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(71) Applicant: **Rimapack Srl**
10122 Carmagnola, Torino (IT)

(72) Inventor: **Domenico, RICCA**
10041 CARIGNANO (IT)

(74) Representative: **Locas, Davide et al**
Cantaluppi & Partners S.r.l.
Piazzetta Cappellato Pedrocchi, 18
35122 Padova (IT)

(54) **TRAY AND METHOD FOR MAKING IT**

(57) A tray (1) comprising a first blank (100) comprising a first central portion (101), comprising an upward folding lead-in member (104) formed so as to allow the first blank (100) to move between an extended configuration (E) and a folded configuration (R), in which a first and second inclinable wall (102, 103) are arranged to be transverse, thereby mutually forming a pointed separator element (150), and a second blank (200) comprising a second central portion (201) having an opening (202) delimited by a border (203) formed so as to be engaged with form-fitting with the first and second inclinable walls (102, 103) of the first blank (100).

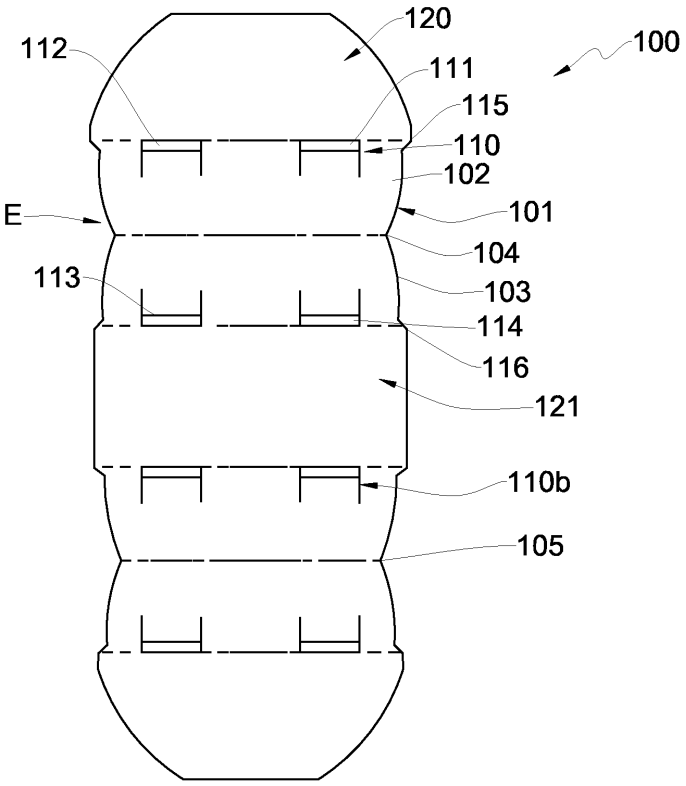

Fig. 2

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Description

Technical field

[0001] The present invention relates to a tray for fruit and a method for producing the tray having the features set out in the preamble of the independent claims.

Technological background

[0002] It is known to use trays for transporting food products securely and storing them efficiently.

[0003] Particularly if the above-mentioned food products are potentially damageable as a result of mutual contact inside the tray and with the walls of the tray itself, it is preferable to use trays which are provided with separator elements which are capable of holding such products spaced apart from each other and positioned in a stable manner in predetermined seats.

[0004] An example of this need may be constituted by persimmon fruit which need to be stored in such a manner as to prevent to the greatest possible extent the contact between the pieces of fruit themselves owing to the risk of the accelerated deterioration thereof with a resultant reduction of the shelf-life thereof.

[0005] It is evident that this condition, if not complied with, results in immediate economic loss constituted by the deteriorated goods which can no longer be sold.

[0006] Typically, this specific type of food products is positioned inside trays which are provided with separators which are constructed from plastics materials, such as, for example, polystyrene.

[0007] These trays can be efficiently stamped directly with the cells which are intended to receive the pieces of fruit by means of known processes carried out and generally used in this technological field.

[0008] However, the increasing sensitivity towards the current conditions of pollution and the increase in the need to use green materials in packaging suggest that it would be preferable to be able to have technical solutions which use a material which can be produced in the desired forms and which is more readily recyclable, reusable, compostable or biodegradable than the ones used currently.

Statement of invention

[0009] An object of the present invention is to provide a tray, preferably for fruit, and a method for producing the tray which is structurally and functionally configured to at least partially overcome at least one of the disadvantages of the cited prior art.

[0010] Within this object, an objective is to provide a tray for fruit (or similar types of food products, such as, for example, eggs or chocolates, for which there is provided a specific seat) which can reduce or eliminate the use of polymer plastics materials by replacing them with other more ecologically sustainable or recyclable or biodegradable or compostable materials, such as paperboard or cardboard or similar materials.

[0011] The invention carried out according to the present invention is a tray for fruit comprising

- a first blank comprising
    - a first central portion in turn comprising
        - ◦ a first upward folding lead-in member between a first inclinable wall and a second inclinable wall,
        - ◦ the upward folding lead-in member being formed so as to allow the first blank to move between an extended configuration, in which a first and second inclinable wall are mutually parallel and coplanar, and a folded configuration, in which the first and second inclinable walls are arranged to be transverse, thereby mutually forming a pointed separator element.

[0012] In this context, the term "blank" is intended to be understood to mean any material in the form of a sheet which can be readily cut to desired shapes by means of a punching machine.

[0013] Preferably, the first blank and a second blank are produced from paperboard, cardboard or similar materials suitable for punching.

[0014] Preferably, the pointed separator element is provided with a given resilience and toughness which allow it to be able to be slightly deformed resiliently when in a folded position without running into brittle fracture and therefore to be able to be engaged with a shape-interference fit within a given tolerance of deformability.

