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(54) Refuse collector/compactor.

(57) A refuse collector/compactor is principally for use on refuse vehicles having a lifting and tipping mechanism at their rear end.

Refuse containers (3) are lifted up and tipped into an upper opening to a chamber (12). At the lower end of the chamber is located a compacting mechanism (14) including a compactor blade (35) which is pivoted towards a receiving body (2) to transfer the refuse into the body and compact it. The blade (35) has at its outer edge an arcuate member (17) which occupies the lower end of the chamber during a compacting movement.

When filled the body (2) is emptied by raising a tailgate carrying the mechanism (14) to open the rear of the body.

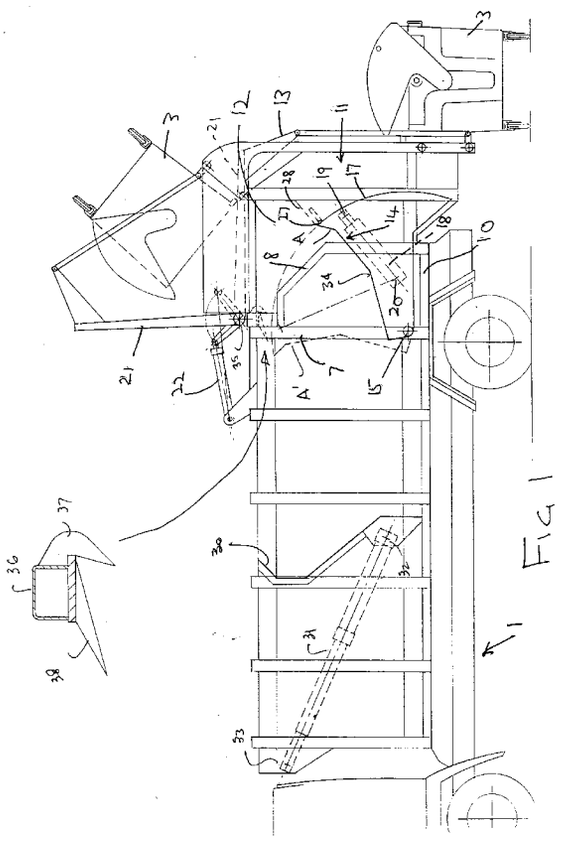

Fig 1

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This invention relates to a refuse collector/compactor.

The refuse collector/compactor of the invention has been devised principally for use on refuse vehicles of the kind which are used to receive the contents of containers or refuse bins which are lifted and tipped into a collection vehicle.

Our prior British patent specifications Nos. 2191461 and 2232952 relate to refuse collectors/compactors of this kind.

It is an object of the invention to provide an improved refuse collector/compactor.

According to the invention a refuse collector/compactor comprises a body for receiving refuse from containers of refuse, a container lifting and tipping mechanism whereby containers of refuse are lifted and tipped to empty the refuse from the containers, a receiving chamber for receiving the refuse from the containers, and a compactor mechanism for compacting the refuse into the body from the chamber, the compactor mechanism having a compactor member defining a receiving surface at the lower end of the chamber pivotally mounted about an axis transverse to the body to move the member upwards about said axis from a receiving position towards the body and a compacting position, the outer end of the compactor member having an arcuate member extending downwards from said outer end to occupy the lower end of the chamber during movement of the compactor member towards the compacting position.

Preferably the lifting and tipping mechanism is arranged to lift containers towards an upwardly directed opening into the chamber, the containers being tipped in an elevated position into said opening so that the contents fall towards the compactor mechanism.

Conveniently the lifting and tipping mechanism and the compacting member are mounted on a tailgate assembly at one end of the body, the tailgate assembly being pivotable about an upper pivot to enable discharge of the contents of the body.

The body may include an ejector member movable along the body between a receiving position and a discharge position, such movement being towards the tailgate assembly and after the assembly is pivoted about its pivot.

The arcuate member may be engageable by sealing means to prevent ingress of refuse during a compacting movement of the compactor member.

