(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 604 150 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
05.02.2020 Bulletin 2020/06

(21) Application number: **18775584.8**

(22) Date of filing: **28.03.2018**

(51) Int Cl.:
B65D 5/02 *(2006.01)*

(86) International application number:
PCT/ES2018/000038

(87) International publication number:
WO 2018/178422 (04.10.2018 Gazette 2018/40)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **31.03.2017 ES 201730534**
16.10.2017 ES 201731217

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(54) **OCTAGONAL BOX HAVING AN AUTOMATIC BASE**

(57) The box of the present invention is based on an octagonal prismatic-type tubular structure that is inserted in a base novelty formed by two identical elements which, when superimposed crosswise with an element, make it possible to block the base by means of counter pressure. The box can be easily transported, since the base can be folded over the base centre, causing the entire structure to fold inwards. Therefore, it is not necessary to assemble the complete structure each time it is transported, since it would be sufficient to unfold the box again from the base centre when necessary, thereby obtaining the complete box. The box has a simple structure that substantially reduces its manufacturing and assembly costs.

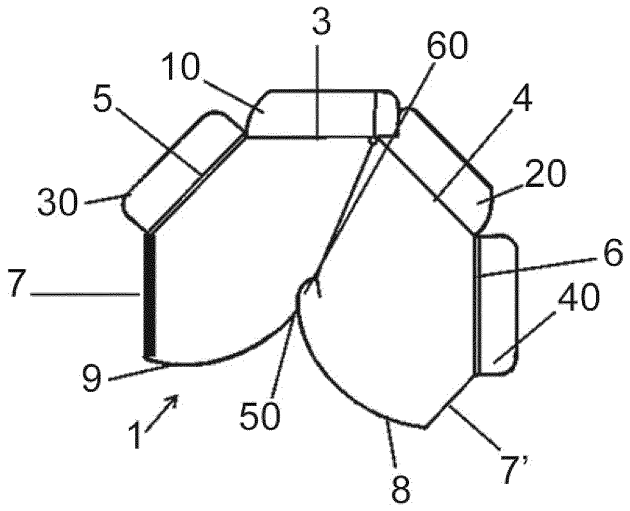

FIG. 1

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Description

OBJECT OF THE INVENTION

[0001] The box of the present invention is a high-performance packaging solution for the transport and storage of bulky material, such as granulated products, powdered products, etc.

[0002] The box of the present invention is based on an octagonal prismatic-type tubular structure that is inserted in a base novelty formed by two identical elements which, when superimposed crosswise with an element, make it possible to block the base by means of counter pressure.

[0003] Therefore, the object of the invention is to provide a box whose base is structurally simpler than that of conventional boxes of this type, improving the manufacturing and assembly process, which are substantially simplified, in addition to making it possible to save in the volume of material used without affecting the resistance of the box, which will respond to market needs.

[0004] It is also the object of the invention that the box be easily folded once unfolded in order to facilitate the reuse thereof.

BACKGROUND OF THE INVENTION

[0005] Boxes made of corrugated cardboard and/or composite materials are widely used in the fruit and vegetable industry and in other non-food industries but have a series of drawbacks related, in general, to the fact that the production process requires considerable amounts of raw material with large amounts of cardboard that is disposed of as waste for the purpose of producing the reinforced corners, especially on the faces of the smaller sides or faces of the larger sides of the box.

[0006] This often leads to the manufacture of boxes without horizontal or lateral support elements, known as "pavements" in the industry, or to the manufacture of boxes with lateral edges with a uniform height with the aim of avoiding a considerable use of cardboard and/or other composite materials.

[0007] Another drawback is that a box made of cardboard and/or composite materials is often supplied as a flat matrix difficult to assemble.

[0008] For the same reasons, pre-assembled cardboard and/or composite material boxes of the type known are difficult to unfold and return to their flat state, necessary to facilitate storage in preparation for reuse or for recycling operations or for destruction prior to their disposal as waste.

