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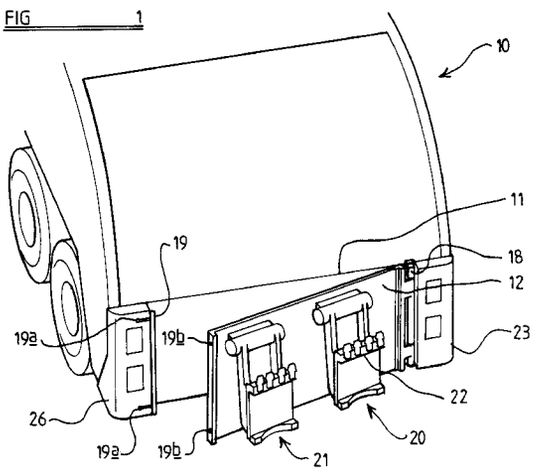
(54) Collection vehicle and method of substituting a hoist of a collection vehicle.

(57) A collection vehicle has a pair of hoists (20, 21) mounted on a common carrier (12). The carrier is hinged to a body (10) of the vehicle for swinging relative thereto about an upright axis. When the carrier is swung away from the body, electrical and hydraulic components at a front face of the carrier are readily accessible.

FIG 1



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From one aspect, the present invention relates to a collection vehicle comprising a body defining a chamber for receiving material to be collected and a hoist for raising from the ground a bin containing material to be collected and for tipping the bin to discharge said material into the body.

There are well known collection vehicles in which the body defines, in addition to the chamber, a hopper for receiving material discharged from a bin, the hopper being at a rear of the vehicle and the chamber being forwards from the hopper. In such vehicles, the hoist or a pair of hoists is mounted at the rear of the vehicle on the outside of the hopper. Typically, the or each hoist includes a plurality of hydraulic rams or other forms of hydraulic motor, valves for controlling operation of the hydraulic motors and signalling devices responsive to movement of components of the hoist to predetermined positions to provide signals for controlling operation of the valves. The signalling devices and other elements of control means of the hoist easily become contaminated by foreign matter.

According to a first aspect of the invention, a collection vehicle of the kind described is characterised by a carrier for the hoist and is further characterised in that the carrier is movable relative to the body, releasable retaining means is provided for retaining the carrier in a working position on the body and in that the hoist is mounted on the carrier for movement therewith relative to the body from the working position to a servicing position.

In a vehicle embodying the first aspect of the invention, the accessibility of at least some components of or associated with the hoist is better when the carrier is in the servicing position than when the carrier is in the working position. In the working position, components may be shielded and relatively inaccessible. The arrangement in the working position can be such as to protect the components to a useful degree against contamination by foreign matter.

Preferably, the carrier is mounted on the body for swinging relative thereto between the working and servicing positions. This facilitates rapid movement of the carrier between these two positions. If the swinging of the carrier takes place about an upright axis, then the weight of the hoist and of the carrier can continue to be borne by the body of the vehicle and the carrier can be moved between the working and servicing positions by hand.

The carrier is preferably mounted on the body of the vehicle by means of hinge elements which facilitate movement of the carrier relative to the body along an axis defined by the hinge elements to disengage hinge elements of the carrier from corresponding hinge elements of the body. This facilitates dismounting of the carrier from the body and substitution of a further hoist and carrier for the hoist and carrier dismounted from the body.

According to a second aspect of the invention, there is provided a method of substituting a first hoist for a second hoist in a collection vehicle wherein the second hoist is swung about an axis relative to a body of the vehicle from a working position to an extended position, the second hoist is moved along the axis relative to the body to disengage the hoist from the body and is then moved away from the body, the first hoist is moved along the axis into an engaged relation with the body and the first hoist is then swung about the axis into the working position.

An example of a vehicle embodying the first aspect of the invention will now be described, with reference to the accompanying drawing, wherein:

FIGURE 1 shows a diagrammatic representation of a perspective view of a rear part of the vehicle, a carrier being at an intermediate position between a working position and a servicing position,

FIGURE 2 shows a partial view from the rear with the carrier in the working position and

FIGURE 3 shows certain of the parts shown in Figure 2 from above.

