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(11) **EP 0 953 518 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
03.11.1999 Bulletin 1999/44

(51) Int. Cl.⁶: **B65F 1/00**

(21) Application number: **98830254.3**

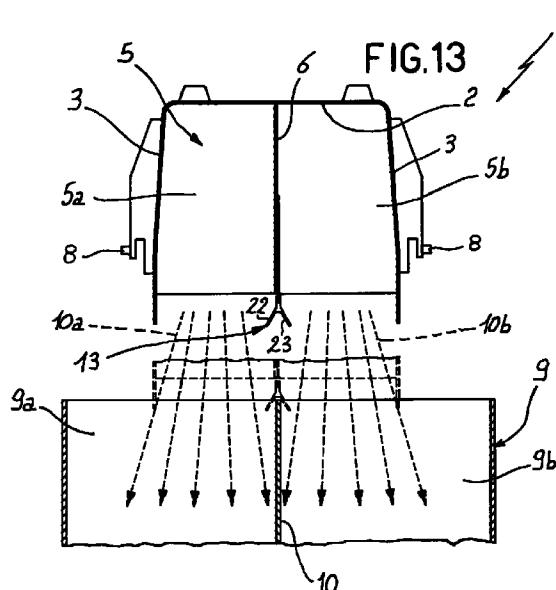
(22) Date of filing: **28.04.1998**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI
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(54) **A container for collecting rubbish in a differentiated manner**

(57) The invention relates to a container (1) for collecting rubbish in a differentiated manner, presenting at least one deflector element (13), engaged on a dividing baffle (6) of the container itself. The dividing baffle (6) defines inside the container (1) two holding chambers (5a,5b) set to receive two different types of waste. The deflector element (13) routes the fall flow (10a, 10b) of the waste held in the two chambers (5a,5b), in an emptying phase of the container (1), into respective chambers (9a,9b) of a hopper (9) provided on a vehicle. Preferably the dividing baffle (6) comprises a movable portion (6b) bearing the deflector element (13) in oscillatory engagement with a fixed portion (6a). The movable portion (6b) shifts, during the emptying phase, to engage in contact a dividing bulkhead of the hopper, as well as to accompany the waste falling towards chambers (9a,9b) of the hopper itself.



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Description

[0001] The present invention relates to a container for collecting rubbish in a differentiated manner of the kind comprising the characteristics expressed in the preamble of Claim 1.

[0002] As is well known, the custom and the requirement are becoming more and more consolidated of collecting urban solid waste in a differentiated manner, to favour recycling and/or disposal operations.

[0003] Currently, one of the most widespread practices to perform the differentiated collection of rubbish entails positioning, in certain collection areas, a number of rubbish containers equal to the number of types of waste to be collected.

[0004] Each container is able to be periodically emptied by a vehicle employed for the collection and transport of the waste into tips and/or treatment centres. However, it has been noted that the need to use one container for each type of waste to be collected leads to the requirement to employ urban areas of considerable size, as well as additional problems in logistical terms for the management of the work shifts and of the times required to empty the containers on the vehicles.

[0005] To obviate these problems, rubbish containers have already been proposed, fitted with at least one dividing baffle defining within the container itself two holding chambers each used to receive a specific type of waste. Such a container is described for instance in patent EP 718217, in the name of the same Applicant. The container described in that patent, subdivided into two holding chambers by means of a longitudinal baffle, is able to be picked up by a lifting apparatus mounted on a vehicle, and set to operate on grip pins projecting from opposite parts in correspondence with the longitudinal centreline of the container itself, to raise the latter off the ground and empty it by upsetting it into a hopper connected to two different holding spaces provided on the vehicle.

[0006] In a first phase of the emptying process, a main closure element of the container is opened, whilst an auxiliary closure element shuts off one of the two chambers. In this situation, only one type of waste is discharged into the hopper, to be transferred into one of the holding chamber spaces of the vehicle. Subsequently, the auxiliary closure element is opened as well, and the second type of waste is consequently deposited into the hopper and then transferred and conveyed into the respective holding chamber space.

[0007] The system described above considerably improves normal collection procedures, but it also entails a certain time expenditure, brought about by the wait required to empty and convey the first type of waste before the second type of waste can be emptied and conveyed.

[0008] Also known are collection systems wherein the different chambers of the rubbish container are emptied simultaneously into a collection hopper which also has

two or more chambers divided by separating bulkheads and connected to the respective holding chamber spaces.

[0009] This contrivance allows to reduce the time required to empty the container, but it entails additional problems. The Applicant has noted that, when emptying the containers of the aforementioned kind, the different types of outgoing waste form two side by side flows which diverge as they move away from the upset container. Hence a common intersection area comes to be formed between the two falling flows, in correspondence with which the waste is mixed depositing itself partly in one chamber and partly in the other chamber of the hopper.

[0010] An additional problem is given by the difficulty in collimating the baffle of the rubbish container and the separating bulkhead of the collecting hopper during the emptying phase. Since the baffle and the bulkhead necessarily have relatively reduced thickness, and since the lifting and upsetting apparatus present on the vehicle has to adapt itself both to the different positions, and to the different dimensions of each rubbish container, it is practically impossible to maintain the perfect separation between the different types of rubbish in the course of the emptying phase. The object of the present invention is essentially to solve the problems noted in the prior art, proposing a rubbish container that guarantees the simultaneous discharge of waste from different chambers without mixing the waste.

[0011] This object and others besides, which shall become more readily apparent in the course of the present description, are essentially reached by a container for collecting rubbish in a differentiated manner, characterised in that it comprises the characteristics expressed in the characterising part of claim 1.