[0009] French patent FR-A-2236738 discloses a single-piece cardboard box formed from a matrix having a base panel, lateral and end wall panels, corner connection panels that intersect edges which are fixed, respectively, to an lateral and end wall panel, a blocking panel joined to, at least, one of the connection panels on each of the ends of the cardboard box and, optionally, one or more upper panels. The connection panels have a diagonal folding line that divides the panel into a first triangular reinforcement section fixed to an end wall panel and a second triangular reinforcement section fixed to a lateral wall panel. The blocking panel is joined to the second triangular section of the connection panel. In the assembled cardboard box, the triangular sections of each connection panel are folded in front contact and disposed along the exterior of the end wall panel with the triangular section sandwiched between the end wall panel and the second triangular section. The blocking panel extends over the upper edge of the first triangular section and the end wall panel in the interior of the cardboard box, wherein it is fixed in front contact with the inner surface of the end wall panel to maintain the cardboard box in the assembled position.

[0010] Utility model application U201500584 reveals a box having an octagonal prism configuration with two larger faces, two smaller faces alternated with the foregoing and another four smaller faces, forming what can be considered four bevels between the smaller and larger faces. Based on this octagon shape, the box has, in correspondence with one of its edges, cutting and folding lines that make it possible to form the base, since the box in question is envisaged to be arranged on a pallet or a surface that will act as part of the base thereof, said base having two larger lateral flaps and another two smaller flaps, the latter having an intermediate and central cutting line that results in two oblique cutting lines, forming a trapezoidal base reinforcement, while the aforementioned larger extensions have oblique folding lines, forming triangles which in one case are attached to the inner side of the smaller sectors and, in another case, are attached to the outer side thereof. The box is obtained from the development of a rectangular sheet of cardboard having transversal folding lines to delimit sectors that will form eight faces that define the lateral surface of the box, said box having an octagon shape, defining two sectors (1) or larger walls, two sectors or intermediate walls (2) alternated with the former and between both sectors (1) and (2) four smaller sectors (3) determining bevels that form the octagonal shape of the box.

[0011] Utility model application U200900797 is based on conventional octagons, specifically two octagons and consists of incorporating an octagonal prismatic tubular body in the box, which is inserted by its lower end in the similarly lower octagon and which is similarly closed by its upper end with the collaboration of the second octagon, by way of a lid. The base of this box is formed from a cardboard piece having a plurality of cuts forming flaps and which, when vertically folded, generate a cavity wherein the octagonal prismatic tubular body is inserted. One of the problems caused by this type of box is that a large amount of material is lost in the manufacture of the base due to the cuts made in the structure that gives rise to the base, in addition to the fact that whenever it is transported the whole structure must be reassembled.

[0012] Patent ES 2230182T discloses a folding con-

tainer, preferably made of corrugated cardboard which, although envisaging different embodiments in accordance with the even number of sides of its base, its octagon base variant is obtained from four independent pieces which are joined together by means of complementary slots defining curved sectors which, when assembled, are partially superimposed therebetween.

[0013] Consequently, this type of containers has a problem that focuses essentially on the following aspects:

- Obtaining an octagon base requires manufacturing four independent pieces, with their four dies, which entails a significant financial cost.
- Due to being four pieces, its assembly is slow and tedious compared to other possible solutions involving a smaller number of pieces.
- As multiple sectors are defined for said base (specifically six), which during assembly are superimposed therebetween, the use of material is duplicated in said areas, which represents a clearly unwanted additional use of material.

[0014] In an attempt to address this problem, the applicant himself is the holder of utility model ES 1076754, wherein a folding receptacle is disclosed, having an octagonal prism configuration wherein the base consists of two identical dovetailed pieces, such that the two identical base pieces have a semi-octagon configuration with an intermediate folding line and wherein the four sides of the semi-octagon extend, after the corresponding folding lines, into four flaps, two of which are adjacent and of greater height than the two end flaps, such that one of these flaps of greater intermediate height has an end fixing tab for fixing the other flap, by gluing therebetween, when the orthogonal offset of said flap with respect to the sectors defined on either side of the intermediate folding line of each of the semi-octagon pieces is carried out.

[0015] Based on this structure, both the flaps of lower height and the flaps of greater height are fixed during the assembly of the two base pieces to the inner lateral surface of the walls of the tubular-shaped octagonal body, while a cut-out of angular configuration is established in correspondence with one of the ends of the intermediate folding line of the two base pieces for dovetailing the two pieces, whereupon the extensions resulting on either side of the cut-outs are delimited by an imaginary line transversal to the intermediate folding line, alternately overlapping each other.

Although this structure reduces the number of pieces required to obtain the base of the container, it has been experimentally verified that said semi-octagon configuration, with its straight free edge (that opposite to the fixing flaps), substantially complicate the assembly manoeuvres of the box from the folded to the unfolded status thereof, such that if said sector is superimposed between the two pieces it is done with less width to facilitate said assembly manoeuvre, which, however, compromises the rigidity of the base.

