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(54) **CONTAINER**

(57) Container (1), in particular for fruit and vegetables, having a cup-shaped body and comprising a bottom (2) and a side wall (3) laterally delimiting a hollow space (4), wherein said container (1) is made of a paper-based material; the side wall (3) being extendable so as to selectively increase the volume of said hollow space (4).

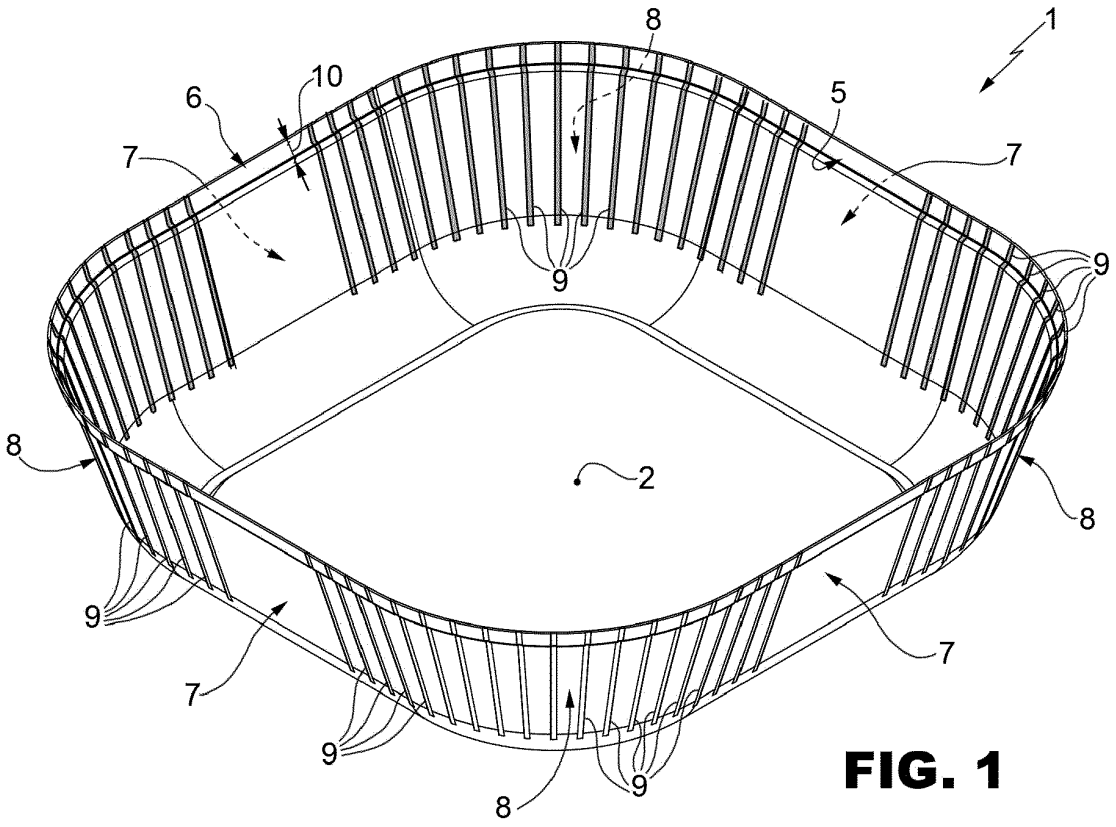

FIG. 1

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims priority from Italian patent application no. 102018000009662 filed on 22/10/2018.

TECHNICAL FIELD

[0002] The present patent application relates to a container, in particular a container for fruit and vegetables with retail portions.

BACKGROUND ART

[0003] The fruit and vegetable containers are intended for the final consumer and are made so as to show a determined number of fruits or vegetables evenly arranged, namely in a predetermined sequence.

[0004] Generally, once filled with the products, the containers for fruit and vegetables of this type are film-covered, namely at least partially covered by a film to ensure the hygiene and the cohesion of the products.

[0005] Different types of containers for fruit and vegetables are known, which can be summarized in three groups:

- containers made of expanded polystyrene;
- thermoformed containers made of plastic material, for example polyethylene;
- containers made of paper or cardboard.

