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(54) **Compartmented urban garbage container**

(57) Urban garbage container (1), having an inner compartment (11, 12) apt to receive garbage and comprising a main body (2), delimiting topwise and sideways

the compartment (11, 12), and a bottom base portion (20), movable with respect to the main body (2) between a garbage collecting position and a garbage unloading position (Fig. 5).

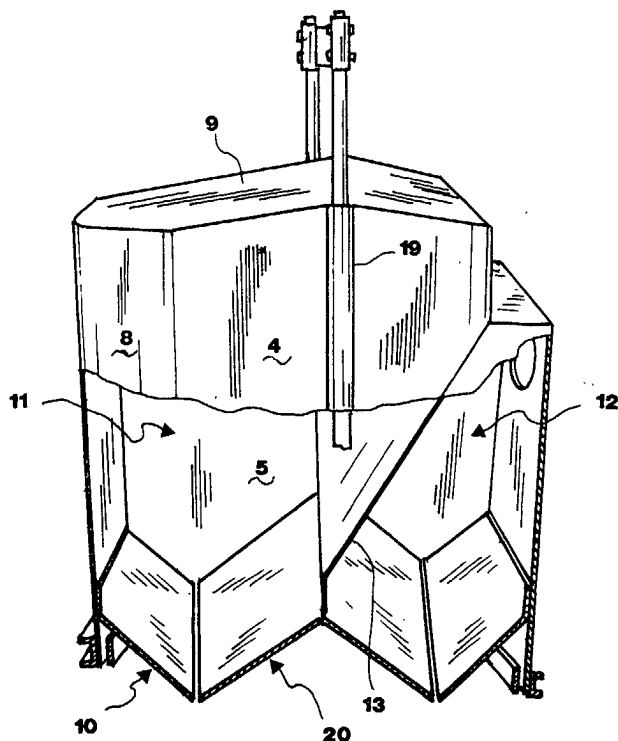


FIG. 1C

Description

[0001] The present invention refers to an urban garbage container, e.g. of the type commonly referred to as 'dumpster' and to a related vehicle for the emptying thereof. The container and the vehicle of the invention are particularly suitable for the concomitant separate collection of two distinct urban garbage merceologic fractions.

[0002] In all cities, the garbage containers, and in particular the solid garbage containers commonly called dumpsters, are located just inside the urban context, and are periodically emptied by suitable collecting vehicles, typically lorries or vans. These vehicles are equipped with mechanisms enabling the lifting of the dumpster and the total or partial overturning of the latter in order to tip the garbage contained therein into a garbage-collecting compartment thereof.

Usually, garbage fractions from separate collection are conveyed into containers suitable for a single material or for several materials concomitantly.

However, said modes of emptying the dumpster into the vehicle are less than satisfactory in several aspects. Firstly, the garbage messily outpouring from the dumpster during its overturning, is at risk of partially falling on the road, anyhow releasing foul smells in the surrounding environment. Secondly, the dumpster overturning mechanisms are quite complex, anyhow requiring an accurate positioning thereof with respect to the vehicle in order to be utilized. Furthermore, these modes of emptying are totally unsuitable for the case of containers for the separate collection of garbage.

The technical problem underlying the present invention is to provide a urban garbage and separate garbage container and a related collecting vehicle overcoming the drawbacks hereto mentioned with reference to the known art.

Moreover, a further object of the invention is to implement a container separately containing two different garbage fractions.

This problem is solved by a container according to claim 1.

According to the same inventive concept, the invention further provides a vehicle according to claim 16.

The term 'garbage container' refers to any type of container for collecting solid and/or liquid garbage.

The present invention provides several relevant advantages. The main advantage lies in that the container of the invention has optimal modes of emptying, as it needs no overturning in order to carry out the emptying. Also for this reason the container requires, onto the associated collecting vehicle, a lifting and emptying system potentially simpler than that of the known containers. Moreover, the modes of emptying the container from the bottom make the latter particularly suitable for the separate collection of garbage, as it will also be made apparent hereinafter, with reference to specific embodiments of the invention.

[0003] Other advantages, features and the modes of employ of the present invention will be made apparent in the following detailed description of some embodiments thereof, given by way of a non-limiting example. Reference will be made to the figures of the attached drawings, wherein:

Figure 1A is a front view of an embodiment of the urban garbage container according to the present invention;

Figure 1B is a partially sectional rear view of the container of Figure 1A;

Figure 1C is a partially sectional side view of the container of Figure 1A;

Figure 2 is a bottom perspective view of a bottom portion of the container of Figure 1;

Figure 3A is a perspective view of a detail of an embodiment of the urban garbage collecting vehicle according to the present invention;

Figure 3B is a perspective view of a detail of a variant embodiment of the urban garbage collecting vehicle according to the present invention;

Figure 4 is a rear view of the container of Figure 1 and of the vehicle of Figure 3A, during the lifting of the former by the latter;

Figure 5 is a perspective view of the container of Figure 1 and of the vehicle of Figure 3A, during the unloading of garbage from the former into the latter; and

Figures 6A, 6B and 6C are each a perspective view, detailing the unloading step of Figure 5.

With initial reference to Figures 1A, 1B and 1C, a urban garbage container according to the present invention is generally indicated with 1. In the present embodiment, the container 1 is apt to the separate collection of solid urban garbage, and in particular to the separate collection of clear glass and of stained glass.

