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

(11) **EP 3 957 573 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.02.2022 Bulletin 2022/08

(21) Application number: **21185211.6**

(22) Date of filing: **13.07.2021**

(51) International Patent Classification (IPC):
B65D 5/70 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
B65D 5/701; B65D 5/0227; B65D 5/541; B65D 2215/04

(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: **17.08.2020 NL 1043759**

(71) Applicant: **Anderling BV**
7201 AE Zutphen (NL)

(72) Inventor: **Hoekstra, Aad**
7201 AE Zutphen (NL)

(74) Representative: **Betten & Resch**
Patent- und Rechtsanwälte PartGmbB
Maximiliansplatz 14
80333 München (DE)

(54) **CHILD-RESISTANT CLOSURE FOR FOLDING CARTON**

(57) A packaging consisting of a folding carton with a closing flap (3) with a contour that is tightly embedded into the lid panel (6), while the front edge (4) of the closing flap extends beyond an opposing depressable locking lip (7) and the locking lip lies below the closing flap.

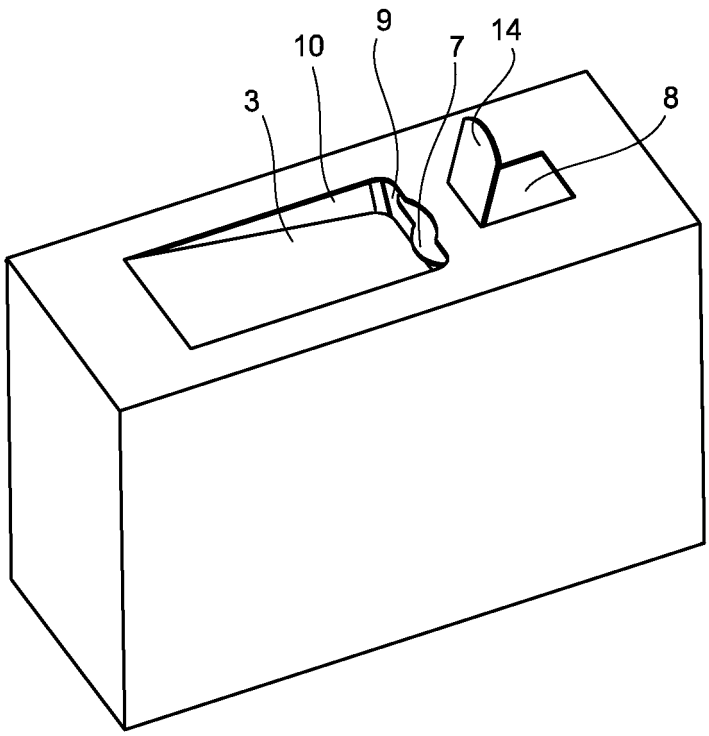

Figure 4

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Description

[0001] Packaging for products that can pose a health risk to users, such as cleaning products, should preferably be fitted with a closure that cannot be opened unintentionaly. This prevents the product in question inadvertently coming into contact with a user. This is particularly relevant where children are concerned. Such a closure is also known as a child-resistant closure.

[0002] Child-resistant closures are mainly used in plastic packaging. This is often a primary closure which first must be broken, for example by tearing through a tear-off strip, and which in second instance can only be reopened with deliberation. An example is a twist-off cap on a bottle of bleach, which can only intially be opened when a tear-off strip at the base of the cap is broken. Subsequently, the cap can only be re-opened by simultaneously pressing and twisting it.
Thus, a hurdle is created which prevents unintended opening of the bottle.

[0003] The invention described below aims to provide a similar functionality in packaging made of folding carton, so that a child-resistant closure can also be offered in packaging made of folding carton.

[0004] According to the invention this object is achieved by a packaging according to claim 1. Advantageous embodiments are defined in dependent claims.

[0005] An embodiment of the invention will be described below in connection with the attached fgures in which:

Figure 1 shows a flat folding carton.
Herein 1 is the lid material that closely surrounds the closing flap and in which the closing flap is embedded, 2 a hinge line that connects the closing flap with the panel of which it is a part, 3 the closing flap, 4 the front part of the closing flap also called the tip, 5 the lifting zone, 6 the lid panel, 7 the locking lip, 8 a flap hingedly connected to the top of a sidewall, 9 a flap connected to the top of a sidewall, 10 a flap extending beyond the hinge line of the closing flap and connected to the top of a sidewall, 11 a glue flap, 12 are wall panels of the packaging, 13 are bottom panels of the packaging and 14 is the keyhole cover.