[0006] Containers made of expanded polystyrene or polyethylene have the disadvantage of not coming from renewable sources, not being biodegradable and not being compostable. Furthermore, containers made of expanded polystyrene or polyethylene can seriously pollute the environment if not properly collected and disposed of. Furthermore, containers made of expanded polystyrene or polyethylene cannot be printed and personalized. Therefore, from the commercial point of view they have a low versatility, are scarcely attractive and do not allow transmitting the peculiarities of the content.

[0007] The known containers, made of paper or cardboard, have the disadvantage of being made starting from a blank, which is folded and fixed in the shape of the container by gluing together overlapping rims. This type of container has the disadvantage of not being hermetically sealed at glued rims, in particular close to slots that are generally formed near the corners, thus allowing a possible liquid leakage.

[0008] The paper or cardboard containers of known type further have the disadvantage of being of a predetermined size and of not being able to adapt to products having different sizes with respect to the predetermined ones. This obviously involves a greater operational effort, given that the number of containers is multiplied according to the sizes of the treated products, with all the costs associated with the storage and logistics of the different containers.

DISCLOSURE OF INVENTION

[0009] The object of the present invention is to provide a container that overcomes the drawbacks described above.

[0010] The object of the present invention is to provide a multipurpose container that is adaptable in size and that is waterproof, printable, biodegradable, recyclable and compostable.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The present invention provides a container as mentioned in the appended claims.

[0012] The invention will now be described with reference to the annexed drawings showing a non-limiting embodiment, in which:

- Figure 1 is a perspective view of a container according to the present invention;
- Figure 2 is a plan view of the container of Figure 1;
- Figure 3 is a section along the line III-III of Figure 2; and
- Figure 4 shows, on an enlarged scale, a detail of Figure 1.

BEST MODE FOR CARRYING OUT THE INVENTION

[0013] In Figure 1, a container according to the present invention is indicated as a whole by 1. The container 1 is substantially a tray and has a cup-shaped body comprising a bottom 2 and a side wall 3, which delimit a hollow space 4.

[0014] The container 1 has an opening 5 to access the hollow space 4. The opening 5 is delimited by the upper rim 6 of the side wall 3.

[0015] Cup-shaped body means a cup-shaped body in which the bottom and the side wall are made of a single piece. Cup-shaped body further means a body having a rounded bottom.

[0016] According to the shown example, the bottom 2 is substantially square and has four sides 7 that are parallel in pairs and connected in continuous by means of a junction 8, so as not to have sharp edges. In the example shown, the junctions 8 form a connection angle of about 90°.

[0017] According to variants not shown, the bottom 2 has different shapes, e.g. it can be rectangular or circular.

[0018] The container 1 has a vertical axis X substantially perpendicular to said bottom 2. Hereinafter the terms vertical, horizontal, upper, lower and the like are used with reference to the normal use of the container 1 with the bottom 2 resting on a supporting horizontal surface.

[0019] The container 1 is made of a paper- or cardboard-based material. The container 1 was made by hot deep drawing or thermoforming.

[0020] Preferably, the container 1 is a single piece, or else it has been made from a single sheet or die-cut, so as not to have junction lines or slots.

[0021] Advantageously, according to what will be better explained below, the container 1 lacks the flange.

[0022] In fact, the containers of the known type made of paper and made by hot deep drawing have a flange, namely a strip of peripheral material, which protrudes outwards from the rim of the side wall. The flange is rigid and is normally used also as a base for a possible junction with any possible closure film of the container. However, the flange prevents the extension of the side wall.

[0023] As shown in Figure 1, the side wall 3 of the container 1 has a plurality of pleats 9, which extend from the upper rim 6 towards the bottom 2. The pleats 9 are substantially vertical, namely they extend transverse to the bottom 2.

[0024] Advantageously, each junction 8 has pleats 9. Preferably, the pleats 9 are formed at the junctions 8 and along the sides 7 in areas adjacent to the junctions 8.

[0025] The pleats 9 are substantially controlled accumulations of material obtained around suitable creases made on the starting material during the hot deep drawing process, in particular during the pressing.