The container 1 comprises a main body 2, which in the present embodiment is substantially shaped as an irregular polyhedron having a substantially hexagon-shaped plan. In particular, the main body 2 comprises a plurality of side walls, and specifically a first wall 3, hereinafter referred to as front wall and being substantially upwardly step-shaped, a second and a third substantially parallel side walls, 4 and 5, respectively, and three rear walls, 6, 7 and 8, respectively. Moreover, the main body 2 comprises a top wall 9 having a variable slant from the front wall 3 to the rear walls 6, 7 and 8.

Moreover, the main body 2 is closed bottomwise by a bottom portion of the container 1, generally indicated with 10 and detailed later on.

Furthermore, the container 1 has a first and a second inner compartment, 11 and 12, respectively, arranged vertically side by side and delimited by the abovementioned side walls 3, 4, 5, 6, 7 and 8, by the top wall 9, by the bottom portion 10 and by an inner partition 13. As it is apparent in Figure 1C, in a side view said partition

13 develops according to a plane substantially slanting with respect to the vertical, extending from the inside corner of the step forming the top portion of the front wall 3 up to a movable portion 20 of the bottom portion 10 of the container 1 that will be described hereinafter. Each of said two compartments 11 and 12 is apt to house garbage of a respective, predetermined type. In particular, in the present embodiment the first compartment 11 is apt to house stained glass and the second compartment 12 is apt to house clear glass. As the former kind of glass is generally more widely utilized than the latter one, the first compartment 11 has a capacity substantially greater than that of the second compartment 12.

Each of the two compartments 11 and 12 is accessible from the outside for introducing garbage via a respective traditional-type access port, 14 and 15, respectively. The ports 14 and 15 are located in correspondence of said step-shaped portion of the front wall 3, so that garbage may easily be inletted into the respective compartment 11, 12 according to a direction of insertion, which is substantially horizontal, i.e. orthogonal to the wall 3 itself. Moreover, the ports 14 and 15 are located the one above the other, at opposite sides of the step corner, so that the garbage inletted therein fall top-wise and the bottom-wise, respectively, the partition 13.

The container 1 further comprises top anchoring means, generally indicated with 16, apt to allow the gripping thereof by a lifting system, and in particular by lifting means associated to a collecting vehicle, as it will be detailed later on.

In particular, these means 16 comprises a pair of uprights 17, located sideways to the main body 2, and a cross member 18 interposed between said uprights 17 and fixed therewith. Onto the cross member 17 there is obtained a shaped seat 171 apt to receive a specific anchoring tool.

The two uprights 17 are received each in a respective vertical guide 19 of the container 1, secured to the inside face of the second or third side wall 4 or 5, respectively. Hence, the uprights 17 are slidable with respect to the main body 2.

Bottom-wise, the two uprights 17 are fixed with the abovementioned movable base portion 20 of the container 1.

As it is detailed in Figure 2, said movable base portion 20 comprises a pair of movable walls, and in particular a first movable wall 21 and a second movable wall 22, having a substantially slanting development with respect to the vertical. In particular, said movable walls 21 and 22 are mutually upwardly-converging and are joined at respective top edges, thereby implementing a sort of inverted V-shaped structure.

The movable base portion 20 further comprises bottom end-of-stroke means 23 that, as it will be illustrated with reference to the modes of employ of the container 1, are apt to prevent the downward sliding of the movable base portion 20.

In the present embodiment, said bottom end-of-stroke means 23 comprises a pair of substantially triangle-shaped plates, also indicated with 23, interposed between the movable walls 21 and 22 and substantially parallel to the second and to the third side wall 4 and 5. Each plate 23 has a respective vertically developing groove 231.

Moreover, the movable base portion 20 has side seats 24 to allow the sliding thereof along the vertical guides 19, fixedly with the uprights 17.

Finally, the movable base portion 20 comprises a frame 25, it also visible in Figure 1B, fixed with the movable walls 21 and 22 and extending along the entire base perimeter of the main body 2.

The remaining part of the bottom portion 10 of the container 1 comprises a pair of fixed walls, and in particular a first fixed wall 26 and a second fixed wall 27, welded to the main body 2, and in particular to the front wall 3 and to the three rear walls 6, 7 and 8, respectively, and located at opposite sides with respect to the movable walls 21 and 22.

Also these fixed walls 26 and 27 have a substantially slanting development, each resulting substantially parallel to a respective wall of the pair of movable walls 21 and 22. In particular, the first fixed wall 26 is substantially parallel to the second movable wall 22, thereby bottomwardly converging towards the first movable wall 21, whereas the second fixed wall 27 is substantially parallel to the first movable wall 21, thereby bottomwardly converging towards the second movable wall 22. Moreover, the overall arrangement is such that when the movable walls 21 and 22 are in the position shown in Figure 2, i.e. in a garbage collecting position, each fixed wall 26, 27 is drawn near a respective movable wall 21, 22 at a respective bottom edge, so that the inner compartments 11 and 12 be closed bottomwise.

The bottom portion 10 of the container 1 further comprises a peripheral abutment edge 28, extending along the entire base perimeter of the main body 2, externally to the frame 25, and being secured to the main body 2 itself.

The edge 28 and the frame 25 lie substantially at the same level and serve as ground resting means for the container 1.

As it will be made apparent hereinafter, the edge 28 further realises a means for blocking the main body 2 onto the garbage collecting vehicle according to the invention.

In the present embodiment, all components of the container 1 are made of steel. Some of the components, e.g. the partition 13 and the bottom portion 10 of the container 1, may be coated with a soundproofing rubber. Moreover, externally the container 1 may be subjected to traditional antigraffiti and antirust surface treatments. With reference now to Figures 4 and 5, a urban garbage collecting vehicle according to the present invention is generally indicated with 100. The vehicle 100 of the present embodiment is a lorry for collecting solid urban

garbage which is apt to be employed in association with the abovedescribed container 1.