[0012] Additional features and advantages shall become more readily apparent from the detailed description of some preferred, but not exclusive, embodiments of a container for collecting waste in a differentiated manner, according to the present invention. Such description shall be made hereafter with reference to the accompanying drawings, provided solely by way of non limiting indication, wherein:

- Figure 1 shows a front section of the rubbish container, performed according to a trace II-II of Figure 2;
- Figure 2 shows a side section of the rubbish container according to a trace I-I of Figure 1;
- Figure 3 shows a cross section of a first embodiment of the deflector element;
- Figure 4 shows a cross section of a second embodiment of the deflector element;
- Figure 5 shows a cross section of a third embodiment of the deflector element;
- Figure 6 shows a cross section of a fourth embodiment of the deflector element;
- Figure 7 shows a cross section of a fifth embodi-

ment of the deflector element;

- Figure 8 shows a cross section of a sixth embodiment of the deflector element;
- Figure 9 shows a section performed along a trace IX-IX of Figure 10 of the rubbish container having the deflector element engaged on a movable portion of a dividing baffle;
- Figure 10 is a section performed according to a trace X-X of Figure 9;
- Figure 11 shows a cross section of the rubbish container of Figure 9, with the movable portion in a second position wherein said movable portion projects at least partially from the container;
- Figure 12 schematically shows the falling flow of the waste from a container not fitted with the deflector element;
- Figure 13 schematically shows the falling flow of the waste from a container according to the invention.

[0013] With reference to the aforementioned figures, the number 1 indicates in its entirety a container for collecting rubbish in a differentiated manner according to the present invention.

[0014] The container 1 comprises at least one base wall 2, at least one side wall 3 rising from the perimeter of the base wall 2 and at least one closure element 4 engaged to the side wall 3 to form therewith and with the base wall 2 at least one holding space 5.

[0015] The container 1 internally presents at least one dividing baffle 6 which subdivides the holding chamber space 5 into at least one holding chamber 5a and at least a second holding chamber 5b destined respectively to receive a first type of waste, for instance paper, and a second type of waste, for instance glass.

[0016] The first and the second type of waste can be inserted through respective insertion openings 7a, 7b provided on the closure element 4, possibly shaped differently from each other and connected respectively to the first and to the second holding chamber 5a, 5b.

[0017] On the outer faces of the side wall are present grip means, comprising for instance grip pins 8 aligned along the longitudinal centreline of the container 1, able to be engaged in a known manner by a lifting and upsetting apparatus (not shown) to empty the waste from the container 1.

[0018] More specifically, in a way known in itself, the emptying operation entails parking a vehicle alongside the container 1 whereupon, by means of the aforesaid lifting apparatus interacting with the grip pins 8, the container itself is upset above a hopper 9 or other collecting element provided on the vehicle itself. The hopper 9 is subdivided, by means of an internal bulkhead 10, into at least a first and a second chamber 9a, 9b which are able to receive respectively the first type of waste and the second type of waste contained in the container 1.

[0019] As shown in Figure 12, when a container 1 constructed according to the prior art is upset above the hopper 9 the two types of waste housed in the respec-

tive collection chambers 5a, 5b exit therefrom, forming respective falling flows 10a, 10b diverging as they move away from the holding chamber space 5. The falling flows 10a, 10b have a common flow zone 11 of mutual interference, inside which both types of waste are present.

[0020] The presence of this common flow zone 11 inevitably causes a part of the first type of waste to be placed into the second hopper chamber 9b, and a part of the second type of waste to be placed into the first hopper chamber 9a.

[0021] In accordance with the present invention, the situation just described is avoided providing in proximity to a terminal edge 12 of the dividing baffle 6, at least one deflector element 13 able to route away from a median plane 14 of the dividing baffle, the waste exiting at least one of said first and second holding chamber 5a, 5b.

[0022] More specifically, the deflector element 13 routes the first type of waste into the respective first chamber 9a of the hopper 9, and the second type of waste into the second chamber 9b of the hopper 9.

[0023] To this end the deflector element 13 comprises at least a first and a second deviating surfaces 13a, 13b extending from laterally opposite sides with respect to the dividing baffle 6 mutually diverging towards the outside of the holding chamber space 5, and facing respectively towards the first holding chamber 5a and towards the second holding chamber 5b of the container 1. In a first embodiment (Figure 3), the first and the second deviating surface 13a, 13b are respectively obtained on at least a first section bar 15 and at least a second section bar 16, preferably made of elastomeric material positioned, symmetrically or asymmetrically, on respectively opposite faces of the dividing baffle 6 to define said deflector element 13.

[0024] Each section bar 15, 16 presents a cross section profile shaped as a right triangle wherein the respective deviating surface 13a, 13b corresponds to the hypotenuse. The section bars 15, 16 can be fastened on the dividing baffle 6 for instance by means of rivets or other fixing means 17.

[0025] In a second embodiment shown in Figure 4, the deflector element 13 comprises a section bar 18 made of elastomeric material, presenting triangular cross section and having, in correspondence with one of its vertices, at least one insertion groove 19 to receive in engagement the dividing baffle 6.

[0026] In this embodiment the first and the second deviating surfaces 13a, 13b are defined by the sides of the aforementioned elastomeric section bar 18 developing from the insertion groove 19 outward.

[0027] As shown in Figure 4, when the deflector element 13 is mounted on the dividing baffle 6 the terminal edge 12 thereof is encompassed by the deflector element itself, which in this case as well can be fastened to the dividing baffle by means of rivets or other known fixing means 17.

[0028] As shown in Figures 5 and 6, in a third and in a fourth embodiment the deflector element 13 comprises a section bar 20 made of elastomeric material presenting a connecting portion 21 presenting an insertion groove set to receive in engagement the terminal edge 12 of the dividing baffle 6. From the connecting portion 21 extend, from the side opposite to the insertion groove 19, at least a first and a second routing fin 22, 23 whereon are defined the deviating surfaces 13a, 13b. The routing fins 22, 23 extend obliquely from the connecting portion 21 towards the outside of the holding chamber space 5, to form therewith an essentially "Y" shaped profile.