The vehicle represented in the accompanying drawings comprises a body 10 mounted on a wheeled chassis in a known manner. At a front of the vehicle, there is a cab (not shown) for accommodating a driver and other operator of the vehicle. The body 10 defines a chamber for receiving refuse or other material which is to be collected and a hopper 11 adjacent to the rear of the body, into which the material to be collected can be tipped. As in known vehicles, means is provided for transferring material from the hopper 11 into the chamber defined by the body and for compacting the material in that chamber. These means are not shown in the accompanying drawing and may be constructed and arranged as in known vehicles.

A carrier 12 is mounted on the body 10 for swinging relative thereto between a working position, in which the carrier lies immediately adjacent to the rear of the body 10, and a servicing position, in which the carrier extends rearwards from the body 10. The carrier 12 is generally rectangular, and when in the working position, as viewed from the rear, has at one of its lateral margins hinge elements 13 and 14 which have bores 13a, 14a in which are pivotally received pivot pins 15a, 16a which project upwardly from respective hinge elements 15, 16 on the body 10 to define a pivot axis 17 about which the carrier can move relative to the body. In the example illustrated, the hinge axis is near to one side of the vehicle and is upright when the vehicle stands on level ground.

The hinge elements 15 and 16 are provided on an upright member 18 rigidly connected with the hopper 11 by means of bolts and suitable brackets. Near to an opposite side of the vehicle, there is provided a corresponding upright 19 which is also rigidly secured to the hopper 11 by means of bolts and suitable brackets. Releasable retaining means is provided for re-

taining the carrier 12 in the working position. The retaining means may comprise one or more latches 19a associated with the upright member 19 and engageable in apertures 19b in the carrier 12 or one or more bolts which can extend through aligned apertures in the carrier 12 and the upright member 19. When in the working position, the carrier 12 lies at least partly between the upright members 18 and 19.

The carrier 18 is of plate-like form. A pair of hoists 20 and 21 is mounted on the carrier at that face of the carrier which is a rear face, when the carrier is in the working position. The hoists are mounted side-by-side and may be known hoists used in collection vehicles. Each hoists includes a respective bin carrier, one of which is identified at 22, and links 22a for guiding the bin carrier for movement from a lowered position to a raised position and for tipping the carrier during movement to the raised position. A rotary actuator or other form of hydraulic motor is provided for raising the bin carrier relative to the carrier 12 and for controlling descent of the bin carrier. A suitable hoist is disclosed in GB 2255547-A.

Hydraulic fluid is supplied under pressure to the hydraulic motor of the hoist 20 via hydraulic ducts and one or more valves. These ducts and valves are mounted on the carrier 12 at the face thereof which is a front face, when the carrier is in the working position. The hopper 11 incorporates a rearwardly projecting lip which overlies at least a part of the carrier 12 when the carrier is in the working position. Accordingly, the valves are shielded and are relatively inaccessible, when the carrier 12 is in the working position. Components of electrical control circuits for the hoists 20 and 21 are also mounted on the carrier 12 at the front face thereof. The electrical circuit components and the hydraulic ducts are connected in electrical and hydraulic circuits of respectively of the vehicle by releasably connectors which also lie at the front of the carrier 12.

When the retaining means is released, the carrier 12 can be swung about the axis 17 to the servicing position, in which the carrier extends rearwards from the upright member 18. Typically, the carrier can be swung through an angle of approximately 90°. This can be achieved without disconnecting electrical and hydraulic circuits of the hoists 20 and 21 from corresponding circuits of the vehicle. When the carrier 12 is in the servicing position, the hydraulic and electrical circuit components mounted on the carrier are easily accessible.

The carrier 12 with the hoists 20 and 21 mounted thereon can readily be removed from the vehicle body 10. If the connectors between the electrical and hydraulic circuit components on the carrier and the corresponding circuits of the vehicle are released, the carrier 12, when in its servicing position, can be lifted along the axis 17 to separate the hinge elements 13 and 14 from the hinge elements 15 and 16 respectively. The carrier can the be moved transversely of the axis 17 away from the body 10. The carrier can be replaced by a second carrier, bearing a respective pair of hoists. To achieve this, the second carrier is moved into a position in which its hinge elements overlie the hinge elements 15 and 16. The carrier is then moved downwards along the axis 17 to engage the hinge elements and is subsequently swung about the axis 17 to the working position, after the electrical and hydraulic connections have been made.

