International Patent Classification:
B65F 1/14 (2006.01) B65F 1/00 (2006.01)
5 65F II 16 (2006.01)

International Application Number:
PCT/EP2011/055055

International Filing Date:
31 March 2011 (3.1.03.2011)

Filing Language:
English

Publication Language:
English

Priority Data:
AN2010U000024 4 May 2010 (04.05.2010)


Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH), GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, CA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Title: PARALLELEPIPED CONTAINER WITH COMPACTABLE STRUCTURE

Abstract: The present invention relates to a compactable parallelepiped container made of plastic material, pressed cardboard and other suitable materials, characterized in that it is formed of easy-to-assemble parts, consisting in a bottom panel (1), a tubular body (2) that can be extended as a bellows to form, in maximum extension configuration, the four vertical walls of the container, as well as a lid (50) adapted to be mounted on top of said vertical walls.
Published:

— with international search report (Art. 21(3))
Description

Parallelepiped container with compactable structure

The present patent application relates to a parallelepiped container with compactable structure.

Parallelepiped containers, which are composed of a rectangular or square bottom and four perimeter sides, have been traditionally used to store and/or pack objects.

This type comprises waste bins, crates, boxes and many other similar containers that are sometimes provided with a suitable lid.

These parallelepiped containers are generally made of light, inexpensive materials, such as plastics or rigid cardboard.

Whereas these parallelepiped containers have always shown high functional efficacy, it is also true that they are impaired by a significant drawback arising, in particular, from the considerable height due to the presence of said perimeter sides.

Certainly, the latter are indispensable to ensure the correct containment of objects inside them. However, when the container is not in typical operational configuration, they evidently create a considerable "passive" vertical volume.

In view of the above, discomfort and expenses are faced by manufacturers and dealers to store, pack and transport large quantities of similar parallelepiped containers.

In order to overcome such a drawback, parallelepiped containers have been realized in stackable version, such that one of said containers can be partially inserted inside an identical underlying container.

It must be noted, however, that a similar solution can only limit the problem of excessive volume of parallelepiped containers, without providing a substantial change.

Alternatively, parallelepiped containers have been made of coated cardboard and provided with collapsible sides incorporated into the bottom,
with the interposition of folding lines, it being provided that said sides can be mutually coupled in vertical operational position by means of snaps or similar fast-coupling means.

However, said containers are characterized by precarious stability and sturdiness, which do not allow them to contain objects with considerable weight.

The specific purpose of the present invention is to finally overcome the problems related with said "passive" vertical volume of parallelepiped containers.

Another purpose of the present invention is to devise a container with higher structural stability and sturdiness than containers with collapsible sides of traditional configuration.

To that end, a modular container has been devised, wherein the parts with higher volume (reference is made to the four vertical sides) can be easily compacted and closed until the container is not in operational configuration.

In such a case, the four sides have a basically bi-dimensional volume, which is similar to the volume of the bottom.

On the other hand, in their "erected" operational configuration, the vertical sides are stabilized because of the cooperation of two rigid fixing elements, which are respectively composed of a box-shaped bottom panel and an upper frame.

Within the present invention, all parts of the container can be disassembled and compacted with said perimeter sides, thus obtaining a basically parallelepiped "package" with very low height, which can be packed and stored easily with minimum volumes.

It is worthless saying that, whenever necessary, the vertical sides of the new container of the invention can be easily and rapidly recover their "erected" position, in such a way to be coupled with the bottom and upper frame, giving the container its typical three-dimensional operational configuration.

More detailed information on the composite structure and assembly/disassembly modes of the container of the invention will be
provided with reference to the enclosed drawings, which only have an
illustrative, not limiting purpose, wherein:
- figures 1A to 1N are axonometric views that show the assembly and
operational configuration of the container of the invention, when it is used to
provide a waste bin with liftable lid
- figures 2A and 2B are axonometric views that show the same container
when it is used to provide a waste bin for selective waste collection.
- figures 3A to 3I are axonometric views that show the assembly and
operational configuration of the container of the invention, when it is used as
crate to contain objects
- figures 4A and 4B are two partial axonometric views, the second one of
which being an exploded view, that show in detail the configuration of the
main parts of the container and the modes for their mutual stable coupling:
- figures 5A to 5F are axonometric views that show the assembly, operational
configuration and compact configuration of a "simplified" constructive version
of the container of the invention.

Referring to figures 1E, 1F, 1G, 4A and 4B, the compactable container
(C) is composed of three cooperating parts (1, 2, 3) adapted to be made of
plastic material, pressed cardboard or other suitable materials.