[0015] According to an embodiment, the first blank comprises

- a first abutment surface and a second abutment surface,
- the first abutment surface being connected to the first inclinable wall by means of a first downward folding lead-in member and the second abutment surface being connected to the second inclinable wall by means of a second downward folding lead-in member,
- the first and second downward folding lead-in members being formed so as to be mutually arranged in a parallel and coplanar manner and to be able to abut against a second central portion of a second blank when the first blank is moved into the folded configuration and engaged with the second blank with interlocking.

[0016] In this context, the term "upward folding lead-in member" is intended to be understood to be a fold of a sheet or plate which involves the production of a crest at the upper side. In other words, starting from a sheet which

is placed in a horizontal state and wishing to produce an upwardly directed fold, the two edges which are interconnected by means of the fold are caused to be quasi planar with a concavity directed downwards. On the other hand, however, the term "downward folding lead-in member" is intended to be understood to be a fold of a sheet or plate which involves the fact that the two edges which are interconnected by means of the fold are quasi planar with a concavity directed upwards.

[0017] Preferably, the tray comprises

- a second blank comprising
    - a second central portion,
    - a plurality of lateral extensions which project from the central portion,
    - the second central portion comprising an opening,
    - the opening having a polygonal form being delimited by a border,
    - the border being formed so as to be engaged with form-fitting with the first and second inclinable walls of the first blank when the first blank is moved into the folded configuration and inserted at a lower position with abutment in the second blank, causing the pointed separator element to move through the opening of the second blank.

[0018] As a result of this system, it is possible to form seats or cells, in which to receive food products for which it is necessary or desirable that they do not come into direct contact with other similar products.

[0019] By way of non-limiting example, there may be set out persimmon fruit which need to be positioned in containers or trays with separators which are capable of spacing them apart because a potential contact between pieces of fruit would involve the rapid deterioration thereof, thereby significantly shortening the useful life, that is to say, the shelf life thereof.

[0020] Similarly, also for food products such as eggs, although without any possibility of rapid contamination or deterioration as a result of contact with other food products, it is desirable to position them inside seats in order to keep them in a fixed position and to prevent them from being able to break following accidental impacts with the walls of the container or other eggs.

[0021] Other food products which are cited by way of example and which can benefit from the presence of this separator in the containment tray are: legumes, vegetables, pasta, etc. Another advantage is that these trays with a separator element can be produced without using adhesives and in particular without adhesives for securing the first blank which constitutes the separator element to the second blank.

[0022] Preferably, these blanks can be produced from punchable and foldable materials, such as, for example, aluminium sheets, steel sheets, etc.

[0023] Another advantage is that the first blank can readily be removed from the form-fitting engagement brought about with respect to the second blank. In this manner, it is possible to replace the first blank without having to also change the second blank. This condition can be particularly useful because there can be connected to the same second blank by form-fitting engagement various first blanks which define the separator element so as to be able to readily adapt to the shapes necessary in accordance with the food product involved.

Brief description of the drawings

[0024] The features and advantages of the present invention will be better appreciated from the detailed description of a preferred embodiment thereof, which is illustrated by way of non-limiting example with reference to the appended drawings, in which:

- Figure 1 is a schematic plan view of a second blank of a tray to which the present invention relates,
- Figure 2 is a schematic plan view of a first blank of a tray to which the present invention relates,
- Figure 3 is a perspective view of a tray obtained by engaging the first blank of Figure 2 with the second blank of Figure 1, respectively,
- Figure 4 is a schematic plan view of another second blank of a tray to which the present invention relates,
- Figure 5 is a schematic plan view of another first blank of a tray to which the present invention relates,
- Figure 6 is a perspective view of the first blank of Figure 5 in a folded configuration,
- Figure 7 is a plan view of the first blank of Figure 6 engaged in the second blank of Figure 4 to form the tray to which the present invention relates,
- Figure 8 is a view from below of the tray of Figure 7,
- Figure 9 is a perspective view of the tray of Figure 8.

Detailed description of an embodiment

[0025] In the Figures, there is designated 1 a tray which is preferably for fruit and which comprises a first blank 100 and a second blank 200.

[0026] Preferably, the first blank 100 and the second blank 200 are produced from paperboard, cardboard or similar natural and recyclable materials.

[0027] These first and second blanks 100, 200 are formed so as to compose the above-mentioned tray 1 when they are combined with each other, at least partially, by means of form-fitting interference engagement.

[0028] According to an embodiment, the tray 1 comprises

- a first blank 100 comprising
    - a first central portion 101 comprising
        - a first upward folding lead-in member 104 between a first inclinable wall 102 and a second

inclinable wall 103.

[0029] Preferably, the upward folding lead-in member 104 can be formed so as to allow the first blank 100 to move between an extended configuration E, in which the first and second inclinable walls 102, 103 are mutually parallel and coplanar, and a folded configuration R, in which the first and second inclinable walls 102, 103 are arranged to be transverse, thereby mutually forming a pointed separator element 150.

[0030] With reference to Figures 3, 6, 7 and 9, the first inclinable wall 102 and the second inclinable wall 103 are illustrated in an inclined or transverse arrangement with respect to the plane which is defined by the first central portion 101 so as to form a pointed element, thereby constituting the folded configuration R.

[0031] Figures 2 and 5 illustrate the first blank 100 in an extended configuration, in which the first and second inclinable walls 102, 103 are still coplanar with the first central portion 101.

[0032] According to an embodiment and with reference to Figures 2, 5 and 6, the first blank 100 comprises a first abutment surface 120 and a second abutment surface 121. Preferably, the first abutment surface 120 is connected to the first inclinable wall 102 by means of a first downward folding lead-in member 115 and the second abutment surface 121 is connected to the second inclinable wall 103 by means of a second downward folding lead-in member 116.