[0029] Being constructed essentially of elastomeric material, the connecting portion 21 is elastically deformable around the development of the terminal edge 12 of the dividing baffle 6, and the fins 22, 23 are elastically deformable towards and away from the median plane 14 of the dividing baffle itself. As shown in Figure 6, the fourth embodiment differs from the third in a different conformation of the profile of the connecting portion 21. In this case the connecting portion presents a cross section profile with undulated configuration which further eases its flexibility around the development of the terminal edge 12 and makes the connecting portion 21 also able to be lengthened elastically away from the dividing baffle itself.

[0030] In a fifth embodiment (Figure 7) the deflector element 13 comprises at least a first routing fin 22 joined as a single piece with the dividing baffle 6 and inclined with respect to the baffle itself. The deflector element 13 can further comprise a second routing fin 23 also tilted with respect to the dividing baffle 6 and rigidly engaged to the first routing fin 12 to form with the first fin 22 an essentially "V" shaped cross section profile. The second routing fin 13 can also be fitted in the plane 14 of the dividing baffle 6.

[0031] In this embodiment, the second routing fin 23, which can be constructed of metallic material, is fastened to the first routing fin 22 by means of welding, rivets or other known fixing means 17 which act on a folded portion 23a of the second routing fin 23.

[0032] For this embodiment as well the surface of the fins 22, 23 which face towards the holding chambers 5a, 5b of the rubbish container 1 correspond to the deviating surfaces 13a, 13b acting on the falling flows 10a, 10b of the discharged waste.

[0033] In a sixth embodiment (Figure 8) the first and the second deviating surface 13a, 13b are obtained respectively on a first and on a second routing fin 22, 23, said fins converging with respect to each other to form in cross section an essentially "V" shaped profile. The container further comprises hinging means 24 positioned on the terminal edge 12 of the dividing baffle 6 to engage in an oscillatory manner the "V" section bar 25 defined by the routing fins 22, 23, in correspondence with its vertex or meeting point 25a between the fins themselves. In this way the "V" section bar 25 is free to

rotate around the longitudinal development of the terminal edge 12 of the dividing baffle 6.

[0034] In order to prevent the "V" section bar 25 from assuming an upset position on a side of the dividing baffle 6 when the container 1 is set on the ground, and/or from rotating excessively in one direction or the other, on opposite faces of the dividing baffle itself are present arresting means 26 which contrast the movement of the "V" section bar 25 limiting its angle of oscillation.

[0035] Such arresting means 26 can for instance comprise at least two arresting fins 26a, 26b obtained by notching along the terminal edge 12, as per Figure 7.

[0036] In accordance with an additional preferential characteristic of the invention, the dividing baffle advantageously comprises a fixed portion 6a and a movable portion 6b in oscillatory engagement to the fixed portion and defining the terminal edge 12 bearing the deflector element 13, configured according to any one of the aforementioned embodiments.

[0037] The movable portion 6b, preferably shaped in the manner of an annulus, is approached parallel to the fixed portion 6a and hinged thereto, in proximity to the terminal edge 12 of the dividing baffle 6 and is thus able to be moved from a first position (Figure 10) wherein said movable portion 6b is located within the holding chamber space 5 and a second position (Figure 11) wherein said movable portion 6b projects at least partially from the holding chamber space 5.

[0038] The invention fully attains the proposed objects.

[0039] The presence of the deflector element causes the falling flows of the waste 10a, 10b during the emptying phase to be adequately deviated away from the median plane 14 of the dividing baffle 6 thereby eliminating the overlapping area of the flows 10a, 10b and any risk of mixing between waste of different kinds.

[0040] The provision of the movable portion 6b of the dividing baffle 6, as described with reference to the Figures 10 and 11, also offers the guarantee that waste of different kinds during the emptying phase is perfectly routed into the respective chambers 9a, 9b of the hopper 9. After the container 1 is upset, the movable portion 6b immediately moves from the first position to the second position until it engages the deflector element 13 bearing against the terminal edge of the dividing baffle 10 provided in the hopper 9 as indicated with dashed line in Figure 13. Thus the critical phase wherein the waste leaves the holding chamber space 5 travelling through a certain portion of their fall without any dividing element being interposed between the fall flow 10a, 10b is eliminated, or at least considerably reduced.

[0041] The presence of the deflector element 13 moreover overcomes the need to collimate perfectly, during the emptying phase, the terminal edge of the dividing baffle 6 with the top edge of the bulkhead 10 of the hopper 9. The transverse amplitude of the deflector element 13 is such as to assure the engagement of the hopper 9 onto the dividing bulkhead 10 without requir-

ing, for this purpose, a perfect coplanarity between the dividing baffle 6 and the baffle itself.

[0042] It should be noted that the embodiments as per Figures 4, 5 and 6 further present the advantage of damping the impacts which could take place during the emptying phase between the dividing baffle 6 and the bulkhead 10 of the hopper 9, protecting them against any risk of damage and preserving the container itself from any maintenance and painting operations.

[0043] The use of a deflector element 13 as shown in Figures 5, 6 and 8 offers the further advantage of easing the falling flows of the waste 10a, 10b during the emptying phase, thanks to the adaptability of the shape and/or orientation of the deflector element itself under the thrust imparted by the falling material.

[0044] It should also be noted that the "Y" or "V" cross section shape of the deflector 13 of the embodiments as per Figures 5 and 8 eases the correct coupling of the dividing baffle 6 to the separating bulkhead 10 of the hopper 9, since the top edge of the bulkhead can easily be inserted between the fins 22, 23 of the deflector element 13, as indicated in dashed line in Figure 13.

[0045] In each of the described embodiments, the section bars or the fins comprising the deflector element 13 can extend along the entire development of the top edge of the dividing baffle 6, or in multiple sections of predetermined length and arranged consecutively to cover the entire longitudinal development of the terminal edge itself. This latter solution is particularly well suited when the longitudinal development of the terminal edge extends along an arched and/or broken line profile, as in the example shown in Figure 2.

