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(54) **FOOD CONTAINER AND CORRESPONDING MANUFACTURING METHOD**

(57) A tray container (1) comprises a bottom wall (2; 102) and a plurality of side walls (3, 4; 103) connected to each other and to the bottom wall (2; 1022) to form a containment cavity (6; 106) and a perimeter flange (5; 105), connected to the side walls (3, 4; 103) and configured to be coupled with a covering element (10); the container (1) is made by folding and forming a respective blank (50; 150; 250) comprising a base portion (52; 152; 252) and a plurality of main panels (53, 54; 153; 253), suitable to form respectively the bottom wall (2; 102) and the side walls (3, 4; 103) of the container (1), and a plurality of minor panels (55, 56; 155; 255) suitable to form the perimeter flange (5; 105) of the container (1); the blank (50; 150; 250) comprises a plurality of fixing tabs (57; 157; 257) connected to first end portions (55a; 155a; 255a) of the minor panels (55; 155; 255) and configured to be folded along shaping lines (67; 167; 267) and be fixed to lower faces (56b; 155c) of respective second end portions (56a; 155b; 255b) of adjacent minor panels (56; 155; 255) so as to create angular portions (15; 115) of the perimeter flange (5; 105); each fixing tab (57; 157; 257) is folded and shaped at the respective shaping line (67; 167; 267) so as to form a step (60) having a height (h) substantially equal to a thickness (s) of the blank (50; 150; 250) so that the first and second end portion (55a, 56a; 155a, 155b; 255a, 255b) of the minor panels (54, 55; 155; 255) are substantially coplanar.

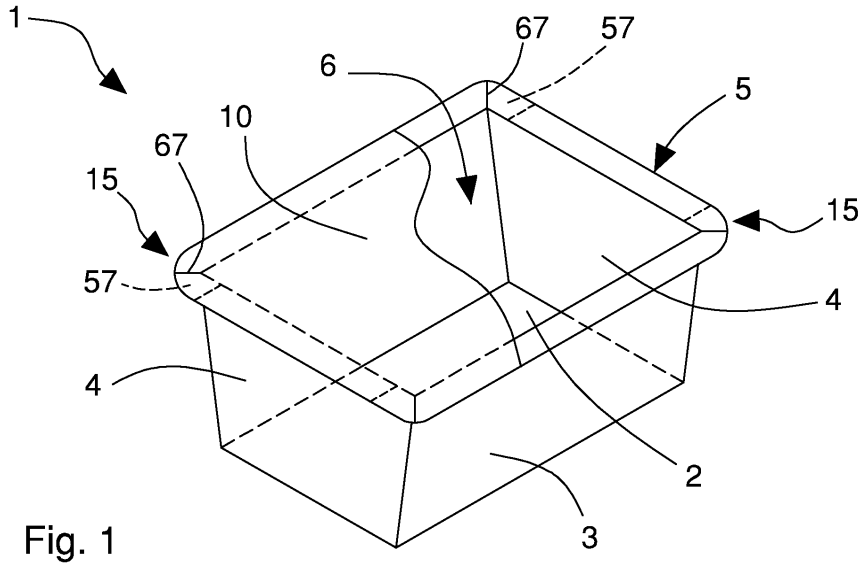

Fig. 1

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Description

[0001] The invention relates to containers for food products made by folding and forming respective blanks of paper, cardboard, plastic material, etc. In particular, the invention refers to a tray container intended to receive food products to be packaged therein and to be closed by a lid or by a film. The invention also relates to a method for making the aforesaid container.

[0002] Tray containers consisting of a bottom wall, typically quadrangular in shape, a plurality of side walls connected to the bottom wall and a flange or perimeter edge connected to the side walls are known and widely used in the food product packaging sector. The bottom wall and the side walls define a containment compartment or cavity of the container. The perimeter flange, outwardly projecting with respect to the containment cavity, forms a flat annular portion, substantially parallel to the bottom wall, on the upper surface of which a covering element is fixed, generally airtightly, consisting for example of a lid or a film made of plastic, so as to hermetically close the cavity after insertion of the content.

[0003] The aforesaid containers are made by folding and forming or erecting respective blanks of paper, cardboard, plastic material, multilayer mixed material, etc. which comprise a base portion and a plurality of main panels that make up the bottom walls and the side walls and a plurality of minor panels that make up the perimeter flange.

[0004] To fix the minor panels together and form the flange or perimeter edge, when the container is erected, the blank also comprises a plurality of fixing tabs or fins. The latter are generally made as extensions of end portions of the minor panels and are configured to be suitably folded and then fixed, for example by gluing or welding, to a lower face of an adjacent minor panel, so as to form a respective angle of the perimeter flange. Therefore at each corner of the perimeter flange an end portion of a minor panel (the relative fixing tab) is arranged and fixed under the end portion of the adjacent minor panel. However, this connection determines on the upper surface of the perimeter flange, at each corner thereof, a relief or step having a height almost equal to the thickness of the blank material.

[0005] This relief, especially in the event that the blank has a conspicuous thickness, may compromise the correct fixing of the covering element.

[0006] As is known, in fact, especially in the case of thermal welds or ultrasonic welds, in order to hermetically fix, airtightly, the covering element to the perimeter flange of the container it is necessary for the upper (connecting) surface of the flange to be as flat and uniform as possible and free of steps and reliefs.

[0007] To overcome this drawback, it is known to compress and press the perimeter flange at the corners thereof so as to reduce the thickness of the material of the two overlapping portions of the minor panels. However, this solution is effective in the case where the blank is made of compressible material, for example corrugated cardboard, and is less effective in the case of materials with small thickness and/or being poorly compressible, such as cardstock, heavy paper, multilayer plastic materials.

[0008] An object of the invention is to improve tray containers for food products of known type made by folding and forming respective blanks of paper, cardboard, plastic material.

[0009] Another object is to make a tray container for food products obtained by folding and forming a blank that has an almost flat perimeter flange or edge, in particular having no steps or reliefs at the corners, so as to allow an optimal fixing of a covering element to the perimeter flange.

