outline of the motor-vehicle along its longitudinal extension. In other words, the maximum permissible overall dimensions can be defined as the vertical plane, parallel to the longitudinal extension of the motor-vehicle, identified by the dimension of the maximum permissible side bulkiness, in terms of law, for the motor-vehicle on which the device 1 is installed.

Advantageously the kinematic amplification means 31 is such conceived that, following operation of the fluid-operated cylinders 29, an angular displacement greater than 180° about the horizontal rotation axis X is transmitted to the guide structure 16 and, as a result, to the grasping arms 20. In the embodiment shown the overall angular displacement performed by the grasping arms 20 is approximately 190° .

To this end, the kinematic amplification means 31 preferable comprises at least one lever 32 pivoted on the bearing framework 10 according to an axis parallel to the horizontal rotation axis X, and at least one connecting rod 33 in operative engagement between the lever 32 and the guide structure 16. In particular, in the example shown the presence of two levers 32 is pro-

vided and they are each pivoted on one of the brackets 11 adjacent to the first bar 17; also provided are two corresponding connecting rods 33 each of them having one end hinged on lever 32 on the opposite side from the hinging point of said lever on the bracket 11 and the other end hinged on an interconnecting arm 34 extending between the first and second bars 17, 18 of the guide structure 16. As clearly shown in Figs. 2 to 5, each of the fluid-operated cylinders 29 acts on the corresponding lever 32, adjacent to the end of the connecting rod 33.

Operation of the device in question described above mainly as regards structure is as follows.

While the motor-vehicle is normally running, the device 1 is kept to the rest position shown in Fig. 2. Advantageously, the grasping arms 20 have such an outline that each of them in this rest position has its respective first and second stretches 20a, 20b extending obliquely inwardly and outwardly of the motor-vehicle 2, respectively. Under this situation the whole device 1 is contained within the maximum permissible overall dimensions of motor-vehicle 2, so that said motor-vehicle can circulate without some of its components running the risk of knocking against objects or other obstacles.

When the motor-vehicle 2 is stopped alongside the skip 6, the fluid-operated actuators 29 are activated to be moved over a starting portion of their stroke, so as to bring the grasping arms 20 from the rest position to the grasping position shown in Fig. 3. At this point, if it is necessary, the displacement actuator 15 is activated to move the device 1 to an appropriate distance from the front wall of the skip 6 so that the fitting seats 21a are substantially aligned under the attachment pins 7. Also activated is the horizontal-movement actuator 28, upon the action of which, in a manner known per se, the grasping arms 20 are moved close to the respective side walls 6a of the skip 6 without causing any displacement of the skip itself. At this point, the fluid-operated cylinders 29 are activated again, which will cause lifting of the arms 20 from the grasping position and consequent introduction of the attachment pins 7 into the fitting seats 21a. Concurrently with this introduction, the first actuating cylinder 25 of each handling member 21 is activated, which will cause positioning of the locating plate 23 against the abutment element 23a and consequent movement of the closing element 22 to the closing position, upon the action of the corresponding spring 27. In this condition, the skip 6 is picked up from the ground and brought above the hopper 4 as soon as the grasping arms 20 reach the lifting position, as shown in Fig. 5. At this point, the second actuating cylinder 26 of each handling member 21 is driven to cause the skip to be turned upside down, by means of the overturning lever 24, so that the content of said skip is emptied into the loading hopper 4, while the cover 8 is kept stationary by the locating plates 23. When emptying has been completed, the skip 6 is laid on the ground

again, a reverse operating sequence being carried out with respect to the described one.

The present invention achieves the intended purposes.

By virtue of the interposition of the kinematic amplification means 31 between the fluid-operated cylinders 29 and the guide structure 16, acting on the skips provided with the attachment elements of the type described with reference to the device in question makes it possible to carry out an operating cycle in a substantially halved period of time with respect to the time hitherto required. In fact, the grasping arms act on the skip starting from a rest position in which they are faced downwardly, which will eliminate the long idle descending and ascending strokes carried out by known devices before picking up the skip and after putting it down on the ground, respectively.

In addition, the device in question is capable of picking up the skip without displacing it sideways and to put it down again exactly on the same point it occupied before being picked up. The invention therefore is free from the drawbacks described with reference to the known devices the grasping arms of which, in a rest position, are turned downwardly but are mutually spread apart.

It is also to be noted that the device in question performs the skip lifting without causing the same to move backward too much from the ground-resting area, thereby reducing the risk of possible interferences with obstacles lying behind the skip.