Claims

1. Container for collecting rubbish in a differentiated manner comprising:

- at least one base wall (2), at least one lateral wall (3) rising from the perimeter of the base wall (2) and at least one closure element (4) engaged to the lateral wall (3) to form therewith and with the base wall (2) at least one holding chamber space (5);
- at least one dividing baffle (6) positioned inside the holding chamber space (5) to define therein at least a first holding chamber (5a) and at least a second holding chamber (5b);
- grip means (7) able to be operatively engaged by a lifting and upsetting apparatus to determine the emptying of waste from the holding chambers (5a, 5b) into a collecting element,

characterised in that it comprises at least a deflector element (13) positioned in proximity with a terminal edge (12) of the dividing baffle (6) and set to route the waste exiting at least one of said first and second holding chamber (5a, 5b) away from a

median plane of the dividing baffle (6).

2. Container according to claim 1, characterised in that the deflector element (13) comprises at least a first and a second deviating surface (13a, 13b) extending from sides laterally opposite with respect to the dividing baffle (6) mutually diverging towards the outside of the holding chamber space (5).
3. Container according to claim 2, characterised in that said deflector element (13) is an elastomeric section bar whereon are obtained the first and the second deviating surfaces (13a, 13b) and at least one insertion groove (19) to receive in engagement the dividing baffle (6).
4. Container according to claim 2, characterised in that said first and second deviating surface (13a, 13b) are respectively obtained on at least a first section bar (15) and at least a second section bar (16) positioned on respectively opposite faces of the dividing baffle (6) to define said deflector element (13).
5. Container according to claim 1, characterised in that said deflector element (13) comprises:
 - at least a connecting portion (21) rigidly engaged to the dividing baffle (6);
 - at least a first and a second routing fin (22, 23) extending obliquely from the connecting portion (21) towards the outside of the holding chamber space (5) to form with the connecting portion (21) an essentially "Y" shaped profile.
6. Container according to claim 5, characterised in that said connecting portion (21) can be elastically deformed at least around the development of the terminal edge (12) of the dividing baffle (6).
7. Container according to claim 6, characterised in that said connecting portion (21) presents a cross section profile (21a) of undulated configuration.
8. Container according to claim 5, characterised in that said first and second routing fin (22, 23) are elastically deformable to approach and move away from the median plane of the dividing baffle (6).
9. Container according to claim 1, characterised in that said deflector element (13) comprises:
 - at least a first routing fin (22) joined as a single piece with the dividing baffle (6) and inclined with respect thereto;
 - at least a second routing fin (23) inclined with respect to the dividing baffle (6) and rigidly engaged to the first routing fin (22) to form

therewith an essentially "V" shaped cross section profile.

10. Container according to claim 2, characterised in that it further comprises hinging means (24) set on the terminal edge (12) of the dividing baffle (6) in oscillatory engagement with the deflector element (13). 5
11. Container according to claim 10, characterised in that said first and second deviating surface (13a,13b) are obtained respectively on a first and on a second routing fin (22,23), said routing fins (22,23) converging one with respect to the other to form an essentially "V" shaped cross section profile, having its vertex engaged to hinging means (24). 10 15
12. Container according to claim 11, characterised in that it comprises arresting means (26) engaged to the dividing baffle (6) to limit the angle of oscillation of the deflector element (13). 20
13. Container for collecting rubbish, particularly according to claim 1, characterised in that said dividing baffle (6) comprises a movable portion (6b) engaged to a fixed portion (6a) and bearing the deflector element (13), said movable portion (6b) being able to shift from a first position wherein said movable portion (6b) is positioned inside the holding chamber space (5) to a second position wherein said movable portion (6b) projects towards the outside of the holding chamber space (5). 25 30
14. Container according to claim 13, characterised in that said movable portion (6b) presents a shape essentially of an annulus and is hinged to the dividing baffle (6) in proximity to the lateral wall. 35