[0010] A further object is to provide a method for making a tray container for food products provided with an almost flat flange or perimeter edge, in particular having no steps or reliefs at the corners, by folding and erecting a blank of paper, cardboard, plastic material.

[0011] In a first aspect of the invention, a container for food products according to claim 1 is provided.

[0012] In a second aspect of the invention, a method for making a container for food products according to claim 10 is provided.

[0013] The invention can be better understood and implemented with reference to the attached drawings which illustrate some exemplifying and non-limiting embodiments thereof, in which:

- figure 1 is a perspective view of the tray container of the invention;
- figure 2 is a plan view of a blank from which the container of figure 1 is made;
- figure 3 is a partial enlarged view from below of the container of figure 1, illustrating in particular an angle of a perimeter flange provided with a fixing tab;
- figure 4 is a partially sectioned side view of the container of figure 1;
- figure 5 is an enlarged detail of figure 4 illustrating in particular an angle of the perimeter flange;
- figure 6 is a perspective view of another embodiment of the tray container of the invention having a triangular plan shape;
- figure 7 is a plan view of a respective blank from which the container of figure 6 is made;
- figure 8 is a partial and enlarged section of a corner of the perimeter flange of the container of figure 6;
- figure 9 is a plan view of a blank with which to make a further embodiment of the tray container of the invention having an octagonal plan shape.

[0014] Referring to figures 1 to 5, there is illustrated a tray-type container 1 for food products comprising a bottom wall 2 and a plurality of side walls 3, 4 connected to each other and to the bottom wall 2 to form a containment cavity 6. The container 1 also comprises a perimeter flange, or edge, 5 connected to the side walls 3, 4

and outwardly projecting with respect to the cavity 6. The perimeter flange 5 is configured to be coupled with a covering element 10, for example a lid or a plastic film, for closing the cavity 6.

[0015] The perimeter flange 5 is substantially parallel to the bottom wall 2.

[0016] The container 1 is obtained by folding and forming a respective blank 50 made by punching and creasing a sheet of material of constant thickness s, for example of paper, cardstock, cardboard, single or multilayer plastics, etc.

[0017] The blank 50 comprises a base portion 52 and a plurality of main panels 53, 54 connected to the base portion 52 and suitable to form respectively the bottom wall 2 and the side walls 3, 4 of the container 1 and a plurality of minor panels 55, 56, connected to respective main panels 53, 54 and suitable to form the perimeter flange 5 of the aforesaid container 1.

[0018] The blank 50 further comprises a plurality of fixing tabs 57 connected to, extending from, first end portions 55a of defined minor panels 55 and configured to be folded along respective shaping lines 67 and then fixed to lower faces 56b of respective second end portions 56a, having no fixing tabs 57, of adjacent minor panels 56 so as to create angular portions 15 of the perimeter flange 5.

[0019] In particular, each fixing tab 57 is folded and shaped at the respective shaping line 67 so as to form a step 60 having a height h substantially equal to a thickness s of the blank 50 so that the first and second end portion 55a, 56a of the minor panels 54, 55 are substantially coplanar when they are joined by the respective fixing tab 57 in the container 1 formed or erected. More precisely, and with particular reference to figure 5, each fixing tab 57 is folded and shaped at the respective shaping line 67 so as to be parallel to the minor panel 55 to which it is connected, but offset with respect to the latter, i.e. lowered towards the bottom wall 2 by the height h in order to receive and be fixed to the end portion 56a (without tab) of the adjacent minor panel 56 which in this way is almost coplanar with the minor panel 55 provided with the aforesaid fixing tab 57.

[0020] With particular reference to figure 2, the main panels 53, 54 of the blank 50 are connected to the base portion 52 at and along main folding lines 63, 64 and the minor panels 55, 56 are connected to the respective main panels 53, 54 at and along minor folding lines 65, 66. The folding lines 63-66 are made on the blank 50 in a known manner by creasing.

[0021] In the embodiment illustrated in the figures, the blank 50 comprises a base portion 52 having a quadrangular shape, four main panels 53, 54 and four minor panels 55, 56. More precisely, the blank 50 includes two first main panels 53 of greater extension connected to respective sides of greater extension of the base portion 52 and two second main panels 54 of smaller extension connected to respective sides of smaller extension of the base portion 52.

[0022] The blank 50 also includes two first minor panels 55 of greater extension connected to the respective first main panels 53 and two second minor panels 56 of smaller extension connected to the respective second main panels 54.

[0023] In this embodiment, the fixing tabs 57 are connected to both end portions 55a of two opposite minor panels 55, for example the first minor panels 55 of greater extension.

[0024] When the container 1 is being formed, the fixing tabs 57 are fixed to the lower faces 56b of the respective end portions 56a of minor panels 56, in particular the second minor panels 56 of smaller extension, by welding or gluing. In particular, the welding can be of the heat or ultrasonic type, depending on the composition of the material with which the blank 50 is made.

[0025] Thanks to the fixing tabs 57 of the blank 50, suitably folded and shaped at the respective shaping lines 67 to form a step 60, it is therefore possible to make a tray container 1 provided with an almost flat and flat peripheral flange or edge 5, in particular having no reliefs and projections on the upper surface of said flange, at the corners 15, which allows to optimally fix a covering element 10. More precisely, since at the corners 15 of the perimeter flange 5 the end portions 55a, 56b of two adjacent minor flanges 55, 56 which are joined by a respective fixing tab 57, are almost coplanar, the upper surface of the flange 5 is flat and planar and it is therefore possible to easily and effectively weld a covering element 10 to it so as to hermetically close the containment cavity 6, once the food product to be packaged has been introduced.

[0026] It is evident that the container 1 of the invention may comprise a bottom wall 2; 102 having any polygonal (convex) shape and having a number of sides greater than two and an equal number of side walls 3, 4, 103. The relative blank 50; 150; 250 thus comprises a base panel 52; 152; 252 having the same shape and the same number of sides of the bottom wall 2; 102 and the same number of main panels 53, 54; 153; 253 and of minor panels 55, 56; 155; 255.

