

(19)



(11)

EP 3 925 900 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
22.12.2021 Bulletin 2021/51

(51) Int Cl.:
B65D 21/04 (2006.01) F25D 3/08 (2006.01)
F25D 3/10 (2006.01) F25D 3/14 (2006.01)

(21) Application number: **20181295.5**

(22) Date of filing: **21.06.2020**

(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

(71) Applicant: **Logistiplast Ltd**
7316500 Rinatya (IL)
 (72) Inventor: **KORKUS, Eyal**
7316500 RINATYA (IL)
 (74) Representative: **Harrison IP Limited**
3 Ebor House
Millfield Lane
Nether Poppleton, York YO26 6QY (GB)

(54) **STACKABLE AND NESTABLE CONTAINERS WITH FOLDABLE THERMAL INSERT AND TECHNIQUES OF USING THE SAME**

(57) An assembly of nestable containers (10A, 10B) with foldable thermal inserts (12) and method of using the same are disclosed. The containers (10A, 10B) are

nested within each other, while the foldable thermal insert (12) is folded and disposed in-between the bottom faces of the nested containers (10A, 10B).

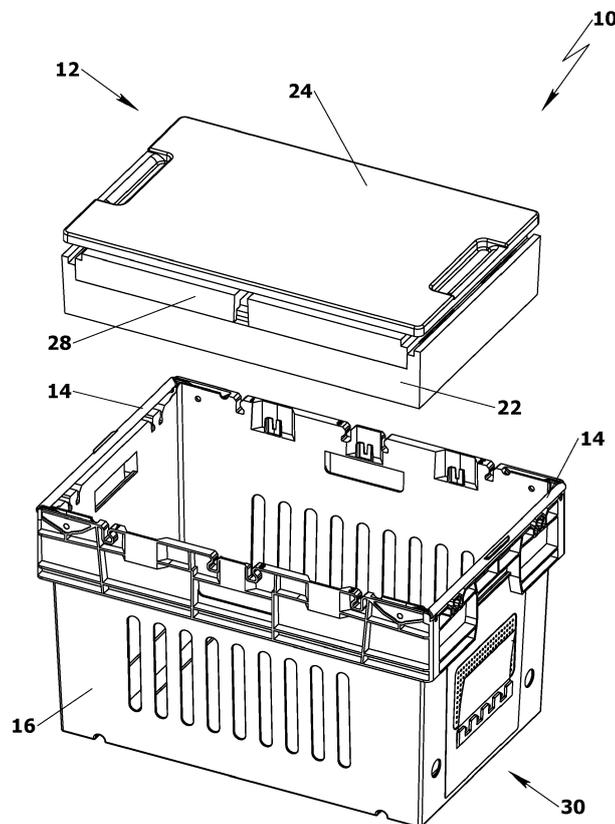


Fig. 5

EP 3 925 900 A1

Description

TECHNICAL FIELD

[0001] The present invention in general pertains to the art of transportation and manufacture of containers. In particular the present invention relates to stackable and nestable containers, configured with a foldable thermal insert, as well as to techniques of using the same.

BACKGROUND ART

[0002] Stackable and nestable containers are widely used today. There are numerous solutions known in the art for achieving the nestable/stackable functionality. Such stackable and nestable containers are typically characterized by two different conformations, where upon rotating one container by 180 degrees relatively to another container or upon altering a confirmation of an element of one container the switch between the nestable and stackable functionality is achieved.

[0003] It is believed that the pertinent state-of-the-art is represented by the following patent literature: CN106742785, CN106043886, EP1225131, DE4109151, DE576647, JP2000203665, US2006254948, US2002070267, US2009001086, US4848578, US7303075, WO2010030191, WO2012028567, WO2017172029 and WO2017082333.

[0004] US2006254948 which is believed to be the most relevant prior art teaches nestable containers having a reversibly deformable covering that is reversibly deformable from a covering position to a storage position, wherein the covering has a projected surface area in the storage position that is less than a projected surface area of the closure in the covering position such that the covering is storable inside the container while other containers of identical size and shape are nested in the container. The covering in US2006254948 may include a fastener that, when fastened, prevents movement of the covering from the storage position to the covering position and the covering and/or container may include a gasket for sealing.

SUMMARY OF THE INVENTION

[0005] The following summary of the invention is provided in order to provide a basic understanding of some aspects and features of the invention. This summary is not an extensive overview of the invention and as such it is not intended to particularly identify key or critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some concepts of the invention in a simplified form as a prelude to the more detailed description that is presented below.

[0006] The invention was made in view of the deficiencies of the prior art and provides containers and techniques for overcoming these deficiencies. According to some embodiments and aspects of the present invention,

there is provided stackable and nestable, configured with a foldable thermal insert.

[0007] According to some embodiments and aspects of the present invention, there is provided an assembly of nestable containers with foldable thermal inserts including a first nestable container including: a rectangular bottom plate, configured for nesting the first nestable container; two pairs of longitudinal sidewalls erecting essentially vertically from longitudinal edges of the bottom plate of the first nestable container; two pairs of lateral sidewalls erecting essentially vertically from lateral edges of the bottom plate of the first nestable container; an essentially rectangular top opening of the first nestable container; a second nestable container including: (I) a rectangular bottom plate, configured for nesting the second nestable container; (II) two pairs of longitudinal sidewalls erecting essentially vertically from longitudinal edges of the bottom plate of the second nestable container; (III) two pairs of lateral sidewalls erecting essentially vertically from lateral edges of the bottom plate of the second nestable container; (IV) an essentially rectangular top opening of an essentially rectangular parallelepiped shape interior volume of the second nestable container, configured for nesting the first nestable container, in which a substantial portion of the first nestable container is nestable within the essentially rectangular parallelepiped shape interior volume of the second nestable container, in a nesting conformation; the assembly is characterized by: a foldable thermal insert including: a base portion; a pair of longitudinal sidewalls; a pair of flanking sidewalls; an openable top cover, in which the foldable thermal insert is configurable in at least two configurations: (i) an unfolded configuration, in which the foldable thermal insert is expandable to assume a major portion of the essentially rectangular parallelepiped shape interior volume of the second nestable container, thereby forming an interior volume of the foldable thermal insert, configured to accommodate thermally preserveable payload; (ii) a folded configuration, in which the foldable thermal insert is collapsible to assume only a minor portion of the essentially rectangular parallelepiped shape interior volume of the second nestable container, in which the foldable thermal insert, in the folded configuration, assumes a size configured to be accommodated with the minor portion of the essentially rectangular parallelepiped shape interior volume of the second nestable container, and in which the foldable thermal insert, in the folded configuration, is configured to be disposed in-between a bottom face of the first nestable container and a bottom face of the second nestable container, in the nesting conformation.

[0008] In some embodiments the first and second nestable containers include at least one static structural element, configured for rendering the first and second containers stackable one on top of another, in a stacked conformation; in which the foldable thermal insert in the unfolded configuration is configured to be accommodated within the essentially rectangular parallelepiped

shape interior volume of the second nestable container.

[0009] In some embodiments the first and second nestable containers include at least one movable element, configured for altering between at least to states, thereby rendering the first and second containers stackable one on top of another, in a stacked conformation; in which the foldable thermal insert in the unfolded configuration is configured to be accommodated within the essentially rectangular parallelepiped shape interior volume of the second nestable container.

[0010] In some embodiments the foldable thermal insert including a thermally active material selected from the group consisting of: a thermal energy accumulating material, thermal energy producing material, heat accumulating element, cold accumulating element, heat producing element, cold producing element, heat producing device, cold producing device, heat producing apparatus, cold producing apparatus, substances configured for actively inducing a temperature than higher ambient environment and substances configured for actively inducing a temperature lower than ambient environment, ice, solid carbon dioxide, exothermic materials and endothermic materials.

[0011] In some embodiments the foldable thermal insert including a thermally passive material selected from the group consisting of: thermally insulating materials, substantially porous materials, polyurethane foam, reflective materials, reflective metallic sheetings, vacuum elements and any combination thereof.

[0012] In some embodiments the foldable thermal insert including a flexible material, in at least one a joint between at least two members selected from the group consisting of: the base portion, the longitudinal sidewalls, the flanking sidewalls and the openable top cover.

[0013] In some embodiments at least one member of the foldable thermal insert, selected from the group consisting of: the base portion, the longitudinal sidewalls, the flanking sidewalls and the openable top cover, is detachably attachable.

