

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication of patent specification: **18.01.84**

(51) Int. Cl.³: **B 30 B 9/30**

(21) Application number: **80200019.0**

(22) Date of filing: **08.01.80**

(54) **Apparatus for compacting waste.**

(30) Priority: **12.01.79 NL 7900279**

(43) Date of publication of application:
23.07.80 Bulletin 80/15

(45) Publication of the grant of the patent:
18.01.84 Bulletin 84/3

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

(56) References cited:
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FR - A - 2 314 823
GB - A - 912 632
GB - A - 1 513 365
US - A - 4 070 962

(73) Proprietor: **Smit, Bernardus Johannes**
Falckstraat 53
NL-1017 VV Amsterdam (NL)

(72) Inventor: **Smit, Bernardus Johannes**
Falckstraat 53
NL-1017 VV Amsterdam (NL)

(74) Representative: **de Boer, Hindrik Geert Jan**
de Boer & Wigman P.O. Box 5265 De
Lairessestraat 131-135
NL-1007 AG Amsterdam (NL)

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Apparatus for compacting waste

The invention relates to an apparatus for compacting waste, such as loose or bulk domestic refuse, waste water from nursing homes, hospitals, offices, industries, etc., the waste to be compacted being supplied through an opening into the confined space designed for the compacting process, which compacting space houses a reciprocating, close-fitting displacement member, under the action of which displacement member the refuse supplied is forced further into the compacting space during each cycle, as a result of which the refuse is compressed. The invention more particularly relates to an apparatus for compacting waste, consisting of an elongated box-like housing enclosing two compacting spaces located on both sides of a displacement member that is reciprocally movable about a swivel axis at the bottom of the housing and means to move said displacement member between two extreme positions, the upper wall of the apparatus consisting of a hinged mounted cover, which hinges along a long side thereof, for removing compacted waste by opening said cover and tilting the apparatus.

An apparatus of this type is known and has been described in US patent specification US—A—4070962. In this known apparatus the reciprocating movement of the displacement member is effectuated by fluid means, particularly by alternately evacuating and/or pressurising the refuse space. As a consequence the displacement member requires a fluid tight sealing with cover and walls of the refuse space during its compacting operation, which also implies that the filling step of the refuse space and the compacting step are unavoidably separate operations.

Object of the present invention is to provide an apparatus which is so designed, that it can be continuously filled with refuse during the compacting operation. The advantage amongst others is that the displacement member will already fulfil its compacting duty during the period that the refuse space will be gradually filled and that this compacting cycle will be substantially completed as soon as the refuse space will be entirely filled. To this end, according to the invention, an apparatus of the type described above, is characterised in that the cover is provided with a central supply opening for continuously supplying waste during the compacting operation of the displacement member, that said swivel axis is situated centrally below said supply opening and is parallel to a short side of the apparatus, the length of the stroke of the upper edge of the displacement member is substantially equal to the length of said opening, and that the supply opening is provided with two swing covers for blocking said opening, which covers, in their open position, are maintained in an inclined

position by means of stops so as to form a chute for the waste supplied.

The apparatus may be preferably constructed as a mobile container equipped with wheels.

As a result of the circumstance that the compacting operation can be started together with the filling operation, that part of the refuse or waste that will gradually fill the refuse space will already be compacted so that the filling degree of the refuse space will be considerably higher than in the case that the refuse space has to be filled with rather loose refuse in a first step as required in the apparatus according to US patent specification US—A—4070962.

A further advantage is, that no fluid tight provision for the displacement member is required, which results in a design of a more simple construction which is moreover much cheaper.

It should be noted that the principle of compressing or compacting waste or refuse by means of a reciprocating displacement member, such as pressure plates, baffles, rams, or pistons is more widely known.

In this connection mention can be made of French patent application FR—A—2314823 describing a stationary container having an opening and chute at the top for receiving refuse and provided with a reciprocating piston for transporting and compacting the refuse. However, the apparatus is open at both ends, where refuse containers are placed for receiving the refuse from the apparatus.

