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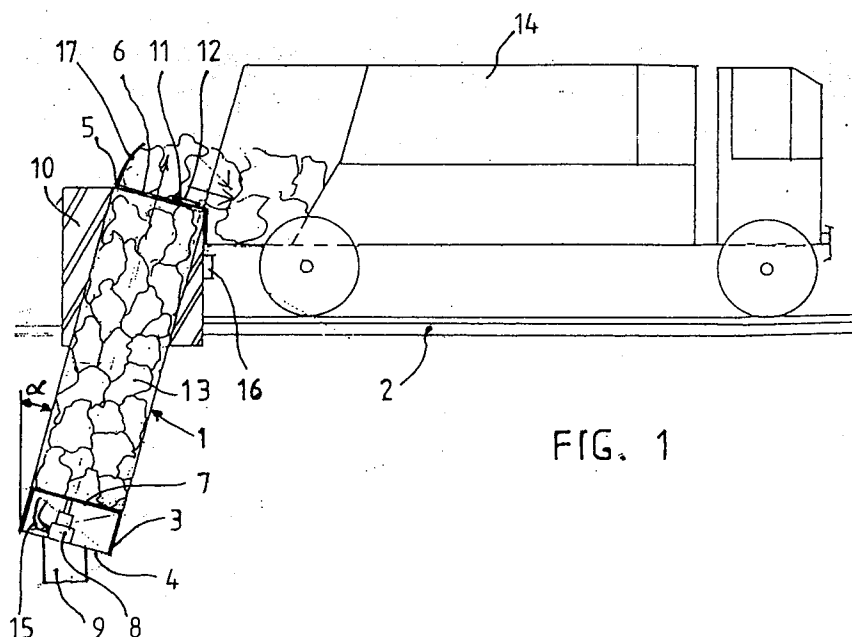
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AT BE CH DE DK ES FR GB GR IT LI LU NL SE(74) Representative: **Lips, Hendrik Jan George, Ir.**(71) Applicant: **van den Herik, Pieter Adriaan**
Roestuin 61
NL-3343 CT Hendrik Ido Ambacht(NL)**HAAGSCH OCTROOIBUREAU Breitnerlaan****146****NL-2596 HG Den Haag(NL)**(54) **Method and device for transporting household refuse.**

(57) Method and device for transporting household refuse from a certain residential area, at which the residents can bring the refuse into one single receiving device (1) accessible to a garbage truck (14), so that it can be immediately emptied therein by connecting a discharge opening of the device (1) to the garbage truck (14). The receiving device comprises an elongated substantially vertical housing (1) sunk

into the ground, which at one transverse end (5) provided with a supply and discharge opening closable by a cover (6, 18) and at the opposed transverse end (3) with a substantially closed wall (4), and a piston (7) adapted to the cross-section of the housing (1) and being reciprocable inside the housing (1) between the cover (6, 18) and the closed wall (4).

**FIG. 1****EP 0 490 456 A1**

First of all, the invention relates to a method for transporting household garbage from a certain residential area.

When groups of houses, among which can also be blocks of houses of several floors, are not directly situated near a road accessible for a garbage truck, the residents are forced to bring their garbage bags and the like to a place which is accessible to a garbage truck.

This will be the cause, that much garbage is supplied on a certain spot and often spread over a certain surface. Due to this, not all of the garbage will be near the side of the road and the work for the persons concerned will be more toughening, or the garbage truck will have to be displaced several times in order to bring all the garbage into it.

The invention intends to remove these difficulties and to that end provides for, that the residents bring the garbage into one single receiving space accessible to a garbage truck, which receiving space on arrival of a garbage truck can be immediately emptied therein by connecting a discharge opening of the space to the garbage truck and activating means for bringing the garbage from the receiving space into the garbage truck.