[0014] In some embodiments the foldable thermal insert is further configurable into a flattened configuration, in which the base portion, the longitudinal sidewalls, the flanking sidewalls and the openable top cover are sprawled essentially planarly.

[0015] In some embodiments at least one member of the foldable thermal insert, selected from the group consisting of: the base portion, the longitudinal sidewalls, the flanking sidewalls and the openable top cover, includes an overlapping portion configured for essentially hermetic closure of the interior volume of the foldable thermal insert in the unfolded configuration.

[0016] According to some embodiments and aspects of the present invention, there is provided a method of using nestable containers with foldable thermal inserts including: providing at least one first nestable container; providing at least one second nestable container, including an essentially rectangular parallelepiped shaped interior volume, configured for accommodating at least a

substantial portion of the first nestable container, within the essentially rectangular parallelepiped shaped interior volume of the second nestable container, in a nested conformation; nesting the at least one first nestable container, within the at least one second nestable container; the method is characterized by: providing a foldable thermal insert configured to assume at least two configurations (I) an unfolded configuration, in which the foldable thermal insert is expandable to assume a major portion of the essentially rectangular parallelepiped shape interior volume of the second nestable container, thereby forming an interior volume of the foldable thermal insert, configured to accommodate thermally preserveable payload, and (II) a folded configuration, in which in which the foldable thermal insert is collapsible to assume only a minor portion of the essentially rectangular parallelepiped shape interior volume of the second nestable container; folding the foldable thermal insert, into the folded configuration, to assume a size configured to be accommodated with the minor portion of the essentially rectangular parallelepiped shape interior volume of the second nestable container; disposing the foldable thermal insert, in the folded configuration, in-between a bottom face of the first nestable container and a bottom face of the second nestable container, in the nesting conformation.

[0017] In some embodiments the at least one first and second nestable containers include at least one structural element, configured for rendering the first and second containers stackable one on top of another, in a stacked conformation; in which the foldable thermal insert in the unfolded configuration is configured to be accommodated within the essentially rectangular parallelepiped shape interior volume of the second nestable container.

[0018] In some embodiments the foldable thermal insert includes at least one thermally active or thermally passive member selected from the group consisting of: a thermally insulating material, substantially porous material, polyurethane foam, reflective material, reflective metallic sheeting, vacuum element, thermal energy accumulating material, thermal energy producing material, heat accumulating element, cold accumulating element, heat producing element, cold producing element, heat producing device, cold producing device, heat producing apparatus, cold producing apparatus, substances configured for actively inducing a temperature than higher ambient environment and substances configured for actively inducing a temperature lower than ambient environment, ice, solid carbon dioxide, exothermic materials, endothermic materials and any combination thereof.

[0019] In some embodiments the foldable thermal insert is further configurable into a flattened configuration, further including essentially planarly sprawling the base portion, the longitudinal sidewalls, the flanking sidewalls and the openable top cover.

[0020] In some embodiments the method of using nestable containers further includes unfolding the foldable thermal insert into unfolded configuration, in which the foldable thermal insert is expanded to assume a major

portion of the essentially rectangular parallelepiped shape interior volume of the second nestable container.

[0021] In some embodiments the method of using nestable containers with foldable thermal inserts further includes activating the foldable thermal insert, to produce heat or cold.

DEFINITIONS

[0022] The term stackable and nestable containers as referred to herein is to be construed as in a non-limiting manner including any containers specially shaped or provided with fittings or attachments, to facilitate nesting and stacking, with movable parts configured to be placed in alternative positions for nesting the containers when empty and for stacking them when full, corresponding to class B65D21/06 of the cooperative patent classification (CPC). The term stackable and nestable containers as referred to herein is to be construed as in a non-limiting manner including any open-ended containers shaped to be nested when empty and superposed when full, specially adapted for nesting after rotation around a vertical axis, corresponding to class B65D 21/043 of the CPC.

[0023] The term thermal as referred to herein is to be construed as in a non-limiting manner including thermally insulating materials, configured for thermally insulating from the ambient environment, as well as thermally accumulating materials and/or elements, configured for inducing a warmed or cooled environment.

[0024] Whenever in the specification hereunder and particularly in the claims appended hereto a verb, whether in base form or any tense, a gerund or present participle or a past participle are used, such terms as well as preferably other terms are to be construed as actual or constructive, meaning *inter alia* as being merely optionally or potentially performed and/or being only performed anytime in future. The terms essentially and substantially, or similar relative terms, are to be construed in accordance with their ordinary dictionary meaning, namely mostly but not completely.

[0025] As used herein, the term "or" is an inclusive "or" operator, equivalent to the term "and/or," unless the context clearly dictates otherwise; whereas the term "and" as used herein is also the alternative operator equivalent to the term "and/or," unless the context clearly dictates otherwise.

[0026] It should be understood, however, that neither the briefly synopsisized summary nor particular definitions hereinabove are not to limit interpretation of the invention to the specific forms and examples but rather on the contrary are to cover all modifications, equivalents and alternatives falling within the scope of the invention.

DESCRIPTION OF THE DRAWINGS

[0027] The present invention will be understood and appreciated more comprehensively from the following detailed description taken in conjunction with the append-

ed drawings in which:

FIG 1A is a perspective view of a prior art storage device having a nestable container and a cover, known from US20060254948;

FIG 1B is a perspective view of the prior art device of **FIG 1A**, known from US20060254948, with the cover folded and rotated for placement into the container;

FIG 1C is a cross-sectional view of the prior art device of **FIG 1A**, known from US20060254948, nested with identically dimensioned containers, with the lids stored in and between the nested containers;

FIG 2 is an isometric view of two stackable and nestable containers, with foldable thermal inserts in an unfolded configuration, in accordance with some embodiments of the present invention, arranged in a stacked conformation;

FIG 3A is an isometric view of a stackable and nestable container, with a foldable thermal insert in an unfolded configuration, in accordance with some embodiments of the present invention;

FIG 3B is an exploded isometric view of a stackable and nestable container, with a foldable thermal insert in an unfolded configuration, in accordance with some embodiments of the present invention;

FIG 3C is a front cross-sectional front view, taken along cross-sectional line C-C, of a stackable and nestable container, with a foldable thermal insert in an unfolded configuration, in accordance with some embodiments of the present invention;

FIG 3D is a front cross-sectional side view, taken along cross-sectional line D-D, of a stackable and nestable container, with a foldable thermal insert in an unfolded configuration, in accordance with some embodiments of the present invention;

FIG 4 is an isometric view of a stackable and nestable container, with a foldable thermal insert in a folded configuration, in accordance with some embodiments of the present invention;

FIG 5 is an exploded isometric view of a stackable and nestable container, with a foldable thermal insert in a folded configuration, in accordance with some embodiments of the present invention;

FIG 6 is an isometric view of two stackable and nestable containers, with foldable thermal inserts in a folded configuration, in accordance with some embodiments of the present invention, arranged in a nested

conformation, where the folded thermal inserts are disposed in-between the bottom faces of the stackable and nestable containers.

[0028] While the invention is susceptible to various modifications and alternative forms, specific embodiments thereof have been shown merely by way of example in the drawings. The drawings are not necessarily complete and components are not essentially to scale; emphasis instead being placed upon clearly illustrating the principles underlying the present invention.

DETAILED DISCLOSURE OF EMBODIMENTS

[0029] Prior to elaborating any embodiment of the present invention, in order to present the background for the inventive concept more clearly, reference is firstly made to **FIG 1A to 1C**, showing prior art storage device **1100**, shown in Figures 1A to 1C of US20060254948. Prior art storage device **1100**, shown in **FIG 1A to 1C**, known from US20060254948, having a container **1102** and a cover **1104** in a covering position **1108**. Cover edges **1112** mate with container rim **1114**. Cover **1104** has a first portion **1116** and second portion **1118** joined by bendable member **1110**. **FIG 1B** depicts cover **1104** disposed in storage position **1106** by bending of bendable member **1110**. The cover fits within container **1102**. **FIG 1C** is a cross section of the container of **FIG 1A and 1B**, and shows how cover **1104** in storage position **1106** can be placed in container **1102** while it is nested with identical containers. Cover **1104**, in position **1106**, takes up less than about 20% of the volume of container **1104**. A user may fold cover **1104** into position **1106**, rotate it about 90 degrees in the plane parallel to the portions **1116**, **1118**, and place cover **1104** into container **1102**. Container **1102** may then be nested with other containers with cover **1102** disposed between the containers.