This means, that this apparatus mainly serves as a transport means for the refuse wherein at the same time during the transport the refuse is compacted during the linear stroke of the piston, however only in a limited degree since there is no counter pressure at the open refuse outlet ends of the apparatus.

Another known apparatus has been described in British patent specification GB—A—1513365 showing a material compressing apparatus which can be defined as a bale press. A reciprocating piston or press ram within the apparatus is provided for compressing the refuse to a solid block or bale, which also requires then a provision of a cutting and tearing mechanism, since coarse refuse parts are not suitable for manufacturing bales, bearing in mind that refuse suitable for making bales usually is of a rather selective composition. In this known apparatus such a tearing mechanism has been provided within the filling channel which not only constitutes an extra mechanism requiring separate driving means but also prevents the inlet to be designed as a chute in the form of swing covers for locking the supply opening as is the case with the apparatus according to the invention.

The invention will now further be illustrated with reference to the accompanying drawing,

showing a preferred embodiment of the invention.

In the drawing,

Fig. 1 is a lateral view of such an apparatus;

Fig. 2 is a front view along the arrow II in Fig.

1;

Fig. 3 is a top view along the arrow III in Fig.

2;

Fig. 4 is a schematic view of an auxiliary installation.

The apparatus comprises a housing 1 constituting the compacting space proper, a cover structure 2 for closing the compacting space, two swing covers 3 for closing the supply opening 13 as well as for forming a chute when they occupy the opened position, for which purpose use is made of stops 12, a displacement member 4, here provided in the form of a plate, the lower end of which is hinged to the bottom of the compacting space, a set of hydraulic or pneumatic cylinders 5 for driving the displacement member 4, a set of slides 6 for sealing the slot in the side wall of the compacting space, a set of sleeves 7 within which the cylinders 5 are movably suspended and which are mounted on both sides of the compacting space, a locking mechanism 8 for fixing the cover 2, a unit 9 which provides the hydraulic or pneumatic energy, the coupling of the unit to the apparatus preferably being accomplished with the aid of quick-detachable couplings, a set of road wheels 10 for making the apparatus mobile, and a control unit 11 comprising such components as valves, switches, pilot lamps, relays and the like.

The operation of the apparatus is as follows. When the starting signal has been imparted to the control unit, the displacement member 4 starts performing its motion cycles. This means that it reciprocates a number of times between the positions 20 and 30. The number of cycles to be performed is adjustable. The waste which is being dumped into the supply opening is forced to the left or to the right, depending on the position of the displacement member 4 at the moment of entry of the waste. Upon completion of the adjusted number of cycles, the displacement member 4 stops in its rest position 40. When the displacement member 4 approaches its turning point 20 or 30, and upon exceeding during this motion a pre-adjusted pressure in the pressure system, it does not continue on its path but reverses its direction of travel and moves towards the other turning point. These motions will be repeated until the adjusted operating time has expired, whereupon the displacement member 4 resumes its rest position 40. The fact of the high pressure in the pressure system being reached is the effect of the counterpressure produced by the waste which has been compressed by the displacement member 4. Once the high pressure is reached in both directions of travel, the apparatus can be said to be "full". When the supply opening 13 is closed by the covers 3 the waste

is contained in a fully confined space, and the apparatus can be transported. The quick-detachable couplings (not shown) of the energizing lines are then disconnected, so that the apparatus can be freely moved. The apparatus is emptied by unlocking the locking mechanism 8, whereupon the entire apparatus is tilted about its longitudinal axis, in such a way that the cover 2 comes to lie undermost. The hinged cover 2 turns to its opened position under its own weight, and the waste falls out of the apparatus. When the apparatus has been tilted back to its original position and the locking mechanism 8 has been locked, the apparatus can be returned to its usual or its desired location.