[0033] Preferably, the first and second downward folding lead-in members 115, 116 are formed so as to be arranged parallel and co-planar with each other and to be able to allow them and/or the first and second abutment surfaces 120, 121 to abut against a second central portion 201 of a second blank 200 when the first blank 100 is moved into the folded configuration R and engaged with the second blank 200 with interlocking.

[0034] Preferably, the tray 1 comprises

- a second blank 200 comprising
    - a second central portion 201,
    - a plurality of lateral extensions 210 which project from the central portion 201.

[0035] According to an embodiment and with reference to Figure 1 and/or Figure 4, the central portion has a polygonal form, preferably a substantially square or rectangular form. More preferably, the second central portion 201 comprises angular transverse connections which confer on it a substantially octagonal profile. Preferably, and still with reference to Figures 1 and 4, the second blank 200 comprises horizontal sides 205 and vertical sides 206 which project from the second central portion 201 and which are secured with permitted rotation to the second central portion 201 by means of downward folding lead-in members. According to an embodiment, there can project from the horizontal sides 205 and/or the vertical sides 206 additional strips 207, 208 which are formed so as to allow at least one of them to at least partially overlap one of the horizontal sides 205 and/or vertical sides 206 and thereby to allow a secure connection by means of adhesive bonding or form-fitting engagement or similar industrial techniques.

[0036] Should it be necessary, the person skilled in the art will know the locations at which to apply the most functional adhesives for the desired applications.

[0037] Preferably, the second central portion 201 comprises an opening 202.

[0038] Preferably, the opening 202 has a polygonal or curved form and is delimited by a border 203.

[0039] According to an embodiment shown in Figures 3 and 7, for example, the border 203 is formed so as to be engaged with form-fitting with the first and second inclinable walls 102, 103 of the first blank 100 when the first blank 100 is moved into the folded configuration R and inserted at a lower position with abutment in the second blank 200, causing the pointed separator element 150 to move through the opening 202 of the second blank 200.

[0040] Preferably, the first blank 100 and/or the second blank 200 is/are produced from paperboard or cardboard.

[0041] According to an embodiment, the first and second inclinable walls 102, 103 of the first blank 100 comprise at least one seat 110 each.

[0042] With reference to Figures 2 and 5, it may be noted that the first and second inclinable walls 102, 103 each preferably comprise a pair of the seats which are identified as a first seat 111, a second seat 112, a third seat 113 and a fourth seat 114.

[0043] Preferably, the at least one seat 110 may be located near a downward folding lead-in member 115, 116. In this manner, there is established the additional form-fitting engagement with the second blank 200 near an end of the first and/or second inclinable wall 102, 103, thereby obtaining a construction of the tray 1 which is even more stable.

[0044] According to an embodiment, the border 203 of the opening 202 of the second blank 200 comprises at least one protrusion 210 which projects towards the opening 202. Preferably, the at least one seat 110 is formed so as to engage securely by means of form-fitting interference with the at least one protrusion 210.

[0045] With reference to Figure 1 or Figure 4, the embodiments shown Preferably have a first protrusion 211, a second protrusion 212, a third protrusion 213, a fourth protrusion 214 for each opening 202.

[0046] Preferably, this opening 202 may comprise a first anchoring tooth and a second anchoring tooth 222, 223 which are formed so as to make it easier to fix the first blank 100 in position when it is inserted in a folded configuration R inside the opening 202 of the second blank 200.

[0047] Preferably and with reference to Figures 1, 2, 4, 5, it is possible to replicate several times the opening 202 in the second blank 200. Similarly, it is preferably

possible to replicate several times the separator element 150 (therefore, comprising at least the first and second inclinable surfaces 102, 103 and the upward folding lead-in member 104) in the first blank 100. Preferably, each separator element 150 which is formed when the first blank is in a folded configuration R corresponds to an opening 202 of the second blank 200.

[0048] In other words, according to an embodiment the second central portion 201 comprises a plurality of openings 202 for a corresponding plurality of pointed separator elements 150 of the first blank 100.

[0049] Preferably and with reference to Figure 1 or Figure 3, the plurality of openings 202 are arranged parallel with each other.

[0050] According to an embodiment, the second central portion 201 of the second blank 200 is substantially rectangular and at least one of the plurality of openings 202 is/are arranged perpendicularly to the long side of the second central portion 201.

[0051] Alternatively, the plurality of openings 202 are arranged transversely to the long side of the second central portion 201. This technical solution is particularly advantageous if it is desirable to fill the tray with the largest possible number of food products having similar spherical shapes.

[0052] According to an embodiment and with reference to Figure 4 or Figure 7, the second blank 200 comprises a plurality of openings 202 in which at least two of them are arranged perpendicularly to each other in a cross-like manner. Similarly, preferably and with reference to Figures 5, 6 and 7, the first blank 100 comprises the first upward folding lead-in member 104 which is between the first inclinable wall 102 and the second inclinable wall 103. Preferably, the first and second inclinable walls 102, 103 comprise a plurality of seats 110 each (similar reasoning used previously in relation to the plurality of seats also apply in this embodiment).

[0053] Preferably, the first blank 100 of Figure 4 or Figure 7 comprises a second upward folding lead-in member 105 which is between a third inclinable wall 102b and a fourth inclinable wall 103b which intersect. Preferably, the third and fourth inclinable walls 102b, 103b comprise a second plurality of seats 110b each, which are arranged perpendicularly to the first upward folding lead-in member 104.

[0054] Preferably and still with reference to Figure 5, the first blank 100 comprises in the first central portion 101 a central opening 130 which is preferably formed in the manner of a star with four tips, the vertices of which correspond to the intersection points of the corresponding first, second, third and fourth downward folding lead-in members 115, 116, 117, 118.