[0026] A pleat 9 is not a simple fold of the material with which the container 1 is made. A pleat 9 is an area in which the material with which the container 1 is made is crumpled and pressed. In other words, at the pleat 9 the material is cohesive and rigid. At each pleat 9, the container 1 has a sort of reserve of additional material, which under the application of a tension allows widening the pleat 9 and, consequently, the volume of the hollow space 4. Therefore, in Figure 1 the pleats 9 on the inner side of the container 1 are schematized with a grey area to show that the pleats 9 do not protrude but are localized areas of the container 1 with different properties (in which the material is crumpled and pressed).

[0027] As shown in Figure 3, the pleats 9 do not protrude from the side wall 3, but are an integral part of the side wall 3 forming a substantially flat surface, possibly having rougher localized points. In other words, the pleats 9 are not folds that deform the side wall, making it not flat. Therefore, the container 1 appears flat and substantially smooth to the eye.

[0028] Advantageously, the presence of the pleats 9 allows obtaining a cohesive and consistent container 1 and, at the same time, adapting the size of the container 1 in a controlled manner, according to the requirements. In this way, a single container format 1 can be used for several different products.

[0029] According to the detail shown in Figure 4, the container 1 can have one or more steps 10 made along the perimeter of the side wall 3.

[0030] Each step 10 increases the rigidity of the container and the opening surface of the container 1 without having to increase the surface of the starting material.

[0031] Each step 10 allows an invitation to be formed near the opening 5 to facilitate the insertion of any product inside the container 1. Thanks to the presence of one or more steps 10, it is possible to obtain an opening 5 with a width that is more than twice its own depth. The presence of one or more steps 10 creates a conical inlet, which favours both the stacking of the containers 1 and the insertion of products.

[0032] Each step 10 also acts as a shock absorber.

[0033] In fact, each step 10 first contacts possible external bodies, since it protrudes radially outwards from the side wall 3. For example, a step 10 can be 4 mm high and 2 mm deep. Each step 10 reduces the risk of product collisions.

[0034] This is particularly useful during the transport or in the comb positioning of the containers 1 on the exhibitors.

[0035] Advantageously, the container 1 is made of a paper-based material. Preferably, the container 1 has been made by hot deep drawing, namely thermoforming of a paper-based starting material, e.g. from a reel or from a blank. The starting material can be made of paper or cardboard.

[0036] The starting material can be single layer or multilayer. A cardboard starting material can be single-jet, double-jet, tri-jet or the like. The starting material can be corrugated, for example of the microwave type.

[0037] Advantageously, the material of the container 1 is obtained from renewable sources and is suitable for direct food contact, biodegradable and recyclable according to the ATICELCA® 501/2017 method. Preferably, the material of the container 1 falls within the class A or better A+ of the ATICELCA® 501/2017 method. Advantageously, the material of the container 1 is compostable, namely it conforms to the characteristics of a material according to the EN 13432 regulation.

[0038] Advantageously, the material of the container 1 is resistant to humidity and grease. The container 1 can be covered with a layer of coating material, which allows obtaining the desired requirements of humidity- and grease-resistance. This prevents the container from losing resistance by absorbing humidity, condensation and product grease.

[0039] Advantageously, the material of the container 1 has a breathability in humid air, generally known as Water Vapour Transmission Rate WVTR, lower than 100 g/m^2 in 24 hours. The breathability parameter is calculated according to ISO 2528 in an environment at 23°C and at a relative humidity (RH) of 50%.

[0040] Advantageously, the material has an impermeability (also known as the Cobb 1800s test), namely a resistance to the absorption of a liquid, lower than 10 g/m^2. The impermeability value is calculated according to ISO 535.

[0041] Advantageously, the container 1 is made of a material resistant to low and high temperatures.

[0042] In particular, it is resistant to temperatures T

comprised between:

$$-40°C \leq T \leq +215°C.$$

[0043] Advantageously, a container 1 that is made of a material having the above indicated characteristics of resistance to humidity and greases and at low and high temperatures can be polyvalent. In other words, the container 1 can also be used for further domestic purposes (e.g. as a non-toxic container for storing food in the refrigerator, in the freezer or for cooking/heating food in the microwave oven or in the traditional oven).