The vehicle 100 comprises a garbage compartment 110, in turn partitioned into a side by side first and second inner vehicle compartment, 101 and 102, respectively, corresponding to the first and to the second compartment 11 and 12, respectively, of the container 1. Therefore, the first vehicle compartment 101 has a capacity substantially greater than that of the second vehicle compartment 102. In particular, the first vehicle compartment 101 is circumscribed to the second compartment 102.

Each vehicle compartment 101, 102 provides first or second closure means, 103 and 104 respectively, independent therebetween, thereby enabling the selective unloading of the collected garbage from the vehicle 100 itself. In the present embodiment, these closure means 103 and 104 are implemented by respective access ports located in correspondence of the rear wall of the garbage compartment 110 of the vehicle 100. These ports are openable independently the one from the other with traditional mechanic, e.g. hydraulic or pneumatic, systems.

With reference also to Figure 3A, the vehicle 100 comprises a garbage inlet opening 105 for introducing garbage into said vehicle compartments 101 and 102, located thereabove, i.e. at the roof thereof. As it will be detailed hereinafter, the inlet 105 is apt to cooperate with the movable base portion 20 of the container 1 to allow the unloading of garbage from the container compartments 11 and 12 into the respective vehicle compartments 101 and 102.

In particular, the inlet opening 105 comprises a raised peripheral structure 106, located externally to the garbage compartment 110 and having the same shape, seen in plan, of the base of the container 1, i.e., a substantially hexagonal shape. The peripheral structure 106 has a substantially bottomwardly-tapered contour, thereby realising a guide for the resting therein of the bottom portion 10 of the container 1.

Furthermore, bottomwise the structure 106 ends in an abutment edge 107 corresponding to the peripheral abutment edge 28 of the bottom portion 10 of the container 1 and apt to cooperate therewith to block the downward descent of the main body 2.

The inlet 105 further comprises means 108 apt to cooperate with the movable base portion 20 of the container 1 to block said portion in a garbage-unloading bottom position. In the present embodiment said means comprises a cross member, it also indicated with 108, located transversally to said peripheral abutment edge 107 and apt to abut the bottom of the grooves 231 of the plates 23 of the container 1.

In the present embodiment the vehicle 100 further comprises means 109 for lifting the container 1, apt to allow the anchoring of the latter at the anchoring means 16.

The vehicle 100 may further comprise means for automatically positioning the container 1 with respect to the

inlet opening 105, associated to the lifting means 109 or independent therefrom.

Since both the abovementioned lifting means and the automatic positioning means can be implemented by hardware and/or software systems well known to a person skilled in the art, a further description thereof will be omitted.

[0004] Hereinafter, the modes of employ of the container 1 and of the vehicle 100 according to the invention will be illustrated with reference to Figures 4, 5, 6A, 6B and 6C.

First of all, during normal employ the container 1 rests onto the floor in correspondence of the bottom portion 20 thereof, and in particular of the edge 28 integral to the main body 2 and of the frame 25 of the movable base portion 20. In this condition, the container 1 is employed by users as a common container for the separate collection of garbage. Garbage is inletted into the container 1, and in particular into the corresponding compartment 11 or 12, via the ports 14 and 15.

Hence, during said normal employ the downward sliding of the movable base portion 20 is prevented by the abutment onto the floor of the frame 25. Hence, the base portion 20 lies in a position hereto defined as garbage collecting position, in which it, by its walls 21 and 22, bottomwise delimits and closes the compartments 11 and 12.

As it is shown in Figure 4, the vehicle 100, during its container-emptying round, collects takes, by means of the lifting means 109, the container 1, lifting the latter to a height above that of its roof, and, therefore, to the height of the inlet opening 105. During said lifting, the movable base portion 20 remains in said garbage-collecting position. In fact, the upward sliding of the portion 20 is prevented by the abutment of the frame 25 onto the fixed part of the bottom portion 10, whereas the downward sliding is prevented by the same traction exerted by the lifting means 109 onto the anchoring means 16.

Hence, the frame 25 implements a means for blocking the base portion 20 in the garbage-collecting position.

As it is shown in Figures 6A and 6B, the container 1 is then positioned, optionally with the aid of the abovementioned automatic positioning means, at the opening 105 of the vehicle 100, so as to have the peripheral abutment edge 28 thereof abut the abutment edge 107 of the opening 105. By virtue of said abutment, the main body 2 of the container 1 is blocked at the mouth of the opening 105. It will be understood that in this condition the movable base portion 20, by virtue of the slanting arrangement of its walls 21 and 22 and of the presence of the grooves 231, can descend with respect to the main body 2.

Therefore, the shape of the opening 105 and of the base of the container 1 allow to implement a shape coupling therebetween.

Then, as it is shown in Figures 5 and 6C, the lifting means 109 are driven so as to release traction onto the

container 1, i.e. onto the anchoring means thereof. This determines the descent by mere gravity, i.e. passively, of the movable base portion 20 of the container 1 through the opening 105. Thus, the portion 20 travels from the garbage collecting position to a garbage un-

loading position, in which the compartments 11 and 12 are opened bottomwise so as to allow a gravity outletting of the garbage received therein. This downward motion of the portion 20 proceeds until the end-of-stroke means 23, and in particular the bottom of the grooves 231, abut

the cross member 108 of the opening 105. Hence, the end-of-stroke means 23 and the cross member 108 implement means for blocking the movable portion 20 in the garbage unloading position. It will be appreciated that, as abovementioned, the arrangement disclosed enables the movable base portion to passively travel from the collecting position to the un-

loading position, due to the mere gravity. This enables an extremely simple and cost-effective implementation of the container and of the vehicle of the invention. Furthermore, it will be understood that the present invention is susceptible of several variant embodiments and shapes alternative to the abovedescribed ones, some of which will be summarily illustrated hereinafter with sole reference to the aspects differentiating them from the hereto-considered embodiments.