Figure 2 shows a folded carton, unopened.
Herein 1 is the lid material that closely surrounds the closing flap and in which the closing flap is embedded, 2 a hinge line which connects the closing flap to the panel of which it is a part, 3 the closing flap, 5 the lifting zone, 6 the lid panel and 14 the key flap.

Figure 3 shows a folding carton, opened.
Herein 1 is the lid material that closely surrounds the closing flap and in which the closing flap is embedded, 3 the closing flap, 4 the front part of the closing flap also called the tip, 7 the locking lip and 10 a flap that extends beyond the hinge line of the closing flap and is connected to the top of a sidewall.

Figure 4 shows a mounted folding carton, closing.
Herein, 3 is the closing flap, 7 is the locking lip, 8 is a flap hingedly connected to the top of a sidewall, 9 is a flap connected to the top of a sidewall, 10 is a flap extending beyond the hinge line of the closing flap and connected to the top of a sidewall and 14 is the keyhole flap.

Figure 5 shows a mounted folding carton.
Herein the line AB is the line through which the section is drawn in Figures 6 and 7.

Figure 6 shows a view of cross-section, closing.
Herein is 3 the closing flap, 8 a flap hingedly connected to the top of a sidewall, 9 a flap connected to the top of a sidewall, and 10 a flap extending beyond the hinge line of the closing flap and connected to the top of a sidewall and 14 the keyhole flap.

Figure 7 shows a view of cross-section, closed.
Herein, 3 is the closing flap, 4 is the front part of the closing flap also called the tip, 8 is a flap hingedly connected to the top of a sidewall, 9 is a flap connected to the top of a sidewall, 10 is a flap extending beyond the hinge line of the closing flap and connected to the top of a sidewall.

[0006] The invention is based on a cardboard closing flap (3) which is hingedly connected by means of a folding line (2) to a wall of a folding carton -hereafter called lid panel (6)- and which closing flap (3) can cover or release an opening in the folding carton.
The contour of the closing flap (3) is part of the lid panel (6). When closed, the contour is tightly surrounded on the outside by a layer of cardboard of the same or greater thickness than the material from which the closing flap (3) is made. This material surrounding the closing flap (3) is hereafter called the bedding (1). Thus, when closed, the closing flap (3) is recessed in the bedding (1) and it is not possible to engage the contour from the plane in which the closing flap (3) is located in order to hinge open the closing flap (3).
See figure 2.

[0007] On a freely selectable side of the closing flap (3), a part of the contour of the closing flap (3) is left free in the bedding (1). This area is referred to as the lifting zone (5). The lifting zone (5) provides a point of contact for one or more fingers to lift the closing flap (3) out of its bedding (1) in order to hinge the closing flap (3) upwards and open the packaging. In the drawings the lifting zone (5) is on the side opposite the hinge line (2).

[0008] On the side opposite the hinge (2) is the end of the closing flap (3), hereafter called the tip (4). Here you will also find the locking lip (7). The locking lip (7) is the end of the locking panel (8). The locking panel (8) is hingedly connected to one of the side panels (12). The

top of the locking panel (8) is partly connected to the bottom of the lid panel (6).

The locking lip (7) is located below the level of the closing flap (3) and extends beyond the tip (4).

Optionally, the locking lip (7) is fixed in a horizontal plane parallel to the closing flap (3) by connecting the part of the locking panel (8) adjacent to the side wall (12) with the underside of the lid panel (6). With this connection of the locking panel (8) the locking lip (7) remains free to be elastically deformed with suitable force and bent downwards from the horizontal plane.

The panels (9) support the locking panel (8) and thus the locking lip (7). These panels (9) are hingedly connected to the top of two opposite wall panels (12). By connecting the panels (9) with the bottom side of the lid panel (6) in the vicinity of the hinge line between the panels (9) and the wall panels (12), the panels (9) are fixed in a horizontal plane while they can still be bent out of this horizontal plane under the influence of a vertical force.

[0009] When closed, the closing flap (3) rests on two panels (10). By connecting the panels (10) to the bottom side of the cover panel (6) in the vicinity of the hinge line between the panels (10) and the wall panels (12), the panels (10) are fixed in a horizontal plane while they can still be bent out of this horizontal plane under the influence of a vertical force. The panels (10) extend beyond the perimeter of the closing flap (3).