Because of this, handling of the garbage by a number of persons riding along with the garbage truck is prevented and only the driver needs to be present. The garbage truck can be driven up to the discharge opening of the receiving space and then the means for bringing the garbage from the receiving space into the garbage truck can be activated, in particular by shoving the garbage from the receiving space into the garbage truck.

The invention also relates to a device for applying the above-mentioned method. The device according to the invention is characterized in that the receiving device for garbage is constituted by an elongated housing, which at one transverse end is provided with a supply and discharge opening closable by a cover and at the opposed transverse end is provided with a substantially closed wall, with a piston adapted to the cross-section of the housing being reciprocable inside the housing between the cover and the closed wall.

This results in a very simple device functioning in a reliable way.

Since it is naturally desirable that such a device does not take up too much space, in most cases it will be provided for, that the axis of the housing runs substantially in vertical direction and the housing has for the greater part been fitted sunk into the ground, such that the upper end of the housing, which is provided with the cover, is at a level above the ground adapted to the garbage truck.

Owing to this, it is also achieved, that the household garbage can be brought into the housing

in a simple way. Although in that it is preferred, that one uses above-mentioned cover, a supplying possibility in an axially extending wall of the housing could naturally also be provided for. Such an opening can then be close above the ground.

The cover and a possible further supply opening will be provided with a lock and/or another protection for preventing children or pets from coming into the housing.

Several means can be applied for reciprocating the piston, such as for example cables engaging the piston at some positions near its edge and are guided over motor-driven cable rollers.

However, in particular it can be provided for, that the piston is actuated by means of a hydraulic cylinder, which is situated near the closed transverse wall of the housing and the hydraulic lines of which can be coupled to hydraulic lines present at the garbage truck.

Then there will be no need for leading lines for electrical energy to the receiving space. At the same time it will then be impossible to displace the piston and thus bringing garbage from the receiving space into the open without the garbage truck being present.

Possibly, the hydraulic cylinder can then be partly countersunk into the closed transverse wall, but it is not absolutely necessary. As it happens, hydraulic cylinders with small constructive length and relatively long stroke are commercially available.

The garbage truck will have to be provided with two quick connect couplings for connecting the lines going to the hydraulic cylinder in the housing.

According to the invention, the axis of the housing will enclose an angle from about 10 to 30° with the vertical. Due to this, garbage coming out of the discharge opening will already have a certain speed in horizontal direction for getting into the garbage truck more easily.

In order to improve the movement of the garbage to the garbage truck still further, a part of the axial wall of the housing near the cover can be provided with a bent plate projecting above the cover, at the top part of the housing.

In most cases, the cross-section of the housing will have such dimensions, that it will not be practical that the cover must be lifted in its entirety when one wants to bring garbage into it. Then, it can be provided for, that in the cover a hatch is made, the size of which is adapted to the size of the garbage to be brought into the housing.

It can also be provided for, that the cover is mounted in a substantially vertical plane and is connected to a part of a bend, which connects to the radial upper end of the housing.

Particularly a part of the bend together with the cover will have been pivotably mounted to the

further part of the bend, which has been fixedly connected to the housing. This last part of the bend will take care of the guiding of the garbage with bringing it into the garbage truck.

Further, it can be provided for, that brushes directed inwardly from the wall of the bend have been mounted in the part of the bend connected with the cover, at a distance behind the cover.

These brushes again limit the size of the opening through which garbage can be brought into the housing. Owing to the fact that the brushes are connected to the part of the bend that can be pivoted away, they do not form a hindrance when the garbage has to be brought from the housing into the garbage truck.

In order to realize the separated collecting of garbage in an easy way, it can be provided for, that several housings have been mounted adjacent each other for receiving different types of garbage. Possibly, the garbage truck can also be divided into a number of adjacent compartments, so that the housings placed next to each other can be emptied at the same time.

This will naturally be dependent on the dimensions of the housings.

In particular with arranging several housings adjacent each other the housings can have a rectangular cross-section, but naturally a circular cross-section is also possible so that then for example one can employ a round steel pipe.