With reference to Figure 3B, the vehicle of the present invention provides a pair of garbage inlet openings, 201 and 202 respectively, located onto the tank top and each apt to actuate the opening of the movable bottom of the dumpster, according to the invention.

These openings 201 and 202 are identical, yet oppositely positioned and apt to allow the unloading of the materials from identical containers. The provision of two identical inlets onto the tank enables an easy unloading and handing of the container, regardless of the latter's initial location with respect to the vehicle, and, in particular, regardless of the side of the road at which it is usually located, as well as a reasonable allocation of the load on the vehicle box.

Moreover, it will be understood that, according to a simplified embodiment, the container of the invention may have a single inner compartment.

Furthermore, the container of the invention could find employ even independently from the vehicle of the invention. E.g., the former could be emptied at a storage or dumping site, anyhow in a structure provided with an opening analogous to those located onto the vehicle of the invention.

Moreover, to a person skilled in the art there will be apparent several alternative implementations for the means for blocking the movable base portion in a collecting and/or in an unloading position, as well as for blocking the main body onto the vehicle. In particular, said means can block any motion of the movable base portion and/or of the main body, instead of merely preventing the sliding thereof in a certain direction. The present invention has hereto been described with

reference to preferred embodiments thereof. It is understood that there may be other embodiments afferent to the same inventive kernel, all falling within the protective scope of the appended claims.

Claims

1. A urban garbage container (1), having at least one inner compartment (11, 12) apt to receive garbage and accessible from the outside, said container comprising:
 - a main body (2), delimiting topwise and sideways said compartment (11, 12); and
 - a base portion (20), movable with respect to said main body (2) between a garbage collecting position, in which it closes said compartment (11, 12) bottomwise, and a garbage unloading position, in which said compartment (11, 12) is opened bottomwise so as to allow the outletting of the garbage received therein.
2. The container (1) according to claim 1, which is apt to the separate collection of urban garbage, having two inner compartments (11, 12) arranged side by side, each apt to house garbage of a respective type, and wherein said movable base portion (20) closes both said compartments (11, 12) bottomwise in said collecting position and determines the opening of said compartments (11, 12) in said unloading position.
3. The container (1) according to the preceding claim, wherein said compartments (11, 12) have different capacities.
4. The container (1) according to claim 2 or 3, which is a container for the separate collection of clear glass and of stained glass.
5. The container (1) according to any one of the claims 2 to 4, wherein each of said compartments (11, 12) is accessible from the outside for introducing garbage via a respective access port (14, 15), said access ports being arranged the one above the other.
6. The container (1) according to any one of the preceding claims, wherein said movable base portion (20) is slidably connected to said main body (2).
7. The container (1) according to any one of the preceding claims, comprising blocking means (25, 26, 27) for blocking said movable base portion (20) in said collecting position.
8. The container (1) according to claims 6 and 7, wherein said blocking means for blocking in said

collecting position comprises abutment means (25, 26, 27) apt to prevent the sliding of said movable base portion (20) towards the inside of said compartment (11, 12).

9. The container (1) according to claim 7 or 8, wherein said blocking means for blocking said movable base portion (20) in said collecting position comprises means (25) for resting the container on the ground.
10. The container (1) according to any one of the preceding claims, comprising means (23, 231) for blocking said movable base portion (20) in said unloading position.
11. The container (1) according to the preceding claim when dependent from claim 6, wherein said unloading position of said movable base portion (20) is a position lowered with respect to said main body (2) and wherein said means for blocking in unloading position comprises abutment means (23, 231) apt to prevent a further bottomwise sliding of said movable base portion (20).
12. The container (1) according to any one of the preceding claims, wherein said movable base portion (20) is apt to travel from said collecting position to said unloading position due to the mere gravity.
13. The container (1) according to any one of the preceding claims, comprising means (28) for blocking said main body (2) on a garbage collecting vehicle (100).
14. The container (1) according to the preceding claim, wherein said means for blocking said main body (2) comprises an abutment edge (28) located peripherally to said movable base portion (20).
15. The container (1) according to any one of the preceding claims, comprising anchoring means (16) apt to allow the lifting thereof and fixed with said movable base portion (20).
16. A urban garbage collecting vehicle (100) apt to be employed in association with a container (1) according to any one of the preceding claims, having at least one inner vehicle compartment (101, 102) apt to receive the garbage and comprising a garbage inlet opening (105), located above the vehicle itself and apt to cooperate with the movable base portion (20) of the container (1) to allow the unloading of garbage from the compartment(s) (11, 12) of the container in said at least one vehicle compartment (101, 102).
17. The vehicle (100) according to the preceding claim,

which is apt to the separate collection of garbage having a first vehicle inner compartment (101) and a second vehicle inner compartment (102) arranged side by side, each apt to receive garbage of a respective type.

