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(72) Inventors:

- **TANARA, Enrico**
37044 COLOGNA VENETA (VR) (IT)
- **CASTAGNARO, Alberto**
37044 COLOGNA VENETA (VR) (IT)

(74) Representative: **Burchielli, Riccardo et al**
Barzano & Zanardo Roma S.p.A.
Via Piemonte 26
00187 Roma (IT)

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(71) Applicant: **Esametal S.R.L.**
37044 Cologna Veneta (VR) (IT)

(54) **IBC CASING FOR DELIVERING HAZARDOUS AND/OR POLLUTING PRODUCTS AND METHOD FOR ITS PRODUCTION**

(57) Described is an IBC casing (10) for delivering hazardous and/or polluting products comprising:
- a body (11) having four substantially flat walls (12, 13, 14, 15);
- a cover to which an upper edge of each of the walls (12, 13, 14, 15) is fixed;
- a hopper to which a lower edge of each of the walls (12, 13, 14, 15) is fixed.

Each of the walls (12, 13, 14, 15) consists of a plate which is not integral with the other walls (12, 13, 14, 15) and, moreover, the body 11 comprises four angular elements 18, 19, 20, 21 each of which has a first longitudinal edge 181 to which is fixed a first side edge 123, 133, 143, 153 of one of the walls 12, 13, 14, 15 and a second longitudinal edge 182 to which is fixed a second side edge 124, 134, 144, 154 of another of the walls 12, 13, 14, 15.

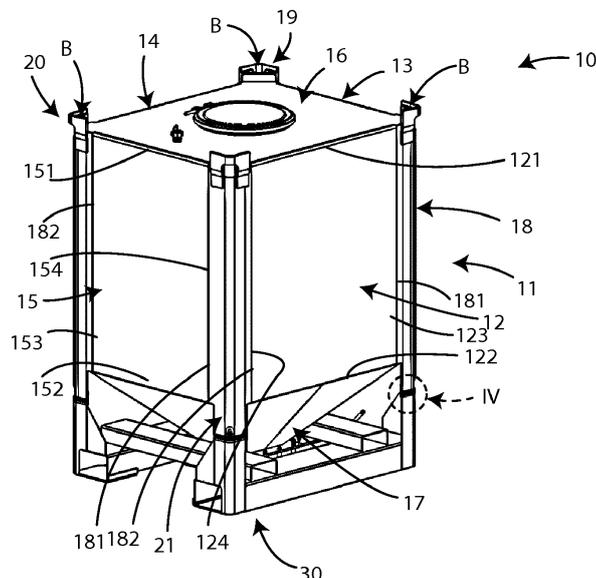


Fig. 1

Description

[0001] This invention relates to an IBC casing for delivering hazardous and/or polluting products and a method for its production.

[0002] More specifically, the invention relates to a casing designed to be fixed to a transport vehicle, especially designed for road transport.

[0003] The casing according to the invention belongs to the type of casings commercially known as IBC ("Intermediate Bulk Container").

[0004] The IBC casings are configured for being mounted on a support pallet and for being moved by means of a forklift truck.

[0005] The most common containment volumes for these casings are 275 US gallons, corresponding to 1040 litres, 330 US gallons, corresponding to 1250 litres, or above.

[0006] The casings traditionally have an overall size in the shape of a parallelepiped, especially quadrangular or rectangular in plan.

[0007] Traditional IBC casings for the containment of hazardous and/or polluting materials are made of aluminium and have a parallelepiped body quadrangular in plan closed above by a cover and below by a hopper. The cover is generally provided with a central opening.

[0008] The hopper is equipped with a discharge opening equipped with a closing valve, for example a guillotine gate valve.

[0009] This traditional casing also comprises a supporting frame which has four uprights fixed to the edges of the body and which connect to a base frame, designed to support the casing and to define seats for the forks of a forklift truck.

[0010] Traditionally, the body is made by means of a plate which forms a rectangular aluminium element which is machined so as to form four bends at 90° which form the four edges of the container.