By GB-A-1 155 701 a garbage container is known with a bottom which is provided with wheels and which can be displaced in the housing to remove garbage from it. To that end, however, the container first has to be lifted from the ground by the garbage truck and then power means attached to said truck has to be connected to said bottom to press this inwardly. Obviously, this construction can only be applied in case of relatively small containers.

By US-A-3 677 422 a garbage container is known which is buried below the ground but has a curved shape so that both opposite ends are at or near ground level. Because of this the container will need much space and removal of the garbage from it will require special means such as a piston which is moved by means of cables. One of said cables will be buried into the garbage thrown into the container and will take along garbage with it during emptying the container.

By EP-A-0 127 956 a garbage container is known which has to be emptied by evacuation of air from the container. Obviously, the container will have to be of heavy construction and valves and a suction pump will have to be present to make the emptying possible.

The invention is further explained by means of two embodiments, illustrated in the drawing, in

which:

fig. 1 diagrammatically shows a vertical section across a first embodiment of a device according to the invention, with a garbage truck placed at it; and

fig. 2 shows a part of fig. 1 but of a somewhat modified embodiment of the device.

Fig. 1 shows in section an elongated housing 1, which is partly sunk into the ground 2. The housing 1 encloses an angle α of about 15° with the vertical.

The lower end 3 of the housing 1 is provided with a substantially closed wall 4 and the upper end 5 of the housing 1 is provided with a cover 6.

Within the housing 1 between the ends 3 and 5 a piston 7 is present, which can be displaced up and down by means of the hydraulic cylinder 8. The hydraulic cylinder 8 is supported by the wall 4, which thereto naturally need not be completely closed. There is also the possibility to support the wall 4, or the hydraulic cylinder 8 by means of a pole 9 mounted in the ground.

The part of the housing 1 projecting above the ground can be provided with a concrete casing 10, so that damage of the wall of the housing 1 can be prevented.

In the cover 6 there can be an opening 11, which can be closed by means of a hatch 12, which hatch be opened to bring a garbage bag 13 into the housing 1.

When the garbage should be removed from the housing 1, a garbage truck 14 is driven up to the housing 1, the cover 6 is opened and hydraulic lines 15, which extend upwards from the hydraulic cylinder 8 in a way not further represented, are connected to hydraulic lines not further represented by means of quick connect couplings mounted to the garbage truck 14. The hydraulic connections, extending from the hydraulic cylinder, can be received in a closable space in the casing 10.

At the highest end of the housing a bent plate 17 projecting upwards can be mounted for guiding the garbage on pushing it into the garbage truck 14.

In the embodiment shown in fig. 2 the cover 18 lies substantially in a vertical plane and is connected to a part 19 of a bend 20, which at the other side connects to the upper end 5 of the housing 1. The part 19 of the bend 20 is pivotably connected to the further part of the bend and in fig. 2 the parts 18 and 19 have been pivoted to that position in which the garbage can be discharged from the housing 1 and brought into the garbage truck 14. In fig. 2 the piston 7 is in its highest position. Possibly, provisions can be made for carrying garbage that would stay behind on the piston away therefrom and bringing it into the garbage truck 14.