Claims

1. Apparatus for compacting waste, consisting of an elongated box-like housing (1) enclosing two compacting spaces located on both sides of a displacement member (4) that is reciprocally movable about a swivel axis at the bottom of the housing (1) and means (5) to move said displacement member (4) between two extreme positions (20, 30), the upper wall of the apparatus consisting of a hingedly mounted cover (2), which hinges along a long side thereof, for removal of compacted waste by opening said cover (2) and tilting the apparatus, characterised in that the cover (2) is provided with a central supply opening (13) for continuously supplying waste during the compacting operation of the displacement member (4), said swivel axis is situated centrally below said supply opening (13) and is parallel to a short side of the apparatus, the length of the stroke of the upper edge of the displacement member (4) is substantially equal to the length of said opening (13), and that the supply opening (13) is provided with two swing covers (3) for blocking said supply opening (13), which covers (3), in their open position, are maintained in an inclined position by means of stops (12) so as to form a chute for the waste supplied.

2. Apparatus according to claim 1, characterised in that it is constructed as a mobile container, equipped with wheels (10).

Patentansprüche

1. Gerät zur Verdichtung von Abfällen, derart gestaltet, dass ein längliches, kastenförmiges Gehäuse (1) zwei auf beiden Seiten eines Verschiebungsorgans (4) befindliche Verdichtungsräume umschliesst und das Verschiebungsorgan (4) durch eine Antriebsvorrichtung (5) um eine am Boden des Gehäuses (1) angeordnete Scharnierachse zwischen (20, 30) hin und her drehbar ist, während die obere Seite des Gerätes aus einem mittels eines Drehgelenks entlang der einen Längsseite aufklappbaren Deckel (2) besteht, so dass durch Öffnen des genannten Deckels (2) und Kippen des Gerätes der verdichtete Abfall entfernt werden

kann, dadurch gekennzeichnet, dass der Deckel (2) für eine kontinuierliche Zufuhr von Abfall während der Verdichtung durch das Verschiebungsorgan (4) mit einer zentralen Einfüllöffnung (13) versehen ist, während die genannte Scharnierachse sich zentral unterhalb der genannten Einfüllöffnung (13) befindet und parallel zur kurzen Seite des Gerätes verläuft, dass der Ausschlag der Oberkante des Verschiebungsorgans (4) grundsätzlich dieselbe weite hat wie die genannte Öffnung (13) und dass die Einfüllöffnung (13) absperrbar ist mit Hilfe von zwei Klappdeckeln (3), die in geöffnetem Stand durch Halteverrichtungen (12) in einer schrägen Position gehalten werden, um eine Rutsche für den zugeführten Abfall zu bilden.

2. Gerät gemäss Anspruch 1, dadurch gekennzeichnet, dass es als ein mit Rädern (10) versehener, fahrbarer Behälter konstruiert ist.

Revendications

1. Dispositif pour compacter des ordures consistant en un carter (1) en forme de boîte allongée enfermant deux espaces de compactage disposés de chaque côté d'un organe de déplacement (4) qui est mobile en mouvement alternatif autour d'un axe de rotation situé vers le fond du carter (1) et des moyens (5) pour

déplacer ledit organe de déplacement (4) entre deux positions extrêmes (20, 30), la paroi supérieure du dispositif étant constituée d'un couvercle (2) monté articulé, lequel s'articule le long d'un de ses longs côtés, pour l'enlèvement des ordures compactées par ouverture dudit couvercle (2) et basculement de l'appareil, caractérisé en ce que le couvercle (2) comporte une ouverture d'approvisionnement central (13) permettant d'apporter de façon continue les ordures pendant l'opération de compactage de l'organe de déplacement (4), ledit axe de rotation est situé en position centrale en-dessous de ladite ouverture d'approvisionnement (13) et est parallèle à un petit côté du dispositif, la longueur de la course du bord supérieur de l'organe de déplacement (4) est sensiblement égale à la longueur de ladite ouverture (13), et en ce que l'ouverture d'approvisionnement (13) est pourvue de deux couvercles basculant (3) pour le blocage de ladite ouverture d'approvisionnement (13) avec les couvercles (3) qui, dans leur position d'ouverture, sont maintenus dans une position inclinée au moyen de butées (12) de façon à former une glissière de chute pour les ordures qu'on apporte.

2. Dispositif selon la revendication 1, caractérisé en ce qu'il est construit comme un récipient mobile équipé de roues (10).

