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(54) **A BLANK, A METHOD OF FOLDING THE BLANK, AND A PACKAGE**

(57) The disclosure relates to a blank (1), to a method of folding a blank (1), and to a package (200). 1. The blank (1) comprises a bottom panel (10) and a first and a second set (21, 22) of end wall panels (21a-b, 22a-b) including a cut (23a-b) which is located centrally as seen along the second direction (T) and which has an extension from the respective first end wall panel (21a, 22a) towards or into the respective second end wall panel (21b, 22b) or from the respective second end wall panel (21b, 22b) towards or into the respective first end wall panel (21a, 22a) such that, as the end wall panels (21a-b, 22a-b) are folded relative to each other, a respective tab (24a-b) extends upwardly from the respective first or second end wall panel (21a-b, 22a-b) and said extension of respective cut (23a-b) from respective first or second end wall panel (21a-b, 22a-b) as seen in a flat-laid state of the blank (100) forms a respective recess (25a-b) located in an upper portion of the respective end wall (221, 222) of the package (200) and being located centrally as seen along the second direction (T).

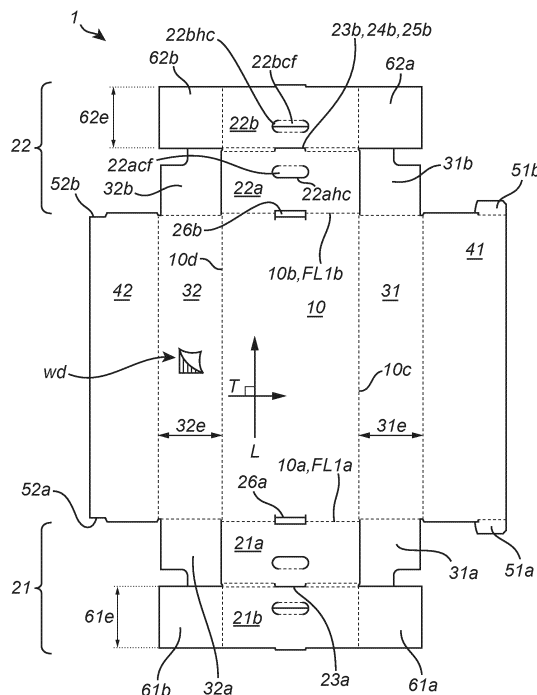


Fig. 1

Description

Field of invention

[0001] The invention relates to a blank configured to be folded into a package. The invention also relates to a package folded from a blank. The invention also relates to a method of folding a blank into a package.

Technical Background

[0002] When designing a package from a blank, it is often desirous to consider a number of different design criteria. The package should e.g., be designed such that it makes efficient use of material, is space efficient during transport and storage before being used to transport goods, and provides a strong structure during use.

[0003] Moreover, it is often desirable that the package is easy to prepare for use. This is especially important when the blank is to be folded manually since it is typically desirous that it only requires one person to perform the task. Thus, it is often desirable that the package should be formed in a manner that requires a limited number of folding operations, and/or folding operations which are easy to perform.

[0004] When designing a package, which is intended to be disposed of after use, it is preferred to use a base material with low environmental impact, such as paper-board, use a minimum of such material, and to minimize the need for adhesives or staples, or the like, or at least provide it in a manner making it easy to separate from the base material.

[0005] US 5,139,195 A discloses a package with overlapping top panels being kept in the closed position by one of the top panels being provided with locking tabs on the sides thereof. The locking tabs are configured to be received in recesses on the upper portions of the side walls of the package. The side walls are formed of a three layer structure where two inner layers are double folded relative to each other and where an outer most layer connected to the bottom panels is glued to an outside of the double folded layer.

[0006] Thus, there is still a need for a package which adequately addresses at least some of the design criteria mentioned above.

Summary of invention

[0007] It is an object of the invention to provide a package addressing at least some of the design criteria concerning that the package should involve efficient use of material, be space efficient during transport and storage before being used to transport goods, provide a strong structure during use, be easy to prepare for use, be easy dispose of after use, to facilitate use of a base material with low environmental impact, such as paper-board, and to minimize the need for adhesives or staples, or the like, or at least provide it in a manner making it easy

to separate from the base material.

[0008] This object has been achieved by a blank configured to be folded into a package, the blank comprising:

a bottom panel configured to form a bottom of said package,

a first and a second set of end wall panels being arranged on opposing sides of the bottom panel as seen along a first direction and being configured to form two opposing end walls, wherein at least one of said sets of end wall panels includes a first and a second end wall panel being arranged one after the other along the first direction and being configured to form two layers of the respective end wall of the package and where the respective first end wall panel is foldably connected to the respective side of the bottom panel and the respective second end wall panel is foldably connected to the respective first end wall panel,

a first and a second side wall panel being arranged on opposing sides of the bottom panel as seen along a second direction, the second direction being substantially transverse to the first direction, and being configured to form two opposing side walls of the package,

a first and a second top panel being foldably connected to a respective one of the first and a second side wall panels and being configured to jointly form a top of the package,

wherein said at least one of said sets of end wall panels includes a cut which is located centrally as seen along the second direction and which has an extension from the respective first end wall panel towards or into the respective second end wall panel or from the respective second end wall panel towards or into the respective first end wall panel as seen in a flat-laid state of the blank such that, as the end wall panels are folded relative to each other, a respective tab extends upwardly from the respective first or second end wall panel and said extension of respective cut from respective first or second end wall panel as seen in a flat-laid state of the blank forms a respective recess located in an upper portion of the respective end wall of the package and being located centrally as seen along the second direction, wherein the first top panel is configured to partly overlap and be positioned on top of the second top panel, and

wherein the first top panel is on at least one side, as seen along the first direction, provided with a locking tab being foldably connected to and extending from the side along the first direction, wherein the locking tab is positioned and sized as seen along the second direction such that the locking tab is received into the centrally located recess as the first top panel is folded into its closed position and thereby aids in keeping the first top panel and due to the overlap thereby also aids in keeping the second

top panel in closed position,
 wherein the blank further comprises a cut-out being
 located at a fold line between the bottom panel and
 the first end wall panel at at least a side where there is
 a tab formed, and preferably at both sides, and being
 located centrally as seen along the second direction
 such that, as several blanks are folded into packages
 that are stacked on top of each other, the tab of a first
 package is received in the cut-out of a second pack-
 age stacked onto the first package.

[0009] The blank disclosed above it is easy to fold into a
 package since the steps may be performed on after the
 other with minimum need to hold other parts of the blank
 in position during folding. There will automatically be
 formed an upwardly extending tab and there will auto-
 matically be formed a recess capable of receiving the
 locking tabs of the first top panel. By the tab and recess
 being formed of a centrally located cut, the resulting
 package may be formed with strong corners, which is
 advantageous both when it comes to stacking strength
 and strength when it comes to withstanding the bottom
 being torn when a heavy loaded package is lifted up.
 Moreover, since it is the same cut that provides the
 upwardly extending tab and also the recess, there is a
 minimum of material removed, which also is advanta-
 geous when it comes to providing a strong package.
 Moreover, the design of the blank facilitates providing
 a package which may be kept in the intended shape
 without the need of any adhesive at all.

[0010] Centrally located as seen along the second
 direction is intended to refer to a position of a midpoint
 of the cut respectively the cut-out being within a central
 portion of the extension of the respective end wall as seen
 along the second direction, where the central portion is
 symmetrically distributed from a midpoint of the exten-
 sion of the of the respective end wall along the second
 direction and covers 30%, preferably 20%, of the total
 extension of the respective end wall along the second
 direction. That is, centrally located relates to the position
 of the cut, recess, and tab at an upper portion of the
 respective end wall and to the position of the cut-out at the
 junction between the bottom panel and the respective
 end wall and is not intended to provide any limit to the
 actual extension of the cut, recess, tab, and cut-out along
 the second direction. Preferably, the cut, recess, and tab
 have all a respective extension along the second direc-
 tion being less than 30% of the total extension of the
 respective end wall along the second direction. It may in
 this context be noted that the cut may be a single line cut
 whereby the recess and tab will have the same size and
 shape. However, the cut may along at least a part thereof
 be a double line cut whereby the recess and tab will have
 different size and/or shape. It is e.g., possible to have a
 recess being wider along the second direction and/or
 deeper along the first direction than the tab. The tab
 formed should preferably be equal to or slightly smaller
 than the cut-out, i.e., positioned and sized such that the

tab fits into the cut-out of another package positioned
 thereupon. It may in this context also be noted that in a
 preferred embodiment, the cut, recess, tab, and cut-out
 are all symmetrically located across a midpoint of the
 respective end wall as seen along the second direction.
 Preferably, also the respective sizes of the cut, recess,
 tab, and cut-out at one of the end walls is the same as the
 respective sizes and cut-out at the other one of the end
 walls. That is, the two cuts have the same size, the two
 tabs have the same size which may be the same or
 different from the size of the cut, etc. One advantage
 with such a design is that the packages present the same
 kind and position of the upwardly extending tab irrespec-
 tive of if the first or second side wall faces in the same
 direction or different directions of different packages
 positioned side by side or on top of each other. However,
 it is also contemplated that the cut, recess, tab, and cut-
 out may be of different sizes at the first end wall compared
 to at the second end wall. It is also contemplated that the
 cut, recess, tab, and cut-out offset relative to a midpoint of
 the respective end wall. Such offset at the respective end
 wall may be mutually diagonally offset towards different
 side walls or be both offset in the same direction towards
 the same side wall. One advantage with some kind of
 difference in sized and/or offset is that it is possible design
 the package such that the upwardly extending tabs may
 only allow stacking of packages in a specific manner,
 such as that all packages must be stacked with the same
 side wall facing the in the same direction or that the
 packages must be stacked in an alternating manner by
 being rotated 90 or 180 degrees relative to the package
 immediately below in the stack of packages.