18. The vehicle (100) according to the preceding claim, comprising first (103) and second (104) independent closure means apt to close said first (101) and second (102) vehicle compartment, respectively, to allow the selective unloading of the collected garbage from the vehicle.
19. The vehicle (100) according to claim 17 or 18, wherein said first (101) and second (102) vehicle compartment have different capacities.
20. The vehicle (100) according to any one of the claims 17 to 19, which is a vehicle for the separate collection of clear glass and of stained glass.
21. The vehicle (100) according to any one of the claims 17 to 20, wherein said first vehicle compartment (101) is circumscribed to said second vehicle compartment (102).
22. The vehicle (100) according to any one of the claims 17 to 21, wherein said garbage inlet opening (105) has an arrangement such as to allow the concomitant unloading of garbage into said first (101) and second (102) vehicle compartment.
23. The vehicle (100) according to any one of the claims 16 to 22, wherein said garbage inlet opening (105) comprises a peripheral structure (106) having a substantially bottomwardly-tapered contour, thereby implementing a guide for the introduction of the container (1).
24. The vehicle (100) according to any one of the claims 16 to 23, comprising means (108) for blocking the movable base portion (20) of the container (1) in the unloading position, located in correspondence of said garbage inlet opening (105).
25. The vehicle (100) according to the preceding claim, wherein said means for blocking the movable base (20) are abutment means (108).
26. The vehicle (100) according to any one of the claims 16 to 25, comprising means (107) for blocking the main body (2) of the container (1), located in correspondence of said garbage inlet opening (105).
27. The vehicle (100) according to the preceding claim, wherein said means for blocking the main body (2) are abutment means (107).

- 28.** The vehicle (100) according to any one of the claims 16 to 27, comprising means (109) for lifting the container (1).
- 29.** The vehicle (100) according to any one of the claims 16 to 28, comprising means for automatically positioning the container with respect to said garbage inlet opening (105). 5
- 30.** The vehicle (100) according to any one of the claims 16 to 29, wherein said garbage inlet opening (105) is apt to implement a shape coupling with a bottom portion (10) of the container (1). 10
- 31.** The vehicle (100) according to any one of the claims 16 to 30, comprising a pair of garbage inlet openings (201, 202), located above the container itself and each apt to cooperate with the movable base portion (20) of a container (1) according to any one of the claims 1 to 15. 15 20

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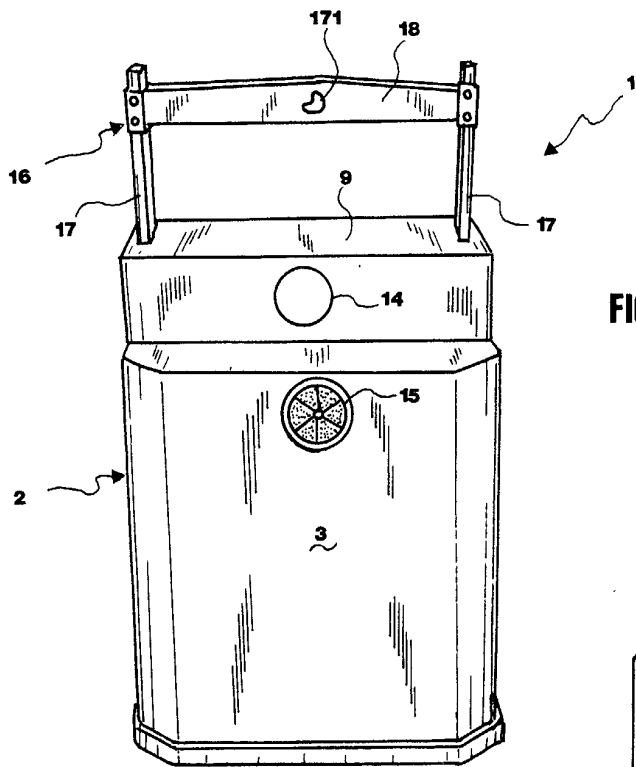


FIG. 1A

FIG. 1B

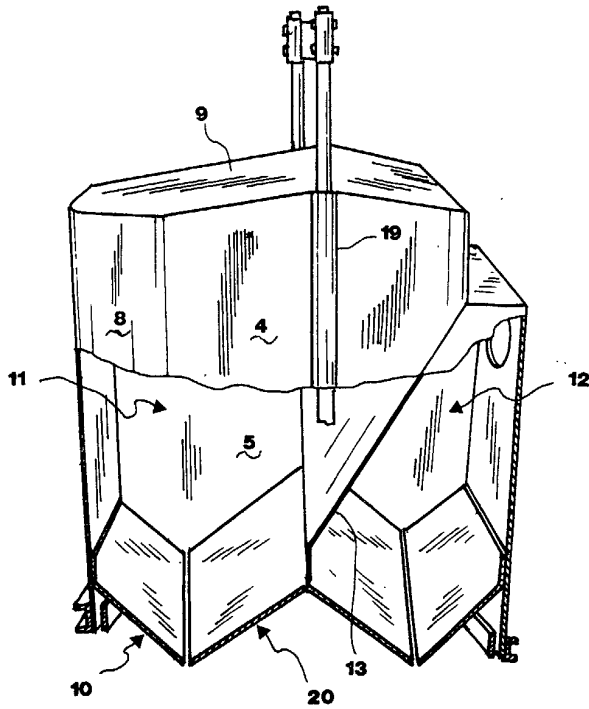
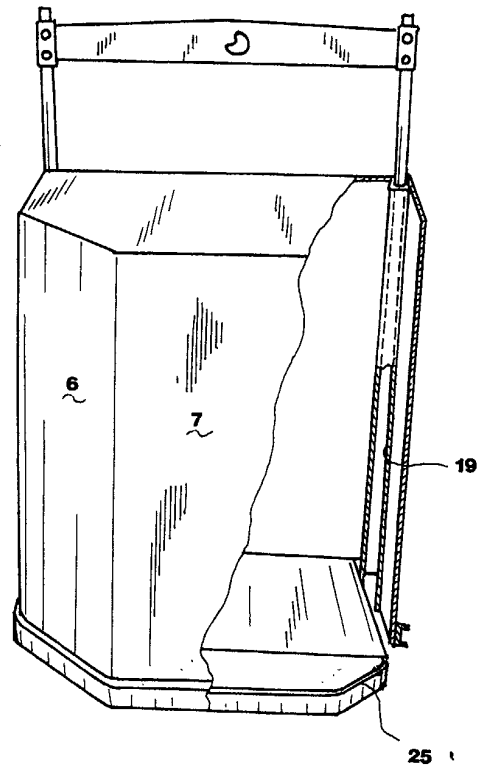