By connecting the panels (10) close to the hinge line with the wall panels (12) to the underside of the lid panel (6), the panels (10) are fixed in a horizontal plane while they can still be bent downwards out of that horizontal plane under the influence of a vertical force. See figures 3 and 7.

[0010] When the packaging has never been opened, the locking lip (7) and the panels (10) block a downward hinging movement of the closing flap (3). As a result, the closing flap (3) cannot be hinged downwards and the pack can only be opened if the closing flap (3) is hinged upwards.

[0011] Once the pack has been opened and is to be closed again, the closing flap (3) is hinged downwards. With the downward pressure the panels (9 and 10) supporting the closing flap (3) and the locking panel (8) bend downwards, thus paving the way for a hinged movement of the closing flap (3) which pushes the tip (4) beyond the locking lip (7). See figures 4 and 6.

[0012] The locking lip (7) will, after passing of the tip (4), hinge upwards again under the upward pressure generated by the panels (9). The panels (10) press the closing flap (3) upwards until it in turn latches against the locking lip (7). Thus, the closing flap (3) is brought into a position in which the contour of the closing flap is guaranteed to be below the level of the bedding (1). Thus, no point of contact is provided for hinging the closing flap (3) open.

The panels (10) support the closing flap (3) over a substantial part or the entire length. This substantial support means that the packaging cannot be opened by pushing down the closing flap (3).

The packaging is locked.

[0013] In order to unlock and open the closing flap (3) the keyhole flap (14) must first be opened. The keyhole flap (14) covers an area that gives access to the locking panel (8) and prevents the locking panel (8) from being pressed when the keyhole flap (14) is not open. Once the keyhole flap (14) has been opened, a downward pressure can be exerted on the locking panel (8) in the area released by the keyhole flap (14) by pressing it down with a finger. In doing so, the closing flap (7) is hinged downwards against the pressure of the panels (9) until it has rotated past the tip (4) of the closing flap (3).

[0014] Thus the closing flap (3) is free to be pushed by the spring force of the panels (10) and to move upwards. This makes the tip (4) available again to be picked up in the lifting zone (5) and to hinge the closing flap (3) upwards out of the plane of the bed (1), thus opening the pack. Thus, three steps are required to open the pack, creating a hurdle to accidental opening.

[0015] In a preferred embodiment, the closing flap (3) is connected to the bedding (1) by a perforation line. This perforation line must be torn when the packaging is opened for the first time. An unbroken perforation line shows that the packaging is in an undamaged condition, that it has never been opened and that the content is therefore intact.

[0016] Exemplars of the packaging can thus be described as follows:

1. A packaging comprising a folding carton with a closing flap (3) hingedly connected by a folding line (2) to a lid panel (6), wherein the closing flap (3) when closed is tightly embedded in the lid material (1) the upper surface of which is at the same level or higher than the upper surface of the closing flap (3) and whereby the material surrounding the closing flap (1) leaves a lifting zone (5) on one side of the closing flap, whereas the closing flap (3) has an outline whose tip (4) extends beyond a locking lip (7) positioned opposite the hinge line (2), which locking lip (7) is situated below the closing flap (3).

2. A packaging according to exemplar 1, wherein the closing lip (7) forms part of a flap (8) hingedly connected to the top of one of the side walls (12).

3. A packaging according to exemplar 1, wherein the closing flap (3) is supported on its underside by two opposite flaps (10) which are hingedly connected to the upper side of side walls (12), the flaps (10) extending beyond the contour of the closing flap (3) and being connected to the underside of the lid panel (6) at the upper side of the flap (10) in the vicinity of the hinges with side walls (12).

4. A packaging according to exemplar 1, wherein the locking lip (7) is part of a flap (8) which is hingedly connected to the top of one of the side walls (12)

which flap (8) is supported at the bottom by two opposite flaps (9) which are hingedly connected to the top of side walls (12), while the top of flap (8) is glued to the bottom of lid panel (6).

5. A packaging according to exemplar 1, wherein the lid panel (6) has a keyhole panel (14) which keyhole panel (14) can be hinged out of the face of the lid panel (6) to reveal an opening giving access to the flap (8) located underneath with its attached locking lip (7).