Retention members may be provided located towards the upper edge of the rear of the body to serve to retain compacted refuse in the body.

Drive means for compactor mechanism may be arranged to drive the compactor member in a continuous operative and return movement, in an intermittent operative and return movement, or in timed movement with the operation of the lifting and tipping mechanism.

Further features of the invention will appear from the following description of an embodiment of the invention given by way of example only and with reference to the accompanying drawings, in which:-

Fig. 1 is a side view of a refuse collection vehicle incorporating the invention, and

Fig. 2 is a rear view of the vehicle of Fig. 1.

Referring to the drawings a commercial vehicle chassis/cab 1 has a collector body rigidly mounted on the chassis or demountably attached to the chassis 1. At the forward end of the body is a telescopic piston in cylinder 31 (shown partially extended) pivotally mounted on the body at 33 and pivotally attached to an ejector blade 30 at 32 such that extension of the piston in cylinder 31 drives the blade 30 rearwards on guide rails (not shown) to discharge the contents from the body 2.

The collector body 2 has a main rear frame 7. To the rear of this frame an understructure and extension to a floor panel 10 extends rearwards. Semi-triangular side extensions 8 are fitted between the floor extension 10 and the rear frame 7 to provide a chute for the body contents during discharge from the body.

On top of the rear frame 7 is a pivot mounting 35 to which is attached a compaction tailgate assembly 11. The tailgate assembly is narrower than the side extensions 8 and in its travelling and working position, as shown in Fig. 1, sits between the extensions.

At the top of the tailgate is a receiving hopper 12 with an upwardly directed opening into which containers 3 of refuse are emptied by means of a lifter 13. The lifter 13 and its associated mechanism are substantially as described in our British patent specifications Nos. 2191461 and 2232952. In the present application piston in cylinder devices 22 perform a dual function, as described below.

Beneath the tailgate receiving hopper 12 a compaction assembly 14 is pivotally mounted in the tailgate at 15. The compaction assembly 14 consists of an outwardly concave compaction blade 34 carrying at its outer edge an arcuately curved plate 17. The plate 17 extends downwards from said edge to trail behind the blade 34 and follows a radius struck from the axis of pivot 15 and contains an included angle of approximately 45°. Between the compaction blade and the tailgate frame is a double acting piston in cylinder device 18 pivotally attached to the blade at 19 and to the tailgate frame at 20 such that extension of the piston in cylinder 18 causes the blade 34 to rotate through about 45° from a receiving position A to a compacting position A', and retraction returns the blade to position A. When refuse is loaded into the receiving hopper 12 from a container 3 the movement of the compaction blade from A to A' sweeps the refuse into the body 2. Once the body 2 is full to its free volume further loading will cause compaction of the refuse in the collector body 2. During operation of the compactor assembly 14 the plate 17 occupies the

lower end of the chamber 12.

A scraper blade 27 is resiliently mounted to the hopper frame 7 at the lower end of a chute surface 28 and is spring biased against the curved outer surface of the plate 17 of the compaction blade to prevent refuse spill back into the part of the tailgate housing the curved plate 17 in the receiving position of the compaction assembly 14.

An interconnecting locking mechanism (not shown) is provided on the tailgate 11. In the compaction mode this mechanism locks the tailgate 11 to the understructure adjacent to the rear edge of the understructure. In its mode for discharging the body contents the mechanism releases the tailgate from the understructure and locks a lid 21 of the bin lifter 13 to the tailgate, the lid 21 being shown in its elevated container discharge position. In this second mode, with the lid 21 locked to the tailgate 11 retraction of the piston in cylinder devices 22 causes the tailgate to rotate and rise about the pivot mounting 35 to the position for discharge of the body contents by operating the piston in cylinder 31, in which position the rear end of the body is opened.

When the contents of the body 2 are sufficient to be under compaction and due to the major part of the compression of the contents occurring towards the top of the body 2 there is a tendency for the contents to move rearwards after an operation of the compaction blade 34. To inhibit such movement there is provided on a tailgate cross member 36 (see inset drawing in Fig. 1) rows of retention teeth 37 and 38 which have their points directed forwardly to engage the upper part of the body contents. The teeth 37 of one row are located spaced to the rear of and between the teeth 38 of the other row.

