



(51) International Patent Classification:
B65D 5/02 (2006.01)

(21) International Application Number:
PCT/IB2014/065258

(22) International Filing Date:
13 October 2014 (13.10.2014)

(25) Filing Language: Italian

(26) Publication Language: English

(30) Priority Data:
BO2013A000566 16 October 2013 (16.10.2013) IT

(71) Applicant: **G. D S.P.A.** [IT/IT]; Via Battindarno, 91, I-40133 Bologna (IT).

(72) Inventors: **GHINI, Marco**; Via Verona, 35, I-40050 Monte San Pietro (Bologna) (IT). **BIONDI, Andrea**; Via Piave, 6, I-40133 Bologna (IT).

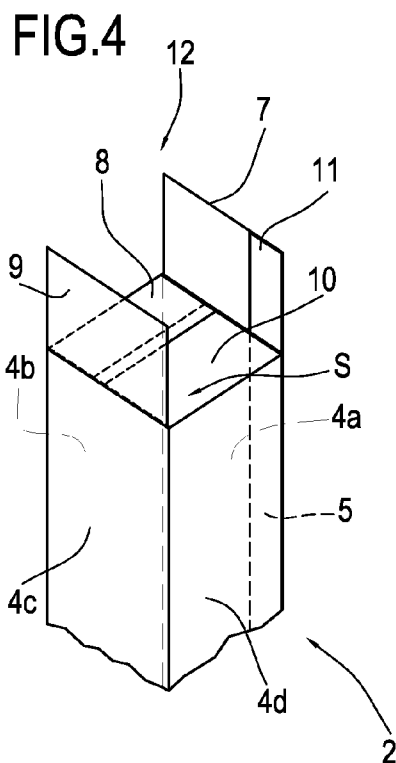
(74) Agent: **BIANCIARDI, Ezio**; Via di Corticella, 87, I-40128 Bologna (IT).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, 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, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: BOX AND METHOD FOR MAKING THE BOX



(57) Abstract: Described are a box (2) made by folding a blank (1) made of flexible material and a method for making the box; the box (2) is provided with at least one top/bottom wall (12) formed by folding one after another a plurality of tongues (7, 8, 9, 10, 11) of the blank (1); the blank (1) comprises a plurality of walls (4a, 4b, 4c, 4d, 5) adjacent to one another in pairs and separated from one another by a pre-weakened fold line (3), and a first wall (5) located at a first side end of the blank (1) is connected, inside the box (2), to an inner portion of a final wall (4a) positioned at the side end of the blank (1) opposite to the first side end; the tongues (7, 8, 9, 10, 11) relating to each top/bottom wall (12) are connected to respective end portions of the walls (4a, 4b, 4c, 4d, 5) and a tongue (11) connected to the first wall (5) being intended to adhere to a portion inside the box (2) of a tongue (7) connected to the final wall (4a); each tongue (8, 7, 9) folded after the first tongue is partly superposed on at least one further tongue (10, 8, 7) which was previously folded, with the consequent presence on top of said further tongue (10, 8, 7) of a free space (S) on which the tongue (8, 7, 9) folded onto it is not superposed, and, after all of the tongues (7, 8, 9, 10, 11) of each top/bottom wall (12) have been folded, the tongue (11) connected to the first wall (5) is contained in a free space (S).

WO 2015/056147 A1



Published:

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

DESCRIPTION

BOX AND METHOD FOR MAKING THE BOX

Technical field

This invention relates to a box and to a method for making the box.

More specifically, this invention has for an object a box made by folding a sheet or blank made of a flexible material, such as paperboard or laminated plastic, and having at least one substantially flat surface defined by folding in sequence a certain number of (preferably four) walls or tongues forming part of the blank.

Background art

10 To make boxes of the above mentioned type on automatic packaging machines, it is common practice to use blanks which have been punched and creased by the manufacturer.