6. A packaging according to exemplar 1, wherein the closing flap (3) is connected to the bedding (1) by a perforation line.

7. A packaging according to exemplar 1, wherein the upper side of flap (8) is connected to the lower side of the lid panel (6) in the vicinity of its hinge with the side wall (12).

8. A packaging according to exemplar 1, wherein the keyhole panel (14) is connected to the lid panel (6) by a perforation line.

Claims

1. A packaging comprising a folding carton with a closing flap (3) hingedly connected by a folding line (2) to a lid panel (6), wherein the closing flap (3) when closed is tightly embedded in the lid material (1) the upper side of which is equal to or higher than the top of the closing flap (3) and whereby the material (1) surrounding the closing flap (3) leaves a lifting zone (5) on one side of the closing flap (3), whereas the closing flap (3) has an outline whose tip (4) extends beyond a locking lip (7) positioned opposite the hinge line (2), which locking lip (7) is situated below the closing flap (3), wherein the closing flap (3) is supported at its lower end by two opposing flaps (10) which are hingedly connected to the top of side walls (12), while the flaps (10) extend beyond the contour of the closing flap (3) and are connected at their upper end to the underside of the lid panel (6) in the vicinity of the hinges with side walls (12).

2. A packaging according to claim 1, wherein the locking lip (7) is part of a flap (8) which is hingedly connected to the top of one of the side walls (12) which flap (8) is supported at the bottom by two opposite flaps (9) which are hingedly connected to the top of side walls (12), while the top of flap (8) is glued to the bottom of lid panel (6).

3. A packaging according to claim 2, wherein the lid panel (6) has a keyhole panel (14) which keyhole panel (14) can be hinged out of the face of the lid panel (6) to reveal an opening giving access to the flap (8) located underneath with its attached locking lip (7).

4. A packaging according to claim 2 or 3, wherein the upper side of the flap (8) is connected to the lower side of the lid panel (6) near its hinge with the side wall (12).

5. A packaging according to claim 3 or 4 when dependent on claim 3, wherein the keyhole panel (14) is connected to the lid panel (6) by a perforation line.

