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

(11) Publication number: **0 085 216**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: 82300750.5

(51) Int. Cl.³: B 65 F 3/20

(22) Date of filing: 15.02.82

(30) Priority: 29.01.82 GB 8202588

(43) Date of publication of application:
10.08.83 Bulletin 83/32

(84) Designated Contracting States:
AT BE CH DE FR IT LI LU NL SE

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(54) Refuse collection and compaction vehicle.

(57) A refuse collection and compaction vehicle (10) has a chassis of a standard type of less than 2.25 metres in width, and carries a refuse compaction and collection body (13) having a pivotally mounted tailgate assembly (14). The tailgate incorporates a sliding member (20) driven by power means (22) and carrying a compactor (23) driven by second power means (24) to pivot relative to the sliding member. The weight and capacity of the body are selected so that the maximum laden weight of the vehicle does not exceed 7,500 kilograms.

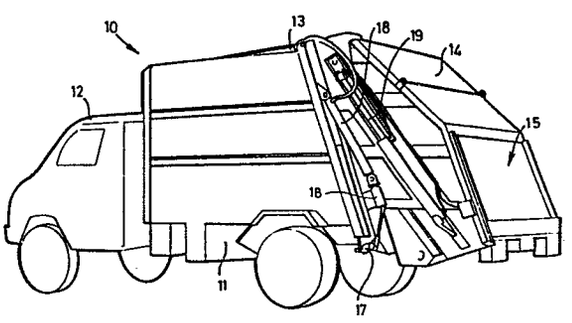

FIG 1

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Refuse Collection and Compaction Vehicle.

This invention relates to refuse collection and compaction vehicles.

Such vehicles include a body and a tailgate assembly mounted on the vehicle chassis and housing a compaction mechanism to compact refuse received by the tailgate and a discharging mechanism to discharge the refuse at for example a tip or incinerator.

Such vehicles have hitherto been large and heavy in weight so as to enable as much refuse as possible to be packed into the vehicle between unloading trips.

For some applications, however, the existing vehicles are unsuitable by reason of their large size and small non-compacting vehicles have had to be used instead. For example disposal of waste from small villages in remote and inaccessible country districts; disposal of litter at scenic areas open to the public but not accessible on metalled roads; and disposal of litter in pedestrian shopping areas all pose this problem.

It is an object of the present invention to provide a refuse collection and compaction vehicle reducing or overcoming this problem.

According to the invention there is provided a refuse collection and compaction vehicle comprising a chassis of relatively narrow width of less than 2·25 metres, and a body adapted to store compacted refuse and a tailgate assembly including compaction mechanism to compact refuse and store it in the body, the weight of the vehicle and the capacity of the body being such that the total weight of the vehicle fully-laden does not exceed 7,500 kilograms.

The weight of 7,500 kilograms or 7·38 tons is the

presently accepted upper limit in certain European countries for a vehicle which can be driven without the need for a special vehicle driving licence of the type needed for a heavy goods vehicle.

The compaction mechanism may comprise a sliding member adapted to be slid upwardly and forwardly, or downwardly and rearwardly within the tailgate by first power means, and a compactor pivotally mounted relative to the sliding member for forward and rearward pivoting movement about an axis disposed laterally of the vehicle and operable by second power means, the compactor co-operating with an interior surface of the tailgate to compact refuse placed in the tailgate.

The compaction mechanism may be controlled by electric or electro-mechanical means and the first and second power means may be hydraulically or pneumatically powered.

The invention will now be described in more detail, by way of example only, with reference to the accompanying drawings in which:-

FIGURE 1 is a perspective view of a vehicle which embodies the invention,

FIGURE 2 is a side elevational view, partly in section, of part of the vehicle, showing the compaction and discharge mechanisms,

FIGURE 3 is a diagrammatic illustration of the compaction mechanism in a first position,

FIGURE 4 is a view similar to that of Figure 3, but showing a further position of the compaction mechanism,

FIGURE 5 is a further view of the compaction mechanism.