[0011] It may be noted that the first side wall panel is
 foldably connected to the bottom panel and the first top
 panel is foldably connected to the first side wall panel at a
 side of the first side wall panel being opposite the bottom
 panel. Correspondingly, the second side wall panel is
 foldably connected to the bottom panel at a side of the
 bottom panel being opposite to the first side wall panel
 and the second top panel is foldably connected to the
 second side wall panel at a side of the second side wall
 panel being opposite the bottom panel.

[0012] It may in this context also be noted that the
 labels side wall and end wall are primarily to be consid-
 ered as labels introduced for clarity reason. The bottom
 panel may have a quadratic shape with the side walls and
 end walls having the same length along the first and the
 second directions, respectively. The bottom panel may
 have a rectangular shape. In such a case, the walls may
 be oriented relative to the shape of the bottom panel such
 that the walls labelled as end walls may in one embodi-
 ment be longer and in another embodiment be shorter
 than the walls labelled as side walls. However, in the
 preferred embodiment, the bottom panel is rectangular,
 and the walls labelled as end walls are positioned along
 the shorter sides of the bottom panel and the walls
 labelled as side walls are positioned along the longer
 sides of the bottom panel. This facilitates folding and it

facilitates handling of the package by e.g., minimizing the length by which the respective top panel extends from the bottom panel when the top panels are in their respective open position. This orientation with shorter end walls typically also facilitates handling in those cases the set of end walls are provided with handle openings.

[0013] The blank is preferably made of a paper-based material, e.g., a material based on paper or paperboard. Paper-based material may provide a lightweight package. Paper-based material may be produced in an environmentally friendly manner and may be recycled in a simple manner. Paper-based material may provide a blank that is easy to transport and handle before the blank is formed to the package. It may be noted that the blank may be made of other materials. It may be noted that the blank as a whole may be made of paper-based material. It may be noted that the blank need not to be made of the same material through-out. The blank may be made of a paper-based material coated or laminated with a polymer-based coating, such as a thermoplastic material, on one or both sides thereof. Such coating may be heat-sealable and/or provide a desired tightness, i.e., barrier properties, such as being waterproof, water resistant, grease proof, grease resistant, food safe, etc.

[0014] Preferably, both sets of end wall panels includes a respective first and a respective second end wall panel being arranged one after the other along the first direction and being configured to form two layers of the respective end wall of the package and where the respective first end wall panel is foldably connected to the respective side of the bottom panel and the respective second end wall panel is foldably connected to the respective first end wall panel.

[0015] That is, in the first set of end wall panels, the first end wall panel is foldably connected to a first side of the bottom panel and the second end wall panel is foldably connected to the first end wall panel at a side of the first end wall panel being opposite the bottom panel. Correspondingly, in the second set of end wall panels, the first end wall panel is foldably connected to a second side of the first end wall panel being connected to the bottom panel and the second end wall panel is foldably connected to the first end wall panel at a side of the first end wall panel being opposite the side of the first end wall panel being connected to the bottom panel. This facilitates providing a strong package and it may be used to facilitate the folding operation by providing symmetrical folding operations at the two end walls.

[0016] Preferably, both sets of end wall panels includes a respective cut which is located centrally as seen along the second direction and which has an extension from the respective first end wall panel towards or into the respective second end wall panel or from the respective second end wall panel towards or into the respective first end wall panel, preferably the respective cut has an extension from the respective first end wall panel towards or into the respective second end wall panel, as seen in a flat-laid state of the blank such that, as the end wall panels are

folded relative to each other, a respective tab extends upwardly from the respective first or second end wall panel and said extension of respective cut from respective first or second end wall panel as seen in a flat-laid state of the blank forms a respective recess located in an upper portion of the respective end wall of the package and being located centrally as seen along the second direction. Thereby, there is provided a respective upwardly extending tab on both end walls and there is also provided a respective recess on both end walls.

[0017] Preferably, the first top panel is on both sides, as seen along the first direction, provided with a respective locking tab being foldably connected to and extending from the respective side along the first direction. Thereby there may be provided a locking effect on both sides of the first top panel and thereby a more secure closure of the package may be achieved. It may in this context be noted that the two locking tabs extends in opposite directions, both in a direction away and outward from the respective side of the top panel; i.e., both extending along the first direction with one extending in the first direction and the other extending in a direction opposite to the first direction. This may also be expressed as that the respective locking tab each have an extension from the first top panel towards a free end of the respective locking panel. It may be noted that the top panel may at other locations as seen along the second direction have an extension along the first direction exceeding the distance between the respective fold line between the respective locking tab and the first top panel. The first top panel may at those other locations even have an extension exceeding a distance between the free ends of the locking tabs. These two latter embodiment may also be expressed as that the locking tabs are positioned partly or fully within a geometrical perimeter of the first top panel. Those other locations of the first top panel having greater extension may end at a distance from the locking tabs or may extend all the way up to the locking tabs as seen along the second direction as seen in a flat-laid state of the blank.

[0018] The respective second end wall panel may be configured to be folded inwardly into the interior of the package relative to the respective first end wall panel. Thereby, the outside surface of the package will be smooth. Moreover, the second end wall panels may be locked in position, such as by frictionally engaging with the bottom panel or by each being provided with locking tab or tabs engaging with a recess.

[0019] Preferably, said at least one of said sets of end wall panels includes a respective locking tab on the respective second end wall panel, the respective locking tab being located centrally as seen along the second direction and having an extension from the respective second end wall panel along the first direction as seen in a flat-laid state of the blank such that, as the end wall panels are folded relative to each other, the respective locking tab is positioned in the respective cut-out and thereby aids in keeping the end wall panels in the double folded position.

[0020] Also for this locking tab, centrally located as seen along the second direction is intended to refer to a position of a midpoint of the locking tab being within a central portion of the extension of the respective end wall as seen along the second direction, where the central portion is symmetrically distributed from a midpoint of the extension of the of the respective end wall along the second direction and covers 30%, preferably 20%, of the total extension of the respective end wall along the second direction. Also, the above discussion relating to the sizes, possible offset, etc. is equally applicable to this locking tab since the respective locking tab is configured to be received in the respective cut-out.

[0021] The blank may further comprise connection panels being provided on both sides, as seen along the first direction, of respective side wall panel, the connection panels being foldably connected to and extending from the respective side of the respective side wall panel along the first direction, wherein the respective connection panel is configured to be positioned between the double folded first and second end wall panels as the blank is folded into said package. That is, there are preferably two connection panels which extends in opposite directions, both in a direction away and outward from the respective side of the first side wall panel and two connection panels which extends in opposite directions, both in a direction away and outward from the respective side of the second side wall panel. This provides a strong package where the positioning of the side walls is provided in a strong manner and in a manner which does not require any adhesive or the like. Preferably, the connection panels has an extension along the first direction as seen in a flat-laid state such that just meet or leave a gap therebetween, such that they do not overlap, when they extend towards each other along the second direction once the side wall panels are folded relative to the bottom panel and the connection panels are folded relative to their respective side wall panel. Preferably, the connection panels has an extension along the second direction as seen in a flat-laid state such that they extend from the bottom panel up to an inside of the fold of the first and second end wall panels such that they take part in taking compressive load from other packages stacked thereupon. Such an extension along the second direction, or height as folded, also prevents the connection panels from tilting out from their position between the first and second end wall panels and thereby the side wall panels are also securely kept in their upright position.

[0022] The blank may further comprise support panels being provided on both sides, as seen along the second direction, of respective second end wall panel, the support panels being foldably connected to and extending from the respective side of the respective second end wall panel along the second direction. The respective support panel is preferably configured to be positioned alongside an inside of the respective side wall panel as the blank is folded into said package. The support panels will further strengthen the corners of the package. It may

be noted that there are two support panels connected to each of the second end wall panels, with one of those two support panels extending in the second direction and the other one of those two support panels extending opposite to the second direction. In a preferred embodiment, the respective support panel has as seen in a flat-laid state of the blank an extension along the first direction corresponding to an extension of the respective side wall panel along the second direction such that the respective support panel will have a respective height corresponding to a respective height of the respective side wall panel when the blank is folded into said package. Thereby, the respective support panel will extend between the bottom panel and the respective one of the first and second top panels and will aid in providing a support of the top panels

[0023] The first and second end wall panels may each comprise an internal handle cut configured to form handle openings through the respective end wall when the package is to be carried. In case the bottom panel is rectangularly shaped, It is preferred that the handle openings are formed through those end wall panels which form the shortest ones of the side walls and the end walls.

[0024] Preferably at least one of the first and second end wall panels of respective set of end wall panels is formed as a cut defining a closing flap foldably connected to remaining portions of the respective end wall panel such that the handle openings may be closed by said closing flap. Thereby the handle openings may remain closed when the blank is folded into a package and filled with goods, put on a conveyor to a pallet, prepared for transport, and transported to a site of use. At the site of use, there is often no other means than to lift the packages by hand and therefore the handle openings are opened at the site of use. However, during transport, the handle openings may have remained closed, which e.g., is beneficial if the goods transported is sensitive to dust and/or if there is a desire to keep a thermal insulation intact.

[0025] The above object has also been achieved with a method of folding a blank, the method comprising:

folding the side wall panels upwardly relative to the bottom panel,

folding the end wall panels upwardly relative to the bottom panel such that the respective tab extends upwardly from the respective first or second end wall panel and the respective recess is formed in an upper portion of the respective end wall of the package whereby a package ready to receive goods is provided,

folding the first and second top panels inwardly and downwardly relative to the respective side wall panel, preferably after goods has been provided into the package, such that the first top panel partly overlap becomes positioned on top of the second top panel, and

folding the respective locking tab relative to the first top panel, and

inserting the respective locking tab into the respective centrally located recess as the first top panel is folded into its closed position and thereby aids in keeping the first top panel and due to the overlap thereby also aids in keeping the second top panel in closed position.