Depending on the size of the cover 18, alter-

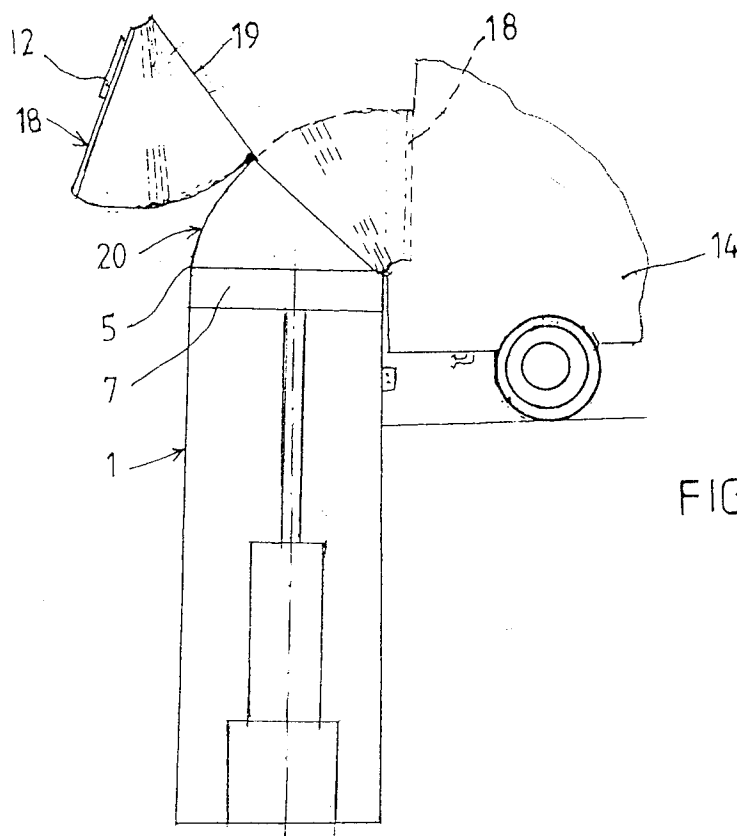
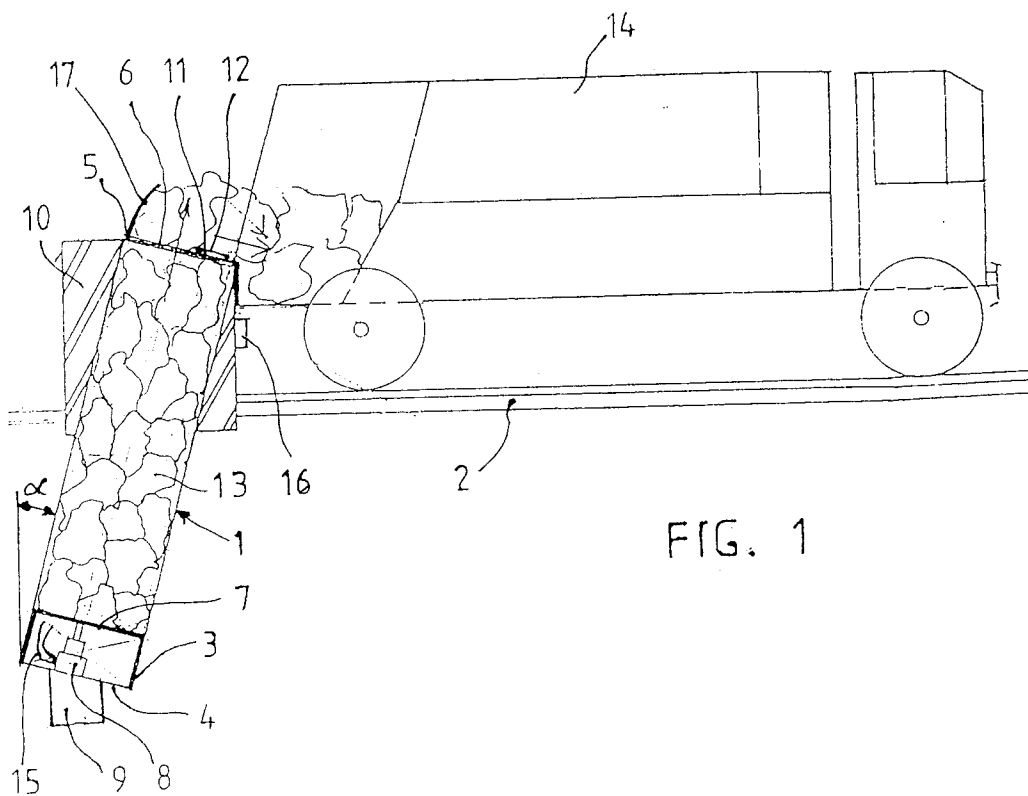
natively again a hatch 12 can be made therein and brushes 21 protruding inwards from the wall can be mounted in the part 19 of the bend 20, for limiting the opening through which garbage is brought into the housing 1.