[0055] As a result of this central opening 130, it is possible to move the first blank 100 into a folded configuration R, as shown in Figures 6, 7 and 9, in which the upward folding lead-in members 104, 105 move towards a respective line reinstatement.

[0056] The operating methods for carrying out the inventions according to the present invention will become clear from the method for carrying out a tray, preferably for fruit, having at least one of the features set out above, comprising

- providing a first blank 100 and a second blank 200 as described above,
- bringing the first blank 100 into the folded configuration R forming the pointed separator element 150,
- positioning the second blank 200 on the first blank 100 by making it at least partially pass the pointed separator element 150 of the first blank 100 through the opening 202 of the second blank 200,
- engaging with an interference fit the first and/or second inclinable walls 102, 103 of the first blank 100 on the border 203 of the opening 202,
- thereby completing a tray 1 comprising a separator element 150 which is fixedly secured in the tray 1 itself. According to an embodiment of the present method, there is provision for
- fixedly securing the first blank 100 to the second blank 200 by engaging with form-fitting interference the seats 110 of the first and second inclinable walls 102, 103 with the protrusions 210 of the second blank 200.

Claims

1. A tray (1) comprising

- a first blank (100) comprising
  - a first central portion (101) comprising
    - a first upward folding lead-in member (104) between a first inclinable wall (102) and a second inclinable wall (103),
    - the upward folding lead-in member (104) being formed so as to allow the first blank (100) to move between an extended configuration (E), in which the first and second inclinable walls (102, 103) are mutually parallel and coplanar, and a folded configuration (R), in which the first and second inclinable walls (102, 103) are arranged to be transverse, thereby mutually forming a pointed separator element (150),
  - a first abutment surface (120) and a second abutment surface (121),
  - the first abutment surface (120) being connected to the first inclinable wall (102) by means of a first downward folding lead-in member (115) and the second abutment surface (121) being connected to the sec-

ond inclinable wall (103) by means of a second downward folding lead-in member (116),
• the first and second downward folding lead-in members (115, 116) being formed so as to be mutually arranged in a parallel and coplanar manner and to be able to abut against a second central portion (201) of a second blank (200) when the first blank (100) is moved into the folded configuration (R) and engaged with the second blank (200) with interlocking,

- a second blank (200) comprising

• a second central portion (201),
• a plurality of lateral extensions (210) which project from the central portion (201),
• the second central portion (201) comprising an opening (202),
• the opening (202) having a polygonal form being delimited by a border (203),
• the border (203) being formed so as to be engaged with form-fitting with the first and second inclinable walls (102, 103) of the first blank (100) when the first blank (100) is moved into the folded configuration (R) and inserted at a lower position with abutment in the second blank (200), causing the pointed separator element (150) to move through the opening (202) of the second blank (200).

2. A tray (1) according to the preceding claim, wherein the first blank (100) and/or the second blank (200) is/are produced from paperboard or cardboard.

3. A tray (1) according to either of the preceding claims, wherein

- the first and second inclinable walls (102, 103) of the first blank (100) comprise at least one seat (110) each,
- the border (203) of the opening (202) of the second blank (200) comprises at least one protrusion (210) which projects towards the opening (202),
- the at least one seat (110) being formed so as to engage securely by means of form-fitting interference with the at least one protrusion (210).

4. A tray (1) according to one or more of the preceding claims, wherein the second central portion (201) comprises a plurality of openings (202) for a corresponding plurality of pointed separator elements (150) of the first blank (100).

5. A tray (1) according to claim 4, wherein the plurality of openings (202) are arranged in a mutually parallel manner.

6. A tray (1) according to any one of the preceding claims, wherein the second central portion (201) has a substantially rectangular form and at least one of the plurality of openings (202) is/are arranged perpendicularly to the long side of the second central portion (201).

7. A tray (1) according to any one of claims 1 to 4, wherein

- the second blank (200) comprises a plurality of openings (202) in which at least two thereof are arranged perpendicularly to each other in a cross-like manner,
- the first blank (100) comprises

• the first upward folding lead-in member (104) between a first inclinable wall (102) and a second inclinable wall (103), the first and second inclinable walls (102, 103) each comprising a plurality of seats (110),
• a second upward folding lead-in member (105) between a third inclinable wall (102b) and a fourth inclinable wall (103b) which intersect, the third and fourth inclinable walls (102b, 103b) each comprising a second plurality of seats (110b), perpendicularly to the first upward folding lead-in member (104) between a first inclinable wall (102) and a second inclinable wall (103),
• a central opening (130) which is formed in the manner of a star with four tips, the vertices of which correspond to the intersection points of the corresponding first, second, third and fourth downward folding lead-in members (115, 116, 117, 118).

8. A tray (1) according to any one of the preceding claims, wherein the second blank (200) comprises holes and teeth in the lateral walls which are suitable for mutually engaging in order to fixedly secure the lateral walls in an inclined position in order to form a tray.

9. A method for producing a tray comprising

- providing a first blank (100) and a second blank (200) having the features of any one of claims 1 to 6,
- bringing the first blank (100) into the folded configuration (R) forming the pointed separator element (150),
- positioning the second blank (200) on the first blank (100) by making it at least partially pass the pointed separator element (150) of the first blank (100) through the opening (202) of the sec-

ond blank (200),
- engaging with an interference fit the first and second inclinable walls (102, 103) of the first blank (100) on the border (203) of the opening (202),
- thereby completing a tray (1) comprising a separator element (150) which is fixedly secured in the tray (1).