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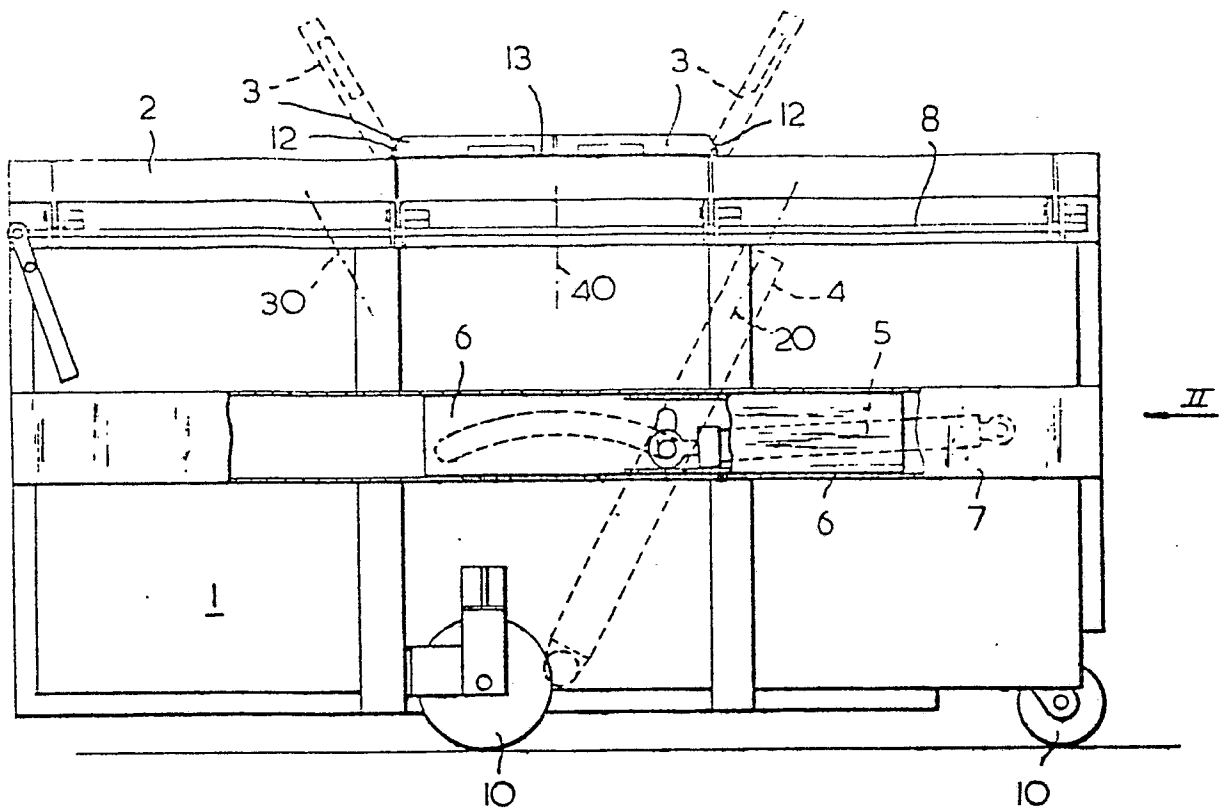