[0027] It is also provided that said blank 50; 150; 250 comprises a number of fixing tabs 57; 157; 257 equal to the number of the sides of the base portion 52; 152; 252 and that each fixing tab 157; 257 is connected to a first end portion 155a; 255a of a respective minor panel 155; 255 and fixed to the lower face 155c of a second end portion 155b; 255b of an adjacent minor panel 155; 255.

[0028] By way of example, figure 6 illustrates an embodiment of the container 1 of the invention comprising a bottom portion 102 having a triangular shape (for example of an equilateral triangle) and three side walls 103, equal and connected to each other and to the bottom wall 102 to form a containment cavity 106 and a perimeter flange 105 connected to the side walls 103, outwardly projecting with respect to the cavity 106 and configured to be coupled with a covering element 10.

[0029] This container 1 is obtained by folding and

forming a respective blank 150 comprising, with reference to figure 7, a base portion 152 of triangular shape and three main panels 153 suitable to form respectively the bottom wall 102 and the side walls 103 of the container 1 and three minor panels 155 suitable to form the perimeter flange 105 of the container 1.

[0030] The blank 150 further comprises three fixing tabs 157 which are connected to, extending from, first end portions 155a of the minor panels 155 and are configured to be folded along respective shaping lines 167 and be fixed to lower faces 155c of respective second end portions 155b, having no fixing tabs 157, of adjacent minor panels 155 so as to create angular portions 115 of the perimeter flange 105 (figure 8). In particular, also in this case each fixing tab 157 is folded and shaped at the respective shaping line 167 so as to form a step 60 having a height h substantially equal to a thickness s of the blank 150 so that the first and second end portion 155a, 155b of the minor panels 155 which are joined by the respective fixing tab 157 are substantially coplanar.

[0031] With reference to figure 9, there is illustrated another embodiment of the container 1 of the invention obtained by folding and forming a respective blank 250 comprising a base portion 252 of octagonal shape and eight main panels 253 suitable to form respectively a bottom wall and side walls of the container 1 and eight minor panels 255 suitable to form the perimeter flange of the container 1.

[0032] In particular, the container 1, when formed and erected, comprises a bottom portion having an octagonal shape and eight side walls, equal and connected to each other and to the bottom wall to form a containment cavity and a perimeter flange connected to the side walls, outwardly projecting with respect to the cavity and configured to be coupled with a covering element.

[0033] The blank 250 comprises eight fixing tabs 257 which are connected to, extend from, first end portions 255a of the minor panels 255 and are configured to be folded along respective shaping lines 267 and be fixed to lower faces of respective second end portions 255b, having no fixing tabs 257, of adjacent minor panels 255 so as to create the angular portions of the perimeter flange. In particular, also in this case each fixing tab 257 is folded and shaped at the respective shaping line 267 so as to form a step having a height substantially equal to a thickness of the blank 250 so that the first and second end portion 255a, 255b of the minor panels 255 which are joined by the respective fixing tab 257 are substantially coplanar. The invention also relates to a method for making the container 1 described above, for example the container of figures 1-5, which comprises a bottom wall 2 and a plurality of side walls 3, 4 connected to each other and to the bottom wall 2 to form a containment cavity 6, and a perimeter flange or edge 5, connected to the side walls 3, 4 and outwardly projecting with respect to the cavity 6. The method comprises the steps of:

- punching and creasing a sheet of material, in particular of paper, cardstock, cardboard, single or multilayer plastic, in order to make a blank 50 comprising:
  - a base portion 52 and a plurality of main panels 53, 54, connected to the base portion 52 at main folding lines 63, 64, the base portion 52 and the main panels 53, 54 being suitable to make respectively the bottom wall 2 and the side walls 3, 4 of the container 1;
  - a plurality of minor panels 55, 56 connected to respective main panels 53, 54 at minor folding lines 65, 65 and suitable to make the perimeter flange 5 of the container 1; and
  - a plurality of fixing tabs 57 extending from first end portions 55a of established minor panels 55 and connected to the latter at respective shaping lines 67;
- folding and shaping each fixing tab 57 at the respective shaping line 67 so as to form a step 60 having a height h substantially equal to a thickness s of the blank 50;
- forming the blank 50 by folding the main and minor panels 53, 54, 55, 56 along the respective folding lines 63, 64, 65, 66 and folding the fixing tabs along the respective shaping lines 67 so as to abut lower faces 56b of second end portions 56a having no fixing tabs 57 of adjacent minor panels 56 so as to make angular portions 15 of the perimeter flange 5 in which the first and second end portions 55a, 56a of the minor panels 54, 55, joined by the fixing tab 57, are substantially coplanar.

[0034] The method further comprises, after folding the fixing tabs 57 so as to abut the bottom faces 56b of the second end portions 56a, fixing the fixing tabs 57 to the second end portions 56a by welding, for example heat welding or ultrasonic welding based on the type and composition of the material of the blank 50.

[0035] Alternatively, the method comprises, before folding the fixing tabs 57 so as to abut the bottom faces 56b of the second end portions 56a, applying an adhesive to the fixing tabs 57 and/or to the second end portions 56a.

[0036] Thanks to the method of the invention, it is therefore possible to create a tray container for food products provided with an almost flat flange or perimeter edge, in particular having a flat upper surface having no reliefs at the corners, by folding and erecting a blank 50, 150, 250 of paper, cardboard, plastic material.