In addition, the employment of a skip with movement of the arms from bottom to top enables an important reduction in the intervening spaces between two or more skips disposed side by side.

Claims

1. A device to pick up and empty rubbish skips onto a motor-vehicle designed to collect refuse, comprising:
 - a bearing framework (10) fastened to a lateral side of said motor-vehicle (2);
 - a guide structure (16) in engagement with the bearing framework (10) in an oscillatable manner and according to a horizontal rotation axis (X) parallel to the longitudinal axis of the vehicle;
 - a pair of grasping arms (20) supported in cantilevered fashion from the guide structure (16) and selectively movable close to and away from each other along said guide structure;
 - a lifting unit comprising at least one fluid-operated cylinder (29) linked to the bearing framework (10) and acting on the guide structure (16) to move the grasping arms (20) about said rotation axis (X), between a grasping position in which said arms (20) project sideways from

the vehicle (2) to operatively engage respective attachment elements (7) arranged on respectively opposite side walls (6a) of the rubbish skip (6), and a lifting position in which said arms (20) extend upwardly to bring the rubbish skip (6) above a loading hopper (4) arranged on said motor-vehicle (2), characterized in that said grasping arms are adapted to adopt a rest position in which they extend downwardly so that they are contained within the maximum permissible overall dimensions of the motor-vehicle, and in that said lifting unit comprises kinematic amplification means (31) operatively interposed between said fluid-operated cylinder (29) and guide structure (16) to move the grasping arms (20) from said rest position to said grasping position and further to said lifting position.

2. A device according to claim 1, characterized in that, upon the action of the fluid-operated cylinder (29), said kinematic amplification means (31) transmits to the guide structure (16) and consequently the grasping arms (20), a rotation greater than 180° about said horizontal rotation axis (X).
3. A device according to claim 1, characterized in that said kinematic amplification means (31) comprises at least one lever (32) pivoted on the bearing framework (10) and at least one connecting rod (33) in operative engagement between said lever (32) and guide structure (16), said fluid-operated cylinder (29) acting on the guide structure (16) by means of said lever (32) and connecting rod (33).
4. A device according to claim 3, characterized in that it comprises two of said levers (32) and two of said connecting rods (33), operatively connected to two of said fluid-operated cylinders (29).
5. A device according to claim 1, characterized in that movement of the grasping arms (20) between the rest position and grasping position takes place during a starting step of the stroke of the fluid-operated cylinder (29).
6. A device according to claim 1, characterized in that, with reference to said rest position, each of the grasping arms has one stretch (20a) extending obliquely from said guide structure towards the inside of the motor-vehicle (2), followed by a second stretch (20b) extending obliquely towards the outside of the vehicle (2) and carrying a handling member (21) at its end.
7. A device according to claim 6, characterized in that said first and second stretches (20a, 20b) form an angle (α) included between 90° and 150° on the

opposite side with respect to the motor-vehicle (2).

8. A device according to claim 1, characterized in that said guide structure (16) comprises a first bar (17) in engagement with the bearing framework (10) according to said horizontal rotation axis (X) and a second bar (18) fastened parallelly to the first bar (17).
9. A device according to claim 8, characterized in that it further comprises at least one interconnecting arm (34) extending between said first and second guide bars (17, 18) and operatively connected to said fluid-operated cylinder (29) via the kinematic amplification means (31).

Patentansprüche

1. Vorrichtung zum Aufnehmen und Entleeren von Müllbehältern in einem Müllsammelfahrzeug, umfassend:
 - einen an einer Flanke des Müllsammelfahrzeuges (2) befestigten Tragaufbau (10);
 - einen am Tragaufbau (10) gemäß einer zur Längsachse des Fahrzeuges parallelen, horizontalen Drehachse (X) verschwenkbar angreifenden Führungsaufbau (16);
 - ein Paar von Greifarmen (20), die vom Führungsaufbau (16) auskragend getragen werden und wahlweise längs des Führungsaufbaues selbst aneinander angenähert und entfernt werden können;
 - eine Hubeinheit, die mindestens einen fluidodynamischen Zylinder (29) umfaßt, der am Tragaufbau (10) festliegt und auf den Führungsaufbau (16) wirkt, um die Greifarme (20), um die Drehachse (X) zwischen einer Greifstellung, in der die Greifarme (20) seitlich vom Fahrzeug (2) vorstehen, um jeweilige an jeweils voneinander abgewandten Seitenwänden (6a) des Müllbehälters (6) angeordnete Angriffselemente (7) zu ergreifen, und einer angehobenen Stellung zu verschieben, in der die Greifarme (20) sich nach oben erstrecken, um den Müllbehälter (6) oberhalb eines am Fahrzeug (2) angeordneten Fülltrichters (4) zu bringen, dadurch gekennzeichnet, daß die Greifarme dazu bereitgestellt sind, eine Ruhestellung einzunehmen, in der sie sich derart nach unten erstrecken, daß sie innerhalb des höchstzulässigen Umrisses des Fahrzeuges liegen, und dadurch, daß die Hubeinheit Bewegungsverstärkungsmittel (31) umfaßt, die zwischen dem fluidodynamischen Zylinder (29) und dem Führungsaufbau (16) zwischengeschaltet sind, um die Greifarme (20) von der Ruhestellung in die