10. A method according to the preceding claim, comprising

- fixedly securing the first blank (100) to the second blank (200) by engaging with form-fitting interference the seats (110) of the first and second inclinable walls (102, 103) with the protrusions (210) of the second blank (200).

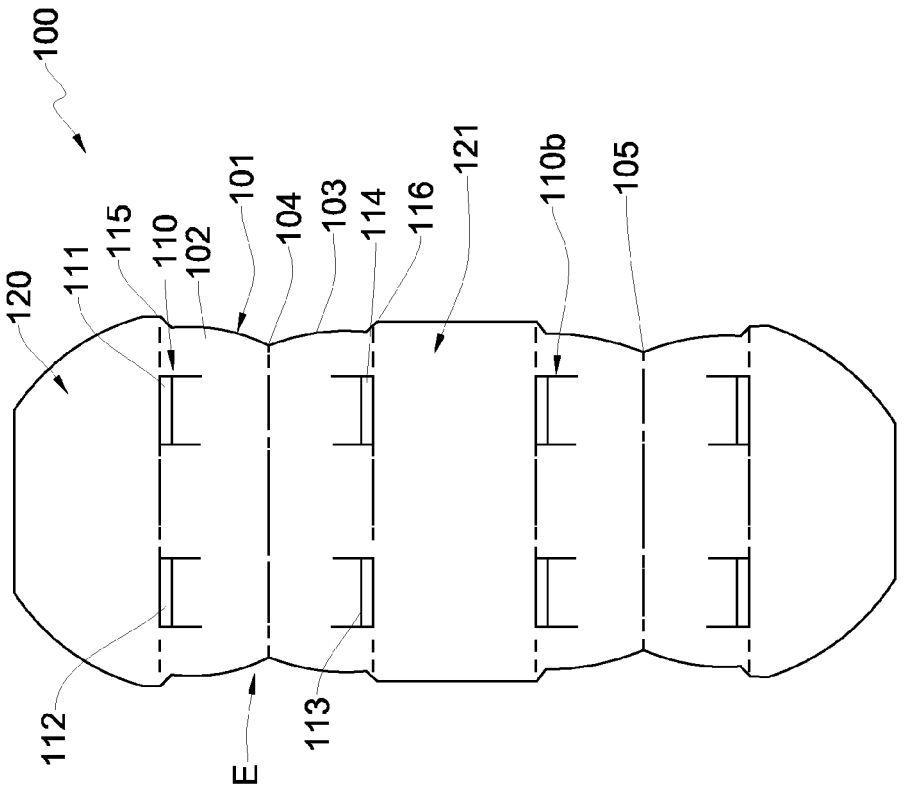
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Fig. 2

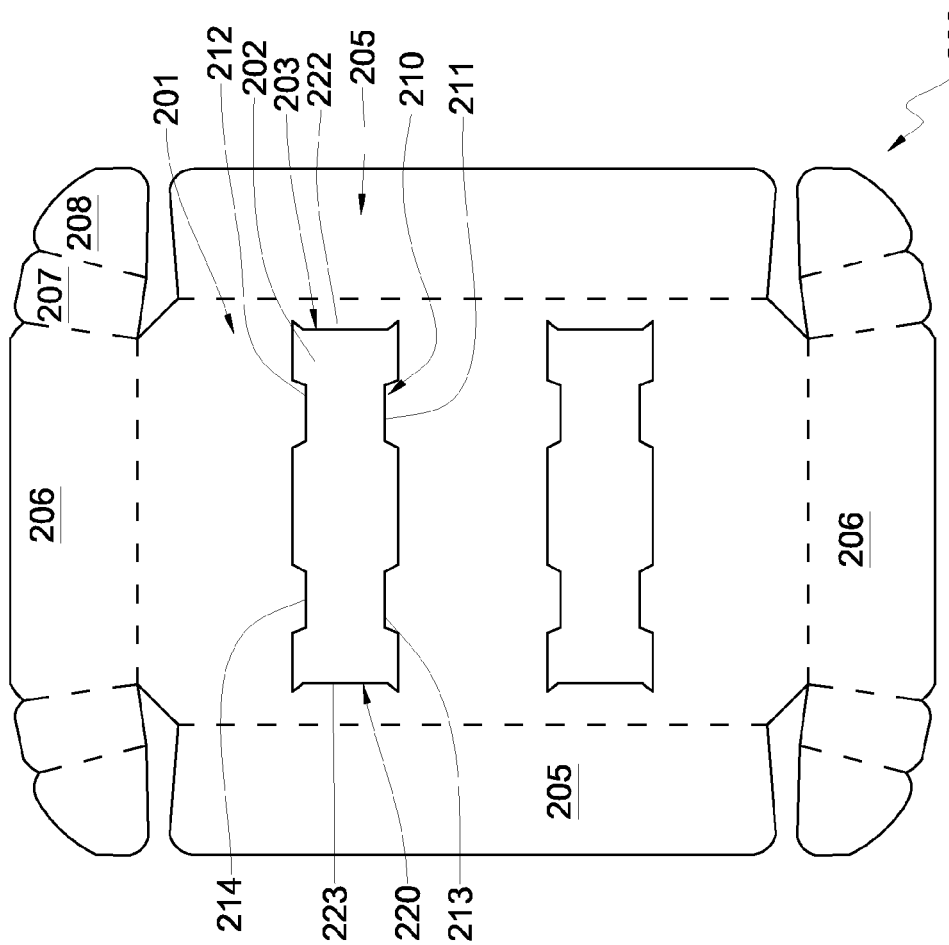
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Fig. 1