[0044] Advantageously, the fact that the container 1 is made of a paper material allows printing the entire surface of the container 1 in a simple and inexpensive way. This involves a great advantage over known containers, where the printable surface is limited. The material of the container 1 can be printed either with traditional offset or flexographic or rotogravure printing techniques or with the latest inkjet techniques for variable data integration. In this way, it is possible to guarantee traceability, print information on the container 1, for example also QR codes, useful both for the consumer (product origin, supply chains, etc...) and for the producer (packaging plant, batch, etc...) .

[0045] In use, the container 1 is filled with products along a packaging line. The presence of any steps 10 favours the insertion of the products inside the hollow space 4.

[0046] If a product is larger than the predefined size, the volume of the container 1 can be increased by pulling the side wall 3 so as to stretch one or more pleats 9. In this way, the container 1 increases its containment capacity by adapting to the specific product. The absence of the flange in the container 1, if compared to traditional containers, allows the enlargement and the extension of the pleats 9.

[0047] Moreover, the absence of the flange in the container 1 reduces the bulkiness in the transport and prevents that during the film-covering of the container 1 a surface (the flange and its outer rim) is provided that can engrave or cut the protective film during the transport or display at the sales point.

[0048] Advantageously, a final consumer can re-use the container 1. For example, the container 1 can be reused as a baking pan for baking in the traditional oven or in a microwave oven. Alternatively, the container 1 can be used as a storage compartment in the refrigerator or in the freezer.

[0049] Therefore, advantageously, the container 1 can also be exploited from the commercial point of view, since besides offering the product (e.g. apples) the manufacturer also offers an instrument (container 1 reusable as a pan) to store or cook other food products.

[0050] Advantageously, the presence of the pleats 9 allows keeping cohesive and consistent the side wall 3 of the container 1 as well as extending the side wall 3 as required.

Claims

1. A container, in particular for fruit and vegetables, having a cup-shaped body and comprising a bottom (2) and a side wall (3), which laterally delimit a hollow space (4); wherein said container (1) is made of a paper-based material; the side wall (3) and/or the bottom (2) being extensible so as to be able to selectively increase the volume of said hollow space (4).

2. A container according to Claim 1, wherein said side wall (3) has an rim (6) that delimits an access opening (5) to said hollow space (4); wherein the side wall (3) has one or more pleats (9) formed near said rim (6); wherein each pleat (9) extends from the rim (6) towards the bottom (2), each pleat (9) being substantially transverse to the bottom (2) .

3. A container according to Claim 2, wherein the side wall (3) has a plurality of sides (7); wherein two adjacent sides (7) are connected to each other by a respective junction (8); wherein each junction (8) has pleats (9) and wherein the pleats (9) do not protrude from the side wall (3) so that the side wall (3) appears substantially compact at said pleats (9).

4. A container according to Claim 2 or 3, wherein each pleat (9) is formed by an accumulation of crumpled and pressed material; wherein each pleat (9) can be extended, if subjected to an external strain; wherein each pleat (9) contributes to the rigidity of the container (1) to make it cohesive and consistent.

5. A container according to any one of the preceding claims, wherein the container (1) can have one or more steps (10) formed along the perimeter of the side wall (3) and defining an inclined inlet to the hollow space (4) to increase the rigidity of the container (1) and favour the insertion of products.

6. A container according to any one of the preceding claims and made of a material obtained from renewable sources, suitable for direct food contact, biodegradable, recyclable according to the ATICELCA® 501/2017 method and compostable according to the EN 13432 regulation.

7. A container according to any one of the preceding claims and made of a material resistant to temperatures T comprised between -40°C ≤ T ≤ +215°C.

8. A container according to any one of the preceding claims and made of a material having a breathability in humid air of less than 100 g/m^2 in 24 hours, where-

in the breathability parameter is calculated according to the ISO 2528 regulation in an environment at 23°C and at a relative humidity of 50%.

9. A container according to any one of the preceding claims and made of a material having an impermeability, namely a resistance to the absorption of a liquid, lower than 10 g/m^2; wherein the impermeability parameter is calculated according to the ISO 535 regulation.

10. A container according to any one of the preceding Claims and **characterized in that** it has been made of a single piece by means of a hot deep drawing process of paper or cardboard and **in that** it lacks a flange, which protrudes externally from the side wall (3).