[0016] In parallel and also experimentally, it has been verified that during assembly the flaps tend to swing with respect to the vertical position they must adopt, hampering said assembly process, wherein the lateral surfaces of the prism tend to collapse towards the vertical axis of symmetry of said prism, whereupon the lateral surface folds inwards.

[0017] The box of the present invention has the novelty that its base is formed exclusively from two identical elements which, when superimposed crosswise, making it possible to block the base by means of counter pressure by performing a simple manoeuvre, guaranteeing the structural rigidity of said base.

[0018] When the two similar structures are superimposed crosswise, the sides can be folded downwards, reinforcing the base and preventing that, upon introducing the belt-type structure, it folds inwards obtaining a highly resistant box that does not require additional elements to support the lateral reinforcements to which its walls are subjected when loaded with products such as melons, potatoes, etc., regardless of the self-assembly process of the box in question, due to which a box is obtained that is reinforced to reduce the lateral sagging or bending caused by the product it contains, thereby addressing the problems and drawbacks of conventional boxes of this type.

[0019] The box can be easily transported, since the base can be folded over the base centre, causing the entire structure to fold inwards; therefore, it is not necessary to assemble the complete structure each time it is transported, since it would be sufficient to unfold the box again from the base centre (50) when necessary, thereby obtaining the box. In this manner the box occupies the least amount of space for storage and transport.

[0020] In parallel, the box of the invention incorporates additional flaps to the constituent elements of the base, which makes it possible to maintain the other flaps in an upright position, resting on the outer lateral surface when two of said base elements are superimposed crosswise, said elements additionally containing a small flap that confers greater rigidity to the octagon, such that the lateral surfaces of the prism do not collapse towards the vertical axis of symmetry of said prism and the lateral surface is not folded inwards.

[0021] The fold formed by the vertical edges of the octagon confer the desired rigidity to the assembly that would not be achieved with a prism with fewer faces. The new flaps, on sliding over the lateral surfaces, confer greater rigidity to the base, keeping it flat.

[0022] The box of the present invention is a high-performance packaging solution for the transport and storage of bulky material, such as granulated, powdered or loose products; the box is made of high-performance corrugated cardboard and can be assembled manually and is also a profitable and environmentally friendly alterna-

tive to wooden or metal crates. The material, lightweight but high-performing, reduces the weight of the load, thereby lowering the costs.

DESCRIPTION OF THE FIGURES

[0023] As a complement to the description being made, and for the purpose of helping to make the characteristics of the invention more readily understandable, in accordance with a preferred example of embodiment thereof, said description is accompanied by a set of drawings constituting an integral part thereof wherein, by way of illustration and not limitation, they represent the following:

Figure 1. Shows a plan view of the element (1).

Figure 2. Shows a view of the box showing the shape of the base.

Figure 3. Shows an elevational view of the box.

Figure 4. Shows a view wherein stages a, b, c, d and e for forming the central body (2) can be observed.

Figure 5. Shows a view of the central body (2) and of the two identical elements superimposed crosswise (1) to form the box.

Figure 6. Shows a plan of a variant of embodiment for the base element (1), indicating each of its parts.

Figure 7. Shows a view of the box showing the shape of the base upon superimposing two base elements (1), such as that of figure 6, crosswise and the insertion of the octagonal prismatic tubular body (2).

Figure 3. Shows a side view of the box wherein the element (2) and main flaps (20) and (30) can be observed.

DESCRIPTION OF THE INVENTION

[0024] The box of the present invention is a high-performance packaging solution for the transport and storage of bulky material and does not require additional elements to bear the lateral stresses to which its walls are subjected when loaded with products such as melons, potatoes, etc.

[0025] The base of the box is formed from two identical semi-tray shaped base elements (1) glued in two places to the outer perimeter of the octagonal central body with the aid of flaps. Each of these components is equipped with a bellows system that makes it possible to fold inwards in order to limit the space. The crosswise assembly of these two elements makes it possible to guarantee the assembly and maintenance of the base by means of a counter pressure system.

[0026] When the two similar base elements (1) are superimposed crosswise, the sides (7) can be folded downwards, reinforcing the base and preventing the octagonal prismatic tubular body (2) from folding in on itself when introduced. This assembly allows the user, when deploying the belt, to automatically form the base without additional components.