To the right of the upright member 18, there is a curved trim panel 23 which extends from the member 18 to the corresponding side of the vehicle body 10. Manually operable controls, for example push buttons, are mounted in front of this trim panel and are accessible from the rear of the vehicle through a window 24 in the panel. Lights of the vehicle also are mounted on the body 10 in front of the panel 23 and can be seen from the rear of the vehicle through a further window 25 in the panel. A corresponding trim panel 26 having upper and lower windows extends from the upright member 19 to the corresponding side of the vehicle body. Collectively, the panels 23 and 26, the upright members 18 and 19 and the carrier 12 form a wall at the rear of the vehicle. This provides a neat appearance and shields components lying forwards of the wall from contamination from refuse which may be spilled during lifting and tipping of a bin.

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

Claims

1. A collection vehicle comprising a body defining a chamber for receiving material to be collected and a hoist for raising from the ground a bin containing material to be collected and for tipping the bin to discharge said material into the body, characterised by a carrier for the hoist and further characterised in that the carrier is movable relative to the body, releasable retaining means is provided for retaining the carrier in a working position on the body and in that the hoist is mounted on the carrier for movement therewith relative to the body from the working position to a servicing position.

2. A vehicle according to Claim 1 wherein the carrier is mounted on the body for swinging relative thereto between the working and servicing positions.

3. A vehicle according to Claim 1 wherein the carrier is mounted on the body for pivoting relative thereto about a pivot axis.

4. A vehicle according to Claim 3 wherein the pivot axis is generally upright when the vehicle stands on level ground.

5. A vehicle according to Claim 4 wherein the pivot axis is adjacent to one lateral boundary of the carrier and the retaining means is adjacent to an opposite lateral boundary of the carrier, when the carrier is in the working position.

6. A vehicle according to any one of Claims 3, 4 and 5 wherein the pivot axis is defined by respective hinge elements on the carrier and on the body and wherein the carrier is movable relative to the body both about the pivot axis and along the pivot axis to separate hinge elements of the carrier from hinge elements of the body.

7. A vehicle according to any preceding claim wherein the hoist includes a mechanical link at the rear of the carrier, when the carrier is in the working position, and at least one component of a control circuit at a front of the carrier.

8. A vehicle according to Claim 7 wherein the carrier is generally of plate-like form.

9. A vehicle according to any preceding claim wherein the hoist comprises a rotary actuator mounted on the carrier at the rear of the carrier.

10. A method of substituting a first hoist for a second hoist in a collection vehicle wherein the second hoist is swung about an axis relative to a body of the vehicle from a working position to an extended position, the second hoist is moved along the axis relative to the body to disengage the hoist from the body and is then moved away from the body, the first hoist is moved along the axis into an engaged relation with the body and the first hoist is then swung about the axis into the working position.