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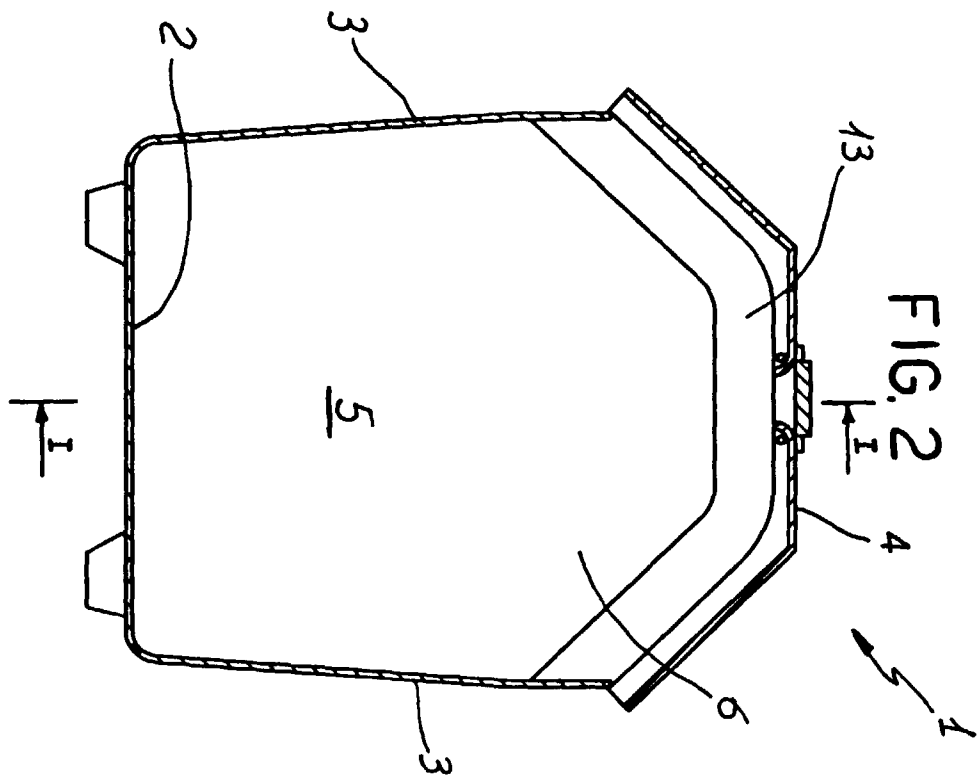
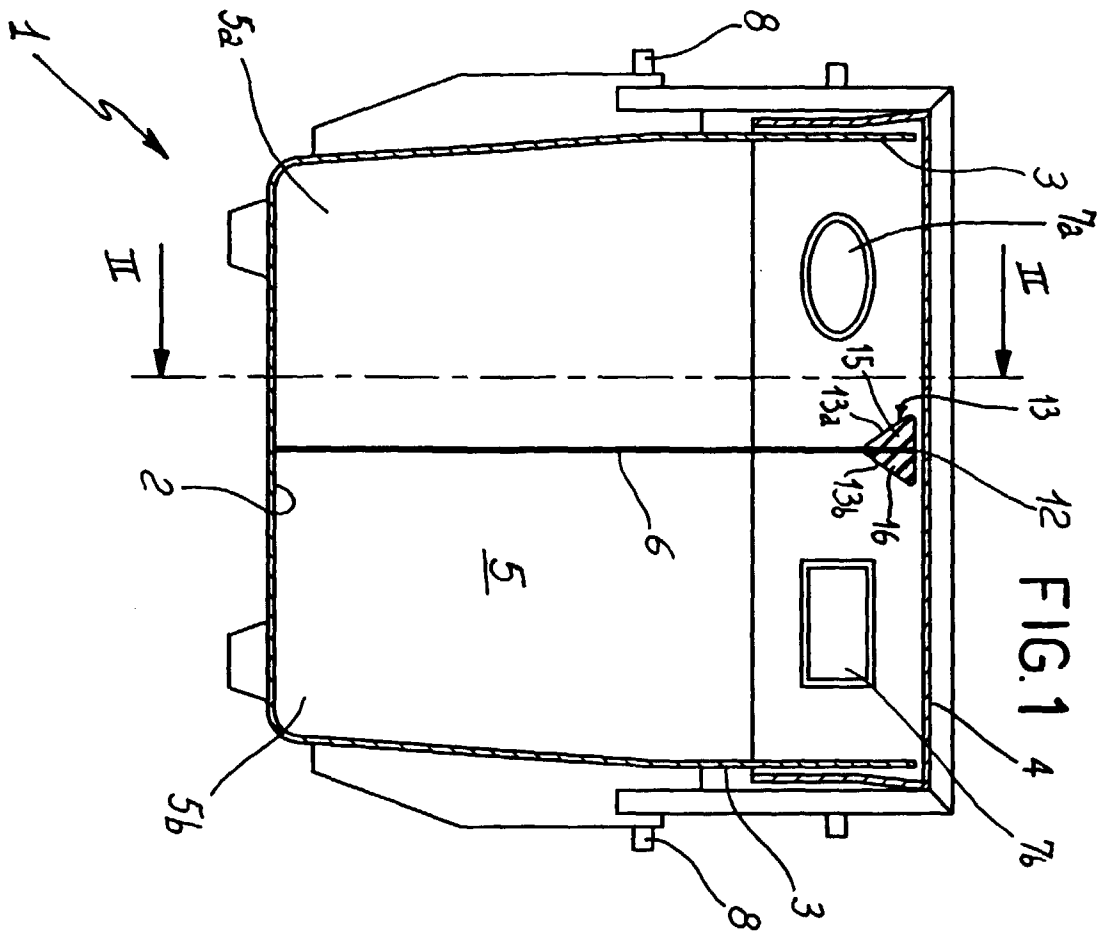


FIG. 3

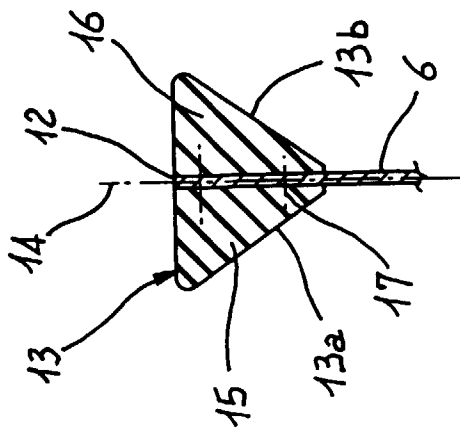


FIG. 4

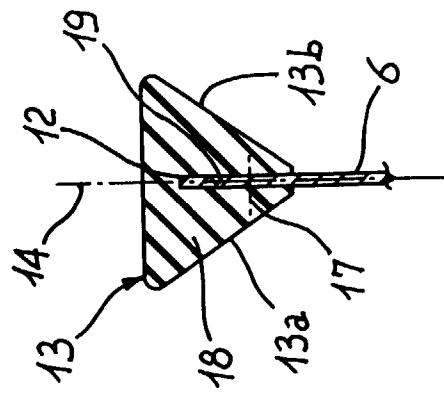


FIG. 5

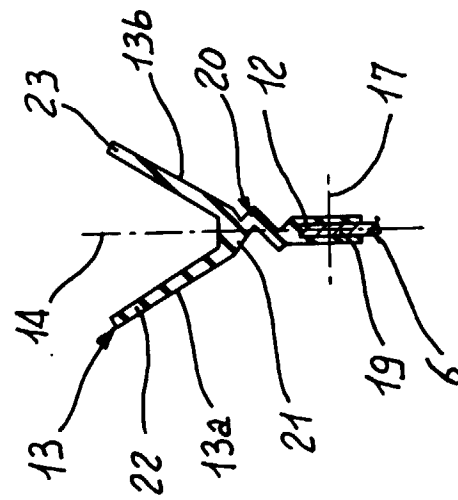
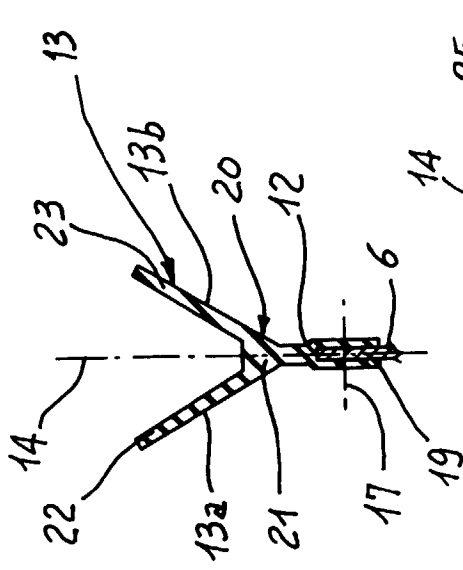