Claims

1. Container (1) for food products comprising at least a bottom wall (2; 102) and a plurality of side walls (3, 4; 103) connected to each other and to said bottom wall (2; 102) to form at least one containment cavity (6;

106), and a perimeter flange (5; 105), connected to said side walls (3, 4; 103), outwardly projecting with respect to said at least one cavity (6; 106) and configured to be coupled with a covering element (10) suitable for closing said at least one cavity (6; 106), said container (1) being obtained by folding and forming a respective blank (50; 150; 250) that comprises at least one base portion (52; 152; 252) and a plurality of main panels (53, 54; 153; 253) suitable to form respectively said at least one bottom wall (2; 102) and said side walls (3, 4; 103) of said container (1) and a plurality of minor panels (55, 56; 155; 255) suitable to form said perimeter flange (5; 105) of said container (1), said blank (50; 150; 250) further comprising a plurality of fixing tabs (57; 157; 257) connected to, extending from, first end portions (55a; 155a; 255a) of said minor panels (55; 155; 255) and configured to be folded along respective shaping lines (67; 167; 267) and to be fixed to lower faces (56b; 155c) of respective second end portions (56a; 155b) having no fixing tabs (57; 157; 257) of adjacent minor panels (56; 155; 255) so as to create angular portions (15; 115) of said perimeter flange (5; 105), wherein each fixing tab (57; 157) is folded and shaped at the respective shaping line (67; 167; 267) so as to form a step (60) having a height (h) substantially equal to a thickness (s) of said blank (50; 150; 250) so that said first and second end portions (55a, 56a; 155a, 155b; 255a, 255b) of said minor panels (55, 56; 155; 255), which are joined by the respective fixing tab (57; 157; 257), are substantially coplanar.

2. Container (1) according to claim 1, wherein said perimeter flange (5; 105) is substantially parallel to said bottom wall (2; 102).

3. Container (1) according to claim 1 or 2, wherein said main panels (53, 54; 153; 253) are connected to said base portion (52; 152; 252) at main folding lines (63, 64; 163; 263) and said minor panels (55, 56; 155; 265) are connected to respective main panels (53, 54; 153; 253) at minor folding lines (65, 66; 165; 265).

4. Container (1) according to any preceding claim, wherein said at least one bottom wall (2) has a quadrangular shape and said blank (50) comprises a base portion (52), having a corresponding quadrangular shape, four main panels (53, 54) and four minor panels (55, 56).

5. Container (1) according to claim 4, wherein said blank (50) comprises two first main panels (53) of greater extension that are connected to respective sides of greater extension of said base portion (52) and two second main panels (54) of smaller extension connected to respective sides of smaller extension of said base portion (52).

6. Container (1) according to claim 5, wherein said blank (50) includes two first minor panels (55) of greater extension connected to respective first main panels (53) and two second minor panels (56) of smaller extension connected to respective second main panels (54).

7. Container (1) according to any preceding claim, wherein said fixing tabs (57) are connected to both end portions (55a) of two opposite minor panels (55).

8. Container (1) according to claim 6, wherein said fixing tabs (57) are connected to both end portions (55a) of the two first minor panels (55).

9. Container (1) according to any of claims 1 to 4, wherein said at least one bottom wall (2; 102; 202) has a polygonal shape having a number of sides greater than two and an equal number of side walls (3, 4; 103) and said corresponding blank (50; 150; 250) comprises a base portion (52; 152; 252) having the same polygonal shape, with the same number of sides and the same number of main panels (53, 54; 153; 253) and of minor panels (55, 56; 155; 255).

10. Container (1) according to claim 9, wherein said blank (50; 150; 250) comprises a number of fixing tabs (57; 157; 257) equal to the number of sides of said base portion (52; 152; 252), each fixing tab (157; 257) being connected to a first end portion (155a; 255a) of a respective minor panel (155; 255) and fixed to the lower face (155c) of a second end portion (155b; 255b) of an adjacent minor panel (155; 255).

11. Container (1) according to any preceding claim, wherein said fixing tabs (57; 155; 255) are fixed to lower faces (56b; 155c) of respective end portions (56a; 155b; 255b) of minor panels (56; 155; 255) by welding or gluing.

12. Method for making a container (1) for food products comprising at least one bottom wall (2; 102) and a plurality of side walls (3, 4; 103), connected to each other and to said at least one bottom wall (2; 102) to form at least one containment cavity (6; 106) and a perimeter flange (5; 105), connected to said side walls (3, 4; 103) and outwardly projecting with respect to said at least one cavity (6; 106), said method comprising the steps of:

- punching and creasing a sheet of material in order to make a blank (50; 150; 250) comprising:

  - at least one base portion (52; 152; 252) and a plurality of main panels (53, 54; 153; 253) connected to said base portion (52; 152; 252) at main folding lines (63, 64; 163; 263), said base portion (52; 152; 252) and

said main panels (53, 54; 153; 253) being suitable to make respectively said bottom wall (2; 102) and said side walls (3, 4; 103) of said container (1);

- a plurality of minor panels (55, 56; 155; 255) connected to respective main panels (53, 54; 153; 253) at minor folding lines (65, 66; 165; 265) and suitable to make said perimeter flange (5; 105) of said container (1); and
- a plurality of fixing tabs (57; 155; 257) extending from first end portions (55a; 155a; 255a) of minor panels (55; 155; 255) and connected to the latter ones at respective shaping lines (67; 167; 267);

- folding and shaping each fixing tab (57; 155; 257) at the respective shaping line (67; 167; 267) so as to form a step (60) having a height (h) substantially equal to a thickness (s) of said blank (50; 150; 250);
- erecting said blank (50; 150; 250) by folding said main and minor panels (53, 54, 55, 56; 153, 155; 253, 255) along the respective folding lines (63, 64, 65, 66; 163, 165; 263, 265) and folding said fixing tabs (57; 155; 257) along the respective shaping lines (67; 167; 267) so as to abut lower faces (56b; 155c) of second end portions (56a; 155b; 255b), having no fixing tabs (57; 155; 257), of adjacent minor panels (56; 155; 255) so as to make angular portions (15; 115) of said perimeter flange (5; 105) in which said first and second end portions (55a, 56a; 155a, 155b; 255a, 255b) of said minor panels (54, 55; 155; 255), joined by the respective fixing tab (57; 155; 257), are substantially coplanar.