A considerably more economical process of making such boxes involves cutting the blanks from a continuous strip on the packaging machines after providing the blanks with the necessary creases and pre-weakened lines.

This process may or may not involve creating swarf when the blanks are made.

20 Swarf is always the result of making specially shaped blanks used to obtain fine quality boxes but inevitably involves periodically removing the swarf from the packaging machines, with consequent costs connected not only with an operator having to actually remove the swarf itself but also with added complications in the machine to extract the swarf from the cutting line and prevent it from falling onto the floor.

25 In a blank produced without creating swarf, on the other hand, some parts of the blank, especially on the walls and tongues which will define the closed top and bottom walls of the box, and which are not cut away,

although better results would be obtained if they were, are overlapped during the process of folding to form the finished box, thereby creating irregular zones which are unusually thick or not perfectly flat. The unattractive appearance of the resulting box means that blanks of this kind are used only to make boxes whose aesthetic quality is not required to be very high.

Aim of the invention

The aim of this invention is to provide a box obtained from a blank cut off from a strip without producing swarf and a method for making the box, which are free of the above mentioned disadvantages of the prior art.

According to this invention there are provided a box and a method of making the box as set out in the accompanying claims.

Brief description of the drawings

The invention is described below with reference to the accompanying drawings, which illustrate a non-limiting embodiment of it and in which:

Figure 1 is a plan view of a blank which can be used to make the box of this invention; and

Figures 2 - 6 are five partial perspective views of the box of this invention illustrating five steps in the assembling of the top/bottom walls of the box.

Detailed description of preferred embodiments of the invention

With reference to Figure 1, the numeral 1 denotes in its entirety a blank made of a flexible material, such as paperboard or laminated plastic, and used to make a box 2 having substantially a parallelepiped shape of rectangular or square cross section, partially represented in Figures 2 to 6 showing five successive steps in the assembling thereof.

The blank 1 is rectangular in shape and is thus obtainable without swarf from a continuous strip of sheet material and is folded to form an elongate

parallelepiped shape about four pre-weakened fold lines 3 extending thereon parallel to a longitudinal direction of extension D of the blank 1 itself. The fold lines 3 define, in pairs of contiguous fold lines 3, four longitudinal side walls of the box 2 adjacent to each other in pairs, labelled 4a, 4b, 4c and 4d from the bottom up in Figure 1, and one of these fold lines 3 separates the longitudinal side wall 4d adjacent to a lateral end of the blank 1 from a narrower wall 5 situated at that lateral end and intended to be glued to the surface, inside of the blank 1, of the longitudinal side wall 4a situated at the other lateral end of the blank 1.

In the proximity of each of the mutually opposite edge zones of the blank 1, situated at the end zones of the fold lines 3 and intended to define the opposite top/bottom wall of the box 2, the blank 1 is provided with a pre-weakened fold line 6 perpendicular to the fold lines 3 themselves. Each of the fold lines 6, together with the fold lines 3 intersected thereby, defines a plurality of walls or tongues, labelled 7, 8, 9, 10 and 11, respectively, which are separated in pairs by through cuts which constitute extensions of the fold lines 3, positioned respectively adjacent to the side walls 4a, 4b, 4c and 4d and to the wall 5.

To assemble the box 2, the blank 1 is first formed into a tubular shape by folding the side walls 4a, 4b, 4c and 4d and the wall 5 about the fold lines 3 and gluing the wall 5 to the surface of the side wall 4a on the inside of the box 2 (Figure 2, which shows only one of the mutually opposite top/bottom walls 12 of the box 2 itself). In this initial situation, the tongues 7, 8, 9, 10 and 11 are co-planar with the walls 4a, 4b, 4c, 4d and 5 they are connected to, and the tongue 5 is glued to the surface of the tongue 7, inside the box 2 (but it might only be pressed against the tongue 7 and not glued thereto).