[0011] This machining ensures that the end flaps of the rectangular element meet for being joined together, generally by welding.

[0012] A drawback of these traditional casings is due to the overall size of the semi-finished products and in particular of the body of the casing.

[0013] The problem at the basis of this invention is to simplify the construction of an IBC casing.

[0014] The main aim of this invention is to make an IBC casing for delivering hazardous and/or polluting products which resolves this problem overcoming the drawbacks of the traditional casings described above.

[0015] A further aim of the invention is to provide an IBC casing for delivering hazardous and/or polluting products which has a production process with less bulky semi-finished products.

[0016] Another aim of the invention consists in providing a method for the production of an IBC casing for delivering hazardous and/or polluting products which is simpler than the traditional methods.

[0017] This as well as other aims which will emerge more fully below are attained by an IBC casing for delivering hazardous and/or polluting products and a method for its production according to appended claim 1.

5 **[0018]** Detailed features of an IBC casing for delivering hazardous and/or polluting products and a method for its production according to the invention are indicated in the corresponding dependent claims.

10 **[0019]** Further features and advantages of the invention will emerge more fully from the description of a preferred but not exclusive embodiment of an IBC casing for delivering hazardous and/or polluting products and a method for its production according to the invention, illustrated by way of non-limiting example in the accompanying drawings, in which:

- Figure 1 is a perspective view of an IBC casing according to the invention;
- Figure 2 illustrates a partly exploded view of the casing of Figure 1 with some parts cut away in order to better illustrate others;
- Figure 3 illustrates an enlarged and exploded perspective view of a detail of the casing of Figures 1 and 2;
- 25 - Figure 4 illustrates the detail IV of Figure 1.

[0020] With particular reference to the above-mentioned drawings, the numeral 10 denotes in its entirety an IBC casing for delivering hazardous and/or polluting products with a capacity of approx. 2000 litres.

[0021] The casing 10 comprises, in a traditional manner:

- a body 11 having four substantially flat walls 12, 13, 14, 15;
- a cover to which an upper edge of each of the walls 12, 13, 14, 15 is fixed;
- a hopper to which a lower edge of each of the walls 12, 13, 14, 15 is fixed.

[0022] According to the invention, the casing 10 has a peculiarity according to which each of the walls 12, 13, 14, 15 consists of a plate, preferably flat and advantageously made of aluminium, which is not integral with the other walls 12, 13, 14, 15.

[0023] Moreover, according to the invention, the body 11 comprises four angular elements 18, 19, 20, 21 each of which has a first longitudinal edge 181 to which is fixed a first side edge 123, 133, 143, 153 of one of the walls 12, 13, 14, 15 and a second longitudinal edge 182 to which is fixed a second side edge 124, 134, 144, 154 of another of the walls 12, 13, 14, 15.

[0024] Thanks to this solution, the embodiment of the body 11 is considerably simplified with respect to the traditional casings.

[0025] In fact, it is sufficient to form the walls 12, 13, 14, 15 by cutting them from sheets of laminated metal material, especially aluminium, and forming the angular

elements 18, 19, 20, 21 preferably by extrusion, then welding them so as to form the body 11 to which the cover 16 and the hopper 17 are subsequently fixed in a traditional manner.

[0026] With respect to the traditional solution, with a body made of bent sheet metal, the invention allows in particular to manage with high efficiency the storage of the components, providing parts which are not very bulky such as the plates which form the walls and the metal sections which form the angular elements.

[0027] In fact, advantageously each of the angular elements comprises a metal section bar 22 having a constant section along a longitudinal direction A and two straight flaps 23, 24 which extend parallel to the longitudinal direction A and which are designed to be fixed to the side edges 123, 133, 143, 153, 124, 134, 144, 154.

[0028] The section of the angular elements 18, 19, 20, 21 comprises a central circular portion 25 and two substantially triangular portions 26, 27 which are mutually mirrored and which extend from the circular portion 25 in two opposite directions which are transversal with respect to the longitudinal direction A.