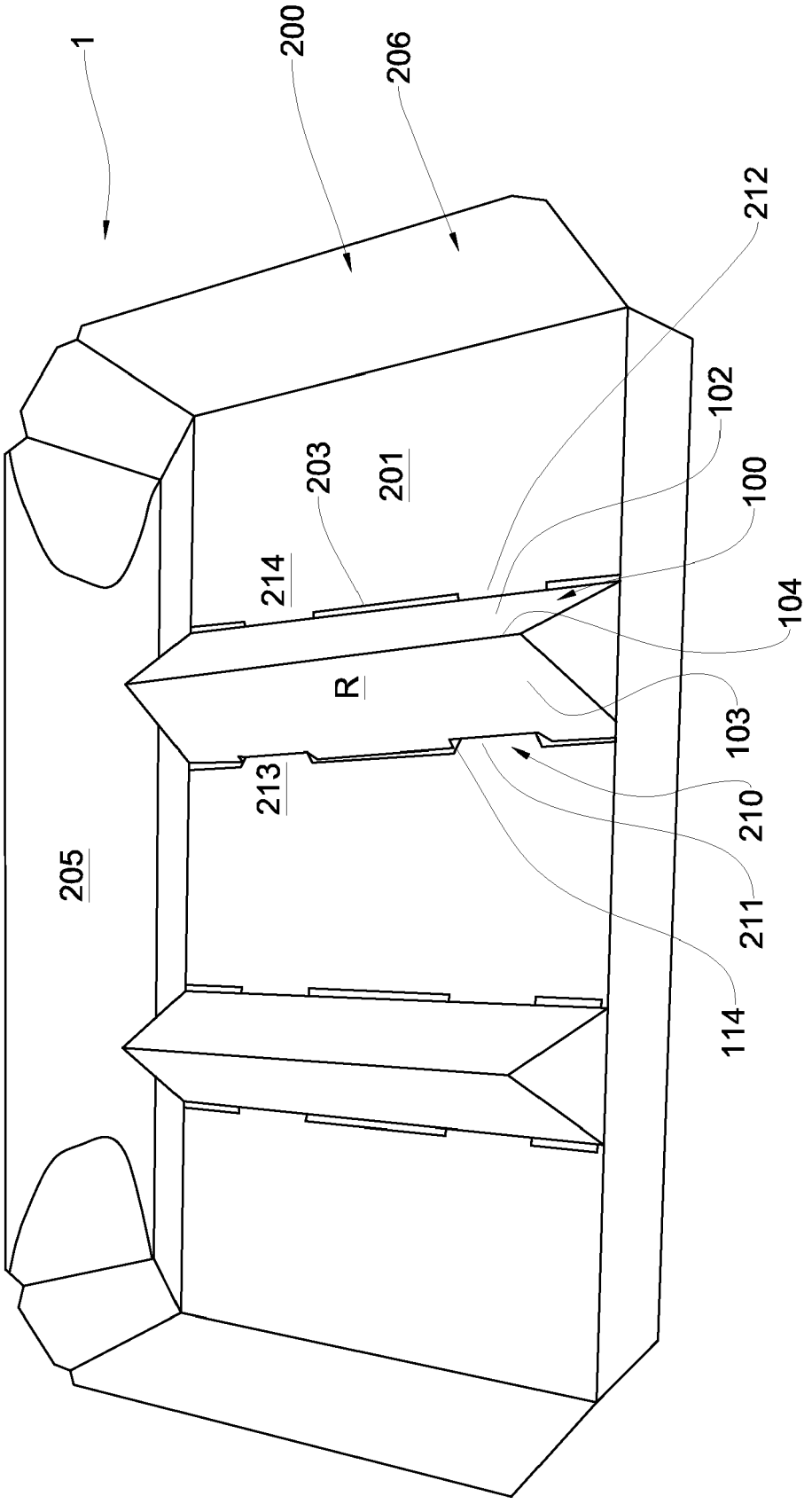

Fig. 3

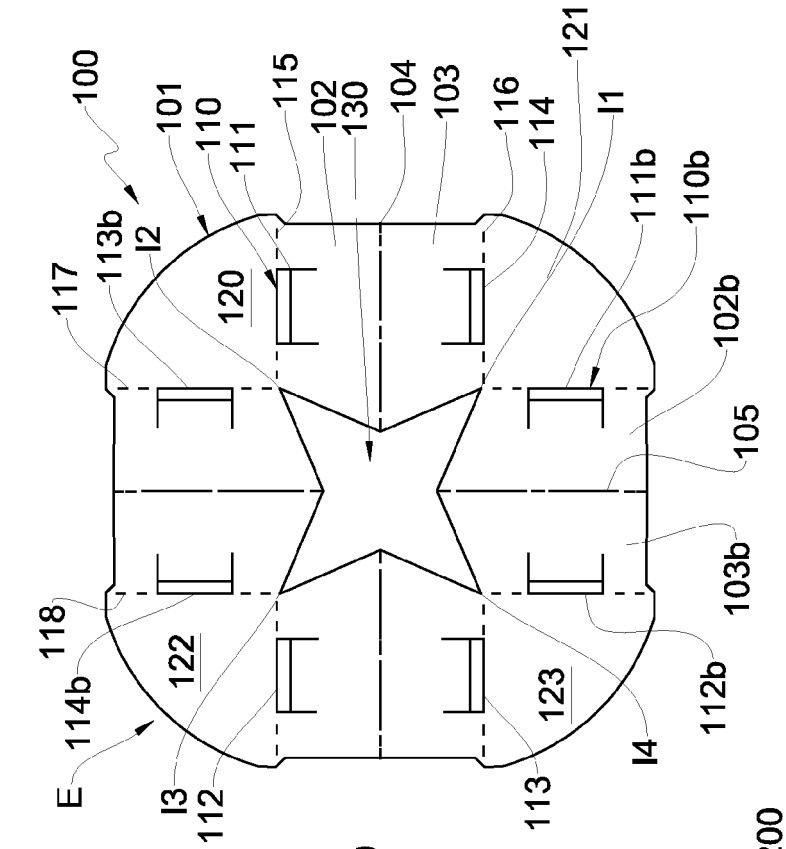
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Fig. 5