It will be obvious, that only some embodiments of a device according to the invention have been illustrated and that many modifications can be made without falling beyond the inventive idea.

Claims

1. Method for transporting garbage from a certain residential area, **characterized in** that the residents bring the garbage into one single receiving space (1) accessible to a garbage truck (14), which receiving space on arrival of a garbage truck can be immediately emptied therein by connecting a discharge opening of the space (1) to the garbage truck (14) and activating means (7, 8) for bringing the garbage from the receiving space (1) into the garbage truck.
2. Device for applying the method according to claim 1, **characterized in** that the receiving device for garbage is constituted by an elongated housing (1), which at one transverse end (5) is provided with a supply and discharge opening closable by a cover (6, 18) and at the opposed transverse end (3) is provided with a substantially closed wall (4), with a piston (7) adapted to the cross-section of the housing (1) being reciprocable inside the housing (1) between the cover (6, 18) and the closed wall (4).
3. Device according to claim 2, **characterized in** that the axis of the housing (1) runs substantially in vertical direction and the housing has for the greater part been fitted sunk into the ground (2), such that the upper end (5) of the housing, which is provided with the cover (6, 18), is at a level above the ground (2) adapted to the garbage truck (14).
4. Device according to claim 2 or 3, **characterized in** that the piston (7) is actuated by means of a hydraulic cylinder (8), which is situated near the closed transverse wall (4) of the housing (1) and the hydraulic lines (15) of which can be coupled to hydraulic lines present at the garbage truck (14).
5. Device according to claim 3 or 4, **characterized in** that the axis of the housing (1) will enclose an angle from about 10 to 30° with the vertical.

6. Device according to one of the claims 3 - 5, **characterized in** that near the cover (6) a part of the axial wall of the housing (1) is provided with a bent plate (17) projecting above the cover (6).
7. Device according to one of the claims 2 - 6, **characterized in** that in the cover (6, 18) a hatch (12) has been made, the size of which is adapted to the size of the garbage to be brought into the housing (1).
8. Device according to one of the claims 3 - 7, **characterized in** that the cover (18) is mounted in a substantially vertical plane and is connected to a part (19) of a bend (20), which connects to the radial upper end (5) of the housing (1).
9. Device according to claim 8, **characterized in** that a part (19) of the bend (20) together with the cover (18) has been pivotably mounted to the further part of the bend (20) which has been fixedly connected to the housing (1).
10. Device according to claim 9, **characterized in** that brushes (21) directed inwardly from the wall of the bend (20) have been mounted in the part (19) of the bend connected with the cover (18), at a distance behind the cover.
11. Device according to one of the claims 2 - 10, **characterized in** that several housings (1) have been mounted adjacent each other for receiving different types of garbage.





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EUROPEAN SEARCH REPORT

Application Number

EP 91 20 3274

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)
D,X D,Y	GB-A-1 155 701 (WALKER) * page 1, line 48 - page 2, line 64 * * figures 1,2 * ---	1,2 3,7,8	B65F5/00 B65F1/14
D,X D,Y	US-A-3 677 422 (MEYERS ET AL.) * column 2, line 52 - column 6, line 24 * * figures 1-3,7 * ---	1 3,7,8	
D,X	EP-A-0 127 596 (WASSDAHL) * page 1, line 33 - page 4, line 14 * * figure 1 * ---	1	
A	US-A-3 016 163 (KESSINGER) ---		
A	LU-A-84 397 (MULLER) ---		
A	FR-A-2 546 141 (SARL SAMU) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B65F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 30 MARCH 1992	Examiner SMOLDERS R. C. H.
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 O : non-written disclosure 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	