Each of the top/bottom walls 12 is then made by folding the tongue 10 (Figure 3), the tongue 8 (Figure 4), the tongue 7 and the tongue 11 glued thereto (Figure 5), and the tongue 9 (Figure 6) squarely and in sequence

towards the central zone of the top/bottom wall 12 itself, about the adjacent fold line 6 of the blank 1, and gluing the tongue 9 to the tongue 7 underneath it.

It should be noted that folding in this sequence means that the tongue 11
5 glued to the tongue 7 moves into contact with the tongue 10 beside the
tongue 8 just folded to partly cover the tongue 10 itself, that is to say, it
moves into the free space S coinciding with the zone of the tongue 8
which is not superposed on the tongue 10, and that its thickness in the
context of the top/bottom wall 12 coincides with that of the tongue 8
10 beside it and does not upset the flatness of the top/bottom wall 12 itself.
More in general, each tongue 8, 7, 9 folded after the first tongue 10 is
partly superposed on a tongue 10, 8, 7 which was previously folded, thus
creating on top of the tongue 10, 8, 7 previously folded a free space S on
which the tongue 8, 7, 9 folded after it is not superposed.

15 The other top/bottom wall 12 of the box 2 is made in exactly the same way
and at the same time as the top/bottom wall 12 whose formation has just
been described.

Lastly, it should be noted that although the box obtainable from the blank
1 described has a rectangular or square cross section, the concepts set
20 out above, which lead to the tongue 11 being contained in the free space
S, are also applicable to cases where the side walls of the blank 1 differ in
number from those considered above.

CLAIMS

1. A box made by folding a blank (1) made of flexible material, the blank (1) being obtainable with no swarf from a continuous strip of sheet material and the box (2) being provided with at least one top/bottom wall (12) formed by folding one after another a plurality of tongues (7, 8, 9, 10, 11) of the blank (1), the blank (1) comprising a plurality of walls (4a, 4b, 4c, 4d, 5) adjacent to one another in pairs and separated from one another by a pre-weakened fold line (3), and a first wall (5) of the blank (1) located at a first side end of the blank (1) being intended to be connected, inside the box (2), to an inner portion of a final wall (4a) positioned at the side end of the blank (1) opposite to the first side end; the tongues (7, 8, 9, 10, 11) of the blank (1) relating to each top/bottom wall (12) of the box (2) being connected to respective end portions of the walls (4a, 4b, 4c, 4d, 5) adjacent to one another in pairs and a tongue (11) connected to the first wall (5) being intended to adhere to a portion inside the box (2) of a tongue (7) connected to the final wall (4a); characterized in that each tongue (8, 7, 9) folded after the first tongue (10) is partly superposed on at least one further tongue (10, 8, 7) which was previously folded, with the consequent presence on top of said further tongue (10, 8, 7) of a free space (S) on which the tongue (8, 7, 9) folded onto it is not superposed, and in that, after all of the tongues (7, 8, 9, 10, 11) of each top/bottom wall (12) have been folded, the tongue (11) connected to the first wall (5) is contained in said free space (S).