Referring to Figure 1 of the drawings, a refuse collection and compaction vehicle is generally illustrated at 10. It comprises a conventional, mass-produced chassis and cab 11 and 12, which are less than 2·25 (e.g. 2·15) metres wide. A refuse-receiving body 13 is mounted on the chassis and a tailgate assembly 14 closes off the body. The tailgate 14 has an opening 15 at its rear end to receive refuse to be disposed of. This is then compacted by means to be described later and packed into the body 13. The compacted refuse is

taken to a suitable tip or incinerator and discharged by opening the rear of the body and pushing the refuse out using the discharging mechanism inside the body and shown in Figure 2 at 16. The tailgate is lifted to open the rear of the body, by firstly releasing a hook mechanism 17 which is operated by piston and cylinder means 18, controlled from the body nearside, and then operating a further piston and cylinder assembly 19 to lift the tailgate.

The compactor mechanism of the tailgate comprises a sliding member 20, which is mounted in guides in the tailgate wall at 21, and which is capable of sliding movement either in a forward and upward direction or in a downward and rearward direction, under the control of power means comprising a piston and cylinder assembly 22. A compactor 23 is pivotally mounted on the foot of the sliding member about an axis which extends transversely of the vehicle axis. It is pivoted by second power means comprising a piston and cylinder assembly 24.

The sequence of operations of the compactor mechanism is shown in Figures 2, 3, 4 and 5. The sliding member 20 starts in the uppermost position as shown in Figure 2, with the compactor swung forwardly as illustrated. When refuse has been deposited in the tailgate, the compactor is swung rearwardly to the position shown in Figure 3 and the sliding member 20 is then lowered to the position shown in Figure 4. The compactor is swung forwardly, as shown in Figure 5, crushing and compacting the refuse against a fixed internal wall of the tailgate at 25. The compacted refuse is fed into the body of the vehicle. Further refuse can continue to be packed into the body until it is full, after which the vehicle is driven to a tip or incinerator and the refuse ejected, as described above.

The size of the vehicle chassis and the body capacity are chosen so that the total or gross vehicle weight of the vehicle fully laden does not exceed 7,500 kilograms. This is achieved partly by the simple and relatively light operating mechanism described above and partly by confining the width of the chassis to less than 2·25 metres.

The control system for operating the compaction and other mechanisms described may be electrical or electro-mechanical. For example, electrical limit switches may be used to stop and start movement of the various parts as required, by detecting their presence at appropriate parts of their travel. Alternatively, mechanical detectors may be used to control the electrical circuitry which in turn controls the power means operating the various parts.

Power means of an hydraulic type are preferred, but could be substituted by pneumatic means if desired. The hydraulic power means are operated, in generally-known manner from the vehicle hydraulic system, via a power take-off, controlled from the cab.

In a vehicle embodying the invention, the size of the body may, for example, be approximately 2·6 metres long and 1·5 metres high, considered from the chassis. The tail-gate may be an additional 1·5 metres in length and of the same height approximately.

It will be found that, allowing for an empty weight of about 4999 kilograms for the vehicle, a payload of about 2500 kilograms of refuse can be accommodated inside the body without the total laden weight exceeding 7500 kilograms, and hence without requiring the driver of the vehicle to have a special heavy goods type driving licence in certain of the European countries. The body is so sized that, when it is fully packed with refuse, the 7500 kilogram limit is never reached.

CLAIMS:

1. A refuse collection and compaction vehicle characterised in that it comprises a chassis (11) of relatively narrow width less than 2·25 metres, and a body (13) adapted to store compacted refuse and a tailgate assembly (14) including compaction mechanism (16) to compact refuse and store it in the body (13), the weight of the body (13) being such that the total weight of the vehicle (10) fully-laden does not exceed 7,500 kilograms.

2. A vehicle according to claim 1 and further characterised in that the compaction mechanism (16) comprises a sliding member (20) adapted to be slid upwardly and forwardly, or downwardly and rearwardly within the tailgate (14) by first power means (22), and a compactor (23) pivotally mounted relative to the sliding member (20) for forward and rearward pivoting movement about an axis disposed laterally of the vehicle and operable by second power means (24), the compactor (23) co-operating with an interior surface (25) of the tailgate (14) to compact refuse placed in the tailgate (14).