[0026] The various details of and advantages associated with the features have been discussed above with reference to the blank and those advantages are equally applicable with reference to the method. Also, different embodiments and variations of the blank are equally applicable to the method.

[0027] Preferably, the connection panels, when present, are folded inwardly relative to the side wall panels such that the connection panels extend upwardly from those sides of the bottom panel which extends along the second direction after the side wall panels has been folded such that the respective first end wall panel is folded upwardly towards the respective connection panel and thereafter the respective second end wall panel is folded downwardly towards an inside of the respective connection panel. Thereby the connection panels will be positioned in the intended position of the respective end wall and they will in a sense act as a support about which the end wall panels are folded.

[0028] Preferably, the support panels, when present are, folded backwardly relative to the respective second end wall panel such that, as the respective second end wall panel is folded inwardly into the interior of the package, the support panels slides in along an inside of the respective side wall panel.

[0029] The above mentioned object has also been achieved by a package folded from a blank, the package comprising

a bottom formed of a bottom panel of the blank, a first and a second end wall formed of a first and a second set, respectively, of end wall panels being arranged on opposing sides of the bottom panel as seen along a first direction, wherein at least one, preferably both, of said sets of end wall panels includes a first and a second end wall panel being arranged one after the other along the first direction as seen in a flat-laid state of the blank and forming two layers of the respective first and second end wall of the package, two opposing side walls formed of a first and a second side wall panel being arranged on opposing sides of the bottom panel as seen along a second direction, the second direction being substantially transverse to the first direction, a top jointly formed of a first and a second top panel being foldably connected to a respective one of the first and a second side wall panels, an upwardly extending tab formed at the one end wall, preferably both end walls, including a first end wall panel and a second end wall panel, the respec-

tive upwardly extending tab being formed by said at least one of said sets of end wall panels including a cut which is located centrally as seen along the second direction and which, as seen in a flat-laid state of the blank has an extension from the respective first end wall panel towards or into the respective second end wall panel or from the respective second end wall panel towards or into the respective first end wall panel as seen in a flat-laid state of the blank, a recess formed at the one end wall, preferably both end walls, including a first end wall panel and a second end wall panel, the respective recess being located in an upper portion of the respective end wall of the package, being located centrally as seen along the second direction, and being formed by said extension of respective cut from respective first or second end wall panel as seen in a flat-laid state of the blank,

wherein the first top panel is configured to partly overlap and be positioned on top of the second top panel, and

wherein the first top panel is on at least one side, preferably both sides, as seen along the first direction and as seen in a flat-laid state of the blank, provided with a locking tab being foldably connected to and extending from the side along the first direction,

wherein the locking tab is positioned and sized as seen along the second direction and as seen in a flat-laid state of the blank such that the locking tab is received into the centrally located recess as the first top panel is folded into its closed position and thereby aids in keeping the first top panel and due to the overlap thereby also aids in keeping the second top panel in closed position,

wherein the package further comprises a cut-out being located at a fold line between the bottom panel and the first end wall panel at at least a side where there is a tab formed, preferably at both sides, and being located centrally as seen along the second direction such that, as several packages that are stacked on top of each other, the tab of a first package is received in the cut-out of a second package stacked onto the first package.

[0030] The various details of and advantages associated with the features have been discussed above with reference to the blank and those advantages are equally applicable with reference to the package. Also, different embodiments and variations of the blank are equally applicable to the package

[0031] It may be noted that the use of first, second, third, fourth, fifth, etc. are mainly to be seen as labels facilitating reading and that it does not necessarily mean that there need to be all the intervening numbers of portions present. It may e.g., be noted that it is contemplated to have a design where there is a first portion, a second portion, a third portion and a fifth portion, with the

fourth portion being omitted. However, to facilitate reading, we have consistently used the numbering first, second, third, fourth, etc., as labels, and in a sense based on an embodiment including all conceivable portions.

[0032] It may also be noted that panel names such as top, bottom and wall are intended meant to be read as labels, not necessarily defining the orientation of the panel. As an example, the package does not need to be oriented such that the first top panel actually forms the top of the package. The package may be oriented such that the panel labelled first top panel actually forms a side wall or even forms a bottom of the package. does not have to be located over the floor panel, but could be positioned under, on the side of, or in any other way relative to it. However, in the preferred embodiment, the package will be oriented so that the bottom panel faces downward, the top panels face upward, and the wall panels faces outwards from an axis between top and bottom.

[0033] Generally, all terms used in the claims are to be interpreted according to their ordinary meaning in the technical field, unless explicitly defined otherwise herein. All references to "a/an/the [element, device, component, means, step, etc]" are to be interpreted openly as referring to at least one instance of said element, device, component, means, step, etc., unless explicitly stated otherwise. The steps of any method disclosed herein do not have to be performed in the exact order disclosed, unless explicitly stated.

[0034] The invention may also, or alternatively, in short be said to relate to a blank comprising a bottom panel and a first and a second set of end wall panels including a cut which is located centrally as seen along the second direction and which has an extension from the respective first end wall panel towards or into the respective second end wall panel or from the respective second end wall panel towards or into the respective first end wall panel such that, as the end wall panels are folded relative to each other, a respective tab extends upwardly from the respective first or second end wall panel and said extension of respective cut from respective first or second end wall panel as seen in a flat-laid state of the blank forms a respective recess located in an upper portion of the respective end wall of the package and being located centrally as seen along the second direction. Other features relating to the presence of additional panels and/or details of the panels of the kind disclosed above is of course also applicable to this embodiment if it is intended to provide additional functionality where such additional functionality is indicated by the advantage associated with the respective feature.

Brief description of the drawings

[0035] The invention will by way of example be described in more detail with reference to the appended schematic drawings, which shows a presently preferred embodiment of the invention.

Figure 1 discloses a blank configured to be folded into a package.

Figures 2a-c are enlargement of different portions of the blank of figure 1, where fig. 2a is an enlargement of end wall panels at a lower part of fig. 1, fig. 2b is an enlargement of lower right corner of the blank, and fig. 2c is an enlargement of lower left corner of the blank.

Figure 3 discloses a step of a folding procedure where side walls are folded upwardly relative to a bottom panel.

Figure 4 discloses a step of the folding procedure where connection panels have been folded relative to the side walls and into their intended position in order to form part of end walls and where end wall panels are slightly folded upwardly relative to the bottom panel.

Figure 5 discloses a step of the folding procedure where a first end wall panel has been folded into its intended position as an outer part of the end wall and a second end wall panel is about to be folded into the interior of the package to form an additional layer of the end wall.

Figure 6 discloses a package which is formed by folding the blank and which is in an open position.

Figure 7 discloses the package in a closed position.

Figure 8 is a schematic diagram discloses a method of folding a blank into a package.

Detailed description of preferred embodiments

[0036] In Fig. 1, there is disclosed a blank 1 configured to be folded into a package 200. In Fig. 1, solid lines depict cut-lines along which neighboring parts or panels of the blank are separated or at least easily separated from each other, and dotted lines depict fold lines along which neighboring parts or panels of the blank are foldably connected to each other. The fold lines may e.g., be provided by creasing the material along said fold lines.

[0037] The blank is preferably made of a paper-based material, e.g., a material based on paper or paperboard. Paper-based material may provide a lightweight package. Paper-based material may be produced in an environmentally friendly manner and may be recycled in a simple manner. Paper-based material may provide a blank that is easy to transport and handle before the blank is formed to the package. It may be noted that the blank may be made of other materials. It may be noted that the blank as a whole may be made of paper-based material. It may be noted that the blank need not to be made of the same material through-out. The blank may be made of a paper-based material coated or laminated with a polymer-based coating, such as a thermoplastic material, on one or both sides thereof. Such coating may be heat-sealable and/or provide a desired tightness, i.e., barrier properties, such as being waterproof, water resistant, grease proof, grease resistant, food safe, etc. The blank 1 may e.g., be made of so-called corrugated

paper. It may also be referred to as welled or fluted paper and typically is formed of one sheet of wave shaped paper sandwiched between two outer flat sheets of paper. The preferred flute direction or well direction wd is indicated in Fig. 1.

[0038] In the preferred embodiment, the blank 1 comprises a bottom panel 10 configured to form a bottom 210 of said package 200, a first and a second set 21, 22 of end wall panels 21a-b, 22a-b, a first and a second side wall panel 31, 32 and a first and a second top panel 41, 42 foldably connected to the first and the second side wall, respectively.

[0039] The first and the second set 21, 22 of end wall panels 21a-b, 22a-b are arranged on opposing sides 10a, 10b of the bottom panel 10 as seen along a first direction L. The first and the second set 21, 22 of end wall panels 21a-b, 22a-b are configured to form two opposing end walls 221, 222. That is, in the first set 21 of end wall panels 21a-b, the first end wall panel 21a is foldably connected to a first side 10a of the bottom panel 10 and the second end wall panel 21b is foldably connected to the first end wall panel 21a at a side of the first end wall panel 21a being opposite the bottom panel 10. Correspondingly, in the second set 22 of end wall panels 21a-b, the first end wall panel 22a is foldably connected to a second side 10b of the first end wall panel 21a being connected to the bottom panel 10 and the second end wall panel 22b is foldably connected to the first end wall panel 22a at a side of the first end wall panel 22a being opposite the side of the first end wall panel 22a being connected to the bottom panel 10.

[0040] The first and the second side wall panels 31, 32 are arranged on opposing sides 10c, 10d of the bottom panel 10 as seen along a second direction T, wherein the second direction T is substantially transverse to the first direction L. The first and the second side wall panel 31, 32 are configured to form two opposing side walls 231, 232 of the package 200.