[0030] Illustrative embodiments of the invention are described below. In the interest of clarity, not all features of actual implementation are described in this specification. It will of course be appreciated that in the development of any such actual embodiment, numerous implementation-specific decisions must be made to achieve the developers' specific goals, such as compliance with technology- or business-related constraints, which may vary from one implementation to another. Moreover, it will be appreciated that the effort of such a development might be complex and time-consuming, but would nevertheless be a routine undertaking for those of ordinary skill in the art having the benefit of this disclosure.

[0031] In accordance with some embodiments of the present invention, reference is now made to **FIG 2**, showing two assemblies of stackable and nestable containers **10A** and **10B** with foldable thermal inserts (not shown), arranged in stacked conformation **20**. Assembly of stackable and nestable container **10A** with a foldable thermal insert (not shown) is stacked on top of container **10B**, thereby forming stack conformation **20**.

[0032] In accordance with some embodiments of the present invention, reference is now made to **FIG 3A**, showing assembly **10** of stackable and nestable container **30** and foldable thermal insert **12**. Container **30** comprises an essentially rectangular parallelepiped shaped shell **16**. Configurable elements **14**, which exemplarily embodied in a form of bars, are alterable between stacking configuration, shown through **FIG 2 to 3D**, and nesting configuration shown through **FIG 4 to 6**.

[0033] It should be acknowledged, however, that the particular embodiment of configurable elements **14** in a form of bars is merely exemplary, whereas a wide variety of configurable elements alterable between stacking and nesting configurations are equally applicable to the present invention and contemplated within the scope of the instant disclosure. Thus any stackable and nestable containers specially shaped or provided with fittings or attachments, to facilitate nesting and stacking, with movable parts configured to be placed in alternative positions for nesting the containers when empty and for stacking them when full, with the movable parts attachable or integral and displaceable into a position overlying the top of the container, corresponding to class B65D21/062 of the cooperative patent classification (CPC). Moreover any open-ended stackable and nestable containers shaped to be nested when empty and superposed when full, specially configured for nesting after rotation around a vertical axis, corresponding to class B65D 21/043 of the CPC, are equally applicable to the present invention and contemplated within the scope of the instant disclosure.

[0034] Foldable thermal insert **12** is accommodated within essentially rectangular parallelepiped shaped shell **16** of container **30**, so that configurable elements **14**, whether in stacking configuration, shown through **FIG 2 to 3D**, or in nesting configuration shown through **FIG 4 to 6**, are disposed on top or aside of foldable thermal insert **12** in an unfolded configuration.

[0035] In accordance with some embodiments of the present invention, reference is now made to **FIG 3B**, showing exploded assembly **10** of stackable and nestable container **30** and foldable thermal insert **12**. Foldable thermal insert **12** in an unfolded configuration is insertable to and retrievable from essentially rectangular parallelepiped shaped shell **16** of container **30**, when configurable elements **14** are in nesting configuration shown through **FIG 4 to 6**.

[0036] Foldable thermal insert **12** is made of and/or incorporates therein a thermally active and/or thermally passive material. Examples of thermally passive materials include any thermally insulating materials, such as substantially porous materials like polyurethane foam and/or reflective metallic sheeting. Examples of thermally active materials include any thermal energy accumulating and/or producing substances, such as heat and/or cold accumulating elements, configured for actively inducing a higher or lower temperature than the ambient environment.

[0037] Foldable thermal insert **12** comprises base portion **22**, openable and/or removable top cover **24**, flanking sidewalls **26** and longitudinal sidewalls **28**. Flanking sidewalls **26** comprise an essentially L-shaped flanges **32**, overlapping above longitudinal sidewalls **28**, thereby contributing to an essentially hermetic closure of foldable thermal insert **12** in an unfolded configuration.

[0038] In accordance with some embodiments of the present invention, reference is now made to **FIG 3C** and **3D**, showing orthogonal cross-sections, of assembly **10** of stackable and nestable container **30** and foldable thermal insert **12**. As can be seen from **FIG 3C** and **3D**, base portion **22** of foldable thermal insert **12** comprises flanking interconnecting portions **34** and longitudinal interconnecting portions **32**. Flanking interconnecting portions **34** are configured for forming hinged and/or bendable connection between base portion **22** and flanking sidewalls **26**; whereas longitudinal interconnecting portions **32** are configured for forming hinged and/or bendable connection between base portion **22** and longitudinal interconnecting portions **28** of foldable thermal insert **12**.

[0039] Flanking interconnecting portions **34** and longitudinal interconnecting portions **32** optionally comprise perforated, reduced or otherwise weakened material, facilitating bending and/or partial rotation of flanking sidewalls **26** and longitudinal sidewalls **28**, relatively to base portion **22** of foldable thermal insert **12**. Flanking interconnecting portions **34** are disposed above longitudinal interconnecting portions **32**, so that when longitudinal sidewalls **28** are in a folded configuration, urged toward base portion **22** of foldable thermal insert **12**, flanking sidewalls **26** are foldable on top of longitudinal sidewalls **28**, as shown through **FIG 4** to **6**.

[0040] In accordance with some embodiments of the present invention, reference is now made to **FIG 4** and **5**, showing stackable and nestable container **30** in a nesting configuration and foldable thermal insert **12** in a folded configuration. As can be seen from **FIG 4** and **5**, in a nesting configuration, configurable elements **14** are disposed aside of essentially rectangular parallelepiped shaped shell **16**, thereby rendering foldable thermal insert **12** insertable to and retrievable from container **30**. Moreover, in a nesting configuration, configurable elements **14** are disposed aside of container **30**, thereby rendering another stackable and nestable container (not shown) insertable into container **30**.

[0041] Foldable thermal insert **12** in a folded configuration, shown in **FIG 4** and **5**, has longitudinal sidewalls **28** folded towards base portion **22** and flanking sidewalls **26** are folded on top of longitudinal sidewalls **28**, so that of foldable thermal insert **12** assumes a relatively miniature size. Accordingly, foldable thermal insert **12** in a folded configuration rendering another stackable and nestable container (not shown) insertable into container **30**, while foldable thermal insert **12** in a folded configuration is disposed in-between the bottom face of container **30** and the bottom face of another stackable and nestable container (not shown), which is inserted into container **30**.

[0042] In accordance with some embodiments of the present invention, reference is now made to **FIG 6**, showing two stackable and nestable containers **30A** and **30B** with foldable thermal inserts **12A** and **12B**, arranged in nested conformation **40**. As can be seen from **FIG 6**, in nested conformation **40**, container **30A** is inserted into container **30B**, while thermal insert **12B** in a folded configuration is disposed in-between the bottom face of container **30A** and the bottom face of container **30B**. Another stackable and nestable container (not shown) can be inserted into container **30A** while thermal insert **12A** in a folded configuration is disposed in-between the bottom face of container **30A** and the bottom face of container another stackable and nestable container (not shown) which is inserted into container **30A**. It will be appreciated by persons skilled in the art that the present invention is not limited by what has been particularly shown and described herein above. Rather the scope of the invention is defined by the claims which follow:

Claims

1. An assembly (20) of nestable containers (10) with foldable thermal inserts (12) comprises:

(a) a first nestable container (10A) comprising:

- (I) a rectangular bottom plate, configured for nesting said first nestable container (10A);
- (II) two pairs of longitudinal sidewalls erecting essentially vertically from longitudinal edges of said bottom plate of said first nestable container (10A);
- (III) two pairs of lateral sidewalls erecting essentially vertically from lateral edges of said bottom plate of said first nestable container (10A);
- (IV) an essentially rectangular top opening of said first nestable container (10A);

(b) a second nestable container (10B) comprising:

- (I) a rectangular bottom plate, configured for nesting said second nestable container (10B);
- (II) two pairs of longitudinal sidewalls erecting essentially vertically from longitudinal edges of said bottom plate of said second nestable container (10B);
- (III) two pairs of lateral sidewalls erecting essentially vertically from lateral edges of said bottom plate of said second nestable container (10B);
- (IV) an essentially rectangular top opening of an essentially rectangular parallelepiped shape interior volume of said second nestable container (10B);

ble container (10B), configured for nesting said first nestable container (10A); wherein a substantial portion of said first nestable container (10A) is nestable within said essentially rectangular parallelepiped shape interior volume of said second nestable container (10B), in a nesting conformation;

said assembly (20) is **characterized by:**

(c) a foldable thermal insert (12) comprising:

(I) a base portion (22);
 (II) a pair of longitudinal sidewalls (28);
 (III) a pair of flanking sidewalls (26);
 (IV) an openable top cover (24);
 wherein said foldable thermal insert (12) is configurable in at least two configurations:

(i) an unfolded configuration, in which said foldable thermal insert (12) is expandable to assume a major portion of said essentially rectangular parallelepiped shape interior volume of said second nestable container (10B), thereby forming an interior volume of said foldable thermal insert (12), configured to accommodate thermally preserveable payload;

(ii) a folded configuration, in which wherein said foldable thermal insert (12) is collapsible to assume only a minor portion of said essentially rectangular parallelepiped shape interior volume of said second nestable container (10B);

wherein said foldable thermal insert (12), in said folded configuration, assumes a size configured to be accommodated with said minor portion of said essentially rectangular parallelepiped shape interior volume of said second nestable container (10B), and wherein said foldable thermal insert (12), in said folded configuration, is configured to be disposed in-between a bottom face of said first nestable container (10A) and a bottom face of said second nestable container (10B), in said nesting conformation.