3. A vehicle according to claim 1 or claim 2 and further characterised in the provision of sensing means to detect the position of the compaction mechanism (20,23) during operation.

4. A vehicle according to claim 3 and further characterised in that the sensing means are electrically operated.

5. A vehicle according to claim 3 and further characterised in that the sensing means are mechanically operated.

6. A vehicle according to any preceding claim and further characterised in that the first and second power means (22,24) are hydraulic.

7. A vehicle according to any preceding claim and further characterised in that the first and second power means (22,24) are pneumatic.

8. A vehicle according to any preceding claim and further characterised in that the body (13) contains a power-operated refuse discharging mechanism.

9. A vehicle according to any preceding claim and further characterised in that the tailgate (14) is pivotally mounted relative to the body and includes power operated unlocking means (17,18).

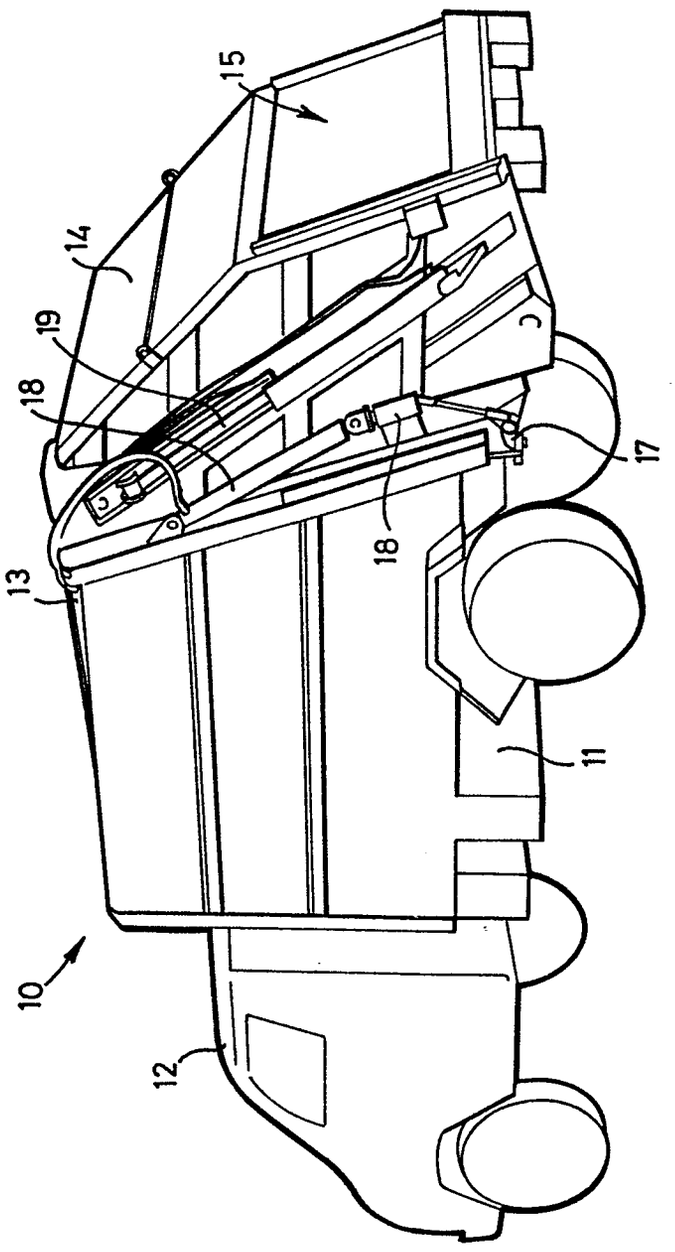

FIG 1

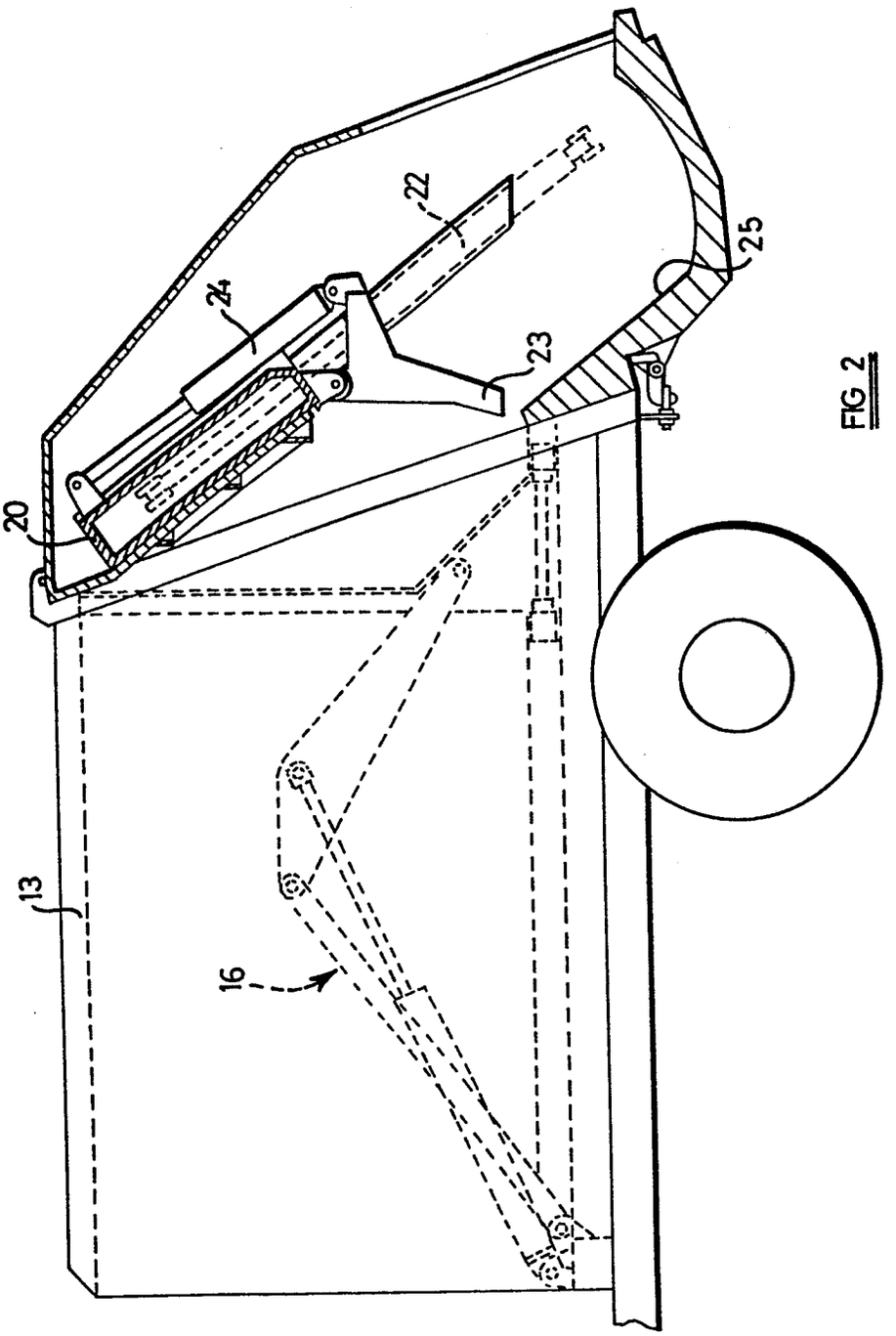

FIG 2

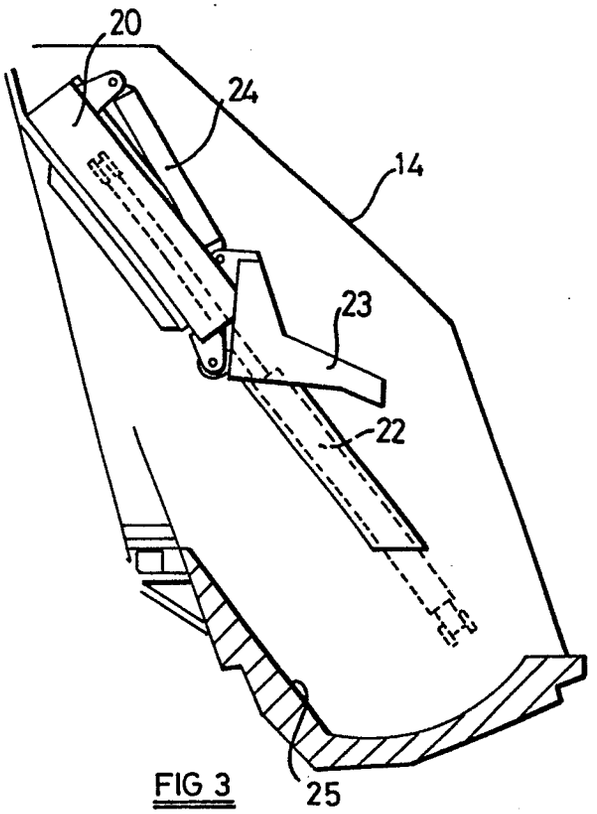

FIG 3

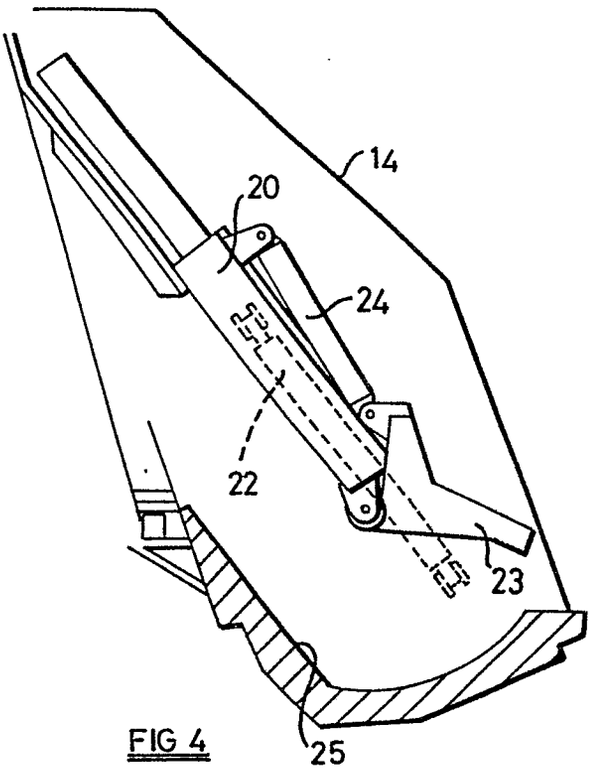

FIG 4

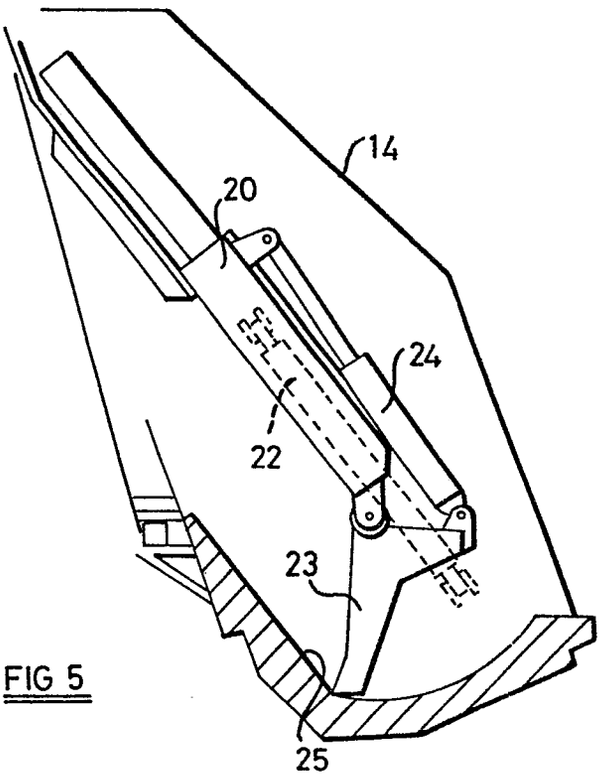

FIG 5