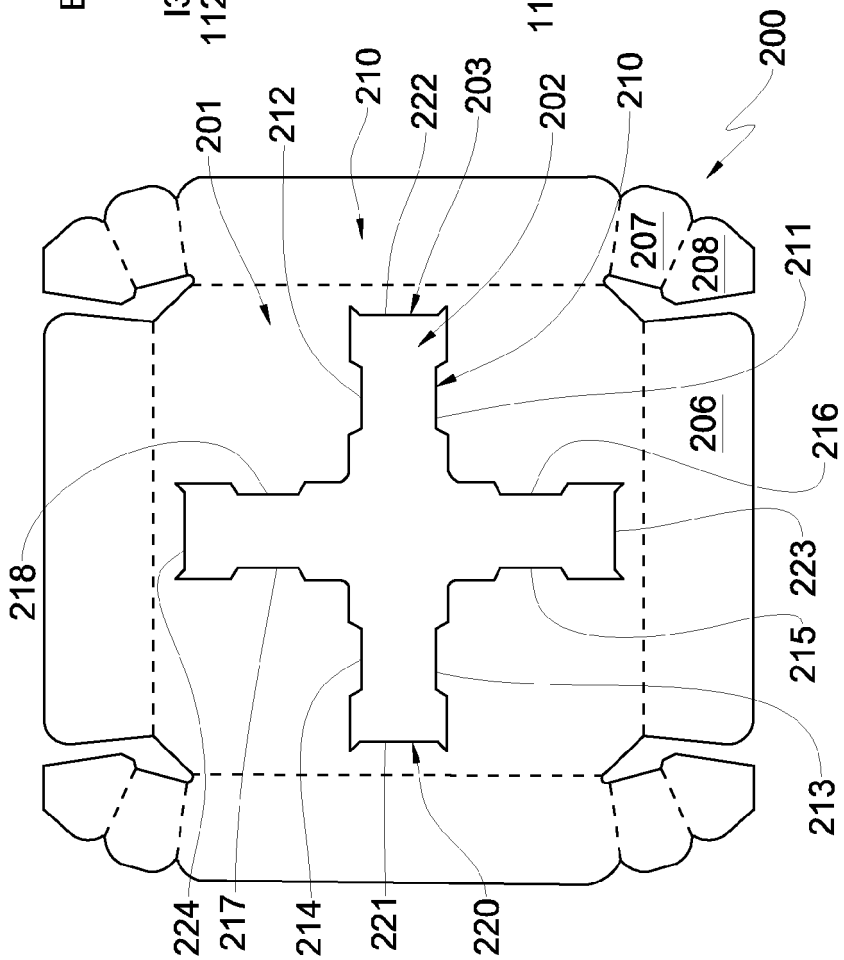
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Fig. 4

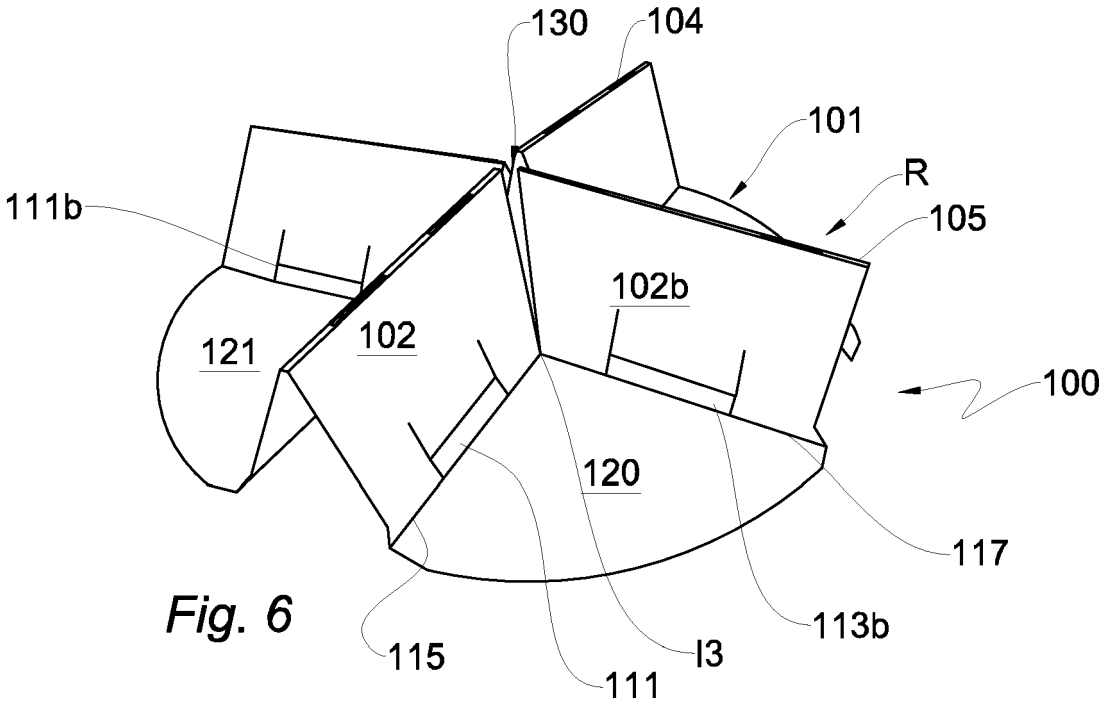
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Fig. 6