Greifstellung und überdies in die angehobene Stellung zu bringen.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß durch Einwirkung des fluidodynamischen Zylinders (29) die Bewegungsverstärkungsmittel (31) dem Führungsaufbau (16) und folglich den Greifarmen (20) eine Verschwenkung größer als 180° um die horizontale Drehachse (X) übertragen. 5
3. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Bewegungsverstärkungsmittel (31) mindestens einen am Tragaufbau (10) angelenkten Hebel (32) und mindestens eine Verbindungsstange (33) umfassen, die wirksam zwischen dem Hebel (32) und dem Führungsaufbau (16) eingreifen, wobei der fluidodynamische Zylinder (29) auf den Führungsaufbau (16) über den Hebel (32) und die Verbindungsstange (33) wirkt. 10
4. Vorrichtung nach Anspruch 3, dadurch gekennzeichnet, daß sie zwei dieser Hebel (32) und zwei dieser Verbindungsstangen (33) umfaßt, die mit zwei der fluidodynamischen Zylinder (29) wirksam verbunden sind. 15
5. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Bewegung der Greifarme (20) zwischen der Ruhestellung und der Greifstellung in einem Anfangsabschnitt des Hubes des fluidodynamischen Zylinders (29) erfolgt. 20
6. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß bezüglich der Ruhestellung jeder der Greifarme einen ersten Abschnitt (20a) aufweist, der sich vom Führungsaufbau schräg zum Inneren des Fahrzeuges (2) erstreckt, dem ein zweiter Abschnitt (20b) folgt, der schräg nach außen des Fahrzeuges (2) verläuft und endseitig Handhabungsorgane (21) aufweist. 25
7. Vorrichtung nach Anspruch 6, dadurch gekennzeichnet, daß der erste und der zweite Abschnitt (20a, 20b) auf der dem Fahrzeug (2) abgewandten Seite einen Winkel (α) bilden, der zwischen 90° und 150° liegt. 30
8. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß der Führungsaufbau (16) eine erste Stange (17), die den Tragaufbau (10) gemäß der horizontalen Drehachse (X) ergreift, und eine zweite Stange (18) umfaßt, die parallel zur ersten Stange (17) festliegt. 35
9. Vorrichtung nach Anspruch 8, dadurch gekennzeichnet, daß sie überdies mindestens einen Verbindungsarm (34) umfaßt, der sich zwischen der 40

ersten und der zweiten Führungsstange (17, 18) erstreckt und mit dem fluidodynamischen Zylinder (29) über die Bewegungsverstärkungsmittel (31) verbunden ist.

Revendications

1. Dispositif pour ramasser et vider des conteneurs à ordures dans un véhicule à ordures, comprenant:
 - une structure de support (10) fixée à un côté dudit véhicule (2);
 - une structure de guidage (16) engagée de manière oscillante à la structure de support (10) selon un axe de rotation horizontal (X) parallèle à l'axe longitudinal du véhicule;
 - une paire de bras de préhension (20) supportés en porte-à-faux par la structure de guidage (16) et sélectivement mobiles l'un vers l'autre et à l'écart l'un de l'autre le long de la structure de guidage;
 - un groupe de relevage comprenant au moins un cylindre hydraulique (29) lié à la structure de support (10) et agissant sur la structure de guidage (16) pour déplacer les bras de préhension (20) autour dudit axe de rotation (X) entre une position de préhension dans laquelle lesdits bras (20) font saillie latéralement du véhicule (2) pour engager de manière opératoire des éléments de préhension respectifs (7) arrangés sur des parois latérales respectivement opposées (6a) dudit conteneur à ordures (6), et une position de relevage dans laquelle lesdits bras (20) s'étendent vers le haut pour amener le conteneur à ordures (6) au-dessus d'une trémie de chargement (4) arrangée sur ledit véhicule (2), caractérisé en ce que lesdits bras de préhension sont susceptibles d'adopter une position de repos dans laquelle ils s'étendent vers le bas de manière à être contenus dans le gabarit maximum admis du véhicule, et en ce que ledit groupe de relevage comporte des moyens d'amplification cinématique (31) interposés de manière opératoire entre ledit cylindre hydraulique (29) et ladite structure de guidage (16) pour déplacer les bras de relevage (20) de ladite position de repos à ladite position de préhension et enfin jusqu'à ladite position de relevage.
2. Dispositif selon la revendication 1, caractérisé en ce que, par l'action du cylindre hydraulique (29), lesdits moyens d'amplification cinématique (31) transmettent à la structure de guidage (16) et par conséquent aux bras de préhension (20) une rotation supérieure à 180° autour dudit axe de rotation horizontal (X).