[0041] In the preferred embodiment, the bottom panel 10 is rectangular, and the walls labelled as end walls 221, 222 are positioned along the shorter sides of the bottom panel 10 and the walls labelled as side walls 231, 232 are positioned along the longer sides of the bottom panel 10. This facilitates folding and it facilitates handling of the package 200 by e.g., minimizing the length by which the respective top panel 41, 42 extends from the bottom panel 10 when the top panels 41, 42 are in their respective open position. This orientation with shorter end walls typically also facilitates handling in those cases the set of end walls are provided with handle openings.

[0042] The blank 1 further comprises a first and a second top panel 41, 42 being foldably connected to a respective one of the first and a second side wall panels 31, 32. The first and the second top panel 41, 42 are configured to jointly form a top 240 of the package 200. The first top panel 41 is configured to partly overlap and be positioned on top of the second top panel 42.

[0043] The first side wall panel 31 is foldably connected

to the bottom panel 10 and the first top panel 41 is foldably connected to the first side wall panel 31 at a side of the first side wall panel 31 being opposite the bottom panel 10. Correspondingly, the second side wall panel 32 is foldably connected to the bottom panel 10 at a side of the bottom panel 10 being opposite to the first side wall panel 31 and the second top panel 42 is foldably connected to the second side wall panel 32 at a side of the second side wall panel 32 being opposite the bottom panel 10.

[0044] At least one of, and preferably both of, said sets 21, 22 of end wall panels 21a-b, 22a-b includes a first 21a, 22a and a second 21b, 22b end wall panel being arranged one after the other along the first direction L and being configured to form two layers of the respective end wall 221, 222 of the package 200 and where the respective first end wall panel 21a, 22a is foldably connected to the respective side 10a, 10b of the bottom panel 10 and the respective second end wall panel 21b, 22b is foldably connected to the respective first end wall panel 21a, 22a.

[0045] At least one of, and preferably both of, said sets 21, 22 of end wall panels 21a-b, 22a-b includes a cut 23a-b which is located centrally as seen along the second direction T. As is best shown in Fig. 2, the cut 23a-b has in the preferred embodiment an extension from the respective first end wall panel 21a, 22a towards the respective second end wall panel 21b, 22b as seen in a flat-laid state of the blank 1. The result of this design is that when the end wall panels 21a-b, 22a-b are folded relative to each other, a respective tab 24a-b extends upwardly from the respective first end wall panel 21a, 22a. Since the portion forming the respective tab 24a-b will extend upwardly relative to the respective first end wall panel 21a, 22a said extension of respective cut 23a-b from the first end wall panel 21a, 22a as seen in a flat-laid state of the blank 100 will form a respective recess 25a-b located in an upper portion of the respective end wall 221, 222 of the package 200. The respective recess 25a-b will also be located centrally as seen along the second direction T.

[0046] Centrally located as seen along the second direction T is intended to refer to a position of a midpoint of the cut 23a-b respectively the cut-out 26a-b being within a central portion of the extension of the respective end wall 221, 222 as seen along the second direction T, where the central portion is symmetrically distributed from a midpoint of the extension of the of the respective end wall 221, 222 along the second direction T and covers 30%, preferably 20%, of the total extension of the respective end wall 221, 222 along the second direction T. That is, centrally located relates to the position of the cut 23a-b, recess 25a-b, and tab 24a-b at an upper portion of the respective end wall 221, 222 and to the position of the cut-out 26a-b at the junction between the bottom panel 10 and the respective end wall 221, 222 and is as such not intended to provide any limit to the actual extension of the cut 23a-b, recess 25a-b, tab 24a-b, and cut-out 26a-b along the second direction T. Preferably, the cut 23a-b, recess 25a-b, and tab 24a-b have all a respective extension along the second direction T being less than 30% of

the total extension of the respective end wall 221, 222 along the second direction T. In the preferred embodiment, the respective cut 23a-b has an extension being about 20-25% of the total extension of the respective first end wall panel 21a, 22a. In the preferred embodiment, the cut 23a-b may be a single line cut whereby the recess 25a-b and tab 24a-b will have the same size and shape. However, the cut 23a-b may along at least a part thereof be a double line cut whereby the recess 25a-b and tab 24a-b will have different size and/or shape. It is e.g., possible to have a recess 25a-b being wider along the second direction and/or deeper along the first direction than the tab 24a-b. The tab 24a-b formed should preferably be equal to or slightly smaller than the cut-out 26a-b, i.e., positioned and sized such that the tab 24a-b fits into the cut-out 26a-b of another package 200 positioned thereupon. It may in this context also be noted that in a preferred embodiment, the cut 23a-b, recess 25a-b, tab 24a-b, and cut-out 26a-b are all symmetrically located across a midpoint of the respective end wall 221, 222 as seen along the second direction T. Preferably, also the respective sizes of the cut 23a-b, recess 25a-b, tab 24a-b, and cut-out 26a-b at one of the end walls 221, 222 is the same as the respective sizes and cut-out 26a-b at the other one of the end walls 221, 222. That is, the two cuts 23a-b have the same size, the two tabs 24a-b have the same size which may be the same or different from the size of the cut, etc. One advantage with such a design is that the packages 200 present the same kind and position of the upwardly extending tab 24a-b irrespective of if the first or second side wall 231, 232 faces in the same direction or different directions of different packages 200 positioned side by side or on top of each other. However, it is also contemplated that the cut 23a-b, recess 25a-b, tab 24a-b, and cut-out 26a-b may be of different sizes at the first end wall 221 compared to at the second end wall 222. It is also contemplated that the cut 23a-b, recess 25a-b, tab 24a-b, and cut-out 26a-b offset relative to a midpoint of the respective end wall 221, 222. Such offset at the respective end wall 221, 222 may be mutually diagonally offset towards different side walls 231, 232 or be both offset in the same direction towards the same side wall 231, 232. One advantage with some kind of difference in sized and/or offset is that it is possible design the package 200 such that the upwardly extending tabs 24a-b may only allow stacking of packages 200 in a specific manner, such as that all packages 200 must be stacked with the same side wall 231, 232 facing the in the same direction or that the packages 200 must be stacked in an alternating manner by being rotated 90 or 180 degrees relative to the package immediately below in the stack of packages 200.

[0047] As is shown in Fig. 1 and shown in more detail in Fig. 2b, the first top panel 41 is on at least one side, preferably both sides 41a-b, as seen along the first direction L, provided with a locking tab 51a-b being foldably connected to and extending from the side 41a-b along the first direction L. As is best understood from

Fig. 6, the respective locking tab 51a-b is positioned and sized as seen along the second direction T such that the locking tab 51a-b is received into the respective centrally located recess 25a-b as the first top panel 41 is folded into its closed position. Thereby respective locking tab 51a-b aids in keeping the first top panel 41 and due to the overlap thereby also aids in keeping the second top panel 42 in closed position. It may in this context be noted that the two locking tabs 51a-b extends in opposite directions, both in a direction away and outward from the respective side of the top panel 41; i.e., both extending along the first direction L with one extending in the first direction L and the other extending in a direction opposite to the first direction L. This may also be expressed as that the respective locking tab 51a-b each have an extension from the first top panel 41 towards a free end of the respective locking panel 51ab. It may be noted that the top panel 41 may at other locations as seen along the second direction T have an extension along the first direction L exceeding the distance between the respective fold line between the respective locking tab 51a-b and the first top panel 41. The first top panel 41 may at those other locations even have an extension exceeding a distance between the free ends of the locking tabs 51a-b. These two latter embodiment may also be expressed as that the locking tabs 51a-b are positioned partly or fully within a geometrical perimeter of the first top panel 51a-b. Those other locations of the first top panel 41 having greater extension may end at a distance from the locking tabs 51a-b or may extend all the way up to the locking tabs 51a-b as seen along the second direction T as seen in a flat-laid state of the blank 1. As is best shown in Fig. 2b, the fold line of the respective locking tab 51a-b are slightly offset inwardly from the respective transversally extending edge of the first top panel 41. As is best shown in Fig. 2c, the second top panel 42 is provided a respective recess 52a-b in the respective transversally extending side of the second top panel 42 being associated with the respective locking tab 51a-b of the first top panel 41. Associated portions refers to those portions of the second top panel 42 that will meet portions of the first top panel 41 when the top panels 41, 42 are folded into their closed positions.

[0048] In the preferred embodiment, the respective second end wall panel 21b, 22b is configured to be folded inwardly into the interior of the package 200 relative to the respective first end wall panel 21a, 22ab. Thereby, the outside surface of the package 200 will be smooth. Moreover, the second end wall panels 21b, 22b may be locked in position, such as by frictionally engaging with the bottom panel 10 or by each being provided with locking tab or tabs engaging with a recess. As is shown in Fig. 1 and in more detail in Fig. 2a, the blank 1 further comprises a cut-out 26a-b being located at a fold line FL1a, FL1b between the bottom panel 10 and the first end wall panel 21a-b at at least a side 10a-b where there is a tab 24a-b formed, and preferably at both sides 10a-b. The respective cut-out 26a-b is located centrally as seen along the

second direction T such that, as several blanks 1 are folded into packages 200 that are stacked on top of each other, the tab 23a-b of a first package 200 is received in the cut-out 26a-b of a second package 200 stacked onto the first package 200.

[0049] Moreover, as is also best shown in Fig. 2a, preferably, the respective sets 21, 22 of end wall panels 21a-b, 22a-b includes a respective locking tab 28a-b on the respective second end wall panel 21b, 22b.

[0050] The respective locking tab 28a-b is located centrally as seen along the second direction T and having an extension from the respective second end wall panel 21b, 22b along the first direction L as seen in a flat-laid state of the blank 1 such that, as the end wall panels 21a-b, 22a-b are folded relative to each other, the respective locking tab 28a-b is positioned in the respective cut-out 26a-b and thereby aids in keeping the end wall panels 21a-b, 22a-b in the double folded position.