2. The assembly (20) of nestable containers (10) with foldable thermal inserts (12), as in claim 1, wherein said first and second nestable containers (10A, 10B) comprise at least one static structural element, configured for rendering said first and second containers (10A, 10B) stackable one on top of another, in a stacked conformation; wherein said foldable thermal insert (12) in said unfolded configuration is config-

ured to be accommodated within said essentially rectangular parallelepiped shape interior volume of said second nestable container (10B).

3. The assembly (20) of nestable containers (10) with foldable thermal inserts (12), as in claim 1, wherein said first and second nestable containers (10A, 10B) comprise at least one movable element (14), configured for altering between at least to states, thereby rendering said first and second containers (10A, 10B) stackable one on top of another, in a stacked conformation; wherein said foldable thermal insert (12) in said unfolded configuration is configured to be accommodated within said essentially rectangular parallelepiped shape interior volume of said second nestable container (10B).

4. The assembly (20) of nestable containers (10) with foldable thermal inserts (12), as in any one of the claims 1 to 3, wherein said foldable thermal insert (12) comprises a thermally active material selected from the group consisting of: a thermal energy accumulating material, thermal energy producing material, heat accumulating element, cold accumulating element, heat producing element, cold producing element, heat producing device, cold producing device, heat producing apparatus, cold producing apparatus, substances configured for actively inducing a temperature than higher ambient environment and substances configured for actively inducing a temperature lower than ambient environment, ice, solid carbon dioxide, exothermic materials and endothermic materials.

5. The assembly (20) of nestable containers (10) with foldable thermal inserts (12), as in any one of the claims 1 to 4, wherein said foldable thermal insert (12) comprises a thermally passive material selected from the group consisting of: thermally insulating materials, substantially porous materials, polyurethane foam, reflective materials, reflective metallic sheetings, vacuum elements and any combination thereof.

6. The assembly (20) of nestable containers (10) with foldable thermal inserts (12), as in any one of the claims 1 to 5, wherein said foldable thermal insert (12) comprises a flexible material, in at least one a joint between at least two members selected from the group consisting of: said base portion (22), said longitudinal sidewalls (28), said flanking sidewalls (26) and said openable top cover (24).

7. The assembly (20) of nestable containers (10) with foldable thermal inserts (12), as in any one of the claims 1 to 6, wherein at least one member of said foldable thermal insert (12), selected from the group consisting of: said base portion (22), said longitudinal

sidewalls (28), said flanking sidewalls (26) and said openable top cover (24), is detachably attachable.

8. The assembly (20) of nestable containers (10) with foldable thermal inserts (12), as in any one of the claims 1 to 7, wherein said foldable thermal insert (12) is further configurable into a flattened configuration, wherein said base portion (22), said longitudinal sidewalls (28), said flanking sidewalls (26) and said openable top cover (24) are sprawled essentially planarly.
9. The assembly (20) of nestable containers (10) with foldable thermal inserts (12), as in any one of the claims 1 to 7, wherein at least one member of said foldable thermal insert (12), selected from the group consisting of: said base portion (22), said longitudinal sidewalls (28), said flanking sidewalls (26) and said openable top cover (24), comprises an overlapping portion (32) configured for essentially hermetic closure of said interior volume of said foldable thermal insert (12) in said unfolded configuration.
10. A method of using nestable containers (10) with foldable thermal inserts (12) comprises:

(a) providing at least one first nestable container (10A);

(b) providing at least one second nestable container (10B), comprising an essentially rectangular parallelepiped shaped interior volume, configured for accommodating at least a substantial portion of said first nestable container (10A), within said essentially rectangular parallelepiped shaped interior volume of said second nestable container (10B), in a nested conformation;

(c) nesting said at least one first nestable container (10A), within said at least one second nestable container (10B);

said method is characterized by:

(d) providing a foldable thermal insert (12) configured to assume at least two configurations:

(I) an unfolded configuration, in which said foldable thermal insert (12) is expandable to assume a major portion of said essentially rectangular parallelepiped shape interior volume of said second nestable container (10B), thereby forming an interior volume of said foldable thermal insert (12), configured to accommodate thermally preserveable payload;

(II) a folded configuration, in which wherein said foldable thermal insert (12) is collapsible to assume only a minor portion of said essentially rectangular parallelepiped shape interior volume of said second nestable

ble container (10B);

(e) folding said foldable thermal insert (12), into said folded configuration, to assume a size configured to be accommodated with said minor portion of said essentially rectangular parallelepiped shape interior volume of said second nestable container (10B);

(f) disposing said foldable thermal insert (12), in said folded configuration, in-between a bottom face of said first nestable container (10A) and a bottom face of said second nestable container (10B), in said nesting conformation.

11. The method of using nestable containers (10) with foldable thermal inserts (12), as in claim 10, wherein said at least one first and second nestable containers (10A, 10B) comprise at least one structural element (14), configured for rendering said first and second containers (10A, 10B) stackable one on top of another, in a stacked conformation; wherein said foldable thermal insert (12) in said unfolded configuration is configured to be accommodated within said essentially rectangular parallelepiped shape interior volume of said second nestable container (10B).

12. The method of using nestable containers (10) with foldable thermal inserts (12), as in any one of the claims 10 or 11, comprises incorporating into said foldable thermal insert (12) at least one thermally active or thermally passive member selected from the group consisting of: a thermally insulating material, substantially porous material, polyurethane foam, reflective material, reflective metallic sheeting, vacuum element, thermal energy accumulating material, thermal energy producing material, heat accumulating element, cold accumulating element, heat producing element, cold producing element, heat producing device, cold producing device, heat producing apparatus, cold producing apparatus, substances configured for actively inducing a temperature than higher ambient environment and substances configured for actively inducing a temperature lower than ambient environment, ice, solid carbon dioxide, exothermic materials, endothermic materials and any combination thereof.

13. The method of using nestable containers (10) with foldable thermal inserts (12), as in any one of the claims 10 to 12, wherein said foldable thermal insert (12) is further configurable into a flattened configuration, further comprising essentially planarly sprawling said base portion (22), said longitudinal sidewalls (28), said flanking sidewalls (26) and said openable top cover (24).

14. The method of using nestable containers (10) with foldable thermal inserts (12), as in any one of the

claims 10 to 13, further comprising unfolding said foldable thermal insert (12) into unfolded configuration, wherein said foldable thermal insert (12) is expanded to assume a major portion of said essentially rectangular parallelepiped shape interior volume of said second nestable container (10B). 5

15. The method of using nestable containers (10) with foldable thermal inserts (12), as in any one of the claims 10 to 14, further comprising activating said foldable thermal insert (12), to produce heat or cold. 10