The above description covers one arrangement but other variations can be used.

Instead of providing an ejector blade 30 a tipping mechanism for discharge of the contents of the body may be provided, the mechanism being located at the front of the body 2 which is pivoted to the rear of the chassis and including a ram operating between the chassis and the body.

The blade 30 of the kind as shown in Fig. 1 may be pulled along the body by wire bonds interconnected between the ejector blade and the tailgate instead of using the piston in cylinder device shown.

Fig. 2 shows a wide lifter and a comparatively large container 3 but it is possible to fit two narrow lifters, each handling smaller containers independently of each other. With two separate lifters the collector body and compaction mechanism may be divided down the longitudinal centre line of the vehicle so that the vehicle may be used for the collection of different kinds of material, for example plastics to one side of the division and metal cans to the other.

With a divided body and two compactors wide containers may be used with a change-over flap in the receiving hopper 12 such that a container of one kind of material may be loaded into one side of the collector body and upon operating the flap a container of metal cans may be loaded into the other side.

The collector body and tailgate mechanism as shown attached to a commercial vehicle chassis/cab but it could, of course, be fitted to a skid frame and handled by a demountable or swap body system. The system could also be used as a free standing mechanism and, when loaded, collected by a vehicle as above.

The compaction mechanism control system may be timed to operate with the lifter system. Alternatively the mechanism can be independent or may operate continuously accepting loads at random.

Any combination of the above alternatives can also be used.

Claims

1. A refuse collector/compactor comprising a body for receiving refuse from containers of refuse, a container lifting and tipping mechanism whereby containers of refuse are lifted and tipped to empty the refuse from the containers, a receiving chamber for receiving the refuse from the containers, and a compactor mechanism for compacting the refuse into the body from the chamber, the compactor mechanism having a compactor member defining a receiving surface at the lower end of the chamber pivotally mounted about an axis transverse to the body to move the member upwards about said axis from a receiving position towards the body and a compacting position, the outer end of the compactor member having an arcuate member extending downwards from said outer end to occupy the lower end of the chamber during movement of the compactor member towards the compacting position.

2. A refuse collector/compactor according to claim 1 wherein the lifting and tipping mechanism is arranged to lift containers towards an upwardly directed opening into the chamber, the containers being tipped when at an elevated position into said opening so that the contents fall towards the compactor mechanism.

3. A refuse collector/compactor according to claim 1 or 2, wherein the lifting and tipping mechanism and the compactor mechanism are mounted on a tailgate assembly at one end of the body, the tailgate assembly being pivotable about an upper pivot to enable discharge of the contents of the body.

4. A refuse collector/compactor according to claim 3

wherein the body includes an ejector member movable along the body between a receiving position and a discharge position, such movement being towards the tailgate assembly after the assembly is pivoted about its pivot.

5. A refuse collector/compactor according to any one of the preceding claims wherein the arcuate member is engageable by sealing means to prevent ingress of refuse during a compacting movement of the compactor member.

6. A refuse collector/compactor according to any one of the preceding claims comprising retention members located towards the upper edge of the rear of the body to serve to retain compacted refuse in the body.

7. A refuse collector/compactor according to any one of the preceding claims comprising drive means for the compactor mechanism arranged to drive the compactor member in continuous operative and return movements, in intermittent and return movements, or in timed movement with the operation of the lifting and tipping mechanism.