[0027] In accordance with a variant of embodiment of the invention, optimised to bear the lateral stresses to which its walls are subjected when loaded with products such as melons, potatoes, etc., and shown in figures 6 to 8, each base element (1) has been envisaged to incorporate an additional flap (70) which, when coupled to another similar base element (1) in opposition thereto, generates two lateral walls resting on the corresponding outer lateral surface of the octagonal prism and reinforce the vertical of the base when the octagonal prismatic tubular body (2) is inserted.

[0028] Said base element (1) also incorporates an additional second flap (80) smaller than flap (70) that gives the octagon greater rigidity, such that the lateral surfaces of the prism do not collapse towards the vertical axis of symmetry of said prism and the lateral surface does not fold inwards.

PREFERRED EMBODIMENT OF THE INVENTION

[0029] The box of the present embodiment is formed from the joining of two identical base elements (1) that form the base and have the shape observed in figure 1 and the insertion of an octagonal prismatic tubular body (2), which is inserted in the result of superimposing the base element (1) with another similar element crosswise. The base elements (1) that form the base as a result of the angle between flap (10) and flap (20) allow them to fold inwards over the folding lines (3) and (4). Each base element (1) that makes it possible to form the base of the box has the intersection of two curved ends (8) and (9) in the coupling zone, whose elliptical curve shape allows element (8) to be assembled on top of element (9) at point (60) and, therefore, when coupled with another base element (1) are resistantly fixed upon forming the base of the box.

[0030] Flaps (30) and (40) are identical symmetrical images with respect to an axis that passes through the joining point between flaps (10) and (20) and are folded inwards over the folding lines (5) and (6). When the flaps are folded upwards along the folding lines (3), (4), (5) and (6) forming 90-degree angles with respect to the lower plane, four adjacent vertical planes formed by means of flaps (10), (20), (30) and (40) are generated, wherein the height of these vertical planes is the same dimensions as the width of said flaps. The joining point between end sides (8) and (9) produce a central point (50) which, when superimposed crosswise with a second element (1) make it possible to form the base of the box, since it is blocked by means of counter pressure. When the two similar base elements (1) are superimposed crosswise, sides (7) and (7') can be folded downwards, reinforcing the base and

preventing the octagonal prismatic tubular body (2) from folding in on itself when introduced.

[0031] The octagonal prismatic tubular body (2) is formed from a sheet of cardboard originally open and folded in the shape of a rectangular parallelepiped, wherein one of the upper ends is folded diagonally, (a) forming a prismatic tubular structure (b) which can be completely folded (c) generating a series of six-sided prefolds (d) and (e), as can be observed in figure 4.

[0032] When said body is extended by means of the folds, an eight-sided structure is obtained that is inserted in the base of the initially developed structure, wherein each side matches the base side; the flaps are then glued to the central body and the octagonal box is formed, as can be observed in figure 4, wherein it shows stages a, b, c, d, e for forming the octagonal prismatic tubular body (2).

[0033] More specifically, flaps (10) and (20) are fixed to the inner surface of the octagonal prismatic tubular body (2), while flaps (30) and (40) are fixed externally to said body.

[0034] In one variant of embodiment, that shown in figures 6 to 8, it has been envisaged that the intersection area between sides (7") and (9') will be rounded, such that side (7") is collinear with the folding line (5), while the other end side, instead of being curved as in the example of figure 1, is obtained from two straight sections perpendicular therebetween (11 and 8'), wherein the latter determines a folding line (8') for an additional tab (80).

[0035] Each base element (1) incorporates a flap (70) which is folded along the folding line (7') at a 90-degree angle and which, when the element is coupled (1) to another similar element in opposition thereto, gives rise to two external lateral walls that rest on the corresponding lateral surface of the octagonal prism and reinforce the vertical of the base when the octagonal prismatic tubular body is inserted (2).

[0036] As mentioned earlier, the base element (1) incorporates a flap (80) smaller in size than flap (70) that is folded along the folding line (8') at a 90-degree angle and which, when superimposed crosswise with another similar base element (1), generates two internal lateral walls that make it possible to confer greater rigidity to the octagon, such that the lateral surfaces of the prism do not collapse toward the vertical axis of symmetry of said prism and the lateral surface is not folded inwards.

[0037] The joining point of ends (9') and (11) produce a central point (50) which, when superimposed crosswise with a similar second base element (1), enable them to fit around said central point (50) forming the base of the box, since it is blocked by means of counter pressure.