[0051] The blank 1 may further comprise connection panels 31a-b, 32a-b being provided on both sides, as seen along the first direction L, of respective side wall panel 31, 32. The connection panels 31a-b, 32a-b are each foldably connected to and extends from the respective side of the respective side wall panel 31, 32 along the first direction L. The respective connection panel 31a-b, 32a-b is configured to be positioned between the double folded first and second end wall panels 31a-b, 32a-b as the blank 1 is folded into said package 200. That is, there are preferably two connection panels 31a-b which extends in opposite directions, both in a direction away and outward from the respective side of the first side wall panel 31 and two connection panels 32a-b which extends in opposite directions, both in a direction away and outward from the respective side of the second side wall panel 32. Preferably, the connection panels 31a-b, 32a-b has an extension along the first direction L as seen in a flat-laid state such that just meet or leave a gap therebetween, such that they do not overlap, when they extend towards each other along the second direction once the side wall panels 31, 32 are folded relative to the bottom panel 10 and the connection panels 31a-b, 32a-b are folded relative to their respective side wall panel 31, 32. Preferably, the connection panels 31a-b, 32a-b has an extension along the second direction T as seen in a flat-laid state such that they extend from the bottom panel 10 up to an inside of the fold of the first and second end wall panels 21a-b, 22a-b such that they take part in taking compressive load from other packages stacked thereupon. Such an extension along the second direction T, or height as folded, also prevents the connection panels 31a-b, 32a-b from tilting out from their position between the first and second end wall panels 21a-b, 22a-b and thereby the side wall panels 31, 32 are also securely kept in their upright position.

[0052] The blank 1 may further comprise support panels 61a-b, 62a-b being provided on both sides, as seen along the second direction T, of respective second end wall panel 21b, 22b. The support panels 61a-b, 62a-b are

each foldably connected to and extends from the respective side of the respective second end wall panel 21b, 22b along the second direction T. The respective support panel 61a-b, 62a-b is preferably configured to be positioned alongside an inside of the respective side wall panel 31, 32 as the blank 1 is folded into said package 200. The support panels 61a-b, 62a-b will further strengthen the corners of the package 200. It may be noted that there are two support panels 61a-b, 62a-b connected to each of the second end wall panels 21b, 22b, with one of those two support panels 61a-b, 62a-b extending in the second direction T and the other one of those two support panels 61a-b, 62a-b extending opposite to the second direction T. In a preferred embodiment, the respective support panel 61a-b, 62a-b has as seen in a flat-laid state of the blank 1 an extension 61e, 62e along the first direction L corresponding to an extension 31e, 32e of the respective side wall panel 31, 32 along the second direction T such that the respective support panel 61a-b, 62a-b will have a respective height corresponding to a respective height h of the respective side wall panel 41, 42 when the blank 1 is folded into said package 200. Thereby, the respective support panel 61a-b, 62a-b will extend between the bottom panel 10 and the respective one of the first and second top panels 41, 42 and will aid in providing a support of the top panels 41, 42.

[0053] The first and second end wall panels 21a-b, 22a-b may each comprise an internal handle cut 21ahc, 21bhc, 22ahc, 22bhc configured to form handle openings through the respective end wall 221, 222 when the package 200 is to be carried. In case the bottom panel 10 is rectangularly shaped, it is preferred that the handle openings are formed through those end wall panels 21a-b, 22a-b which form the shortest ones of the side walls 231, 232 and the end walls 221, 222.

[0054] Preferably at least one of the first and second end wall panels 21a-b, 22a-b of respective set 21, 22 of end wall panels 21a-b, 22a-b is formed as a cut 21ahc, 21bhc, 22ahc, 22bhc defining a closing flap 21acf, 21bcf, 22acf, 22bcf foldably connected to remaining portions of the respective end wall panel 21a-b, 22a-b such that the handle openings may be closed by said closing flap 21acf, 21bcf, 22acf, 22bcf. Thereby the handle openings may remain closed when the blank 1 is folded into a package 200 and filled with goods, put on a conveyor to a pallet, prepared for transport, and transported to a site of use.

[0055] The method of folding a blank 1 will be described with reference to Fig. 8.

[0056] The blank 1 is positioned on a support surface with the intended inside surface of the bottom panel 10 facing upwardly.

[0057] The side wall panels 31, 32 are folded upwardly relative to the bottom panel 10.

[0058] If present, the connection panels 31a-b, 32a-b are folded inwardly relative to the side wall panels 31, 32 such that the connection panels 31a-b, 32a-b extend upwardly from those sides 10a-b of the bottom panel

10 which extends along the second direction T. The connection panels 31a-b, 32a-b are folded inwardly relative to the side wall panels 31, 32 before, during, or after the side wall panels 31, 32 are folded upwardly relative to the bottom panel 10. In any case the connection panels 31a-b, 32a-b may be folded to the intended position. Intuitively it is most likely that the side wall panels 31, 32 are folded first and thereafter the connection panels 31a-b, 32a-b are folded relative to the already folded side wall panels 31, 32, whereby the respective folding operation will not only be a preparatory folding of the connection panels 31a-b, 32a-b but rather a folding of the connection panels 31a-b, 32a-b to the intended final position.

[0059] The end wall panels 21a-b, 22a-b are folded upwardly relative to the bottom panel 10 such that the respective tab 24a-b extends upwardly from the respective first or second end wall panel 21a-b, 22a-b and the respective recess 25a-b is formed in an upper portion of the respective end wall 221, 222 of the package 200 whereby a package 200 ready to receive goods is provided.

[0060] If the connection panels 31a-b, 32a-b are present, the set of end wall panels 21a-b, 22a-b including a respective first and second end wall panels 21a-b, 22a-b are folded around the connection panels 31a-b, 32a-b after the connection panels 31a-b, 32a-b have been folded relative to the side wall panels 31, 32. Folded around refers in this case to the respective first end wall panel 21a, 22a being folded upwardly along an outwardly facing surface of the connection panels 31a-b, 32a-b whereafter the respective second end wall panel 21b, 22b is folded downwardly along an inwardly facing surface of the connection panels 31a-b, 32a-b. Thereby the connection panels 31a-b, 32a-b which are positioned in the intended position of the respective end wall 221, 222 will in a sense act as a support about which the end wall panels 21a-b, 22a-b are folded.

[0061] Once goods have been positioned in the thus formed package, the first and second top panels 41, 42 are folded inwardly and downwardly relative to the respective side wall panel 31, 32. It may be noted that goods do not need to have been positioned in the package before the top panels 41, 42 are closed. However, preferably the top panels 41, 42 are closed for the first time after goods has been provided into the package. In any case, the top panel 41, 42 are folded and closed such that the first top panel 41 partly overlap becomes positioned on top of the second top panel 42.

[0062] Before the first top panel 41 is completely closed, the respective locking tab 51a-b are folded relative to the first top panel 41. The respective locking tab 51a-b folded relative to the first top panel 41 is inserted into the respective centrally located recess 25a-b as the first top panel 41 is folded into its fully closed position and thereby aids in keeping the first top panel 41 and due to the overlap thereby also aids in keeping the second top panel 42 in closed position.

[0063] If present, the support panels 61a-b, 62a-b are

folded backwardly relative to the respective second end wall panel 21b, 22b such that, as the respective second end wall panel 21b, 22b is folded inwardly into the interior of the package 200, the support panels 61a-b, 62a-b slides in along an inside of the respective side wall panel 31, 32. When the respective second end wall panel 21b, 22b starts to enter into the space between the side wall panels 31, 32, the support panels 61a-b, 62a-b will automatically be folded in the intended direction since they cannot pass into the space between the side wall panels 31, 32 unless they are folded backwardly relative to the respective second end wall panel 21b, 22b.

[0064] The thus formed package 200 is in the following described in short with reference to Figs. 6 and 7. The package 200 is folded from a blank 1 of the kind disclosed above. The package 200 comprises a bottom 210 formed of a bottom panel 10 of the blank 1. The package 200 comprises a first and a second end wall 221, 222 being formed of a first and a second set 21, 22, respectively, of end wall panels 21a-b, 22a-b being arranged on opposing sides 10a, 10b of the bottom panel 10 as seen along a first direction L. At least one, preferably both, of said sets 21, 22 of end wall panels 21a-b, 22a-b includes a first 21a, 22a and a second 21b, 22b end wall panel being arranged one after the other along the first direction L as seen in a flat-laid state of the blank 1 and forming two layers of the respective first and second end wall 221, 222 of the package 200. The package 200 comprises two opposing side walls 231, 232 formed of a first and a second side wall panel 31, 32 being arranged on opposing sides 10c, 10d of the bottom panel 10 as seen along a second direction T, the second direction T being substantially transverse to the first direction L. The package 200 comprises a top 240 jointly formed of a first and a second top panel 41, 42 being foldably connected to a respective one of the first and a second side wall panels 31, 32. The package 200 comprises an upwardly extending tab 24a-b formed at the one end wall 221, 222, preferably both end walls 221, 222, including a first end wall panel 21a, 22a and a second end wall panel 21b, 22b. The respective upwardly extending tab 24a-b is formed by said at least one of said sets 21, 22 of end wall panels 21a-b, 22a-b including a cut 23a-b which is located centrally as seen along the second direction T and which, as seen in a flat-laid state of the blank 1 has an extension from the respective first end wall panel 21a, 22a towards or into the respective second end wall panel 21b, 22b or from the respective second end wall panel 21b, 22b towards or into the respective first end wall panel 21a, 22a as seen in a flat-laid state of the blank 1. The package 200 comprises a recess 25a-b formed at the one end wall 221, 222, preferably both end walls 221, 222, including a first end wall panel 21a, 22a and a second end wall panel 21b, 22b, the respective recess 25a-b being located in an upper portion of the respective end wall 221, 222 of the package 200, being located centrally as seen along the second direction T, and being formed by said extension of respective cut 23a-b from

respective first or second end wall panel 21a-b, 22a-b as seen in a flat-laid state of the blank 100.