In particular, the three parts respectively consist in:
- a quadrangular bottom panel (1) surrounded by four raised sides (1a)
internally provided with a perimeter groove (1b)
- a tubular body (2) adapted to have a parallelepiped shape in its operational
configuration, thus forming four vertical sides of the container, having the
possibility to be "extended" and compacted as a bellows by means of six
vertical folding lines, of which four (2a) provided on the corners and two (2b)
provided in the centre of the lateral walls
- an upper frame (3) provided with box-shaped structure with basically
overturned-U cross-section, which defines a perimeter groove (3a) and
provides that the internal vertical side (3b) has a considerably lower height
than the external vertical side.
The cooperation of said parts provides that, when it is brought in extended configuration, said compactable tubular body (2) is inserted into said bottom panel (1) in such a way that the lower perimeter border (2d) is exactly engaged into the perimeter groove (1b) provided in internal position on said raised perimeter sides (1a).

In order to provide stable coupling, the compactable tubular body (2) is provided, in the proximity of its lower perimeter border (2d), with a horizontal series of slots (2c) adapted to be fitted with a corresponding series of teeth (1c) situated inside said perimeter groove (1b) and obtained in particular on the internal side of said raised sides (1a).

The frame (3) is adapted to be inserted into said tubular body (2), which is now securely extended, in such a way that the upper border (2e) of the latter is exactly engaged into said downward-facing perimeter groove (3a) internally provided on said frame (3).

In order to provide stable coupling, the compactable tubular body (2) is provided, in the proximity of its upper perimeter border (2e), with an additional horizontal series of slots (2c) adapted to be fitted with a corresponding series of teeth (3c) situated inside said perimeter groove (3a) and obtained in particular on the internal side of the shorter sides (3b).

After a general description of the inventive idea of the invention, specific forms of practical application are illustrated hereinafter.

Referring to figures 1A to 1N, the inventive idea has been used, first of all, to realize a pedal waste bin that uses two containers of the type of the invention, one inside the other, of which the external one (C1) has a bearing function and the internal one (C) can be extracted from it and is actually designed to collect waste.

As shown in figs. 1C, 1D and 1E, the first of said containers (C1) is obtained by coupling, according to the aforementioned modes, three parts (10, 20, 30), basically corresponding to those (1, 2, 3) used to form the container (C) of figs. 4A and 4B.
More precisely, the compactable tubular body (20) and the upper frame (30) of the external container (C1) exactly correspond to the same components (2, 3) of the internal container (C).

Instead, a structural difference can be noted between the bottom panel (10) of the external container (C1) and the bottom panel (1) of the internal container (C), consisting in the fact that the first one incorporates a pedal (40) adapted to favor the upward extraction of the internal container (C), according to modes that will be hereinafter illustrated in detail.

Moreover, referring to figs. 1D and 1N, the pedal (40), which slightly protrudes on the front of the bottom panel (10), is pivoted, with respect to two pins with horizontal axis (40a), to the opposite longitudinal sections of a vertical wall (40b), with basically U-shaped configuration, which defines a seat obtained in the centre of the bottom panel (10) in order to exactly house the pedal (40).

Additionally, the external container (C1) is provided with a liftable lid (50) pivoted, with respect to two pins with horizontal axis (50a), towards the rear ends of the lateral sections of the upper frame (30), as expressly shown in fig. 1N.

Figures 1H to 1N illustrate the modes for "static" and "dynamic" cooperation of said two containers (C, C1).

In particular, figures 1H and 1I are a sequential view of how the internal container (C) is exactly inserted into the external container (C1), after lifting the liftable lid (50).

Of course, at the end of the insertion, the lid (50) is closed, as expressly shown in fig. 1L.

In order to extract the internal container (C) again, pressure is exerted on the pedal (40), so that the rear section, which is situated upstream the pivoting pins (40a), is able to exert an upward thrust on the lower side of the bottom panel (1) of the internal container (C), as expressly shown in figs. 1M and 1N.
The short upward travel makes the upper end of the internal container (C) protrude from the internal container (C1), thus interfering with the lid (50) and favoring the partial lifting of the same.

Now the user can manually lift the lid (50) and grab the internal container (C) in order to extract it completely from the external container (C1).

Finally, figures 1A and 1B show the advantageous compactness of the waste bin obtained with said two cooperating parts (C, C1) of the container of the invention.

Figure 1B is an exploded view of the various parts dismounted and overlapped, according to a logic for which parts with lower area tend to be "contained" inside parts with higher area.

As shown in Fig. 1A, wherein said components are stacked, the dismounted waste bin is configured as a rectangular "package" that is extremely easy to pack and possibly stack with other identical specimens.

Before continuing the present description, it must be noted that in all the aforementioned figures, from 1A to 1N, as well as in all the following figures, including fig. 3H, a lower illustrative detail level than the one of figures 4A and 4B has been used for graphic convenience purposes.

In fact, such a lower detail level has eliminated the need to show the grooves obtained both on the bottom panels (1, 10) and on the upper frames (3, 30) of the corresponding containers (C, C1), as well as the fixing teeth (1c, 3c) provided on said bottom panels (1, 10) and frames (3, 30); likewise, this has avoided showing the series of slots (2c) provided in the proximity of the lower and upper perimeter border of the box-shaped compactable body (2, 20).

Nevertheless, all versions of the container described with reference to said figures 1A to 3F are preferably provided with said means to ensure the stable coupling of their corresponding parts.