15

20

25

30

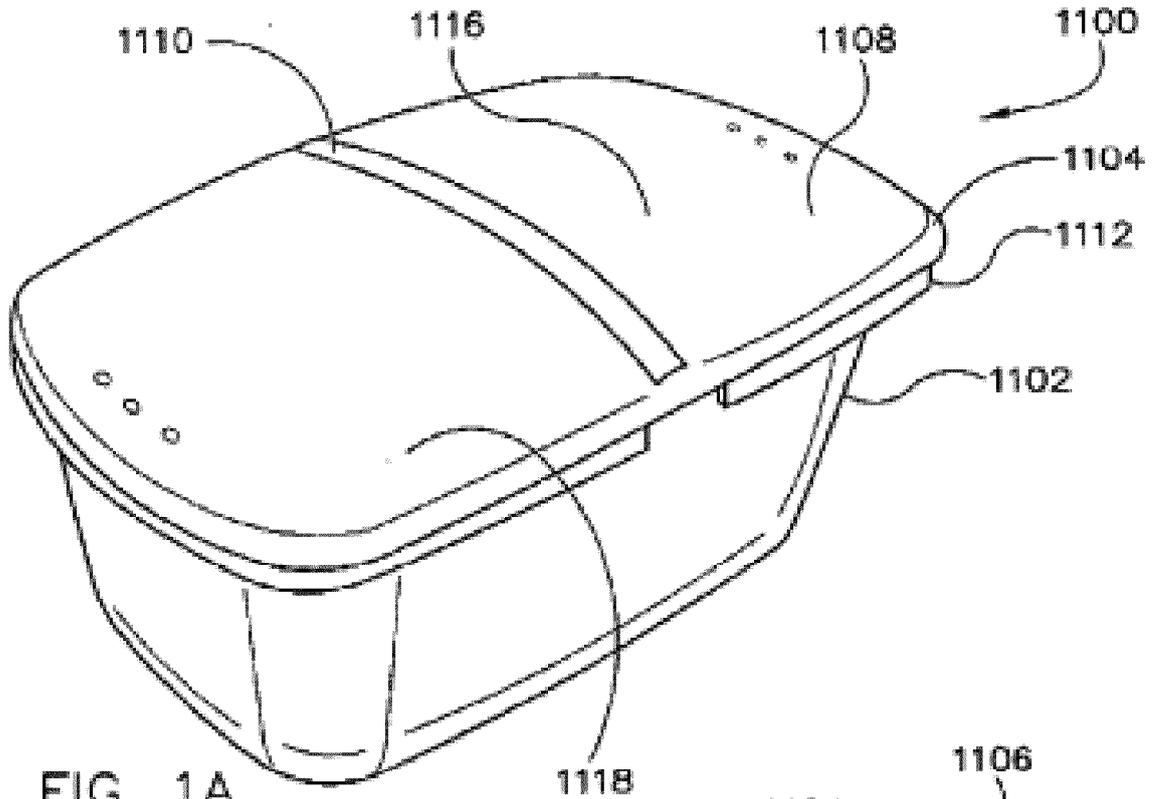
35

40

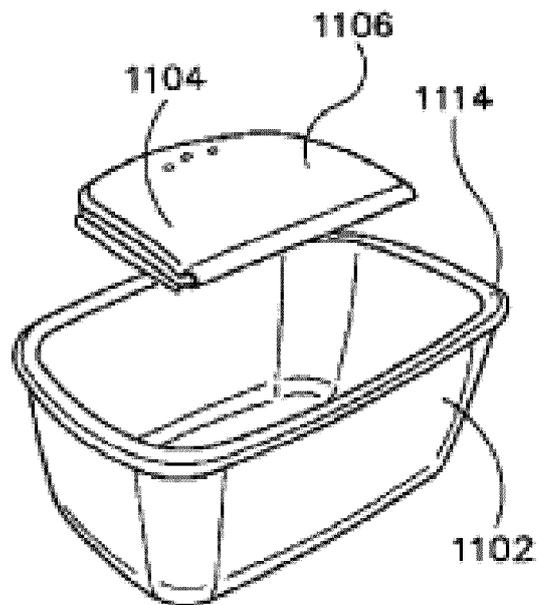
45

50

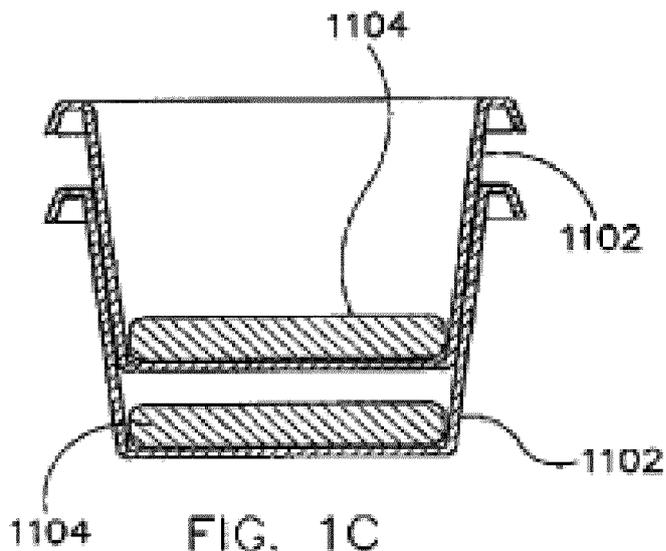
55



PRIOR ART



PRIOR ART



PRIOR ART

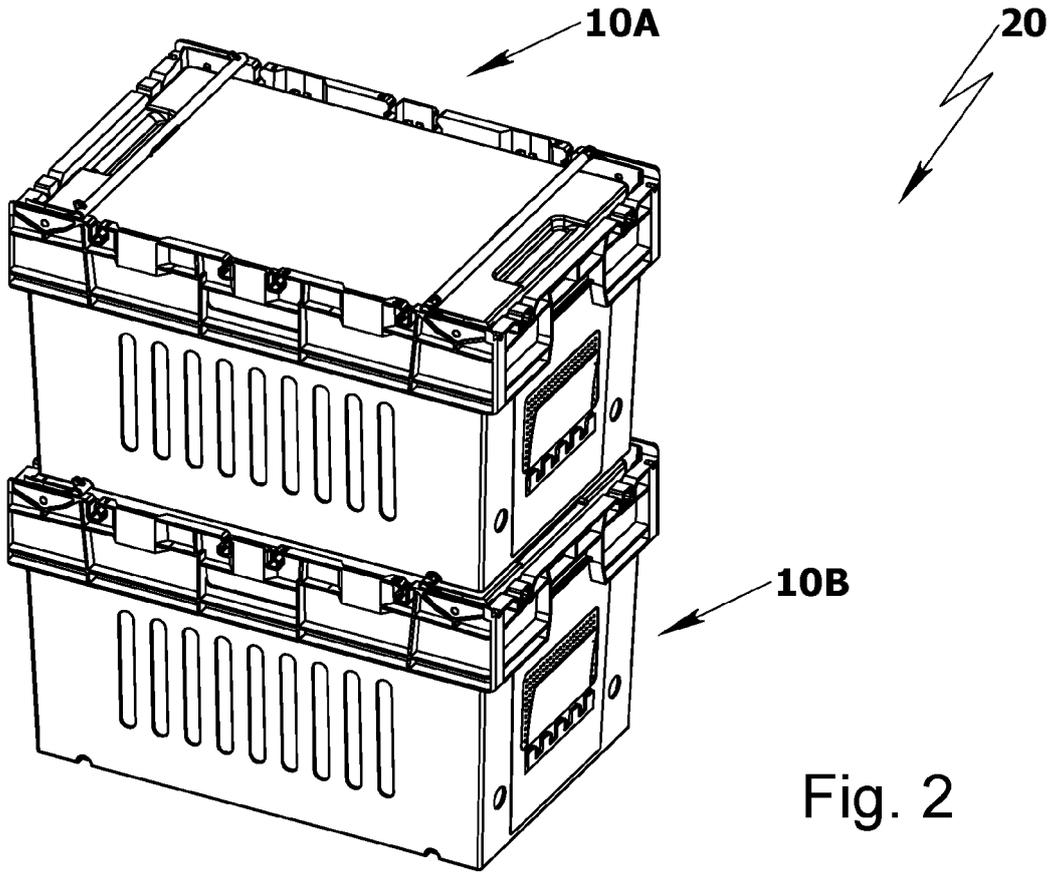


Fig. 2

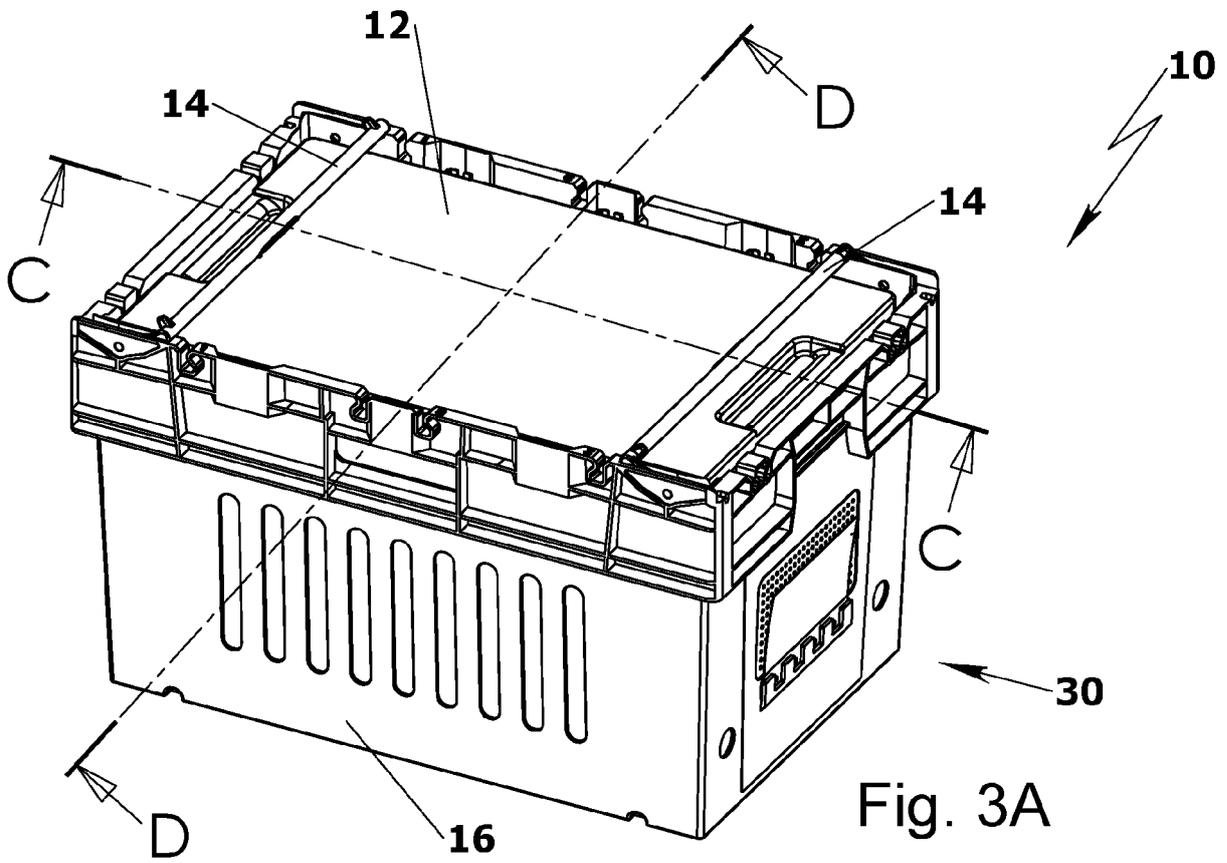


Fig. 3A

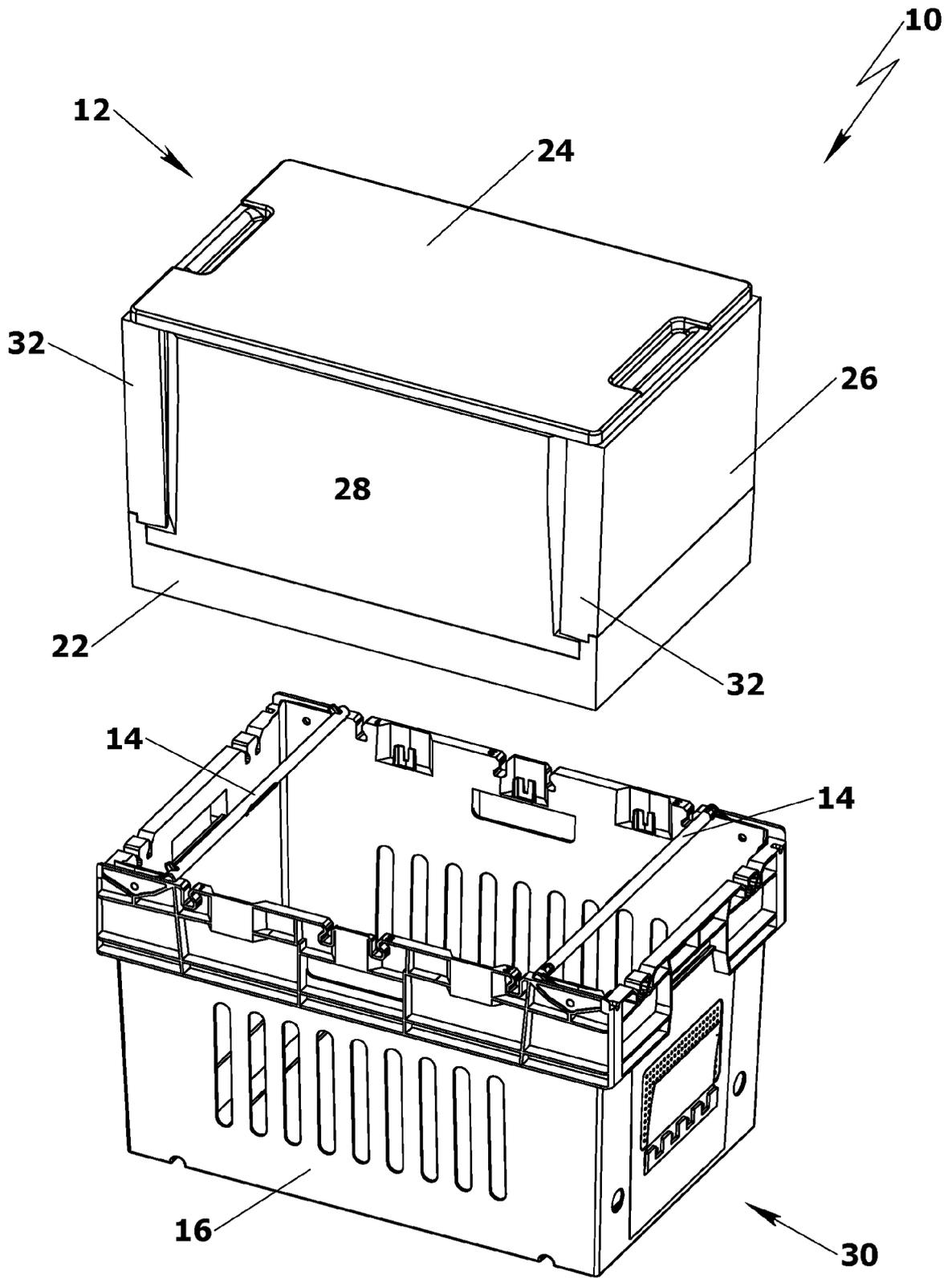


Fig. 3B

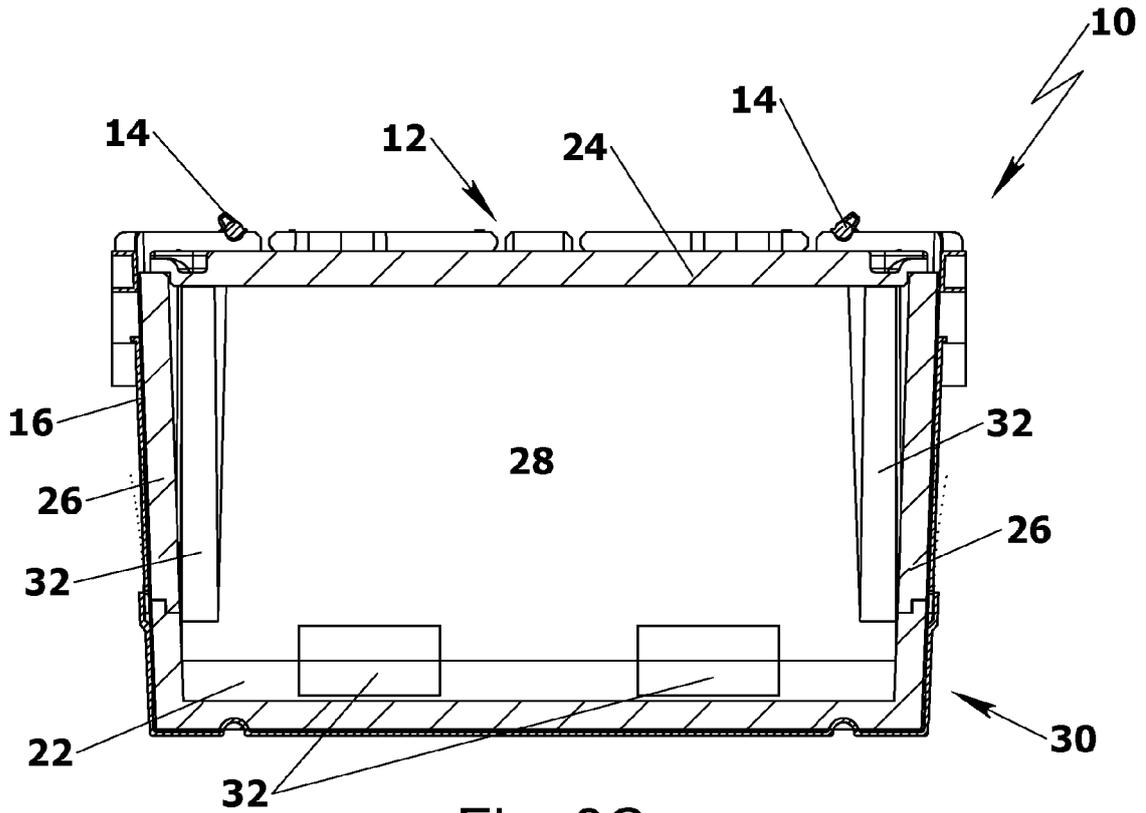


Fig. 3C

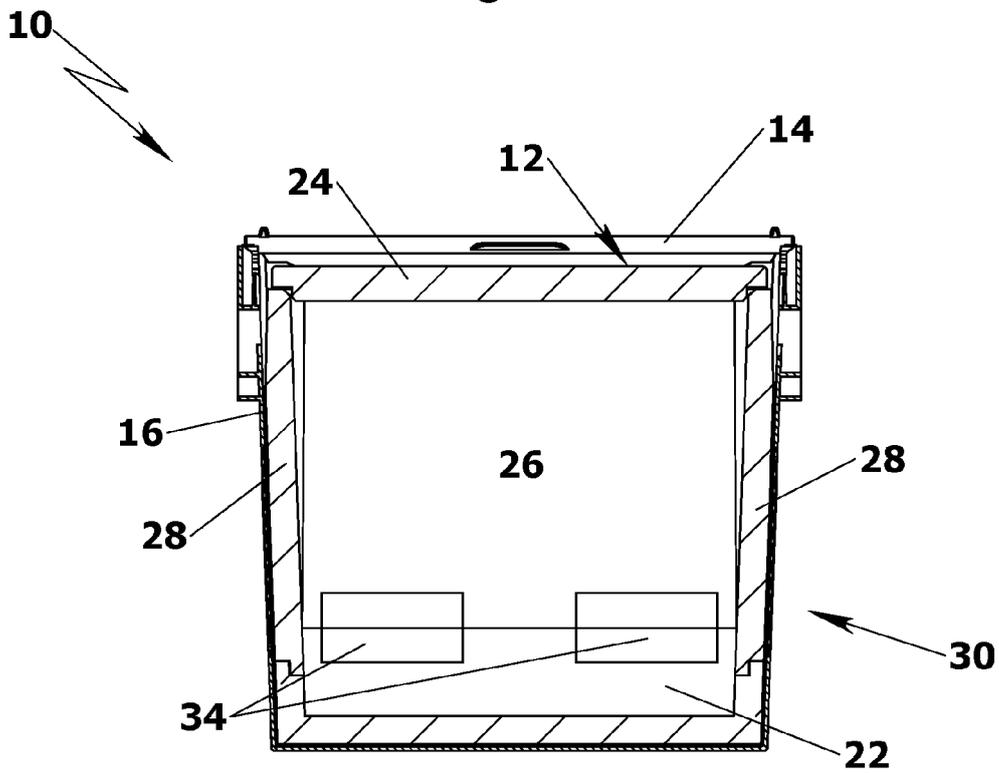


Fig. 3D

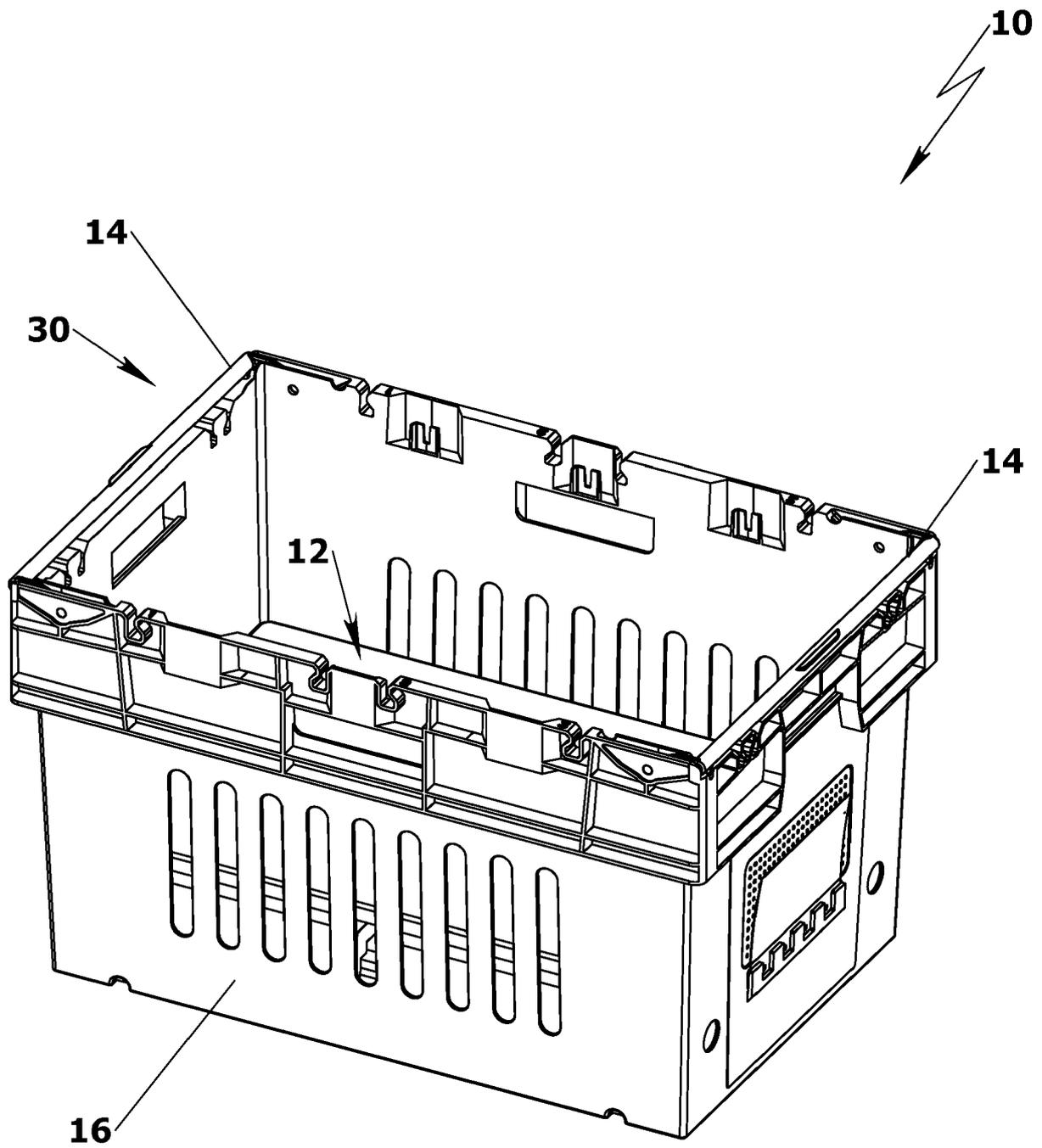


Fig. 4

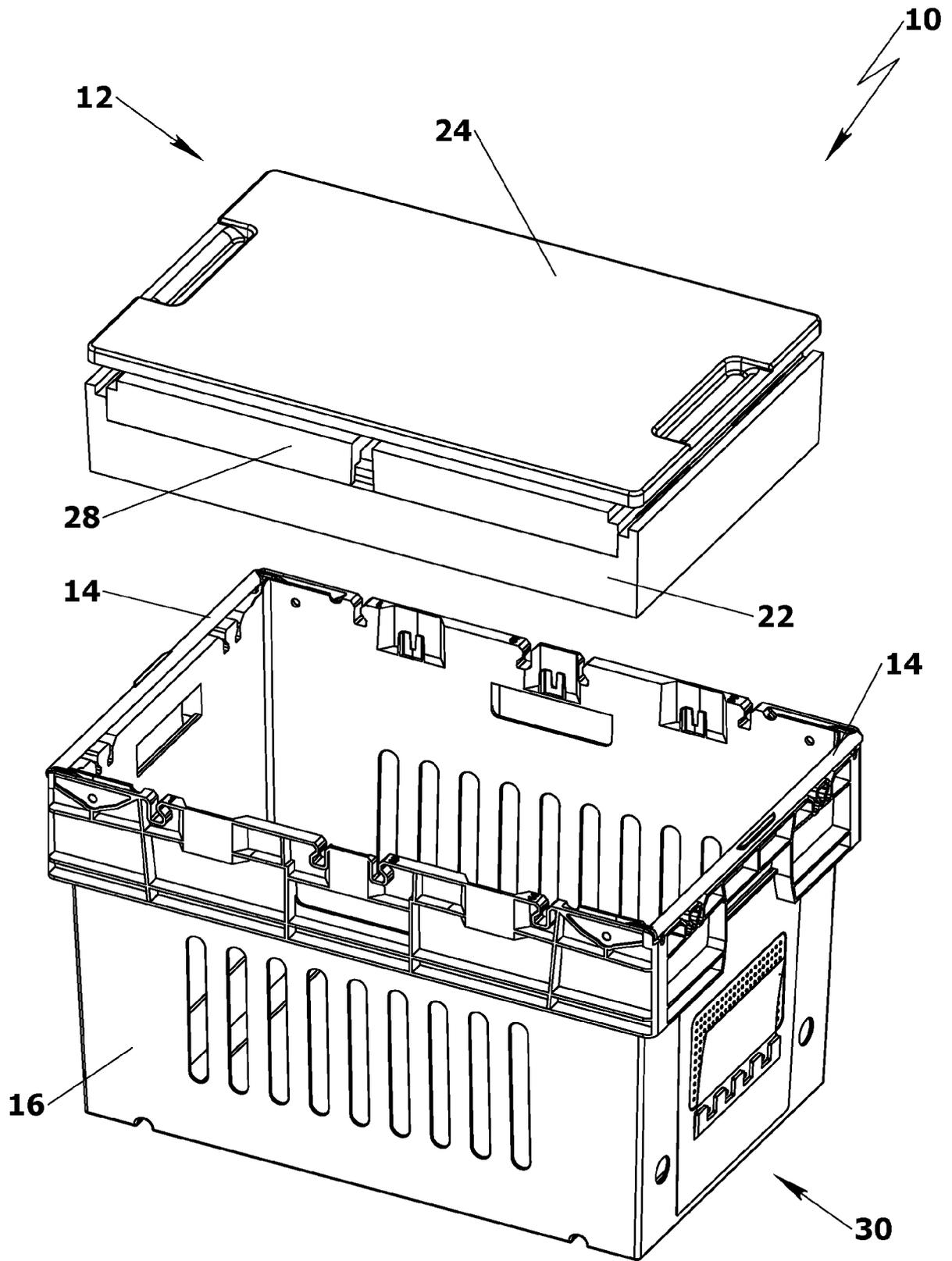


Fig. 5