The first top panel 41 is configured to partly overlap and be positioned on top of the second top panel 42. The first top panel 41 is on at least one side 41a-b, preferably both sides, as seen along the first direction L and as seen in a flat-laid state of the blank 1, provided with a locking tab 51a-b being foldably connected to and extending from the side 41a-b along the first direction L. The locking tab 51a-b is positioned and sized as seen along the second direction T and as seen in a flat-laid state of the blank 1 such that the locking tab 51a-b is received into the centrally located recess 25a-b as the first top panel 41 is folded into its closed position and thereby aids in keeping the first top panel 41 and due to the overlap thereby also aids in keeping the second top panel 42 in closed position.

[0065] The package 200 further comprises a cut-out 26a-b being located at a fold line FL1a, FL1b between the bottom panel 10 and the first end wall panel 21a-b at at least a side 10a-b where there is a tab 24a-b formed, preferably at both sides 10a-b, and being located centrally as seen along the second direction T such that, as several packages 200 that are stacked on top of each other, the tab 23a-b of a first package 200 is received in the cut-out 26a-b of a second package 200 stacked onto the first package 200.

[0066] It is contemplated that there are numerous modifications of the embodiments described herein, which are still within the scope of the invention as defined by the appended claims.

[0067] Additionally, variations to the disclosed embodiments can be understood and effected by the skilled person in practicing the claimed invention, from a study of the drawings, the disclosure, and the appended claims. In the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality. The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage.

Claims

1. Blank (1) configured to be folded into a package (200), the blank (1) comprising:

a bottom panel (10) configured to form a bottom (210) of said package (200),
a first and a second set (21, 22) of end wall panels (21a-b, 22a-b) being arranged on opposing sides (10a, 10b) of the bottom panel (10) as seen along a first direction (L) and being configured to form two opposing end walls (221, 222), wherein at least one of said sets (21, 22) of end wall panels (21a-b, 22a-b) includes a first (21a, 22a) and a second (21b, 22b) end wall

panel being arranged one after the other along the first direction (L) and being configured to form two layers of the respective end wall (221, 222) of the package (200) and where the respective first end wall panel (21a, 22a) is foldably connected to the respective side (10a, 10b) of the bottom panel (10) and the respective second end wall panel (21b, 22b) is foldably connected to the respective first end wall panel (21a, 22a),

a first and a second side wall panel (31, 32) being arranged on opposing sides (10c, 10d) of the bottom panel (10) as seen along a second direction (T), the second direction (T) being substantially transverse to the first direction (L), and being configured to form two opposing side walls (231, 232) of the package (200),

a first and a second top panel (41, 42) being foldably connected to a respective one of the first and a second side wall panels (31, 32) and being configured to jointly form a top (240) of the package (200),

wherein said at least one of said sets (21, 22) of end wall panels (21a-b, 22a-b) includes a cut (23a-b) which is located centrally as seen along the second direction (T) and which has an extension from the respective first end wall panel (21a, 22a) towards or into the respective second end wall panel (21b, 22b) or from the respective second end wall panel (21b, 22b) towards or into the respective first end wall panel (21a, 22a) as seen in a flat-laid state of the blank (1) such that, as the end wall panels (21a-b, 22a-b) are folded relative to each other, a respective tab (24a-b) extends upwardly from the respective first or second end wall panel (21a-b, 22a-b) and said extension of respective cut (23a-b) from respective first or second end wall panel (21a-b, 22a-b) as seen in a flat-laid state of the blank (100) forms a respective recess (25a-b) located in an upper portion of the respective end wall (221, 222) of the package (200) and being located centrally as seen along the second direction (T), wherein the first top panel (41) is configured to partly overlap and be positioned on top of the second top panel (42), and

wherein the first top panel (41) is on at least one side (41a-b), as seen along the first direction (L), provided with a locking tab (51a-b) being foldably connected to and extending from the side (41a-b) along the first direction (L), wherein the locking tab (51a-b) is positioned and sized as seen along the second direction (T) such that the locking tab (51a-b) is received into the centrally located recess (25a-b) as the first top panel (41) is folded into its closed position and thereby aids in keeping the first top panel (41) and due to the overlap thereby also aids in

- keeping the second top panel (42) in closed position,
 wherein the blank (1) further comprises a cut-out (26a-b) being located at a fold line (FL1a, FL1b) between the bottom panel (10) and the first end wall panel (21a-b) at at least a side (10a-b) where there is a tab (24a-b) formed, and preferably at both sides (10a-b), and being located centrally as seen along the second direction (T) such that, as several blanks (1) are folded into packages (200) that are stacked on top of each other, the tab (23a-b) of a first package (200) is received in the cut-out (26a-b) of a second package (200) stacked onto the first package (200).
2. Blank (1) according to claim 1, wherein both sets (21, 22) of end wall panels (21a-b, 22a-b) includes a respective first (21a, 22a) and a respective second (21b, 22b) end wall panel being arranged one after the other along the first direction (L) and being configured to form two layers of the respective end wall (221, 222) of the package (200) and where the respective first end wall panel (21a, 22a) is foldably connected to the respective side (10a, 10b) of the bottom panel (10) and the respective second end wall panel (21b, 22b) is foldably connected to the respective first end wall panel (21a, 22a).
 3. Blank (1) according to claim 1 or 2, wherein both sets (21, 22) of end wall panels (21a-b, 22a-b) includes a respective cut (23a-b) which is located centrally as seen along the second direction (T) and which has an extension from the respective first end wall panel (21a, 22a) towards or into the respective second end wall panel (21b, 22b) or from the respective second end wall panel (21b, 22b) towards or into the respective first end wall panel (21a, 22a), preferably the respective cut (23a-b) has an extension from the respective first end wall panel (21a, 22a) towards or into the respective second end wall panel (21b, 22b), as seen in a flat-laid state of the blank (1) such that, as the end wall panels (21a-b, 22a-b) are folded relative to each other, a respective tab (24a-b) extends upwardly from the respective first or second end wall panel (21a-b, 22a-b) and said extension of respective cut (23a-b) from respective first or second end wall panel (21a-b, 22a-b) as seen in a flat-laid state of the blank (100) forms a respective recess (25a-b) located in an upper portion of the respective end wall (221, 222) of the package (200) and being located centrally as seen along the second direction (T).
 4. Blank (1) according to any one of claims 1-3, wherein the first top panel (41) is on both sides (41a, 41b), as seen along the first direction (L), provided with a respective locking tab (51a-b) being foldably connected to and extending from the respective side (41a, 41b) along the first direction (L).
 5. Blank (1) according to any one of claims 1-4, wherein the respective second end wall panel (21b, 22b) is configured to be folded inwardly into the interior of the package (200) relative to the respective first end wall panel (21a, 22a-b).
 6. Blank (1) according to any one of claims 1-5, wherein said at least one of said sets (21, 22) of end wall panels (21a-b, 22a-b) includes a respective locking tab (28a-b) on the respective second end wall panel (21b, 22b), the respective locking tab (28a-b) being located centrally as seen along the second direction (T) and having an extension from the respective second end wall panel (21b, 22b) along the first direction (L) as seen in a flat-laid state of the blank (1) such that, as the end wall panels (21a-b, 22a-b) are folded relative to each other, the respective locking tab (28a-b) is positioned in the respective cut-out (26a-b) and thereby aids in keeping the end wall panels (21a-b, 22a-b) in the double folded position.
 7. Blank (1) according to any one of claims 1-6, further comprising connection panels (31a-b, 32a-b) being provided on both sides, as seen along the first direction (L), of respective side wall panel (31, 32), the connection panels (31a-b, 32a-b) being foldably connected to and extending from the respective side of the respective side wall panel (31, 32) along the first direction (L), wherein the respective connection panel (31a-b, 32a-b) is configured to be positioned between the double folded first and second end wall panels (31a-b, 32a-b) as the blank (1) is folded into said package (200).
 8. Blank (1) according to any one of claims 1-7, further comprising support panels (61a-b, 62a-b) being provided on both sides, as seen along the second direction (T), of respective second end wall panel (21b, 22b), the support panels (61a-b, 62a-b) being foldably connected to and extending from the respective side of the respective second end wall panel (21b, 22b) along the second direction (T), wherein the respective support panel (61a-b, 62a-b) is configured to be positioned alongside an inside of the respective side wall panel (31, 32) as the blank (1) is folded into said package (200).
 9. Blank (1) according to any one of claims 1-8, wherein, as seen in a flat-laid state of the blank (1), the respective support panel (61a-b, 62a-b) has an extension (61e, 62e) along the first direction (L) corresponding to an extension (31e, 32e) of the respective side wall panel (31, 32) along the second direction (T) such that the respective support panel (61a-b,

62a-b) will have a respective height corresponding to a respective height (h) of the respective side wall panel (41, 32) when the blank (1) is folded into said package (200).

10. Blank (1) according to any one of claims 1-9, wherein the first and second end wall panels (21a-b, 22a-b) each comprises an internal handle cut (21ahc, 21bhc, 22ahc, 22bhc) configured to form handle openings through the respective end wall (221, 222) when the package (200) is to be carried, wherein preferably at least one of the first and second end wall panels (21a-b, 22a-b) of respective set (21, 22) of end wall panels (21a-b, 22a-b) is formed as a cut (21ahc, 21bhc, 22ahc, 22bhc) defining a closing flap (21acf, 21bcf, 22acf, 22bcf) foldably connected to remaining portions of the respective end wall panel (21a-b, 22a-b) such that the handle openings may be closed by said closing flap (21acf, 21bcf, 22acf, 22bcf).