[0029] The substantially triangular portions 26, 27 have a first side 261, 271 and a second side 262, 272 which are both substantially tangential to the circular portion 25 and which intersect at a vertex 28; the second sides 262, 272 of the substantially triangular portions 26, 27 are substantially aligned, that is to say, they are segments of a same straight line; moreover, advantageously the sides 261, 271 extend beyond the vertex 28 to define the rectilinear flaps 23, 24.

[0030] Advantageously, the section has a substantially triangular profile and the metal sections advantageously consist of aluminium alloy extrusions.

[0031] For constructional simplicity, the angular elements 18, 19, 20, 21 are preferably fixed to the walls 12, 13, 14, 15 by welding, brazing or gluing. The casing 10 preferably also comprises a supporting frame 29, preferably made of galvanised steel.

[0032] The frame 29 advantageously comprises four uprights 30 each designed to couple with a lower end of the angular elements 18, 19, 20, 21.

[0033] Each of the latter advantageously comprises an end plate 31 designed to be fixed to the uprights preferably by a nut 32.

[0034] The end plates 31 are advantageously welded to the metal sections 22 which, at their end joined to the end plate 31 advantageously have an opening 221 for operating the nut 32 or an equivalent fixing means.

[0035] The angular elements preferably also comprises connectors 33 which can be coupled to an upper end of the angular elements 18, 19, 20, 21 and equipped with a seat B designed to receive an edge of the frame 29 to allow the stacking of a plurality of casings 10.

[0036] Another object of this invention is a method for constructing a casing 10 which has a peculiarity in that it comprises:

- making a plurality of walls 12, 13, 14, 15 designed to form the walls 12, 13, 14, 15 of the casing 10;
- making a plurality of angular elements 18, 19, 20, 21 designed to interconnect the walls 12, 13, 14, 15 for forming the body 11;
- fixing the walls 12, 13, 14, 15 to the angular elements 18, 19, 20, 21 in such a way that each of the angular elements has a first longitudinal edge 181 fixed to a first side edge 123, 133, 143, 153 of one of the walls 12, 13, 14, 15 and a second longitudinal edge 182 fixed to a second side edge 124, 134, 144, 154 of another of the walls 12, 13, 14, 15;
- fixing a cover to an upper edge of the walls 12, 13, 14, 15 and fixing a hopper to a lower edge of the walls 12, 13, 14, 15.

[0037] Advantageously, the step of making a plurality of angular elements 18, 19, 20, 21 comprises making the angular elements 18, 19, 20, 21 by extruding a metal section, preferably made of aluminium alloy.

[0038] The step of fixing the walls 12, 13, 14, 15 to the angular elements 18, 19, 20, 21 preferably comprises welding the longitudinal edges to the side edges 123, 133, 143, 153, 124, 134, 144, 154.

[0039] The invention as it is conceived is susceptible to numerous modifications and variants, all falling within the scope of protection of the appended claims.

[0040] Further, all the details can be replaced by other technically-equivalent elements.

[0041] In practice, the materials used, as well as the contingent forms and dimensions, can be varied according to the contingent requirements and the state of the art.

[0042] Where the constructional characteristics and the technical characteristics mentioned in the following claims are followed by signs or reference numbers, the signs or reference numbers have been used only with the aim of increasing the intelligibility of the claims themselves and, consequently, they do not constitute in any way a limitation to the interpretation of each element identified, purely by way of example, by the signs or reference numerals.

Claims

1. An IBC casing (10) for delivering hazardous and/or polluting products including:
 - a body (11) having four substantially flat walls (12, 13, 14, 15);
 - a cover to which an upper edge of each of said walls is fixed (12, 13, 14, 15);
 - a hopper to which a lower edge of each of said walls is fixed (12, 13, 14, 15);

characterized in that each of said walls (12, 13, 14, 15) consists of a plate which is not integral with the other walls (12, 13, 14, 15),

said body (11) comprising four angular elements (18, 19, 20, 21) each of which has

- a first longitudinal edge (181) to which a first side edge (123, 133, 143, 153) of one of said walls (12, 13, 14, 15) is fixed, and
- a second longitudinal edge (182) to which a second side edge (124, 134, 144, 154) of another of said walls (12, 13, 14, 15) is fixed.