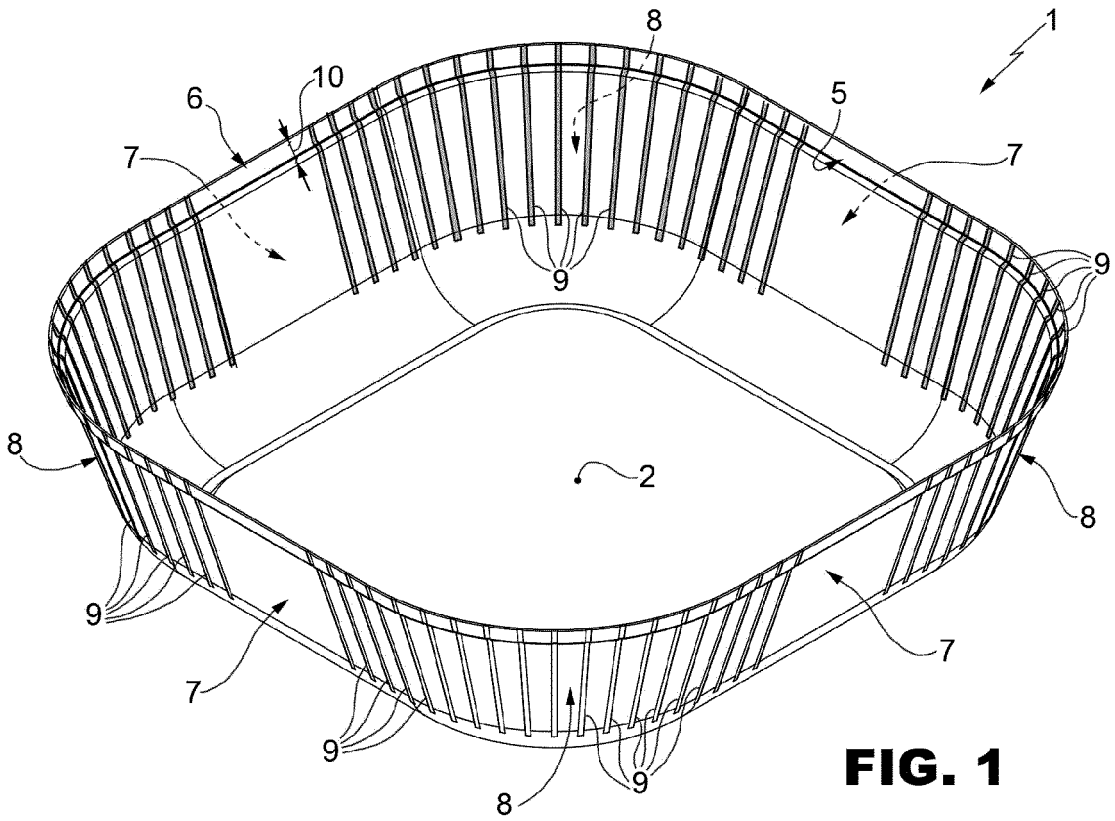

FIG. 1

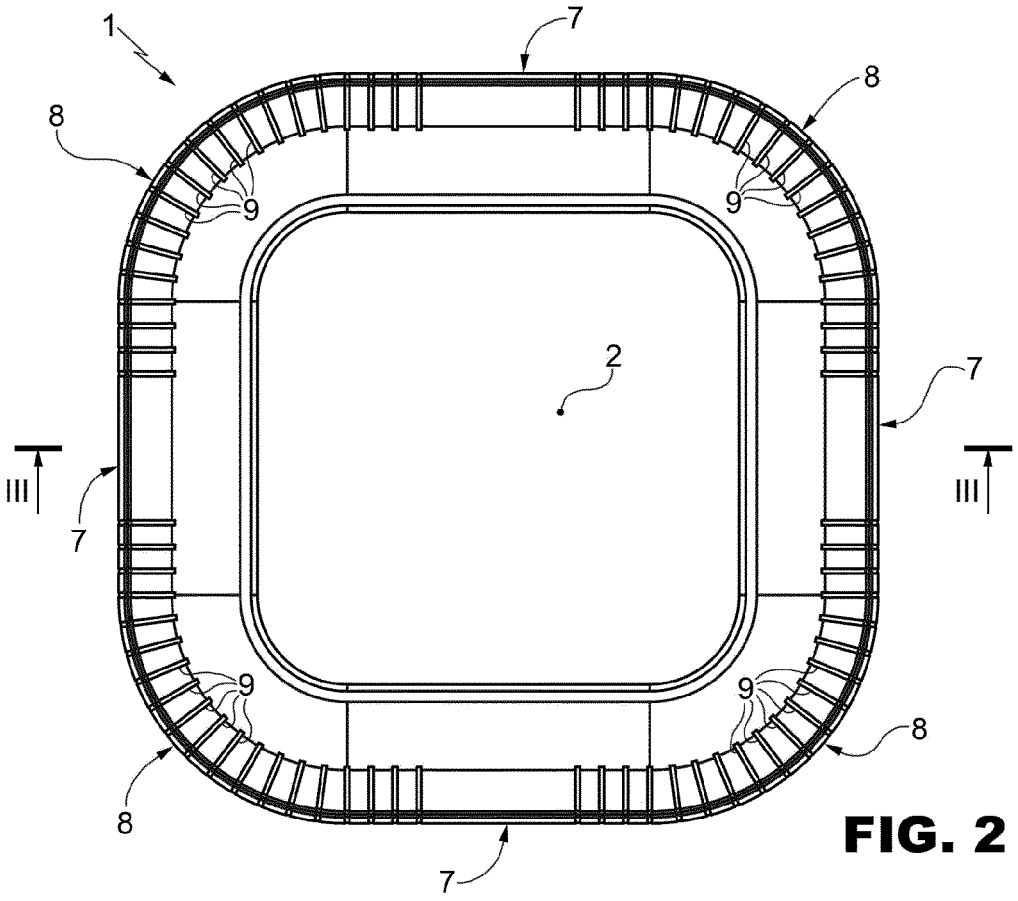

FIG. 2

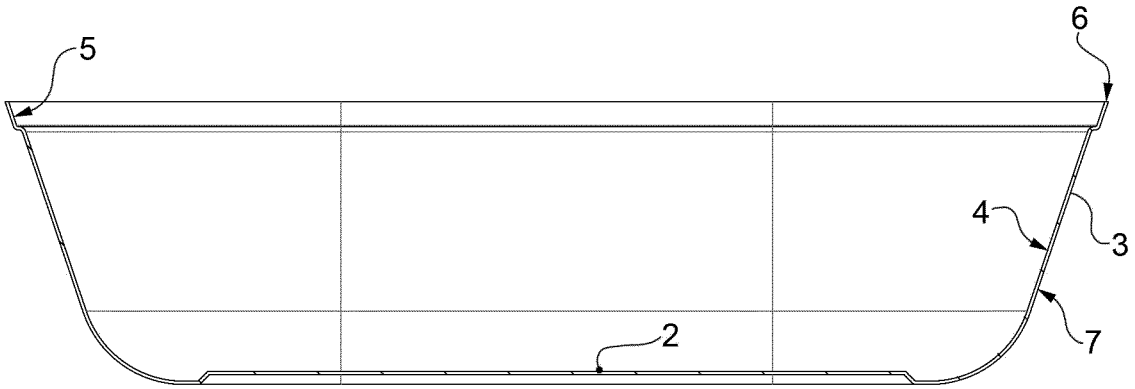

FIG. 3

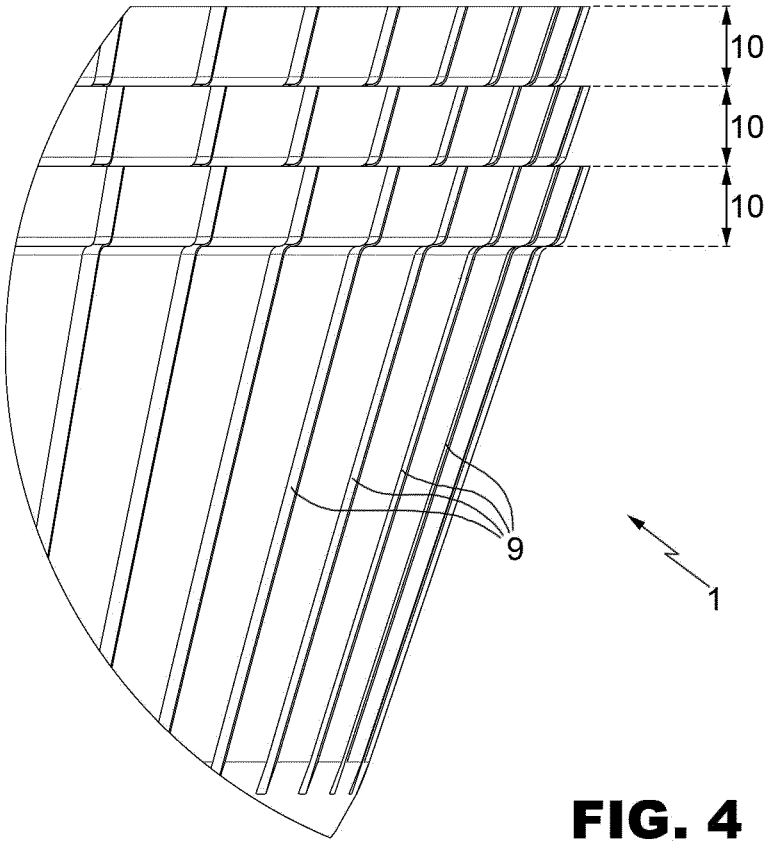

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 19 20 4711

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2017/069972 A1 (SONOCO DEV INC [US]) 27 April 2017 (2017-04-27) * page 5, line 8 - page 13, line 17; figures 2-13 *	1-10	INV. B65D21/02 B65D21/08 B65D1/34 B65D81/24 B65D85/34
X	WO 93/19996 A1 (CAPY GILBERT [FR]; BUCHBERG AKIVA [FR]) 14 October 1993 (1993-10-14) * page 3, line 19 - page 9, line 15; figures 1-19 *	1-10	
X	US 2011/048999 A1 (WNEK PATRICK H [US]) 3 March 2011 (2011-03-03) * paragraph [0014] - paragraph [0024]; figures 1-4 *	1-10	