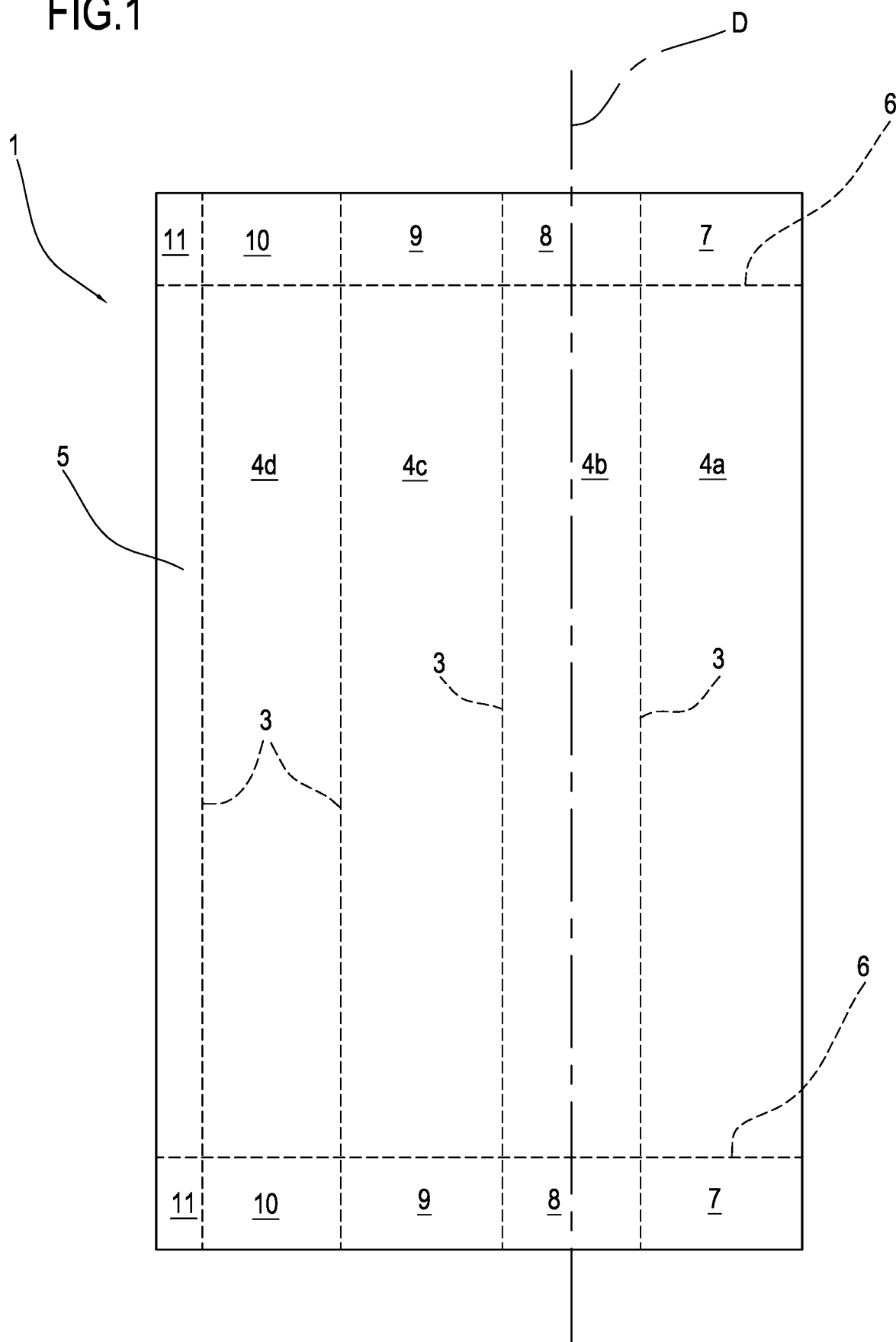
2. The box according to claim 1, wherein the blank (1) comprises four side walls (4a, 4b, 4c, 4d) which are adjacent to one another in pairs and a wall (5) with smaller width which is connected to a side wall (4d) adjacent to a side end of the blank (1); the walls (4a, 4b, 4c, 4d, 5) being separated from one another by a pre-weakened fold line (3), and the wall (5) with smaller width being designed to be glued to the surface inside the

blank (1) of the side wall (4a) located at the other side end of the blank (1).