[0038] The octagonal prismatic tubular body (2) is formed in the same manner as in the example of figures 4 and 5, adapting regular octagons, i.e. with eight sides of identical size, but said body may also form irregular octagonal prisms such that there are two opposite sides of identical dimension, each separated by three sides (a total of six sides) of another identical dimension, such as to form an irregular octagonal prism initially having two identical sides parallel to another three identical sides between the aforementioned initial sides.

[0039] The box can be easily transported, since the base can be folded over the central point (50) of the base, causing the entire structure to fold inwards; therefore, it is not necessary to assemble the complete structure each time it is transported, since it would be sufficient to unfold the box again from the central point of the base (50) when necessary, thereby obtaining the complete box; in this manner the box occupies the least amount of space for storage and transport.

[0040] The box of the present invention is a high-performance packaging solution for the transport and storage of bulky material, such as granulated, powdered or loose products; the box is manufactured with high-performance corrugated cardboard and can be assembled manually and is also a profitable and environmentally friendly alternative to wooden or metal crates.

Claims

1. Octagonal box having an automatic base, formed from an octagonal prismatic tubular body (2) where to a base is fixed, **characterised in that** said base is formed by superimposing two identical base elements (1) crosswise, having a semi-octagon configuration, from whose sides four flaps (10), (20), (30) and (40) emerge, respectively, with their respective folding lines (3), (4), (5) and (6), therefrom at a 90-degree angle, such that two of said flaps (30) and (40) are externally fixed to the octagonal prismatic tubular body (2) and the other two flaps (10) and (20) are internally fixed to said tubular body, said base element (1) having, in opposition to the area of emergence of the aforementioned flaps, two sectors delimited by two curved ends (8) and (9) whose intersection produce a central point (50); and two straight lateral edges (7) and (7') adjacent to flaps (30) and (40), respectively.

2. Octagonal box having an automatic base, according to claim 1, **characterised in that** flaps (30) and (40) are identical symmetrical images with respect to an axis that passes through the joining point between flaps (10) and (20).

3. Octagonal box having an automatic base, according to claim 1, **characterised in that** when the base element (1) is superimposed with a second base element (1) they enable the base of the box to be formed by means of counter pressure.

4. The octagonal box having an automatic base, according to claim 1, **characterised in that** the intersection of two curved ends (8) and (9) have an elliptical curved shape, enabling element (8) to be as-

sembled on element (9) at a point (60) and coupled to the other element (1) at the base of the box.

5. The octagonal box having an automatic base, according to claim 1, **characterised in that** when the two similar base elements (1) are superimposed crosswise, sides (7) and (7') can be folded downwards.

6. The octagonal box having an automatic base, according to claim 1, **characterised in that** the central point (50) enables the box to be folded inwards.

7. The octagonal box having an automatic base, according to claim 1, **characterised in that** the base element (1) additionally comprises a flap (70) that emerges from the lateral edge (7') that can be folded over said lateral edge at a 90-degree angle, establishing a second additional flap (80) laterally to said flap which is folded by means of a folding line (8') at a 90-degree angle, said flaps being fixed to the inner face of the octagonal prismatic tubular body (2).

8. The octagonal box having an automatic base, according to claim 7, **characterised in that** flap (80) is smaller in size than flap (70).

9. The octagonal box having an automatic base, according to claim 7, **characterised in that** when flap (70) is folded along line (7') at a 90-degree angle and coupled crosswise to another similar base element (1), it generates two external lateral walls that rest on the corresponding lateral surface of the octagonal prism.

10. The octagonal box having an automatic base, according to claim 7, **characterised in that** when flap (80) is folded along line (8') at a 90-degree angle and superimposed in opposition to another similar base element (1), it generates two internal lateral walls of the octagonal prism.

11. The octagonal box having an automatic base, according to claim 7, **characterised in that** when the two similar base elements (1) are superimposed crosswise, ends (9') and (11) can be folded down the base centre (50) of the box inwards.