3. Dispositif selon la revendication 1, caractérisé en ce que lesdits moyens d'amplification cinématique (31) comportent au moins un levier (32) monté à pivotement sur la structure de support (10) et au moins une bielle d'accouplement (33) engagée de manière opératoire entre ledit levier (32) et ladite structure de guidage (16), ledit cylindre hydraulique (29) agissant sur la structure de guidage (16) par l'intermédiaire dudit levier (32) et de ladite bielle d'accouplement (33). 5 10
4. Dispositif selon la revendication 3, caractérisé en ce qu'il comporte deux desdits leviers (32) et deux desdites bielles d'accouplement (33), reliés de manière opératoire à deux desdits cylindres hydrauliques (29). 15
5. Dispositif selon la revendication 1, caractérisé en ce que la mise en mouvement des bras de préhension (20) entre la position de repos et la position de préhension a lieu pendant une étape initiale de la course du cylindre hydraulique (29). 20
6. Dispositif selon la revendication 1, caractérisé en ce que chacun des bras de préhension présente, en Se référant à ladite position de repos, une première portion (20a) s'étendant de ladite structure de guidage obliquement vers l'intérieur du véhicule (2), suivie d'une deuxième portion (20b) s'étendant obliquement vers l'extérieure du véhicule (2) et portant un organe de manipulation (21) à son extrémité. 25 30
7. Dispositif selon la revendication 6, caractérisé en ce que lesdites première et deuxième portions (20a, 20b) forment, du côté opposé par rapport au véhicule (2), un angle (α) compris entre 90° et 150°. 35
8. Dispositif selon la revendication 1, caractérisé en ce que ladite structure de guidage (16) comporte une première barre (17) engagée à la structure de support (10) selon ledit axe de rotation horizontal (X) et une deuxième barre (18) fixée parallèlement à la première barre (17). 40 45
9. Dispositif selon la revendication 8, caractérisé en ce qu'il comporte en outre au moins un bras d'interconnexion (34) s'étendant entre lesdites première et deuxième barres de guidage (17, 18) et relié de manière opératoire audit cylindre hydraulique (29) par les moyens d'amplification cinématique (31). 50