Figures 2A and 2B refer to the same waste bin as the one illustrated above, with the only difference that the internal container (C) is provided with an upper transversal bridge (6) applied between the longitudinal sections of the upper frame (3).
The presence of such bridge (6) is used to suspend two different bags for selective waste collection inside the container (C), of which one on the right and one on the left of the bridge.

An additional embodiment of the inventive idea of the present invention is shown in figures 3A to 3H.

In such a case, the container of the invention (C2) is used to obtain a modular crate, possibly provided with swiveling wheels.

Referring to figs. 3C to 3F, the container (C3) is formed of the usual set of three cooperating parts, respectively a bottom panel (100) with raised perimeter sides, a box-shaped compactable bellows-shaped body (200) and an upper frame (300).

The crate of the invention is also provided with a box-shaped liftable lid (500) that, in the version shown in figures 3G and 3H, is provided with two handles (500b); in such a case, four swiveling wheels (100a) are provided and applied under said bottom panel (100).

Figures 3A and 3B show how the parts of the crate are stacked in order to rationalize and minimize volumes.

Fig. 3A is an exploded view of said parts, whereas in figure 3B (and especially the enlarged view obtained with a section with a longitudinal vertical plane) said parts are shown in final compact configuration.

In particular, all the other parts are housed in said box-shaped lid (500) in overturned position, that is with upward-facing lateral sides (500a).

The following parts are sequentially disposed on said lid (500): - the compactable tubular body (200) in "compressed" configuration
- the bottom panel (100) in overturned position
- the upper frame (300).

If the crate is provided with handles and wheels, the same can be suitably contained in a similar compact "package" and, more precisely, above said bottom panel (100) in overturned position, as expressly shown in fig. 3I.

Finally, figures 5A to 5F refer to a "simplified" embodiment of the container of the invention, provided with said box-shaped liftable lid (500), but
deprived of the upper stiffening frame that is indicated with numeral (3) in figures 4A and 4B.
Claims

1) A modular container made of plastic material, pressed cardboard and other suitable materials, characterized in that it is formed of:
   - a quadrangular bottom panel (1, 10, 100) surrounded by four raised sides (1a) internally provided with a perimeter groove (1b)
   - a tubular body (2, 20, 200) with structure that can be extended and compacted as a bellows, adapted to have such a parallelepiped shape in operational configuration that the lower perimeter border (2d) is exactly inserted into the groove (1b) of said bottom panel (1, 10, 100).
2) A modular container as claimed in claim 1, characterized in that it is provided, as additional modular part, with an upper frame (3, 30, 300) having the same shape as the quadrangular bottom panel (1), as well as a basically overturned-U cross-section that internally generates a perimeter groove (3a), adapted to exactly receive the upper perimeter border (2e) of the tubular body (2, 20, 200).
3) A modular container as claimed in claim 1, characterized in that said tubular body (2) can be compacted as a bellows by means of six folding lines, of which four (2a) obtained on the corners and two (2b) obtained in the centre of the lateral walls.
4) A container as claimed in one or more of the preceding claims, characterized in that it can exactly contain a second specimen with identical structure and configuration, which is inserted inside it through the upper frame (3, 30, 300).
5) A container as claimed in one or more of the preceding claims, characterized in that it is provided with liftable lid (50) pivoted, by means of two symmetrically opposite pins with horizontal axis (50a), on the back of said upper frame (30).
6) A container as claimed in one or more of the preceding claims, characterized in that said bottom panel (10) is provided with a pedal (40), slightly protruding on the front, which is pivoted, with respect to two symmetrically opposite pins with horizontal axis (40a), with opposite
longitudinal sections of a basically U-shaped vertical wall (40b) that defines the seat, provided in the center of the panel (10), that exactly houses the pedal (40).

7) A container as claimed in one or more of the preceding claims, characterized in that it is provided with four wheels (100a) applied under the bottom panel (1, 10, 100).

8) A container as claimed in one of claims 1 to 4, characterized in that is provided with removable lid (500).

9) A container as claimed in claim 8, characterized in that said removable lid (500) is provided with two lateral handles (500b).

10) A container as claimed in one or more of the preceding claims, characterized in that the tubular body (2, 20, 200) is provided, in the proximity of the lower and upper perimeter border (2d, 2e), with corresponding horizontal series of slots (2c), adapted to be fitted with corresponding horizontal series of projections (1c, 3c) respectively provided inside the groove (1b) of the bottom panel (1, 10, 100) and inside the groove (3a) of the upper frame (3, 30, 300).

11) A container as claimed in one or more of the preceding claims, characterized in that it is provided with a bridge (6) adapted to be transversally fixed on said upper frame (3, 30, 300).
**A. CLASSIFICATION OF SUBJECT MATTER**

INV. B65F1/14 B65F1/16 B65F1/00

According to International Patent Classification (IPC) and/or both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)
B65D B65F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:
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**Date of the actual completion of the international search**

9 May 2011

**Date of mailing of the international search report**

18/05/2011

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