8. A refuse collector/compactor substantially as described with reference to the drawings.

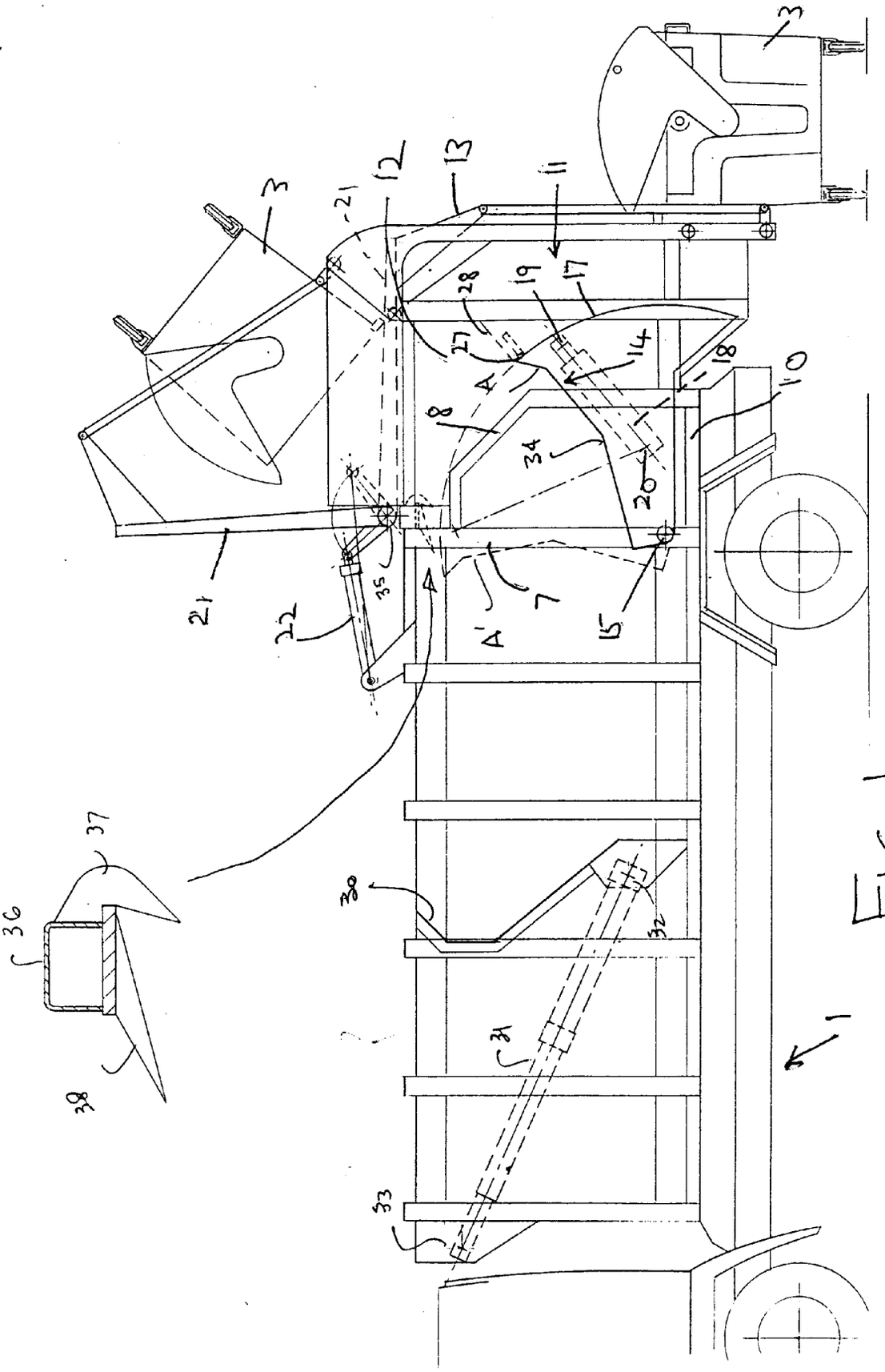
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FIG 1