13. Method according to claim 12, comprising after folding said fixing tabs (57; 155; 257) so as to abut said lower faces (56b; 155c) of second end portions (56a; 155b; 255b), fixing said fixing tabs (57; 157; 257) to said second end portions (56a; 155b; 255b) by welding.

14. Method according to claim 12, comprising before folding said fixing tabs (57; 155; 257) so as to abut said lower faces (56b; 155c) of second end portions (56a; 155b; 255b), applying an adhesive to said fixing tabs (57; 155; 257) and/or to said second end portions (56a; 155b; 255b).

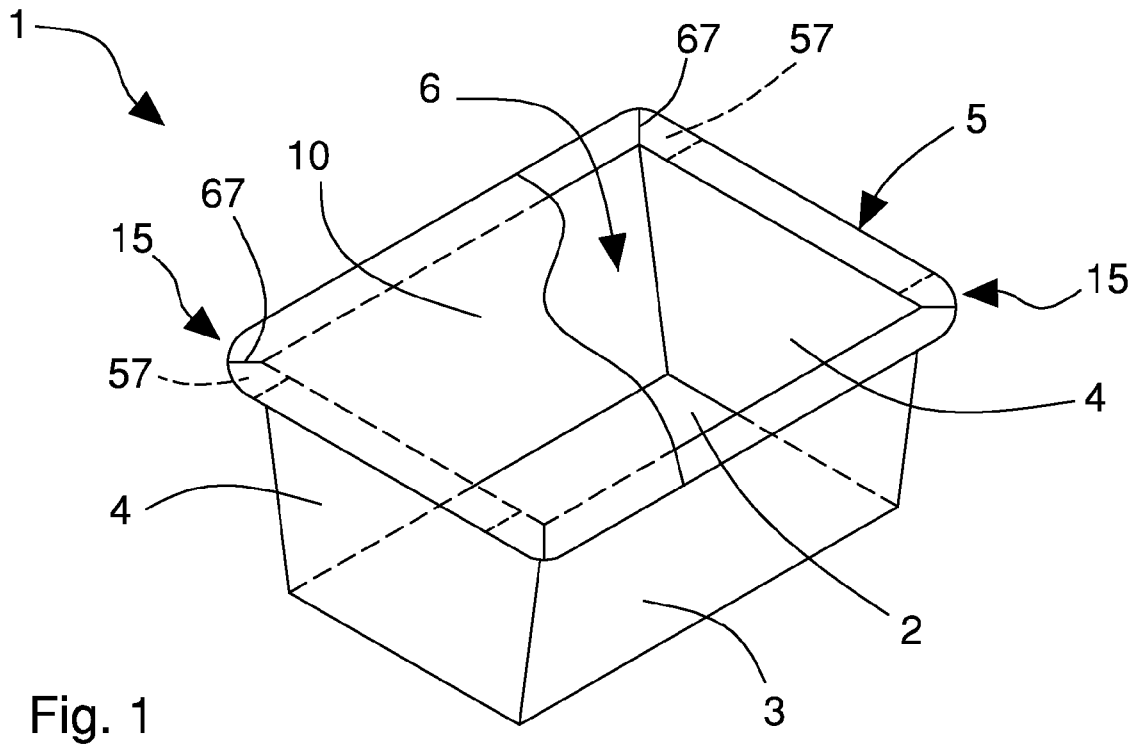
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Fig. 1