3. A method for making, using a blank (1) made of flexible material and obtainable with no swarf from a continuous strip of sheet material, a box
5 provided with at least one top/bottom wall (12) formed by folding one after another a plurality of tongues (7, 8, 9, 10, 11) of the blank (1); the tongues (7, 8, 9, 10, 11) of the blank (1) relating to each top/bottom wall (12) of the box (2) being connected to respective end portions of a plurality of walls (4a, 4b, 4c, 4d, 5) of the blank (1) which are adjacent to one another in
10 pairs and separated from one another by a pre-weakened fold line (3), a first wall (5) of the blank (1) located at a first side end of the blank (1) being connected inside the box (2) to an inner portion of a final wall (4a) positioned at the side end of the blank (1) opposite to the first side end, and a tongue (11) connected to the first wall (5) adhering to a portion
15 inside the box (2) of a tongue (7) connected to the final wall (4a); characterized in that, after the folding of a first tongue (10), each tongue (8, 7, 9) which is subsequently folded is partly superposed on a further tongue (10, 8, 7) which was previously folded, with the consequent presence on top of said further tongue (10, 8, 7) of a free space (S) on
20 which the tongue (8, 7, 9) folded onto it is not superposed; the tongue (11) connected to the first wall (5) being housed in said free space (S).