11. Method of folding a blank (1) according to any one of claims 1-10 into a package (200), the method comprising:

folding the side wall panels (31, 32) upwardly relative to the bottom panel (10),
folding the end wall panels (21a-b, 22a-b) upwardly relative to the bottom panel (10) such that the respective tab (24a-b) extends upwardly from the respective first or second end wall panel (21a-b, 22a-b) and the respective recess (25a-b) is formed in an upper portion of the respective end wall (221, 222) of the package (200) whereby a package (200) ready to receive goods is provided,
folding the first and second top panels (41, 42) inwardly and downwardly relative to the respective side wall panel (31, 32), preferably after goods has been provided into the package, such that the first top panel (41) partly overlap becomes positioned on top of the second top panel (42), and
folding the respective locking tab (51a-b) relative to the first top panel (41), and
inserting the respective locking tab (51a-b) into the respective centrally located recess (25a-b) as the first top panel (41) is folded into its closed position and thereby aids in keeping the first top panel (41) and due to the overlap thereby also aids in keeping the second top panel (42) in closed position.

12. Method according to claim 11, wherein, when present, the connection panels (31a-b, 32a-b) are folded inwardly relative to the side wall panels (31, 32) such that the connection panels (31a-b, 32a-b) extend upwardly from those sides (10a-b) of the

bottom panel (10) which extends along the second direction (T) after the side wall panels (31, 32) has been folded such that the respective first end wall panel (21a, 21b) is folded upwardly towards the respective connection panel (31a-b, 32a-b) and thereafter the respective second end wall panel (22a, 22b) is folded downwardly towards an inside of the respective connection panel (31a-b, 32a-b).

13. Method according to claim 11 or 12, wherein, when present, the support panels (61a-b, 62a-b) are folded backwardly relative to the respective second end wall panel (21b, 22b) such that, as the respective second end wall panel (21b, 22b) is folded inwardly into the interior of the package (200), the support panels (61a-b, 62a-b) slides in along an inside of the respective side wall panel (31, 32).

14. Package (200) folded from a blank (1), the package comprising

a bottom (210) formed of a bottom panel (10) of the blank (1),

a first and a second end wall (221, 222) formed of a first and a second set (21, 22), respectively, of end wall panels (21a-b, 22a-b) being arranged on opposing sides (10a, 10b) of the bottom panel (10) as seen along a first direction (L), wherein at least one, preferably both, of said sets (21, 22) of end wall panels (21a-b, 22a-b) includes a first (21a, 22a) and a second (21b, 22b) end wall panel being arranged one after the other along the first direction (L) as seen in a flat-laid state of the blank (1) and forming two layers of the respective first and second end wall (221, 222) of the package (200),

two opposing side walls (231, 232) formed of a first and a second side wall panel (31, 32) being arranged on opposing sides (10c, 10d) of the bottom panel (10) as seen along a second direction (T), the second direction (T) being substantially transverse to the first direction (L),

a top (240) jointly formed of a first and a second top panel (41, 42) being foldably connected to a respective one of the first and a second side wall panels (31, 32),

an upwardly extending tab (24a-b) formed at the one end wall (221, 222), preferably both end walls (221, 222), including a first end wall panel (21a, 22a) and a second end wall panel (21b, 22b), the respective upwardly extending tab (24a-b) being formed by said at least one of said sets (21, 22) of end wall panels (21a-b, 22a-b) including a cut (23a-b) which is located centrally as seen along the second direction (T) and which, as seen in a flat-laid state of the blank (1) has an extension from the respective first end wall panel (21a, 22a) towards or into the respec-

tive second end wall panel (21b, 22b) or from the respective second end wall panel (21b, 22b) towards or into the respective first end wall panel (21a, 22a) as seen in a flat-laid state of the blank (1),

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a recess (25a-b) formed at the one end wall (221, 222), preferably both end walls (221, 222), including a first end wall panel (21a, 22a) and a second end wall panel (21b, 22b), the respective recess (25a-b) being located in an upper portion of the respective end wall (221, 222) of the package (200), being located centrally as seen along the second direction (T), and being formed by said extension of respective cut (23a-b) from respective first or second end wall panel (21a-b, 22a-b) as seen in a flat-laid state of the blank (100),

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wherein the first top panel (41) is configured to partly overlap and be positioned on top of the second top panel (42), and

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wherein the first top panel (41) is on at least one side (41a-b), preferably both sides, as seen along the first direction (L) and as seen in a flat-laid state of the blank (1), provided with a locking tab (51a-b) being foldably connected to and extending from the side (41a-b) along the first direction (L),

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wherein the locking tab (51a-b) is positioned and sized as seen along the second direction (T) and as seen in a flat-laid state of the blank (1) such that the locking tab (51a-b) is received into the centrally located recess (25a-b) as the first top panel (41) is folded into its closed position and thereby aids in keeping the first top panel (41) and due to the overlap thereby also aids in keeping the second top panel (42) in closed position,

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wherein the package (200) further comprises a cut-out (26a-b) being located at a fold line (FL1a, FL1b) between the bottom panel (10) and the first end wall panel (21a-b) at at least a side (10a-b) where there is a tab (24a-b) formed, preferably at both sides (10a-b), and being located centrally as seen along the second direction (T) such that, as several packages (200) that are stacked on top of each other, the tab (23a-b) of a first package (200) is received in the cut-out (26a-b) of a second package (200) stacked onto the first package (200).

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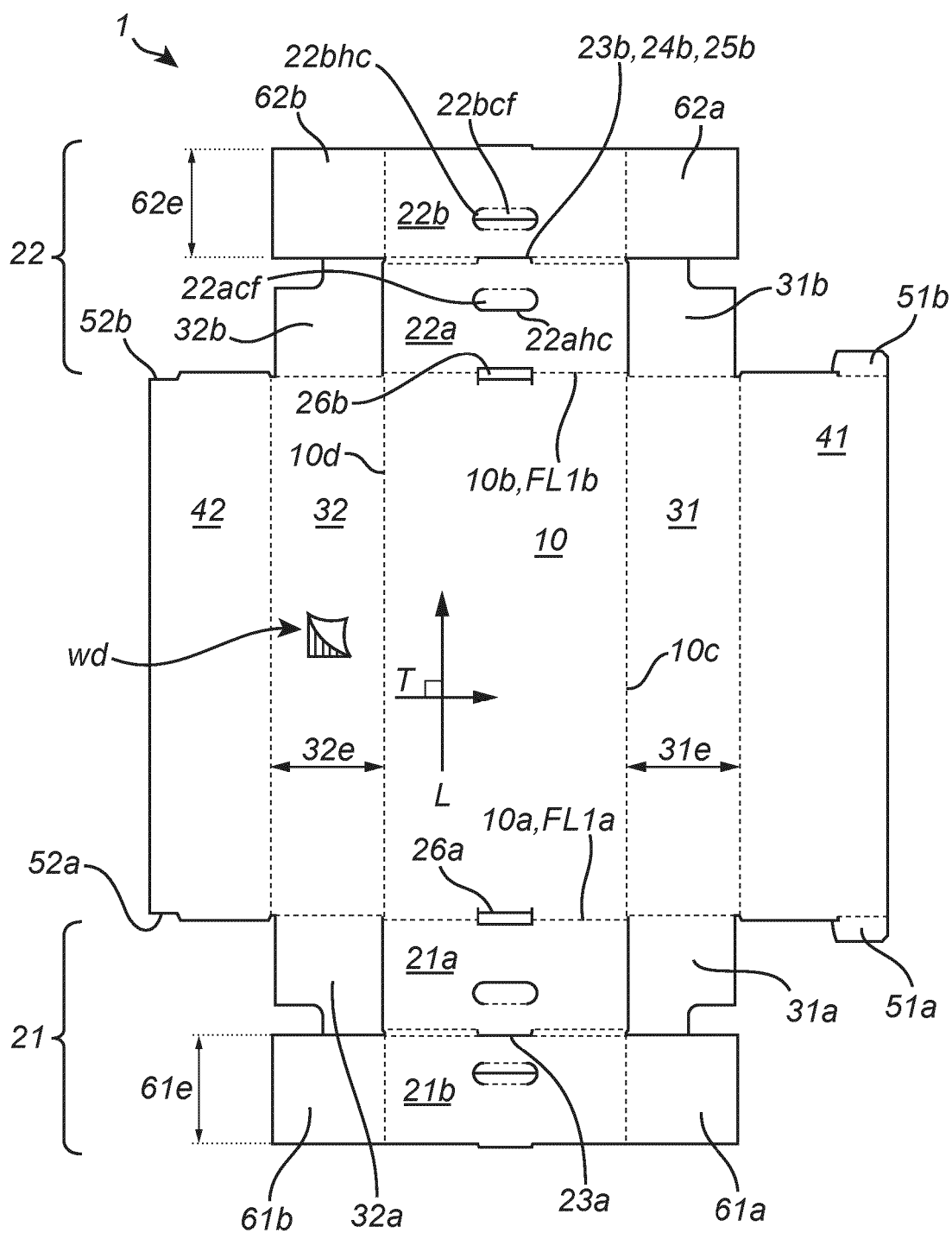