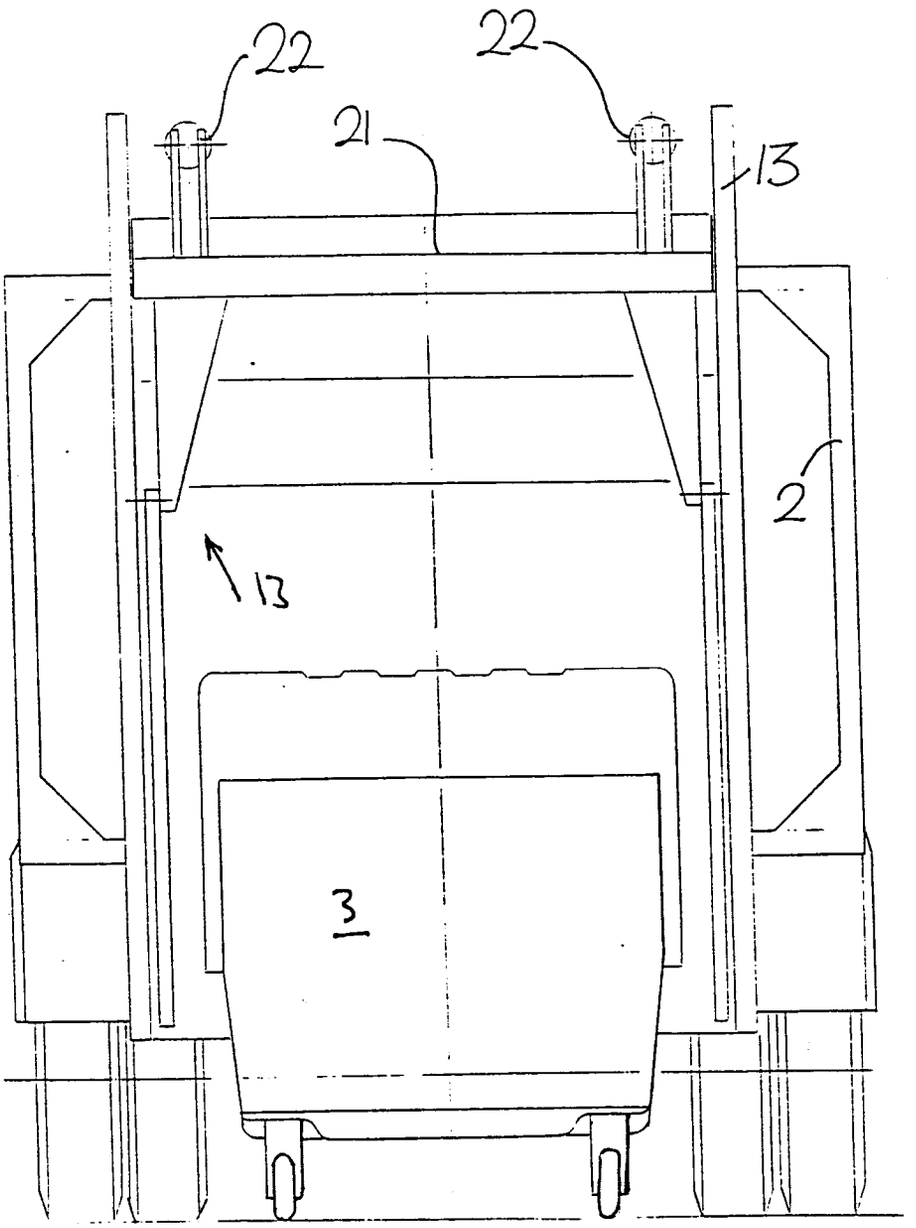

FIG 2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 30 6188

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	FR-A-1 553 516 (GLOVER, WEBB & LIVERSIDGE LTD.)	1,5-7	B65F3/20
Y	* the whole document *	2-4	
Y,D	GB-A-2 191 461 (HOWARD) * page 1, line 92 - page 2, line 11; figures 1,2 *	2-4	
A	GB-A-1 011 931 (SHELVOKE AND DREWRY)		
A	US-A-3 034 672 (BARRETT)		
A	FR-A-2 649 083 (GRUELLES)		
A	EP-A-0 076 527 (GRUELLES)		

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	15 November 1993	DEUTSCH, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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E : earlier patent document, but published on, or after the filing date
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