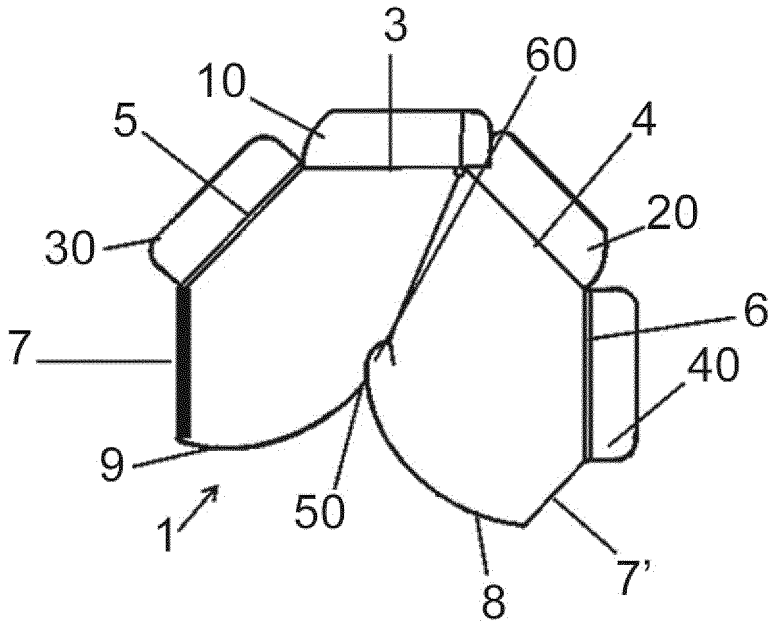

FIG. 1

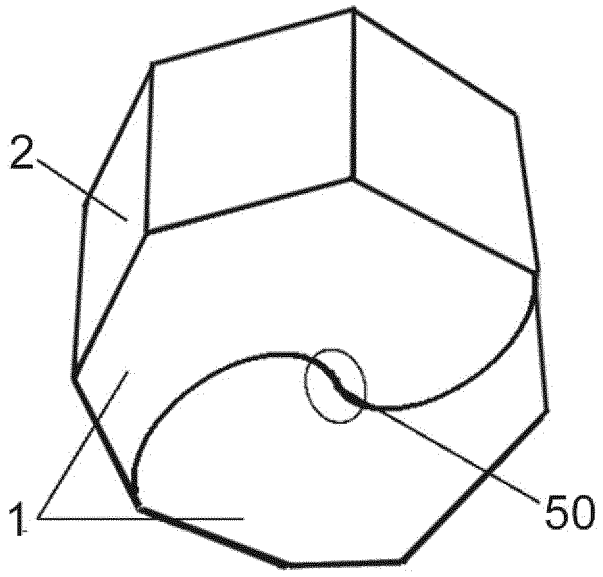

FIG. 2

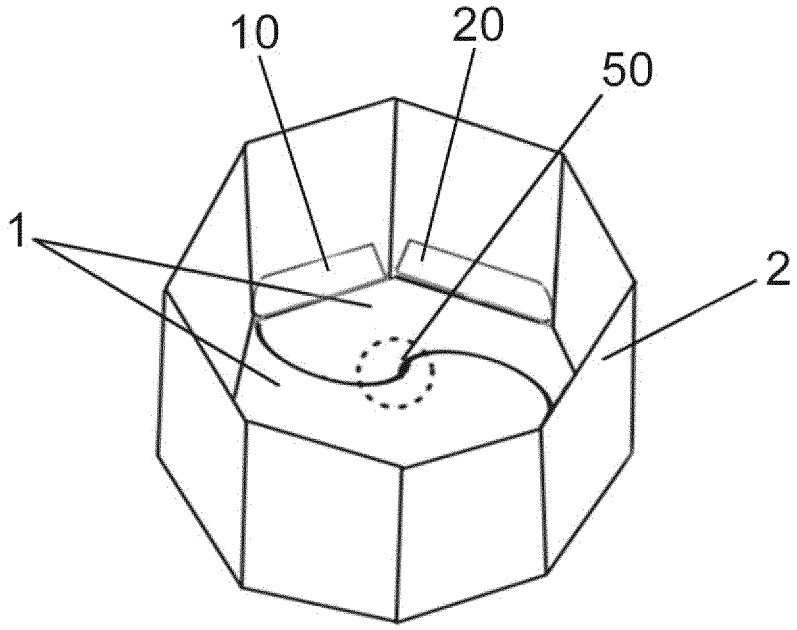

FIG. 3

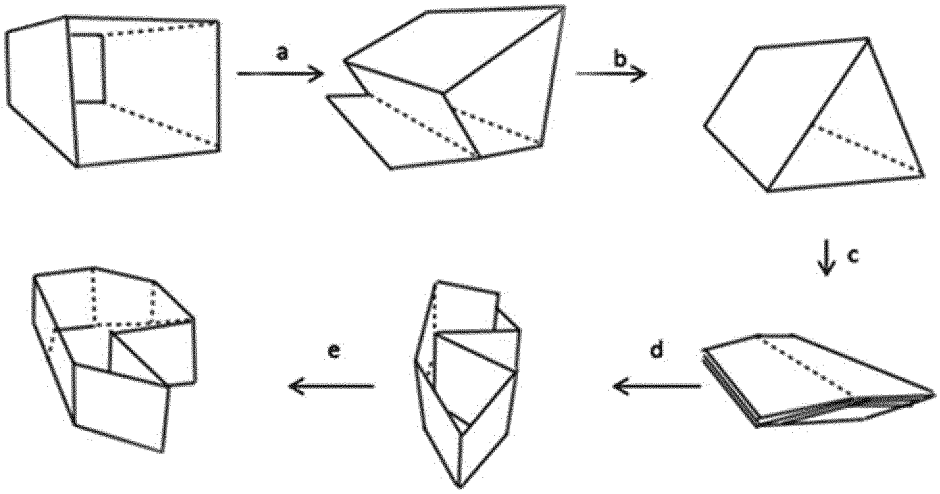

FIG. 4

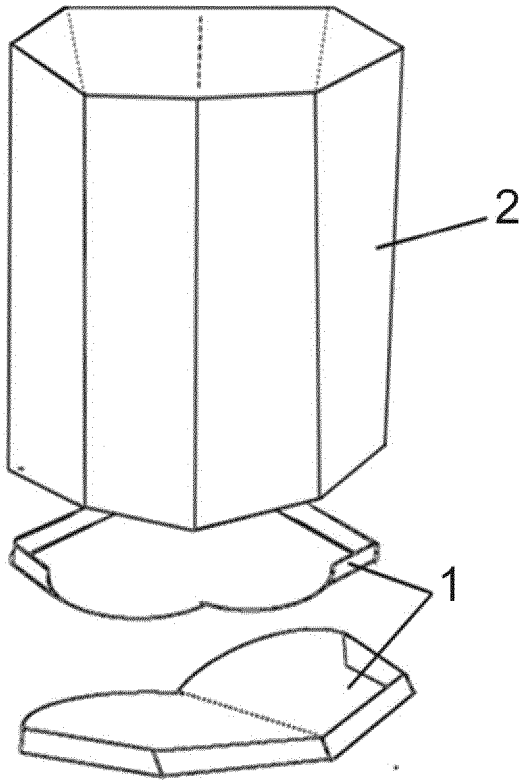

FIG. 5

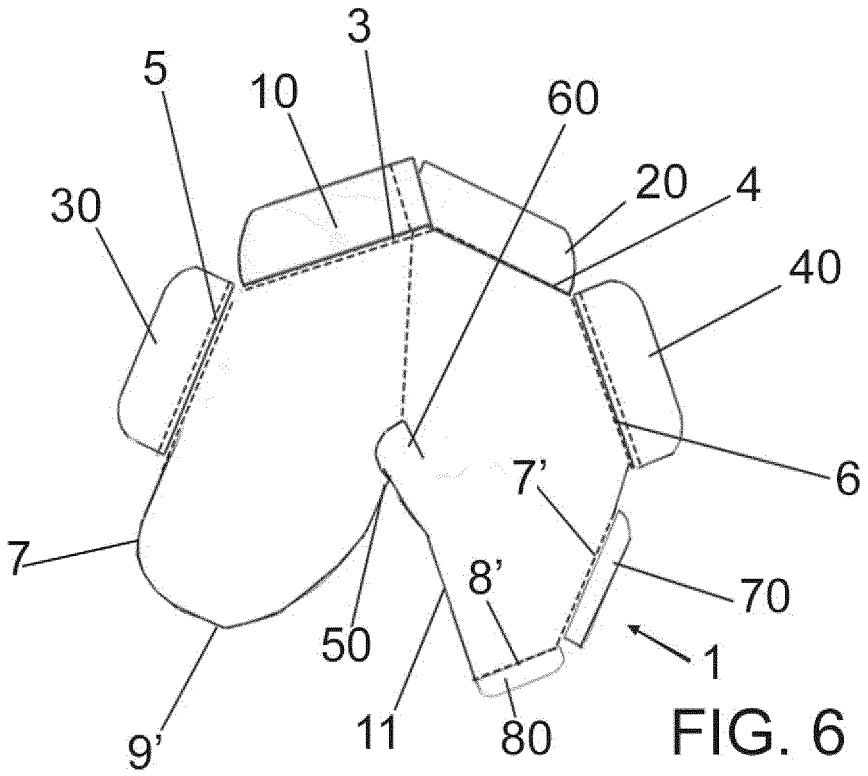

FIG. 6

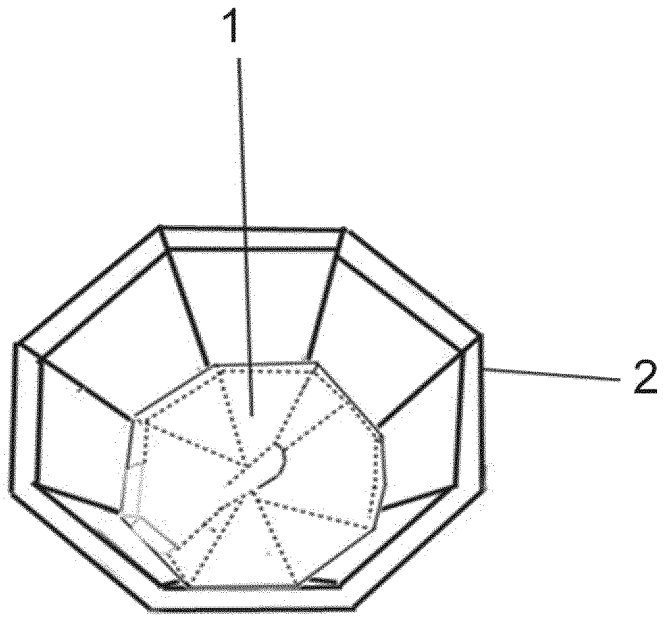

FIG. 7

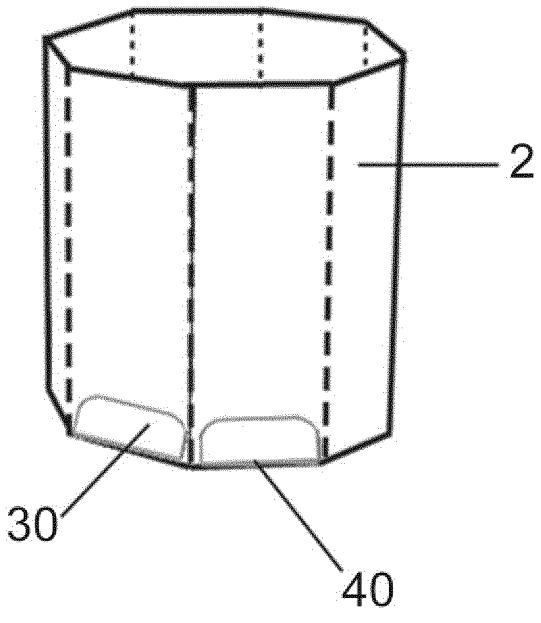

FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2018/000038

A. CLASSIFICATION OF SUBJECT MATTER

B65D5/02 (2006.01)

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

B. FIELDS SEARCHED

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

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 practicable, search terms used)

EPODOC, INVENES, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ES 2230182T T3 (MULLER MARTIN) 01/05/2005, description; figures 1 - 5.	1-6
Y	ES 2230182T T3 (MULLER MARTIN) 01/05/2005,	7-11
Y	US 3738563 A (EIFRID S) 12/06/1973, description; figures 1 - 3.	7-11
A	EP 1593607 A1 (SMURFIT EUROPA CARTON GMBH SMURFIT KAPPA GMBH) 09/11/2005, description; figures 1 - 4.	1-11
A	GB 2243596 A (REED PACKAGING LTD) 06/11/1991, description; figures 1 - 5.	1-11
A	GB 2037711 A (WALTON D) 16/07/1980, description; figures 1 - 9.	1-11

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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24/07/2018	**(25/07/2018)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer J. Moreno Rodriguez Telephone No. 91 3495556

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2018/000038

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ES 2584953 A1 (CARTONAJES LANTEGI SL) 30/09/2016, description; figures 1 - 4.	1-11

Form PCT/ISA/210 (continuation of second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/ES2018/000038

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
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