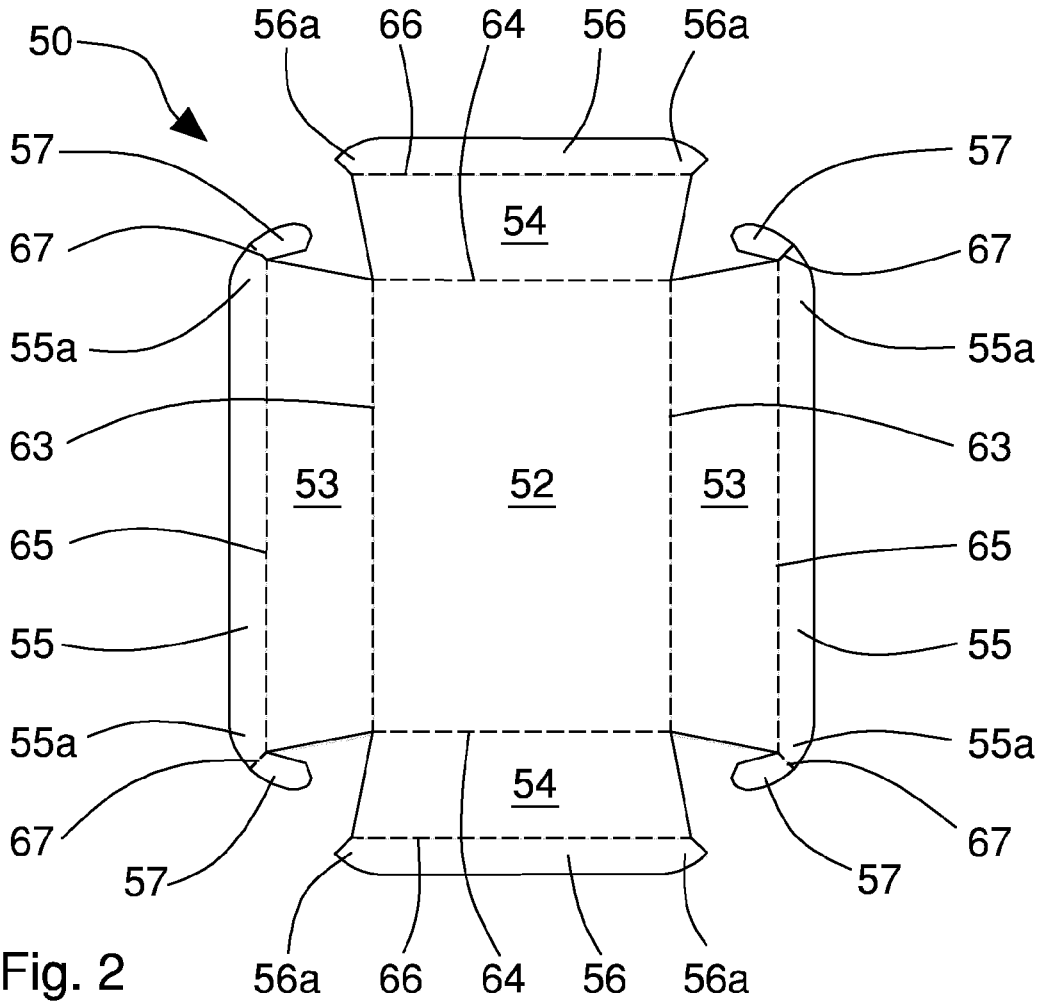
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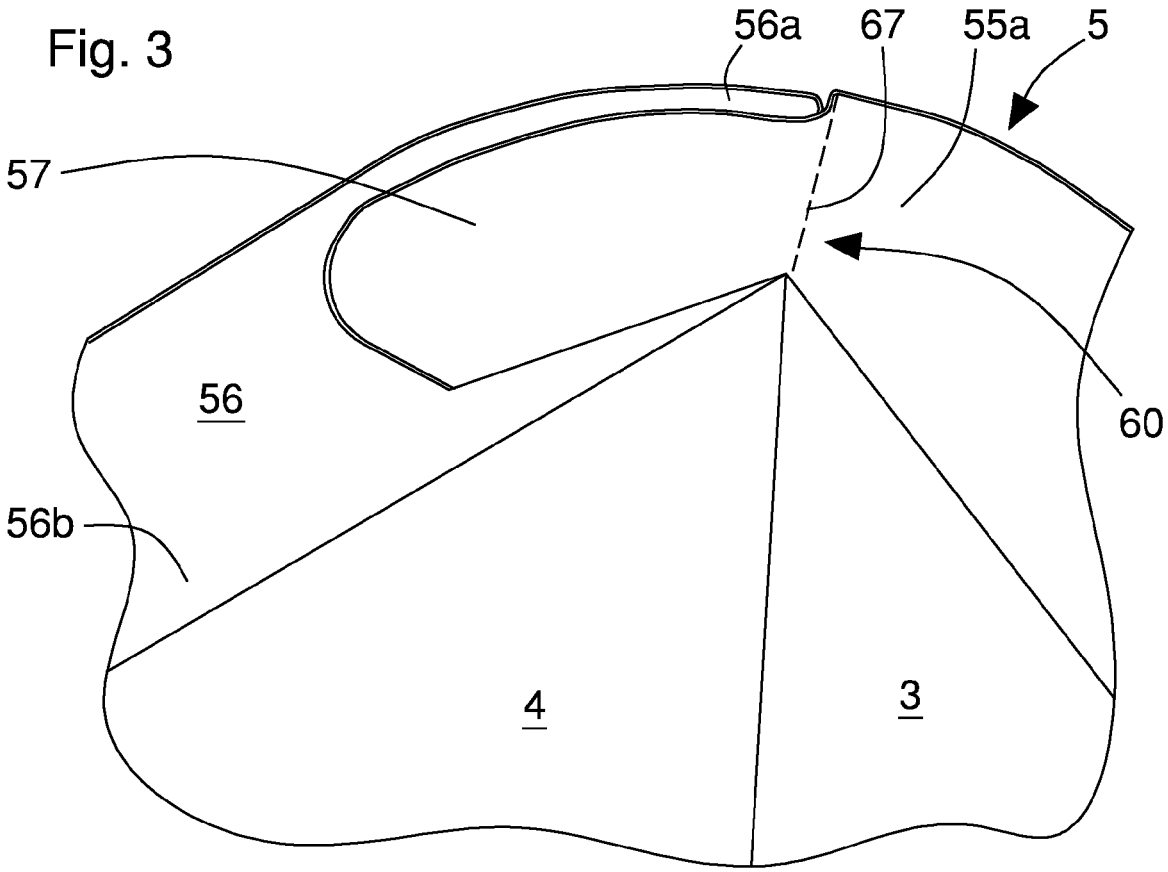
Fig. 2