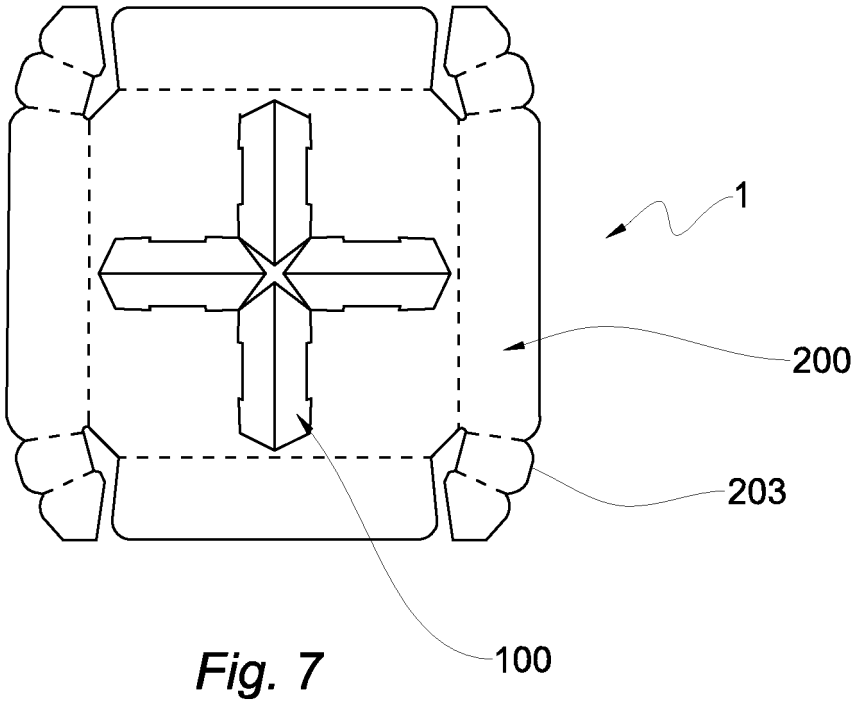
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Fig. 7

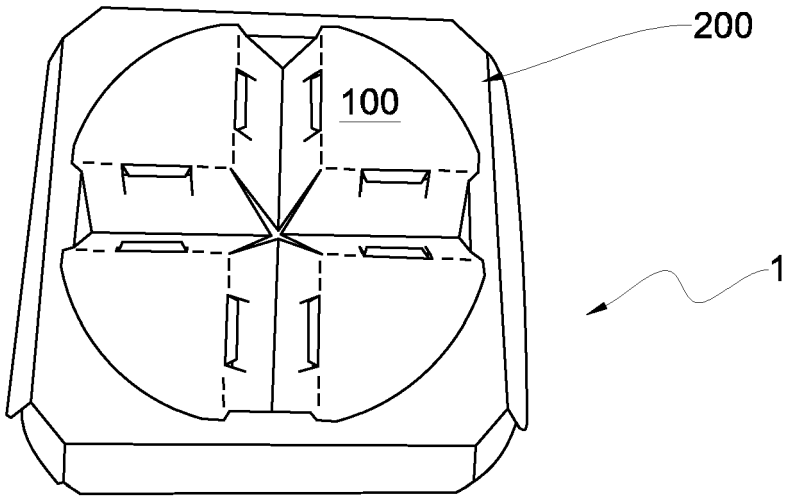

Fig. 8

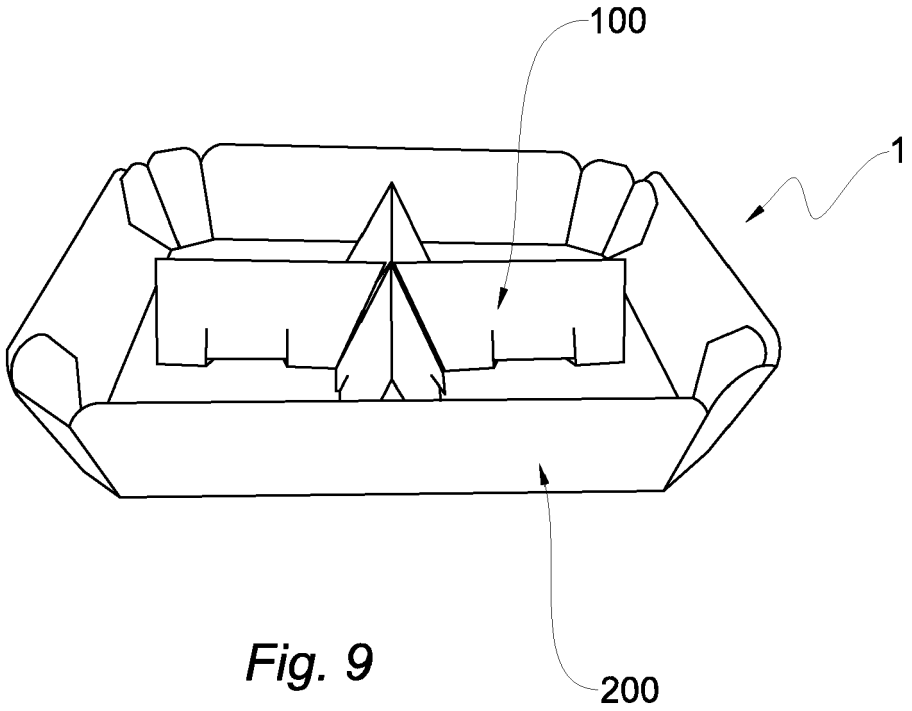

Fig. 9

Europäisches Patentamt
European Patent Office
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EUROPEAN SEARCH REPORT

Application Number
EP 20 20 4431

DOCUMENTS CONSIDERED TO BE RELEVANT

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
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