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FIG.1

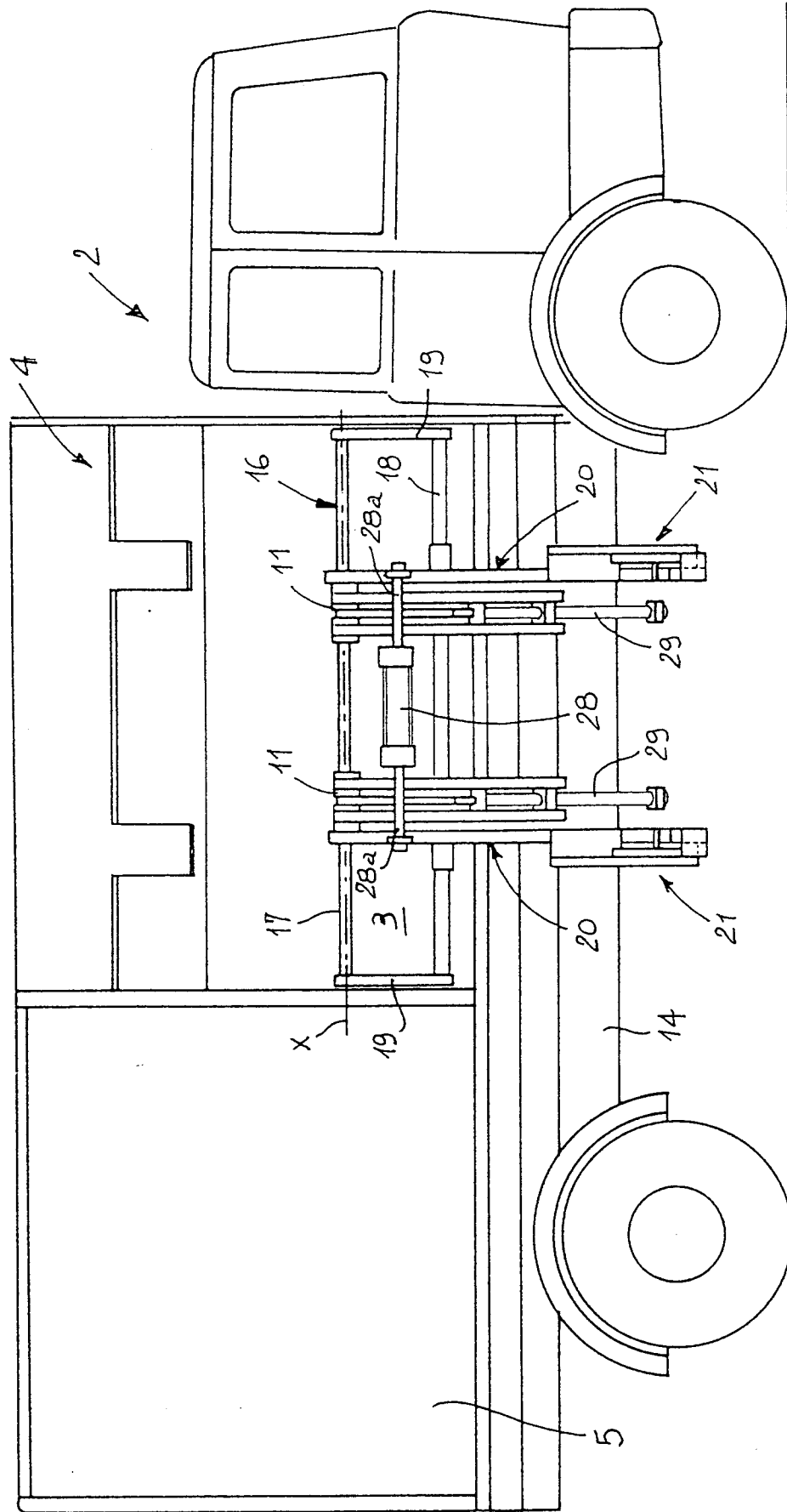
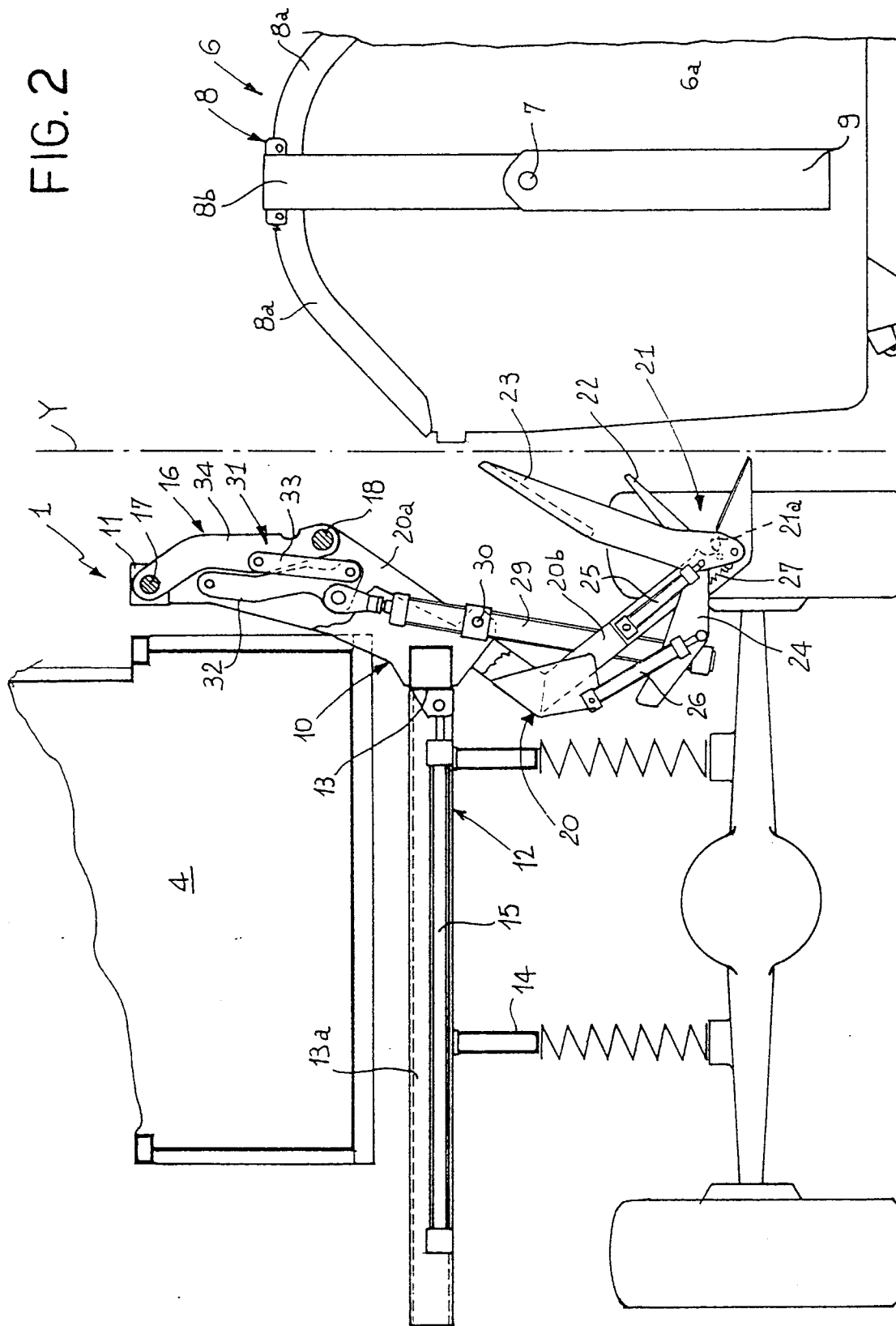