Fig. 3



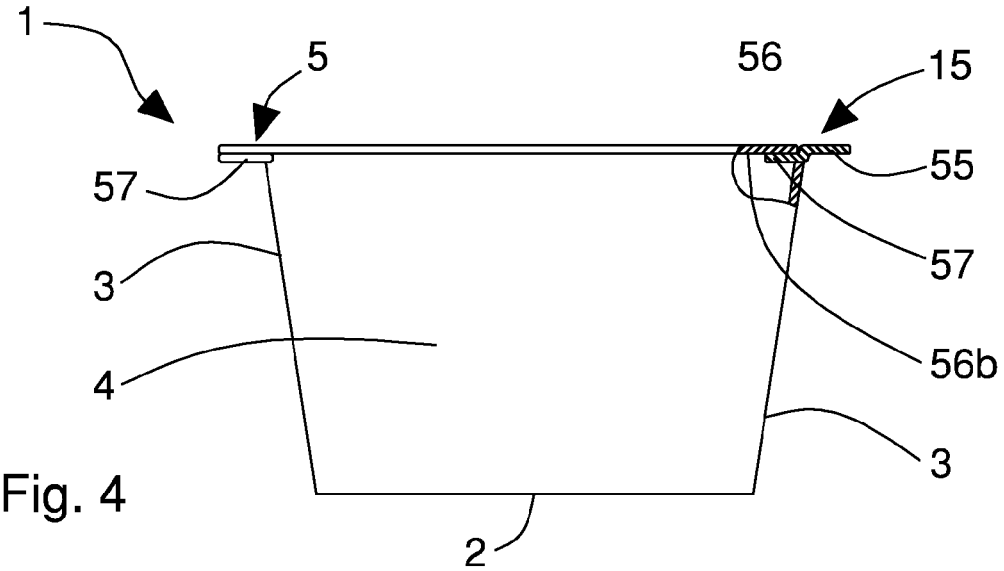


Fig. 4

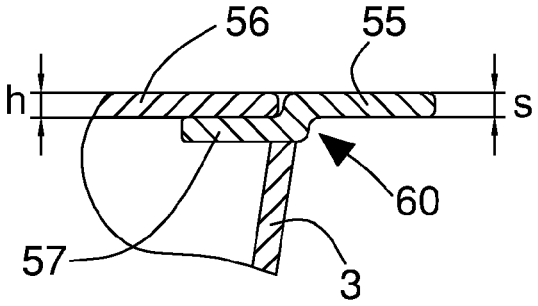
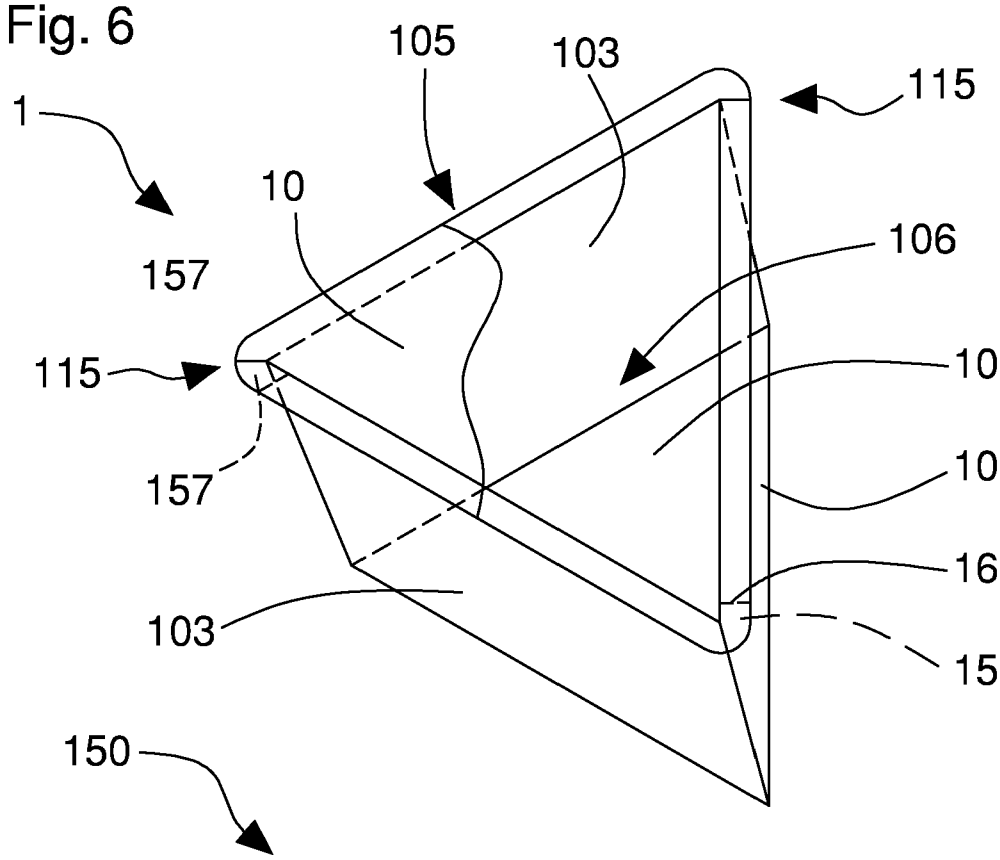


Fig. 5

Fig. 6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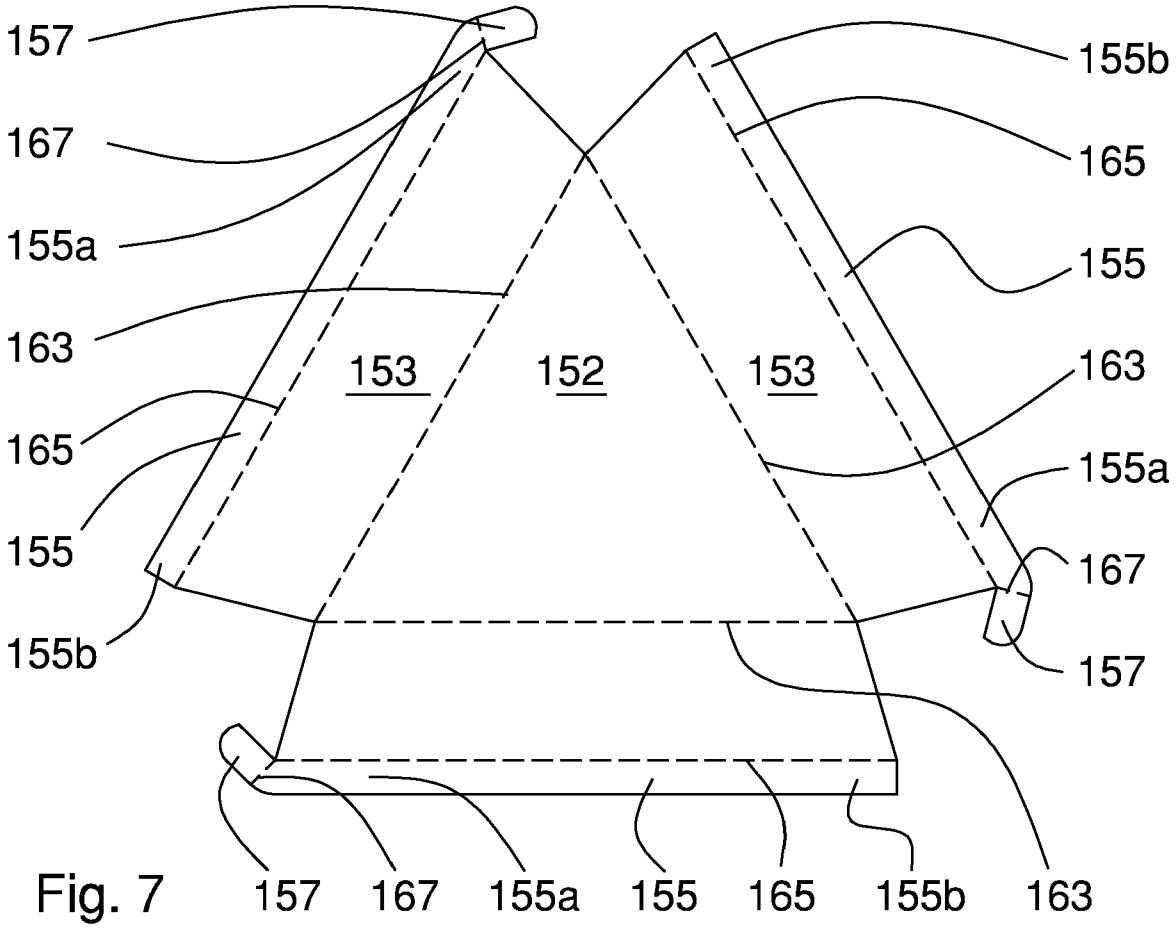
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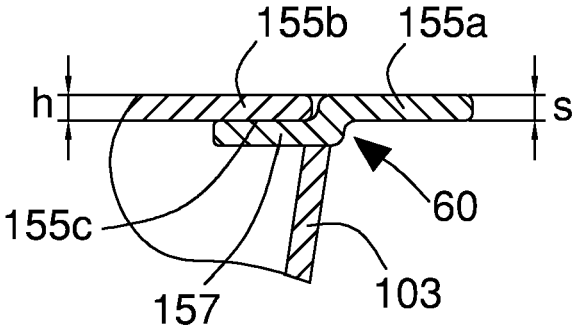
Fig. 7