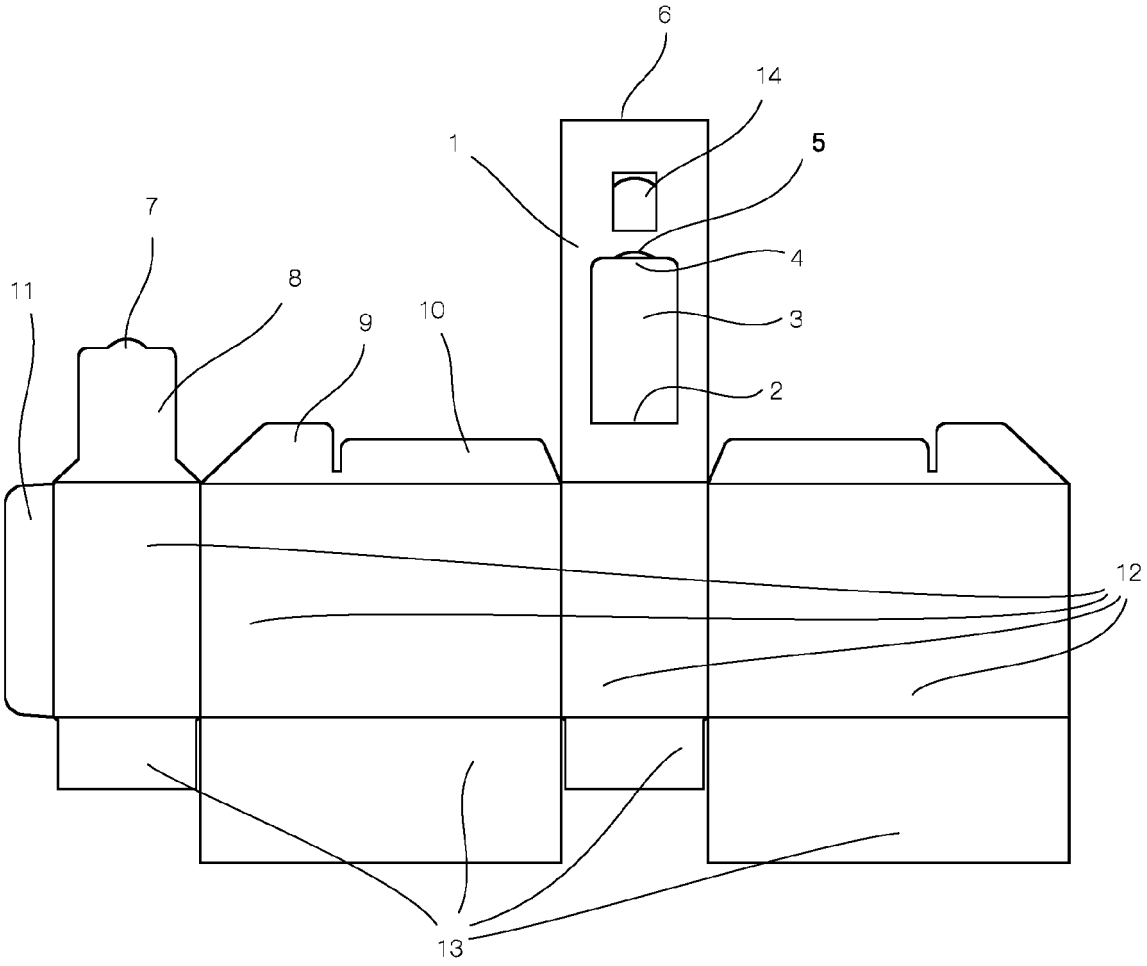

Figure 1

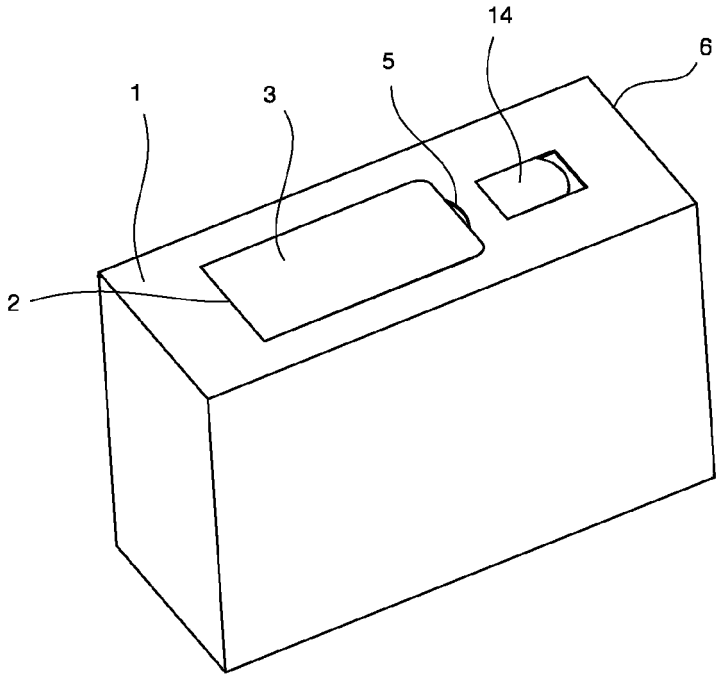

Figure 2

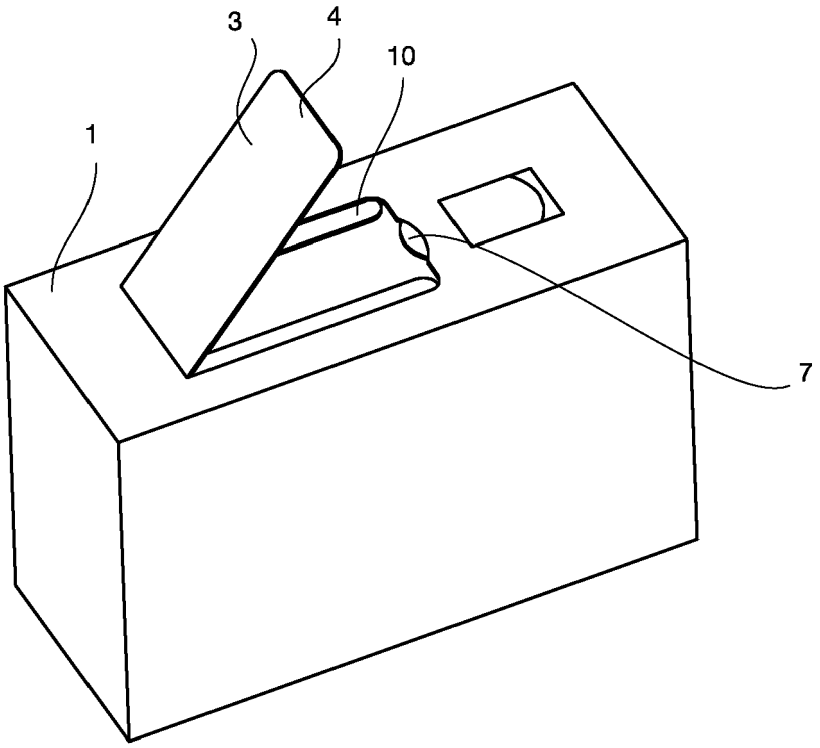

Figure 3

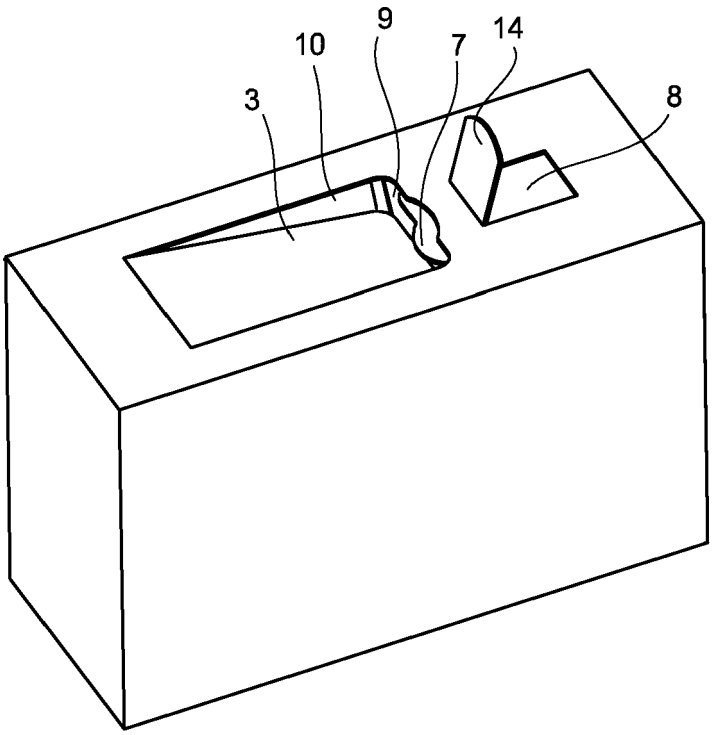

Figure 4

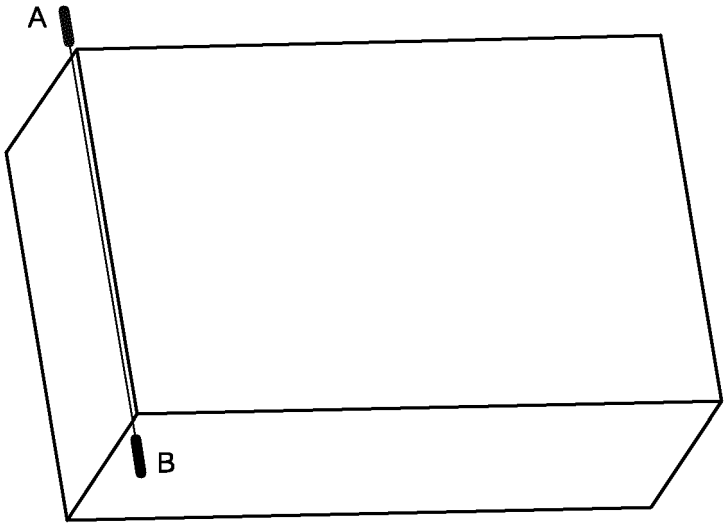

Figure 5

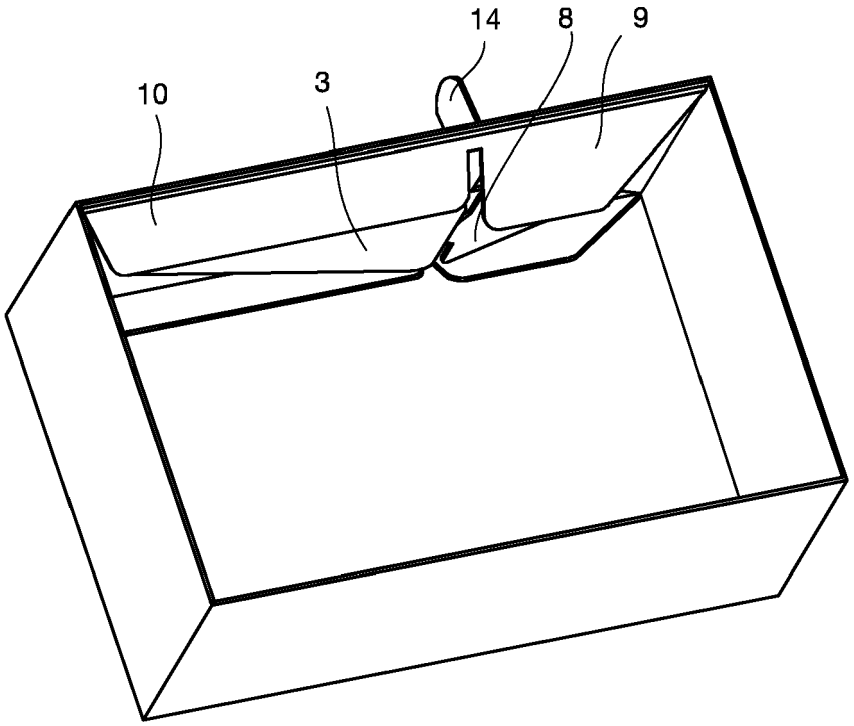

Figure 6

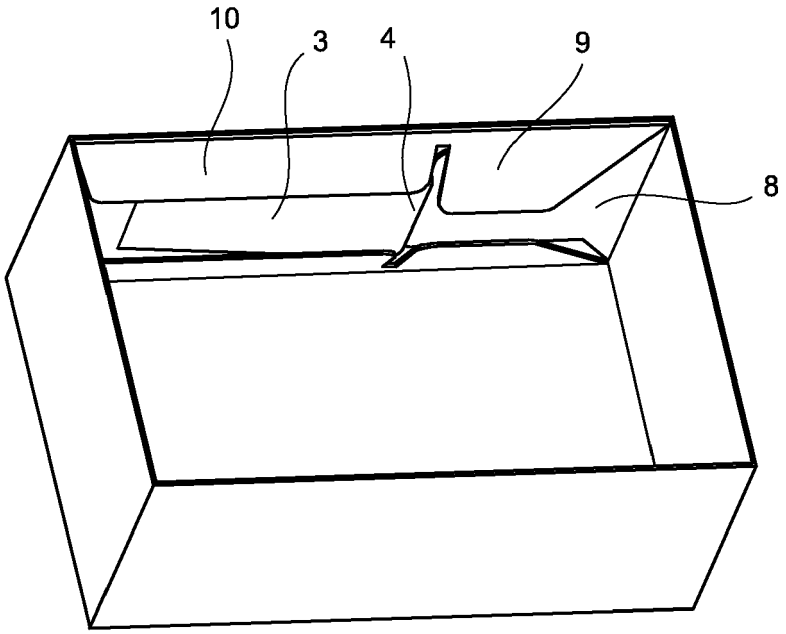

Figure 7

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EUROPEAN SEARCH REPORT

Application Number
EP 21 18 5211

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	GB 2 323 352 A (PROCTER & GAMBLE [US]) 23 September 1998 (1998-09-23) * line 8, paragraph 10 - line 36, paragraph 11; figure 8 *	1-5	INV. B65D5/70
A	WO 99/39983 A1 (PROCTER & GAMBLE [US]; CALUWE ROBERT CORNEEL JULIA MA [BE] ET AL.) 12 August 1999 (1999-08-12) * page 7, paragraph 2 - page 10, paragraph 1; figures 4-7 *	1-5	
A	US 3 372 853 A (RUMBERGER GEORGE G) 12 March 1968 (1968-03-12) * column 2, line 1 - column 3, line 12; figures 1-4 *	1-5	
A	US 3 226 007 A (ROBERT THIES ET AL) 28 December 1965 (1965-12-28) * column 5, line 51 - column 6, line 20; figures 1-6 *	1	
			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	26 November 2021	Leijten, René

CATEGORY OF CITED DOCUMENTS

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82