FIG. 2



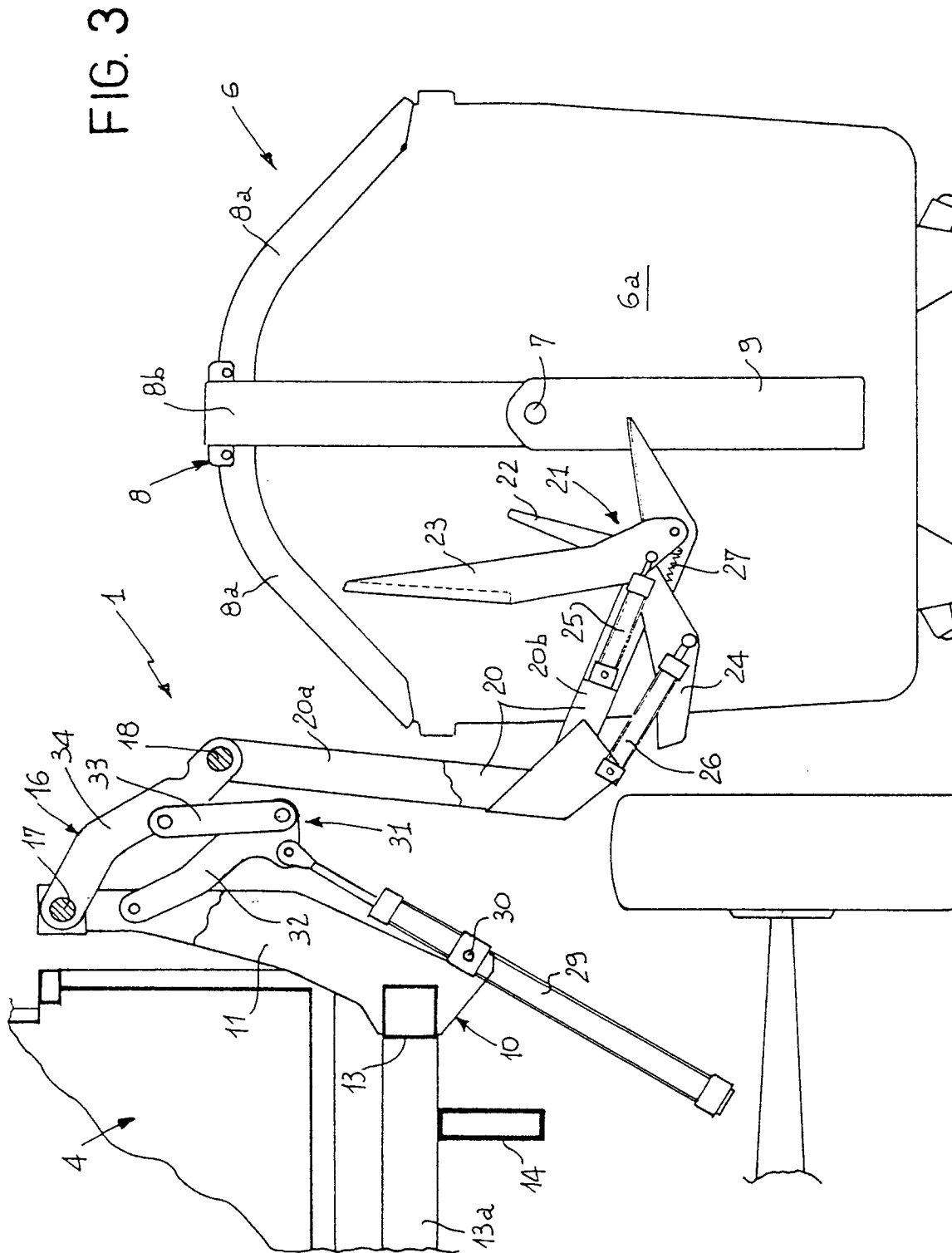
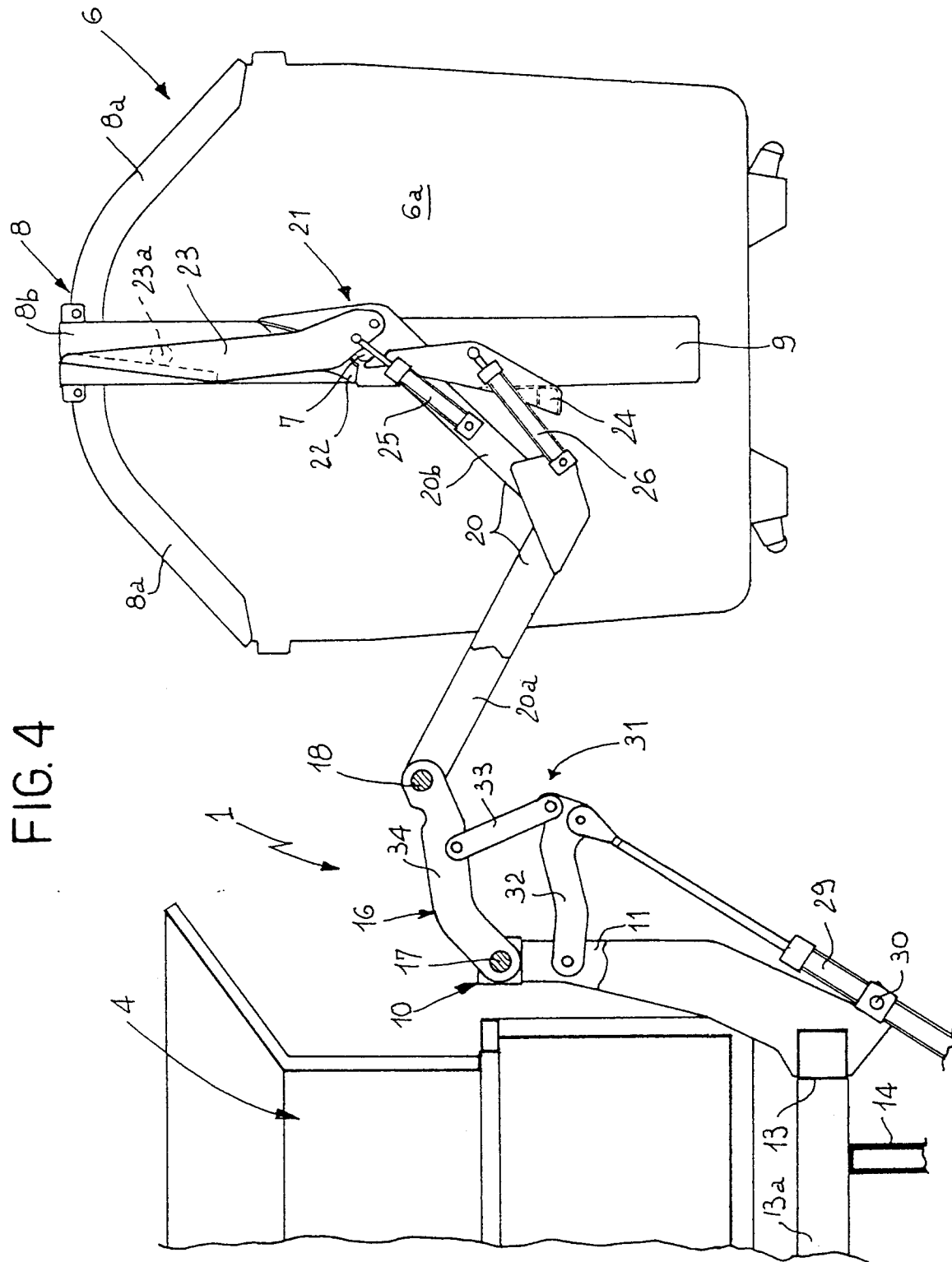