FIG. 1C

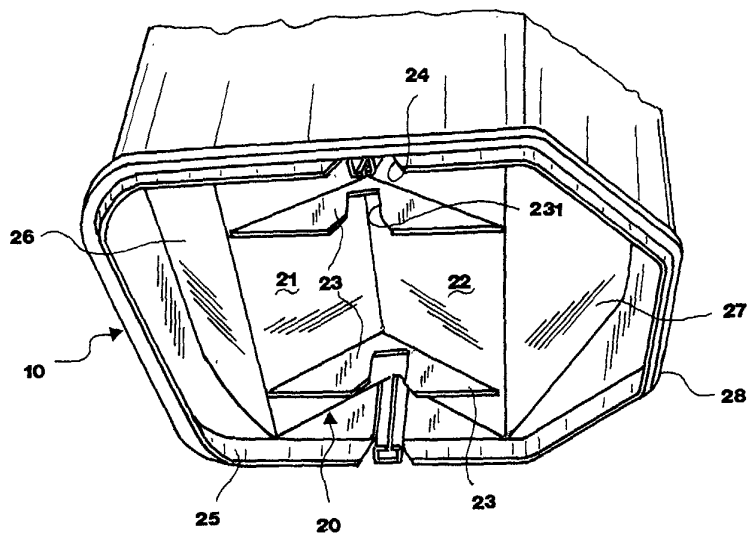


FIG. 2

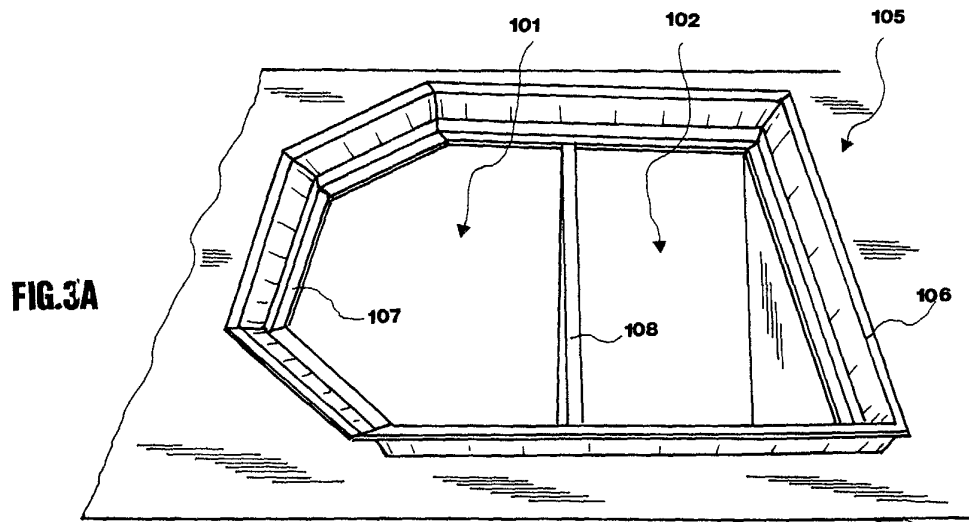


FIG. 3A

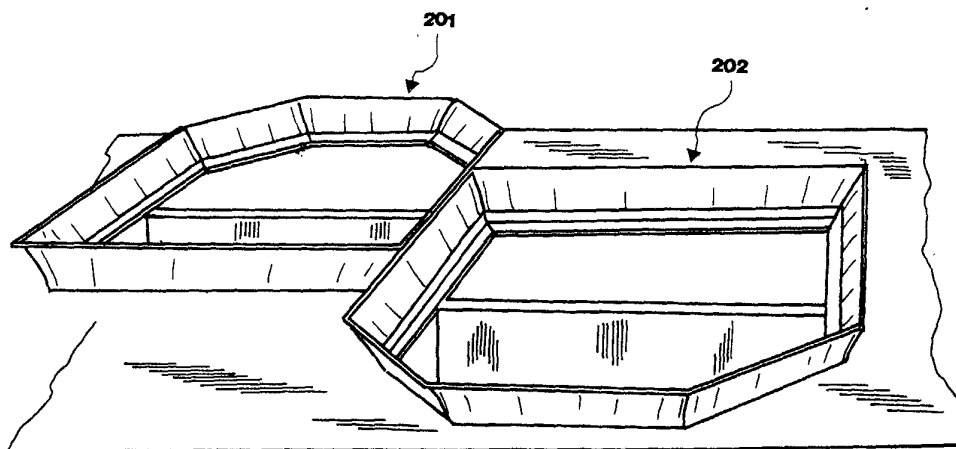
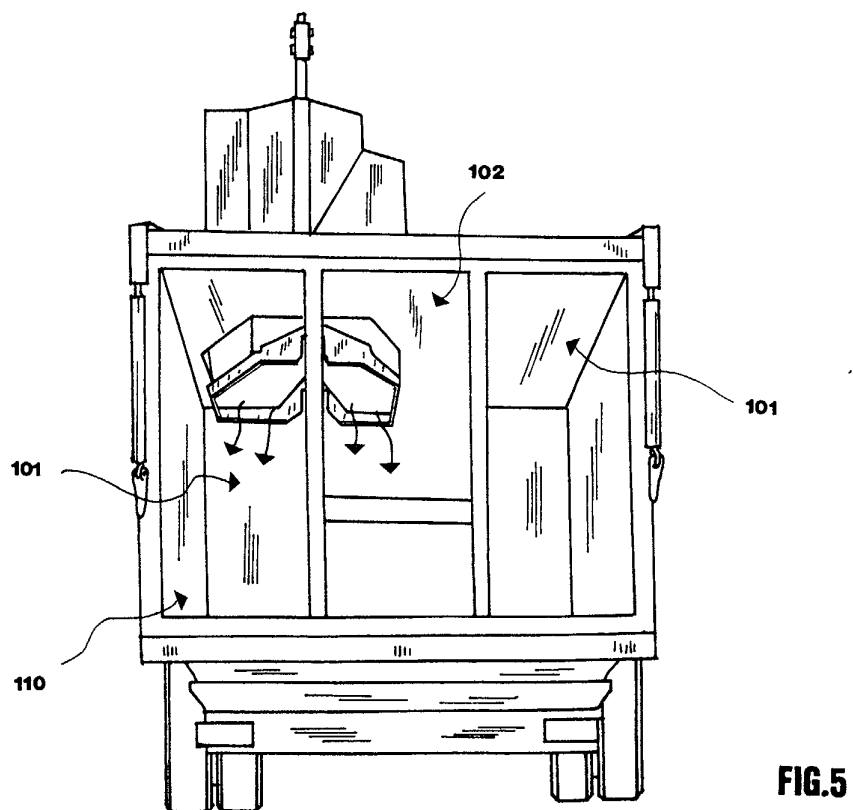
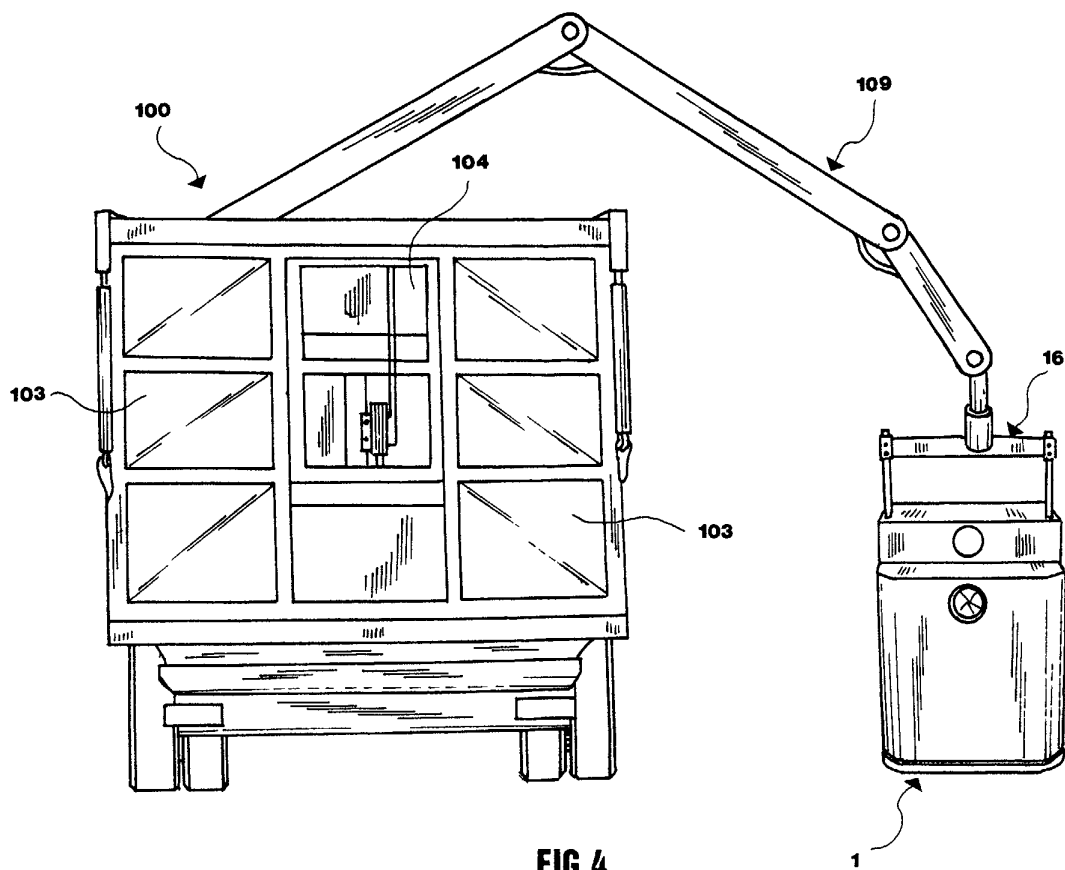
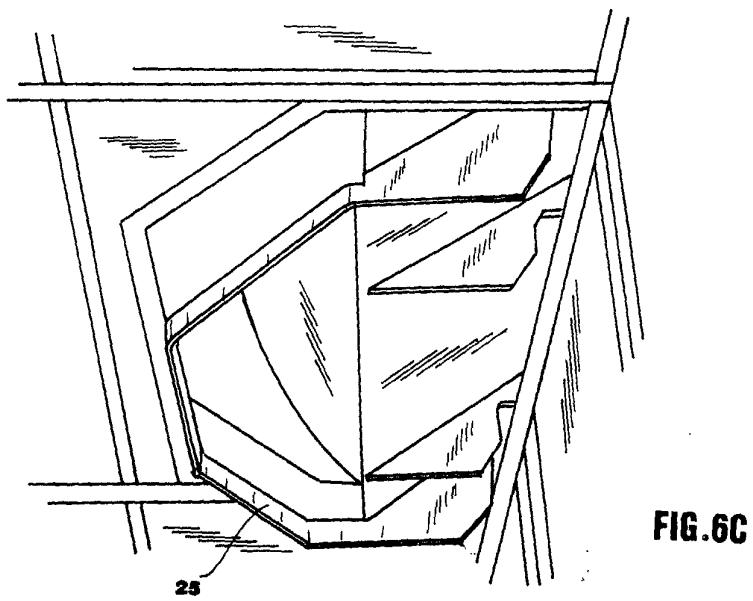
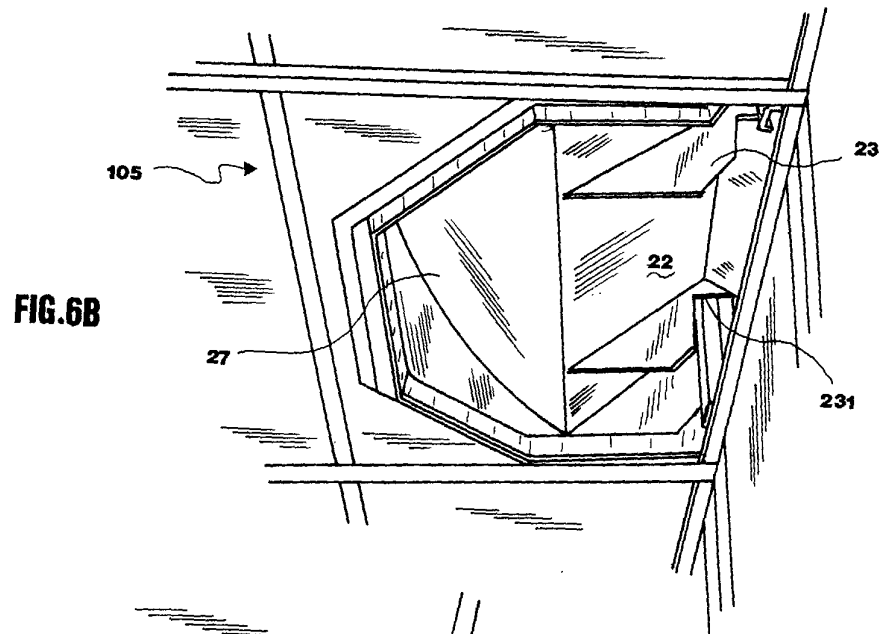
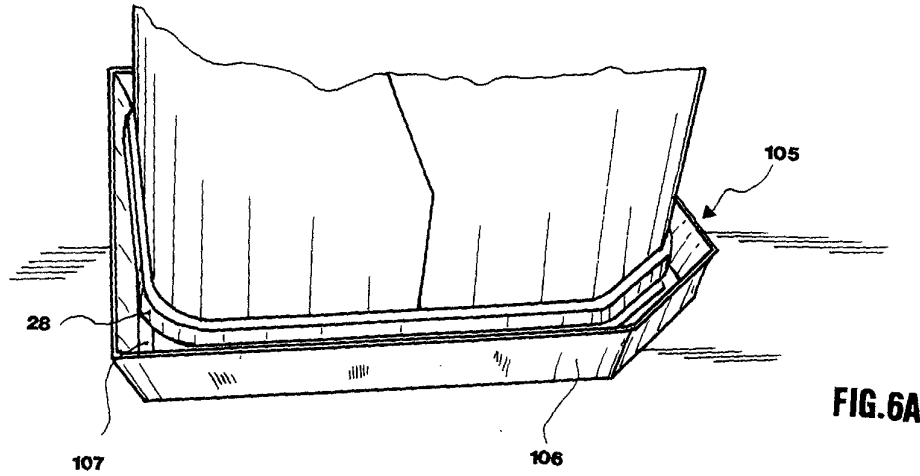


FIG. 3B







European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 42 5463

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.7)
X	US 5 478 186 A (R. ZUIDEMA) 26 December 1995 (1995-12-26)	1-4,6-9, 13-25, 28-31	B65F1/12 B65F3/02
A	* column 2, line 19 - column 4, line 8 * * figures 1-4 *	5	
X	US 5 228 591 A (J. JONES) 20 July 1993 (1993-07-20)	1,2,4, 6-11,13, 14,16, 17,20, 22,23, 26-30	
A	* column 4, line 18 - column 7, line 56; figures 1-8 *	5,15	
X	US 4 768 670 A (C. LIN) 6 September 1988 (1988-09-06)	1,6-8, 10,13, 14,16, 23,26-31	
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7) B65F
Place of search THE HAGUE		Date of completion of the search 22 November 2002	Examiner Smolders, R
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	

EPO FORM 1503 03/82 (P4/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 42 5463

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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