1/2

FIG.1



2/2

FIG.2

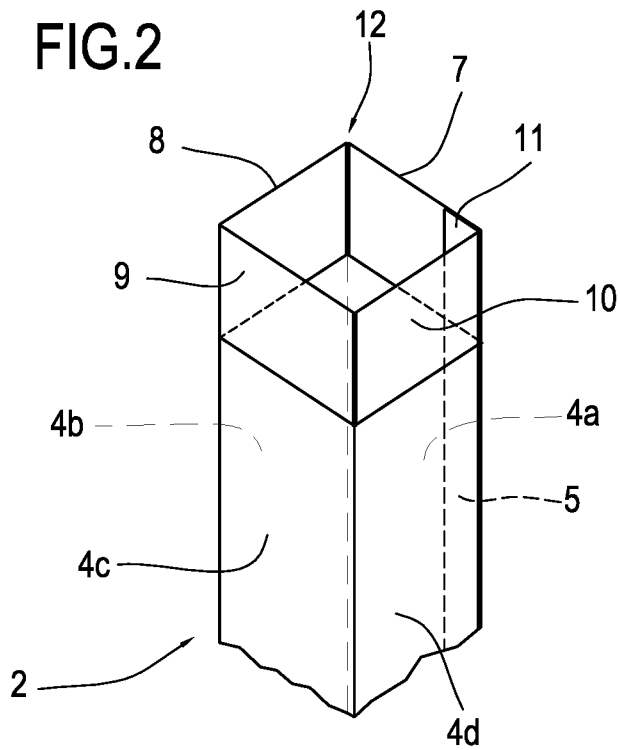


FIG.3

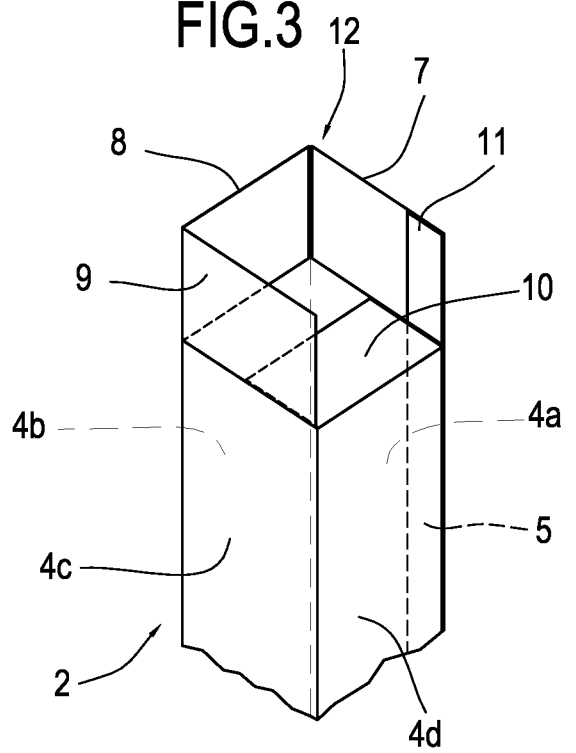


FIG.4

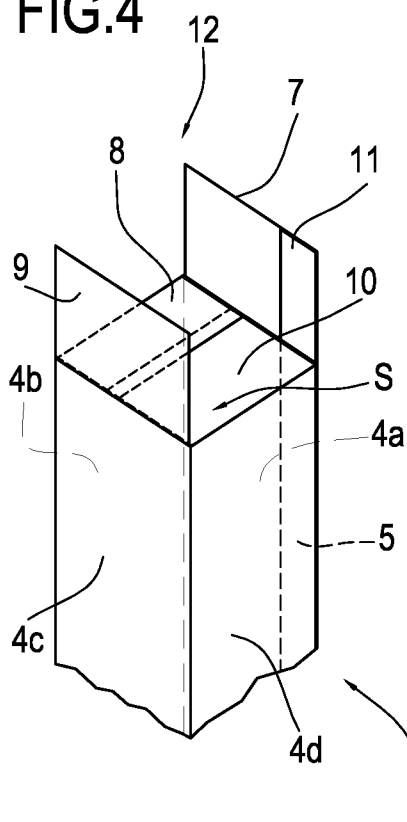


FIG.5

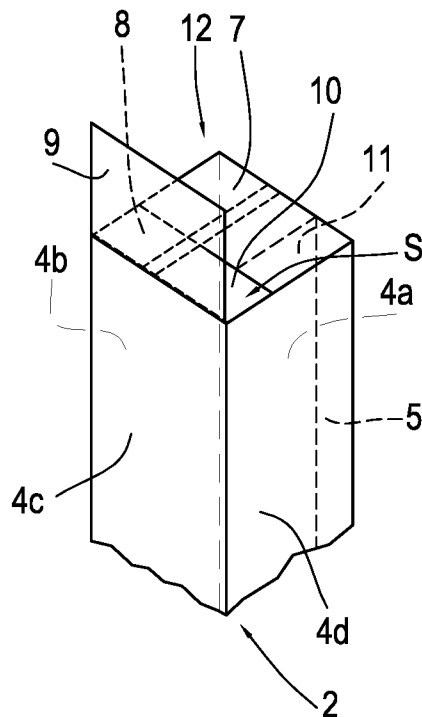
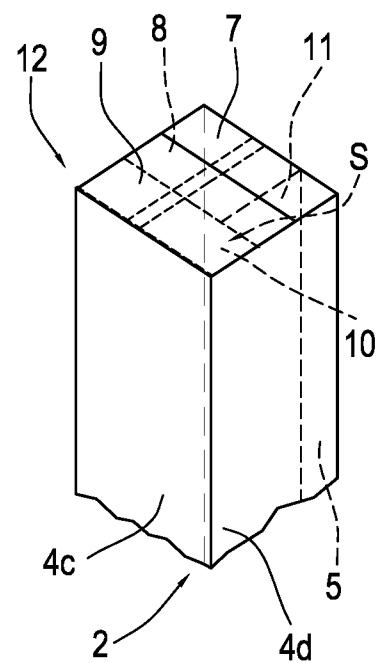


FIG.6



INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2014/065258

A. CLASSIFICATION OF SUBJECT MATTER INV. B65D5/02 ADD.		
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) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 140 178 A (ALBERT WESSELMAN) 13 December 1938 (1938-12-13) page 1, right-hand column, line 28 - page 2, line 52, paragraph r; figures 1,2 -----	1-3
X	US 5 148 970 A (JOHNSTON ALAN [US]) 22 September 1992 (1992-09-22) column 2, line 26 - column 4, line 51; claim 1; figures 1-5 -----	1-3
A	US 3 397 832 A (THIELE EDWARD G) 20 August 1968 (1968-08-20) column 2, line 14 - column 3, line 15; claim 1; figures 1-4 -----	1-3
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 12 January 2015	Date of mailing of the international search report 20/01/2015	
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Janosch, Joachim	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2014/065258

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2140178	A	13-12-1938	NONE	
US 5148970	A	22-09-1992	NONE	
US 3397832	A	20-08-1968	NONE	