FIG. 4



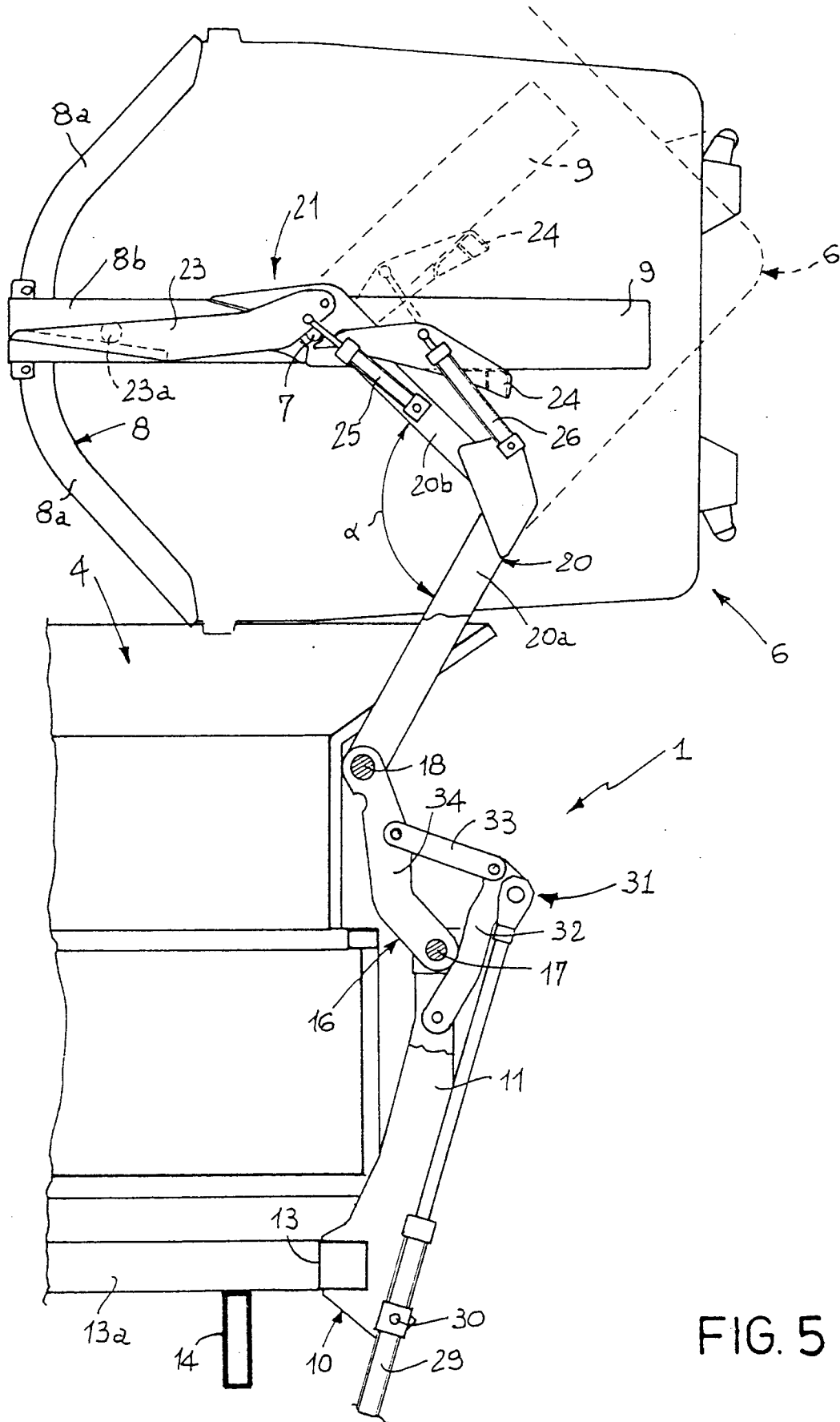


FIG. 5