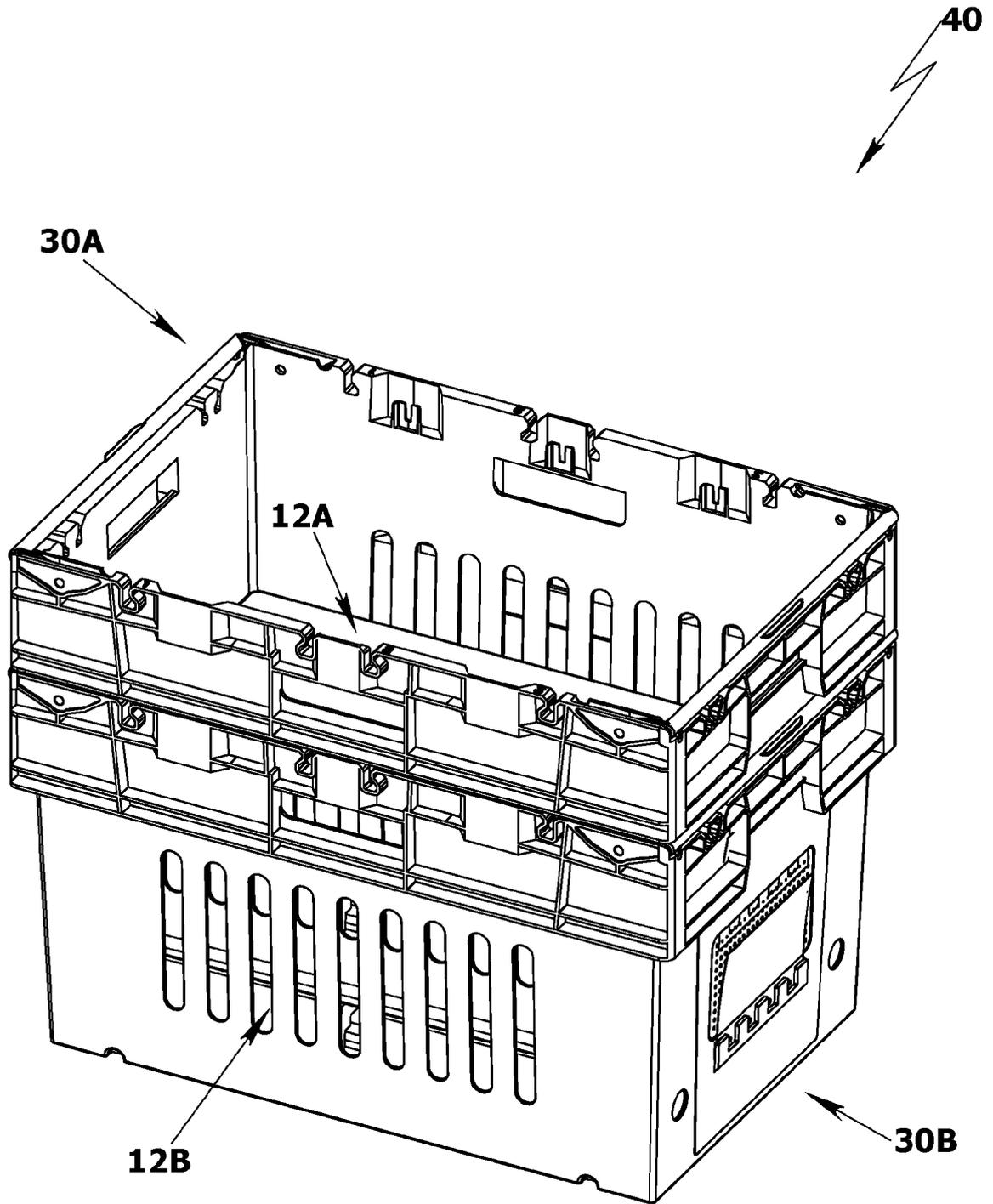


Fig. 6



EUROPEAN SEARCH REPORT

Application Number
EP 20 18 1295

5

10

15

20

25

30

35

40

45

50

55

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	US 6 325 281 B1 (GROGAN KEVIN [US]) 4 December 2001 (2001-12-04) * the whole document * -----	1,10	INV. B65D21/04 F25D3/08 F25D3/10 F25D3/14
A	US 2020/148453 A1 (SOLLIE GREG [US] ET AL) 14 May 2020 (2020-05-14) * the whole document * -----	1,10	
A	US 1 865 688 A (HANNAFORD FREDERICK C) 5 July 1932 (1932-07-05) * the whole document * -----	1,10	
A	US 5 598 943 A (MARKUS THEODORE [US]) 4 February 1997 (1997-02-04) * the whole document * -----	1,10	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			F25D B65D
Place of search		Date of completion of the search	Examiner
The Hague		9 November 2020	Kolev, Ivelin
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

1
EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 20 18 1295

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-11-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6325281	B1	04-12-2001	NONE
US 2020148453	A1	14-05-2020	US 2020148453 A1 14-05-2020 WO 2020101939 A2 22-05-2020
US 1865688	A	05-07-1932	NONE
US 5598943	A	04-02-1997	NONE

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- CN 106742785 [0003]
- CN 106043886 [0003]
- EP 1225131 A [0003]
- DE 4109151 [0003]
- DE 576647 [0003]
- JP 2000203665 B [0003]
- US 2006254948 A [0003] [0004]
- US 2002070267 A [0003]
- US 2009001086 A [0003]
- US 4848578 A [0003]
- US 7303075 B [0003]
- WO 2010030191 A [0003]
- WO 2012028567 A [0003]
- WO 2017172029 A [0003]
- WO 2017082333 A [0003]
- US 20060254948 A [0027] [0029]