FIG 1

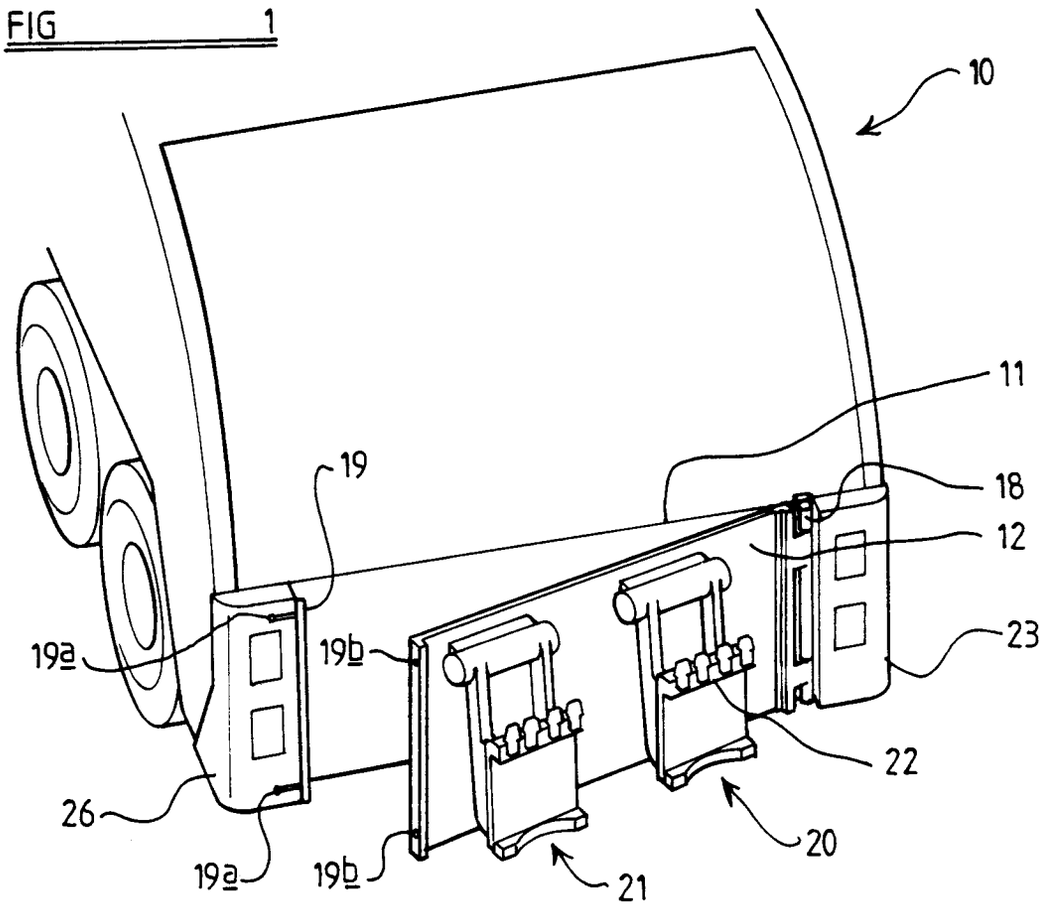
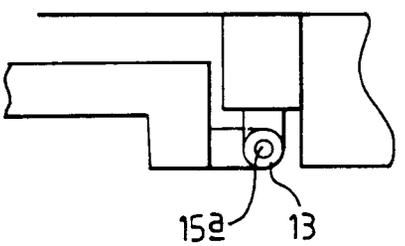


FIG 3



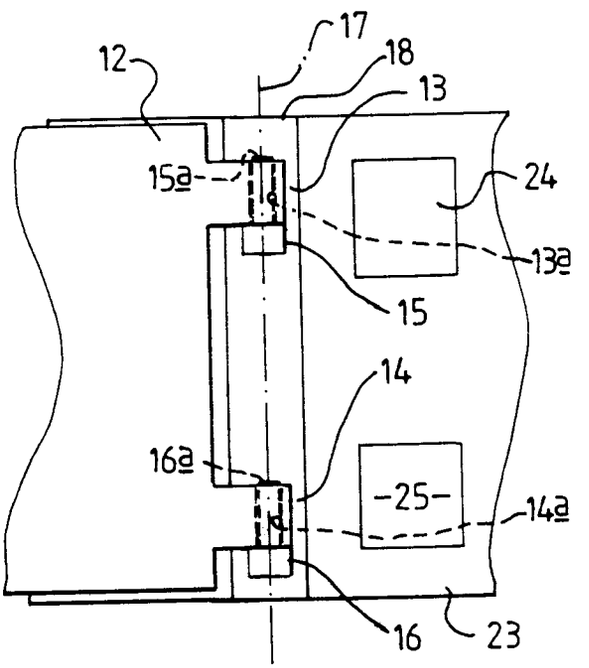


FIG 2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 30 1289

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X	DE-A-28 16 959 (UTTNER) * page 11, line 7 - page 12; figures 1-5 *	1-6,10	B65F3/02
X	EP-A-0 364 835 (WINTER) * claims 1-3; figures 1-3 *	1-3,10	
A	US-A-4 479 751 (WYMAN ET AL.)		
D,A	GB-A-2 255 547 (GREEN)		

TECHNICAL FIELDS SEARCHED (Int.Cl.5)

B65F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	18 May 1994	Deutsch, J-P

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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