X	US 2006/198972 A1 (UEDA TAKASHI [JP] ET AL) 7 September 2006 (2006-09-07) * paragraph [0035] - paragraph [0045]; figures 4-7 *	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 February 2020	Lämmel, Gunnar

CATEGORY OF CITED DOCUMENTS

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03-02-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2017069972 A1	27-04-2017	CA 3002402 A1	27-04-2017
		EP 3365248 A1	29-08-2018
		US 2017112303 A1	27-04-2017
		WO 2017069972 A1	27-04-2017
WO 9319996 A1	14-10-1993	AT 138872 T	15-06-1996
		AU 3758193 A	08-11-1993
		BR 9306141 A	13-01-1998
		CA 2117683 A1	14-10-1993
		CZ 286951 B6	16-08-2000
		DE 69303012 D1	11-07-1996
		DE 69303012 T2	16-01-1997
		DK 0631560 T3	21-10-1996
		EP 0631560 A1	04-01-1995
		ES 2089805 T3	01-10-1996
		FI 944407 A	23-09-1994
		GR 3020688 T3	31-10-1996
		HU 216337 B	28-06-1999
		JP 2691379 B2	17-12-1997
		JP H07504875 A	01-06-1995
		KR 957000848 A	20-02-1995
		NO 303727 B1	24-08-1998
		NZ 249909 A	25-06-1996
		RO 113729 B1	30-10-1998
		RU 2107647 C1	27-03-1998
		SK 108994 A3	08-02-1995
		WO 9319996 A1	14-10-1993
US 2011048999 A1	03-03-2011	CA 2771557 A1	10-03-2011
		CA 2959273 A1	10-03-2011
		EP 2470431 A2	04-07-2012
		JP 5814239 B2	17-11-2015
		JP 2013503088 A	31-01-2013
		US 2011048999 A1	03-03-2011
		WO 2011028588 A2	10-03-2011
US 2006198972 A1	07-09-2006	DE 112004001080 T5	06-04-2006
		JP 4369770 B2	25-11-2009
		JP 2005029259 A	03-02-2005
		US 2006198972 A1	07-09-2006
		WO 2005002981 A1	13-01-2005

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Patent documents cited in the description

- IT 102018000009662 **[0001]**