2. An IBC casing (10) according to claim 1 **characterized in that** each of said angular elements (18, 19, 20, 21) comprises a metal section bar (22) having a constant section along a longitudinal direction (A) and two straight flaps (23, 24) extending parallel to said longitudinal direction (A) and which are configured to be fixed to said side edges (123, 133, 143, 153, 124, 134, 144, 154).

3. An IBC casing (10) according to claim 2 **characterized in that** the section of said angular elements (18, 19, 20, 21) comprises a central circular portion (25) and two substantially triangular portions (26, 27) which are mutually mirrored and extending from said circular portion (25) in two opposite directions transverse to said longitudinal direction (A).

4. An IBC casing (10) according to claim 3 **characterized in that** said substantially triangular portions (26, 27) have a first side (261, 271) and a second side (262, 272) which are both substantially tangential to said circular portion (25) and that intersect at one vertex (28); the second sides of said substantially triangular portions (26, 27) being substantially aligned.

5. An IBC casing (10) according to claim 4 **characterized in that** said first sides (261, 271) extend beyond said vertex (28) to define said rectilinear flaps (23, 24).

6. An IBC casing (10) according to one of the claims from 2 to 5, **characterized in that** said section has a substantially triangular profile.

7. An IBC casing (10) according to one of the claims from 2 to 6, **characterized in that** said metal sections consist of aluminum alloy extrusions.

8. An IBC casing (10) according to one of the preceding claims, **characterized in that** said angular elements (18, 19, 20, 21) are fixed to said walls (12, 13, 14, 15) by welding or brazing or gluing.

9. Method for producing a casing (10) having the features of one of the preceding claims, **characterized in that** said method comprises the following steps:

- making a plurality of walls (12, 13, 14, 15) configured to form the walls (12, 13, 14, 15) of said casing (10);

- making a plurality of angular elements (18, 19, 20, 21) configured to connect said walls (12, 13, 14, 15) to form said body (11);

- fixing said walls (12, 13, 14, 15) to said angular elements (18, 19, 20, 21) so that each of said angular elements has a first longitudinal edge (181) fixed to a first side edge (123, 133, 143, 153) of one of said walls (12, 13, 14, 15) and a second longitudinal edge (182) fixed to a second lateral edge (124, 134, 144, 154) of another of said walls (12, 13, 14, 15);

- fixing a lid to an upper edge of said walls (12, 13, 14, 15) and fixing a hopper to a lower edge of said walls (12, 13, 14, 15).

10. Method according to claim 9 **characterized in that** said step of making a plurality of angular elements (18, 19, 20, 21) provides for making said angular elements (18, 19, 20, 21) by extruding a profile preferably made of an aluminum alloy and **in that** said step of fixing said walls (12, 13, 14, 15) to said angular elements (18, 19, 20, 21) provides for welding said longitudinal edges to said side edges (123, 133, 143, 153, 124, 134, 144, 154).