Fig. 8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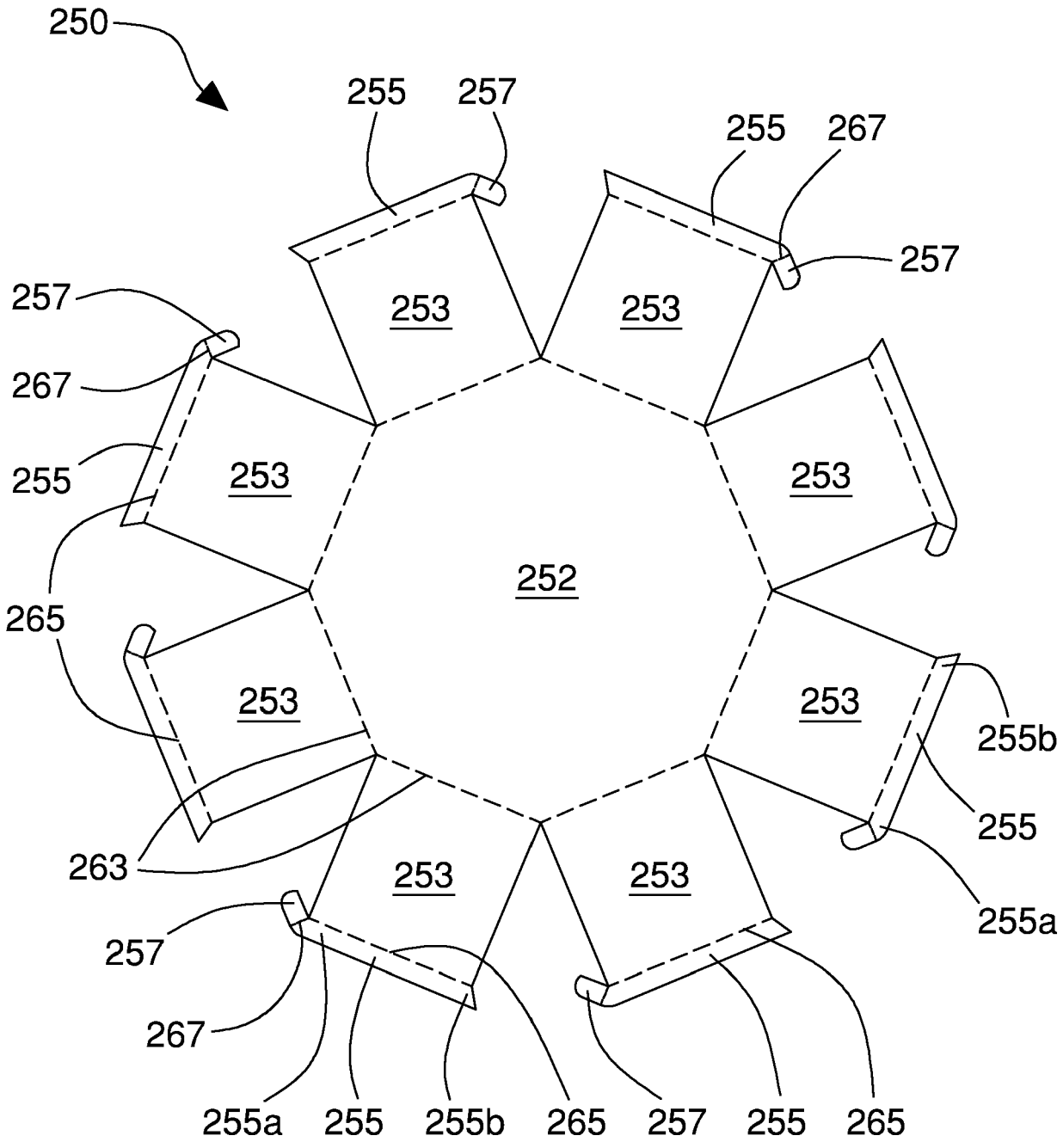
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Fig. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 24 20 6656

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Place of search	Date of completion of the search	Examiner
The Hague	12 February 2025	Tzianetopoulou, T

CATEGORY OF CITED DOCUMENTS

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