FIG. 1

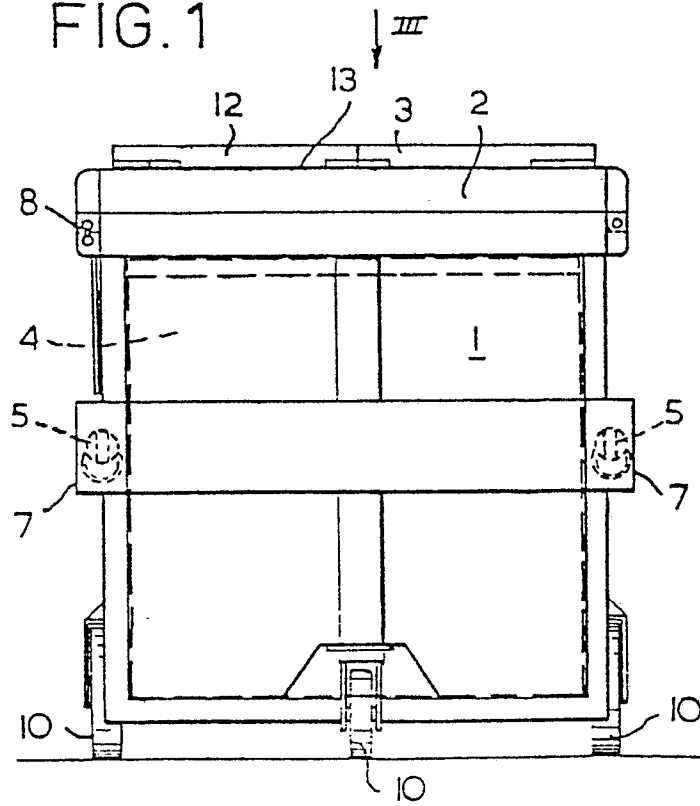


FIG. 2

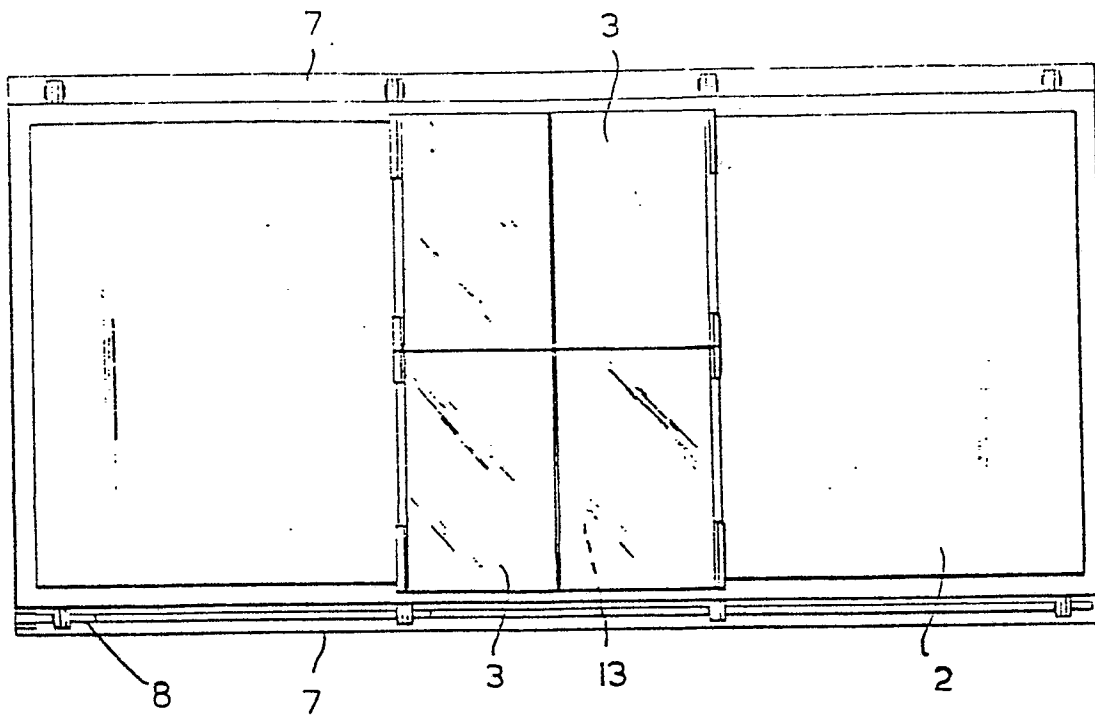


FIG.3

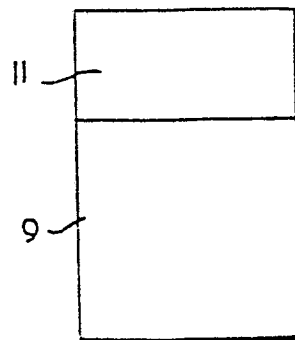


FIG.4