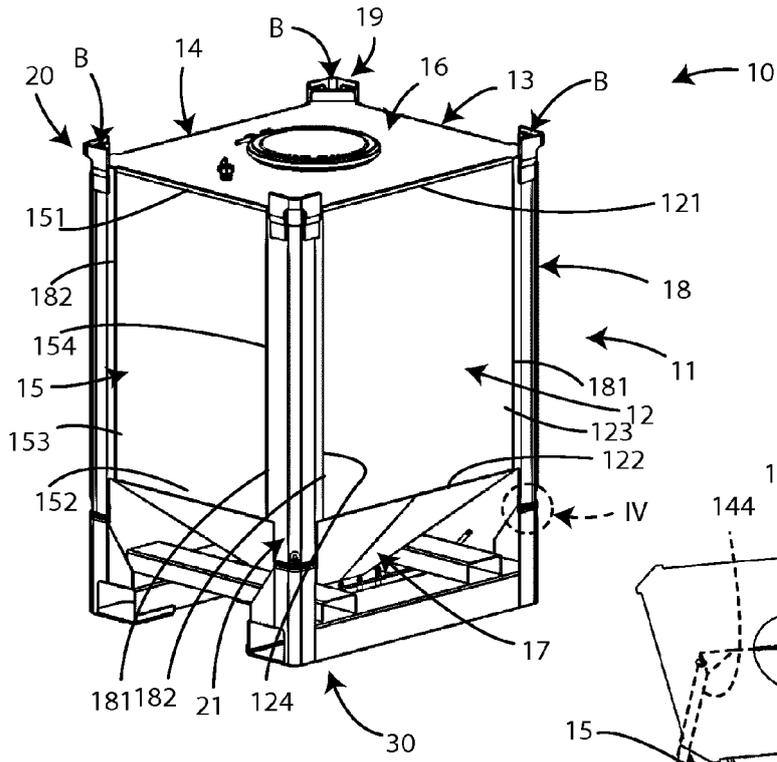


Fig. 1

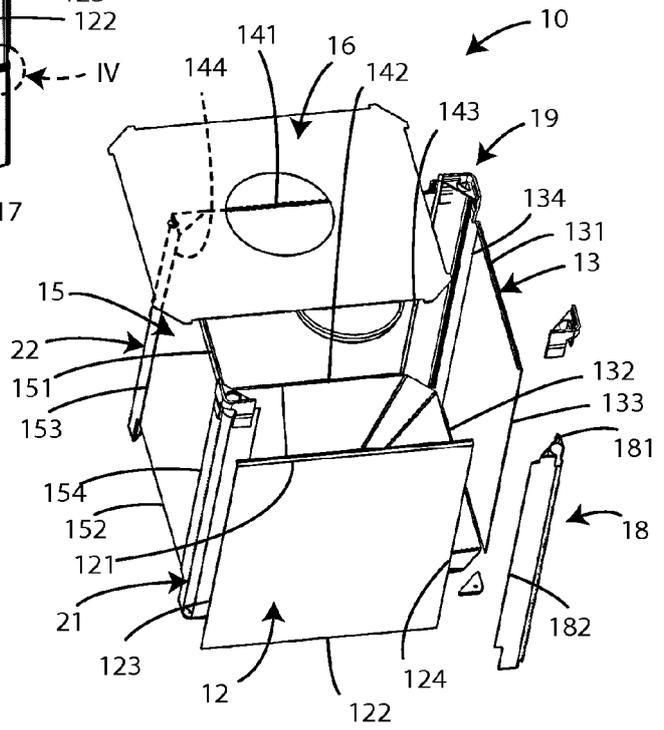


Fig. 2

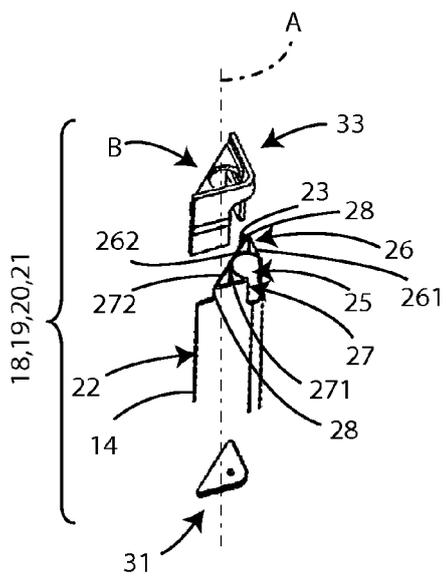


Fig. 3

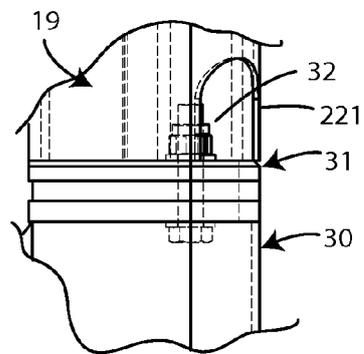


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 18 21 2533

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 18 February 2019	Examiner Lämmel, Gunnar
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ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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