FIG. 6

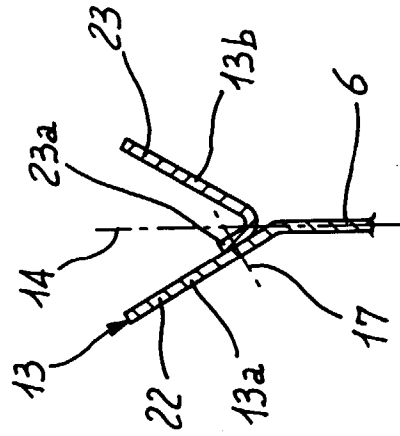


FIG. 7

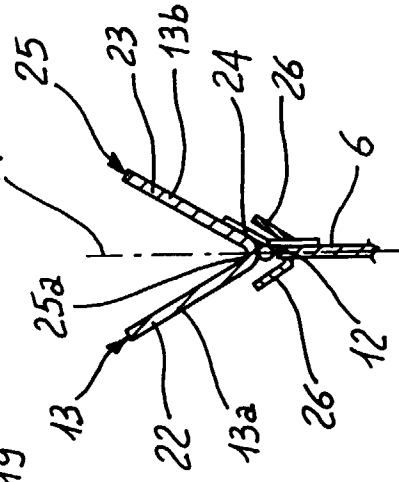


FIG. 8

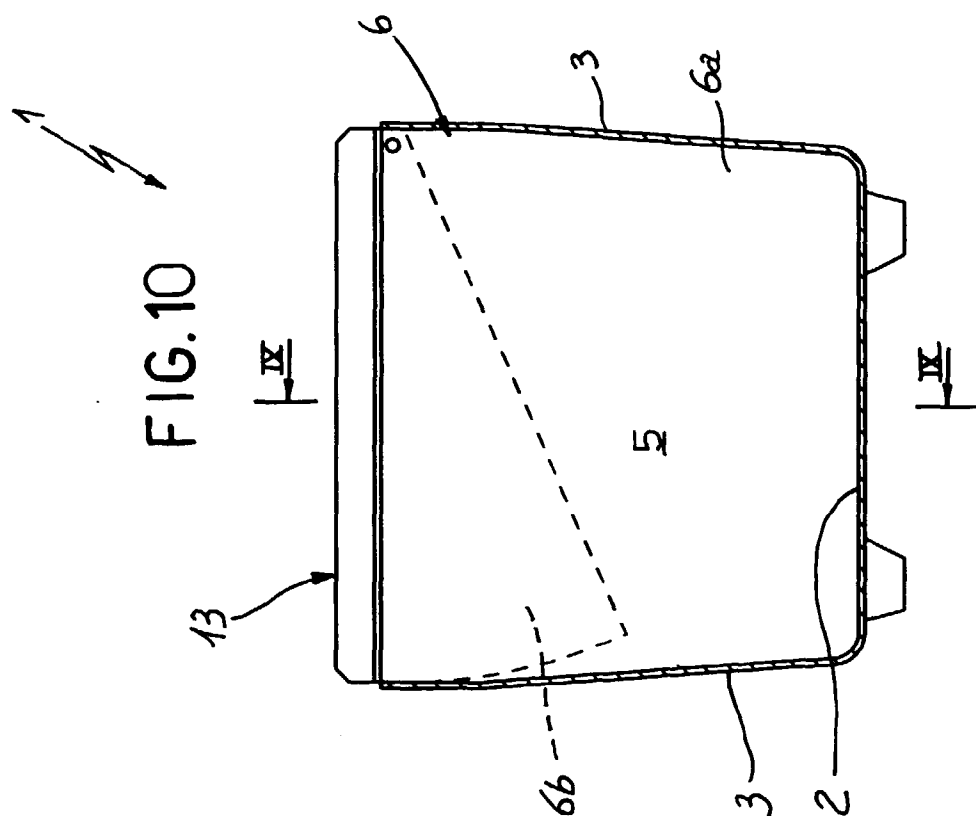
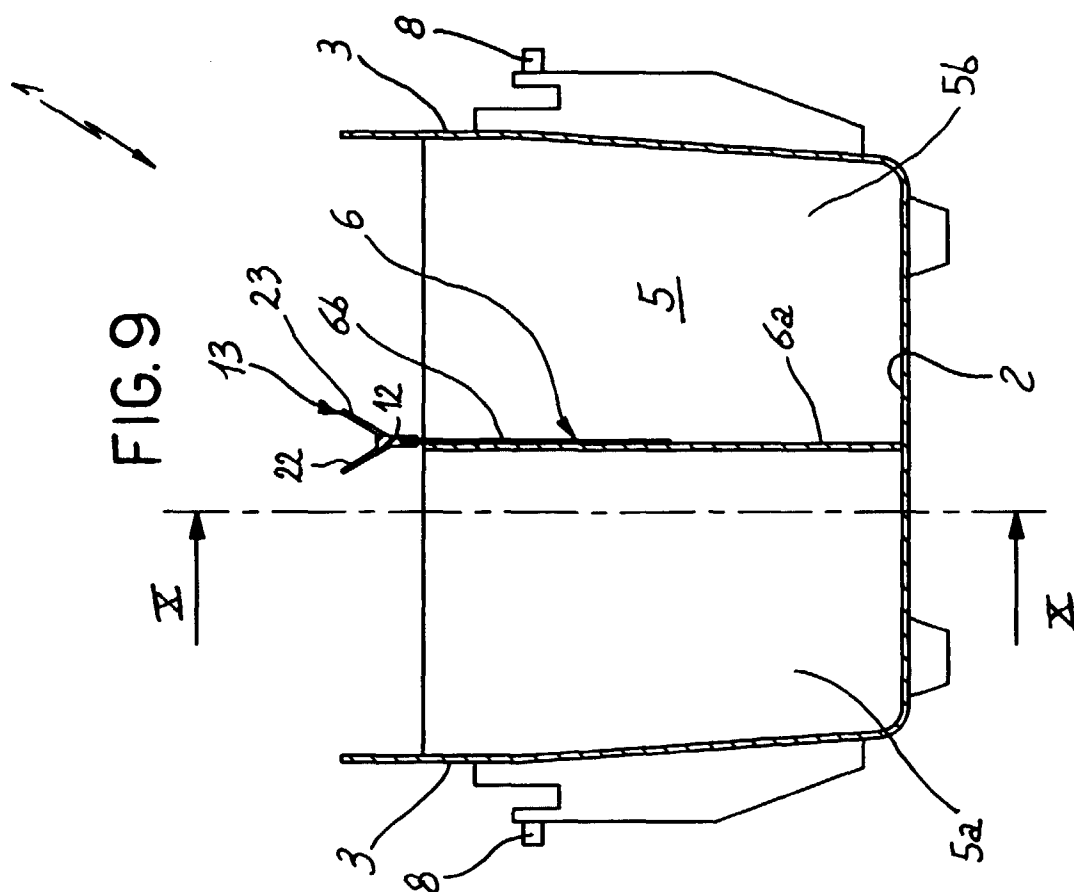
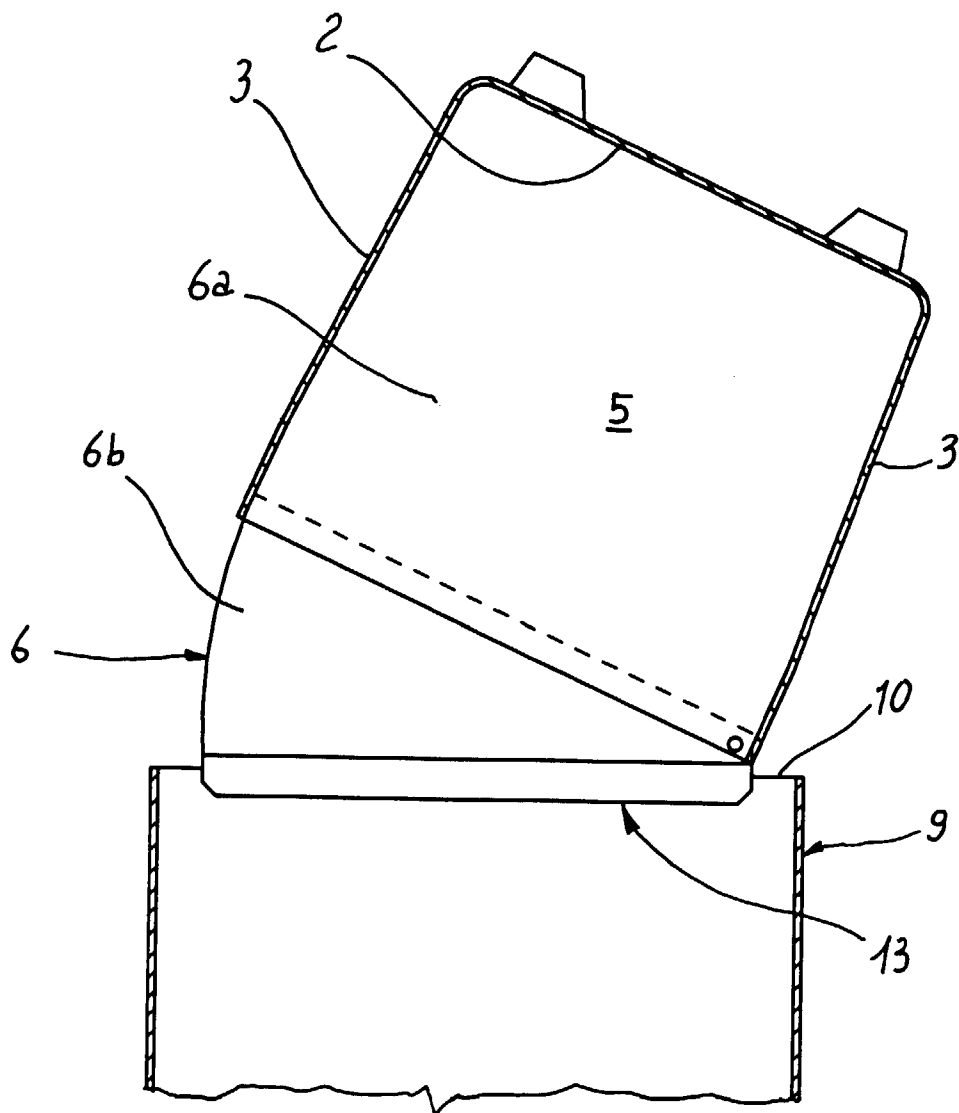
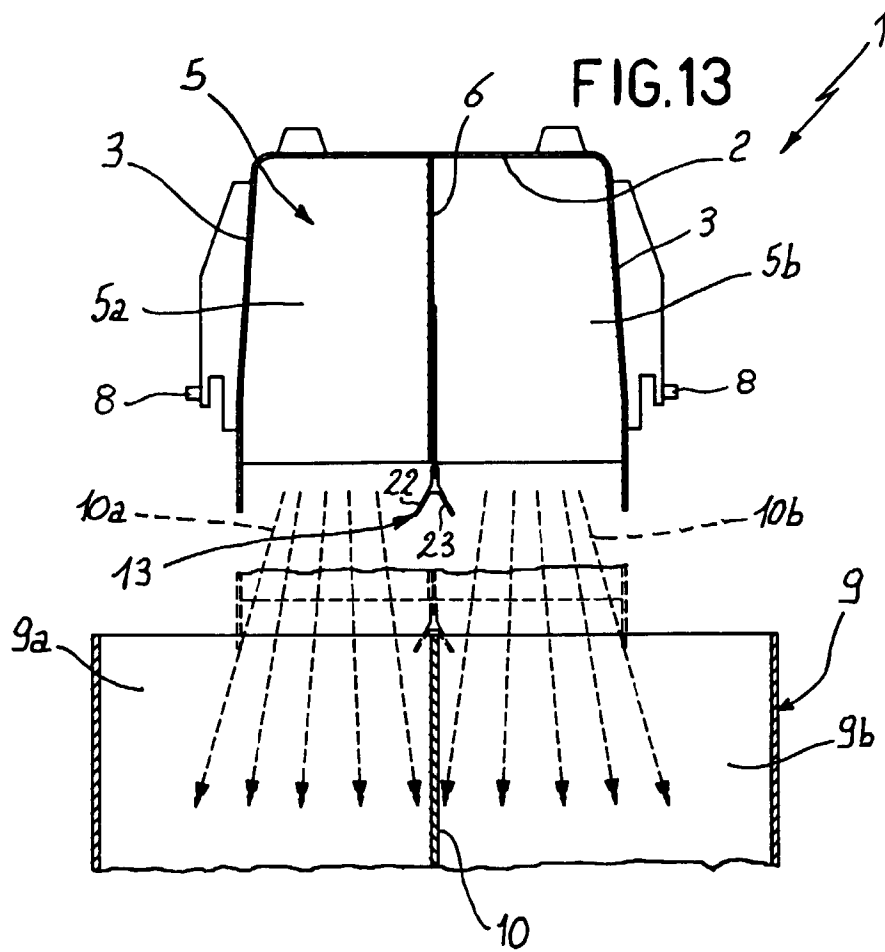
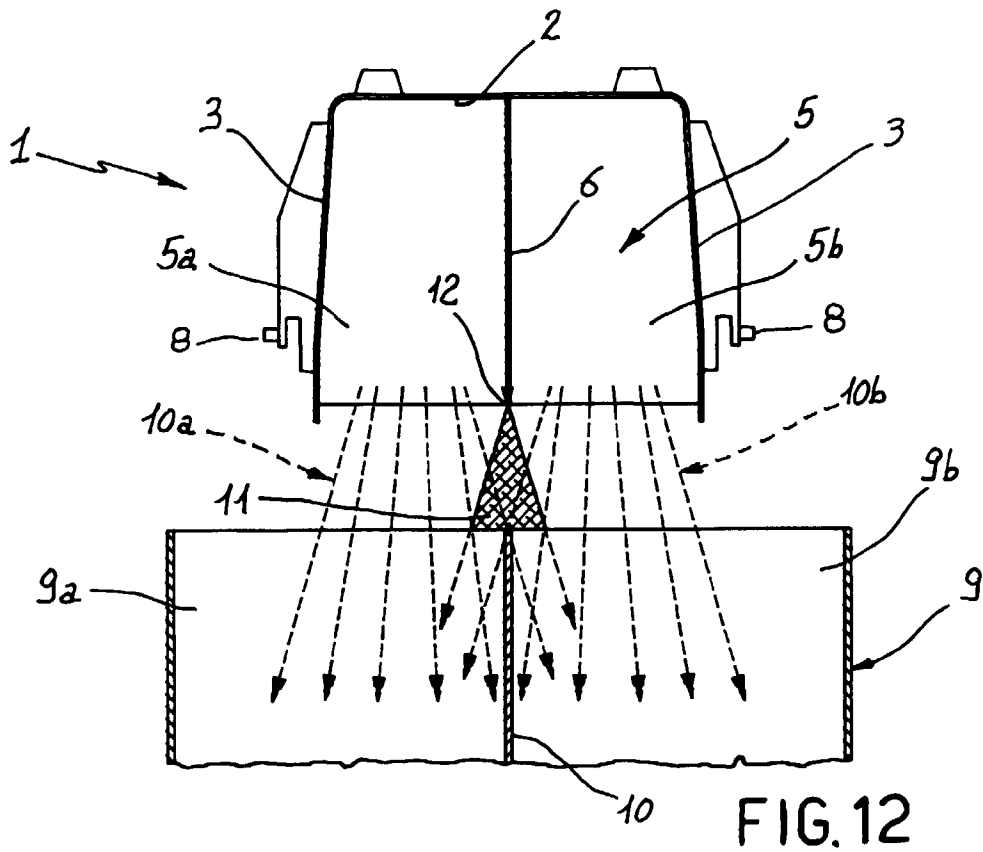


FIG. 11







European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 98 83 0254

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.6)
X	EP 0 511 785 A (PLASTICS OMNIUM LTD) 4 November 1992 * column 2, line 57 - column 3, line 6; figure 2 *	1	B65F1/00
A	EP 0 356 833 A (OTTO LIFT SYSTEME GMBH) 7 March 1990 * column 6, line 21 - line 41; figure 1 *	1,13	
A	DE 37 03 557 A (MEHRKAMMER MUELL SYSTEM GMBH) 18 August 1988 * figures 1-3 *	1,13	
A	WO 93 01111 A (HICKEY COLIN JOSEPH) 21 January 1993 * page 7, line 29 - line 32; figure 6 *	1	
A	FR 2 582 924 A (ROSSIGNOL SA) 12 December 1986 * page 8, line 21 - line 30; figure 5 *	1	
A	WO 93 20006 A (RECLAIMAT PTY LIMITED ;PIAZZA GRANT (AU)) 14 October 1993 * figures 12,13 *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.6) B65F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11 September 1998	Examiner Martínez Navarro, A.
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