Fig. 1

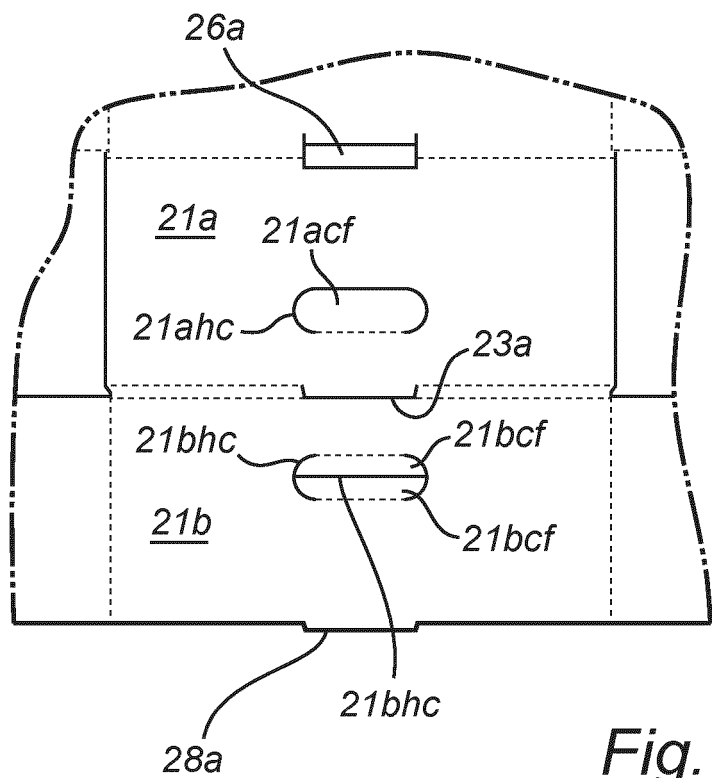


Fig. 2a

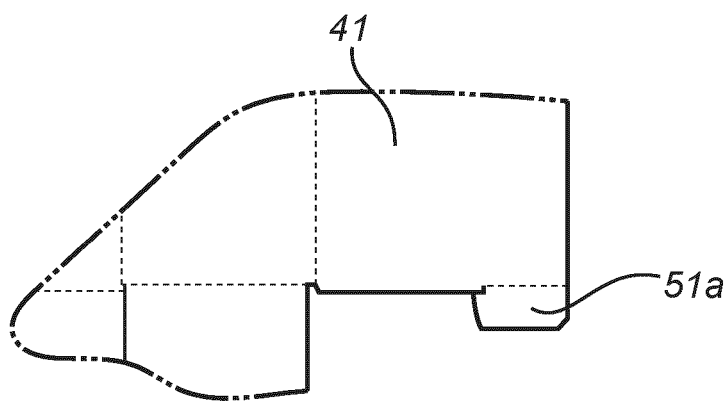


Fig. 2b

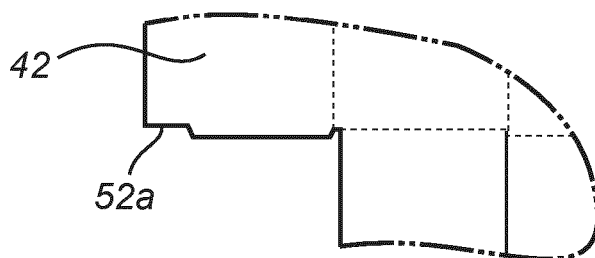


Fig. 2c

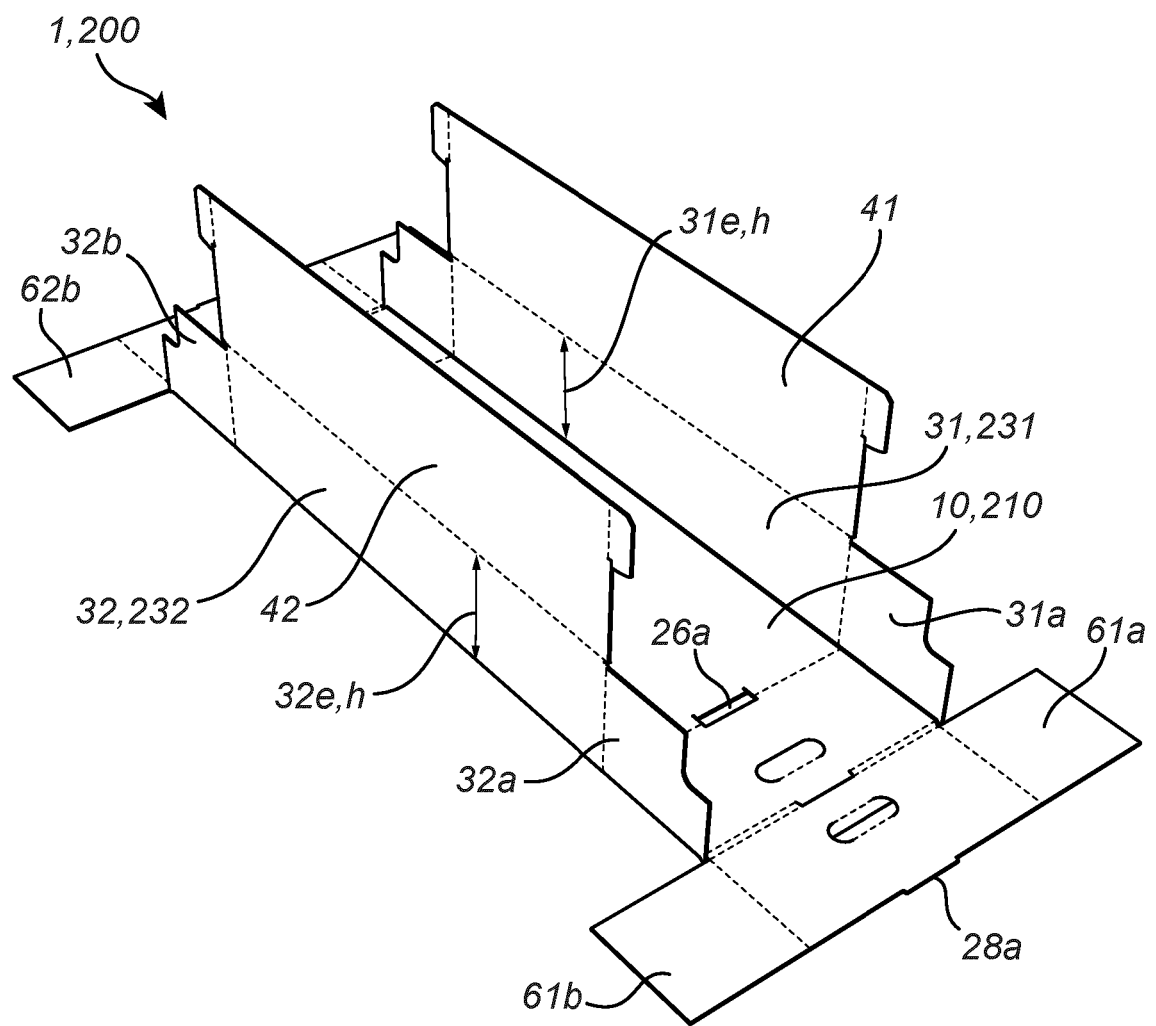
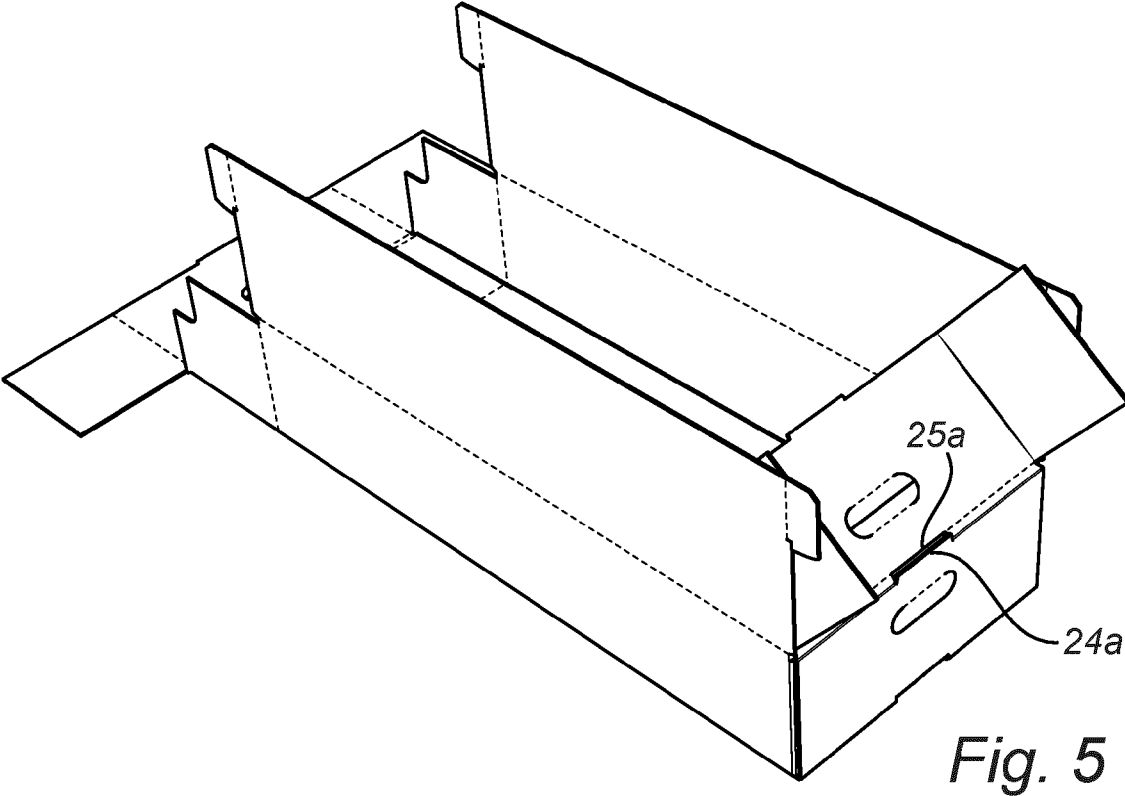
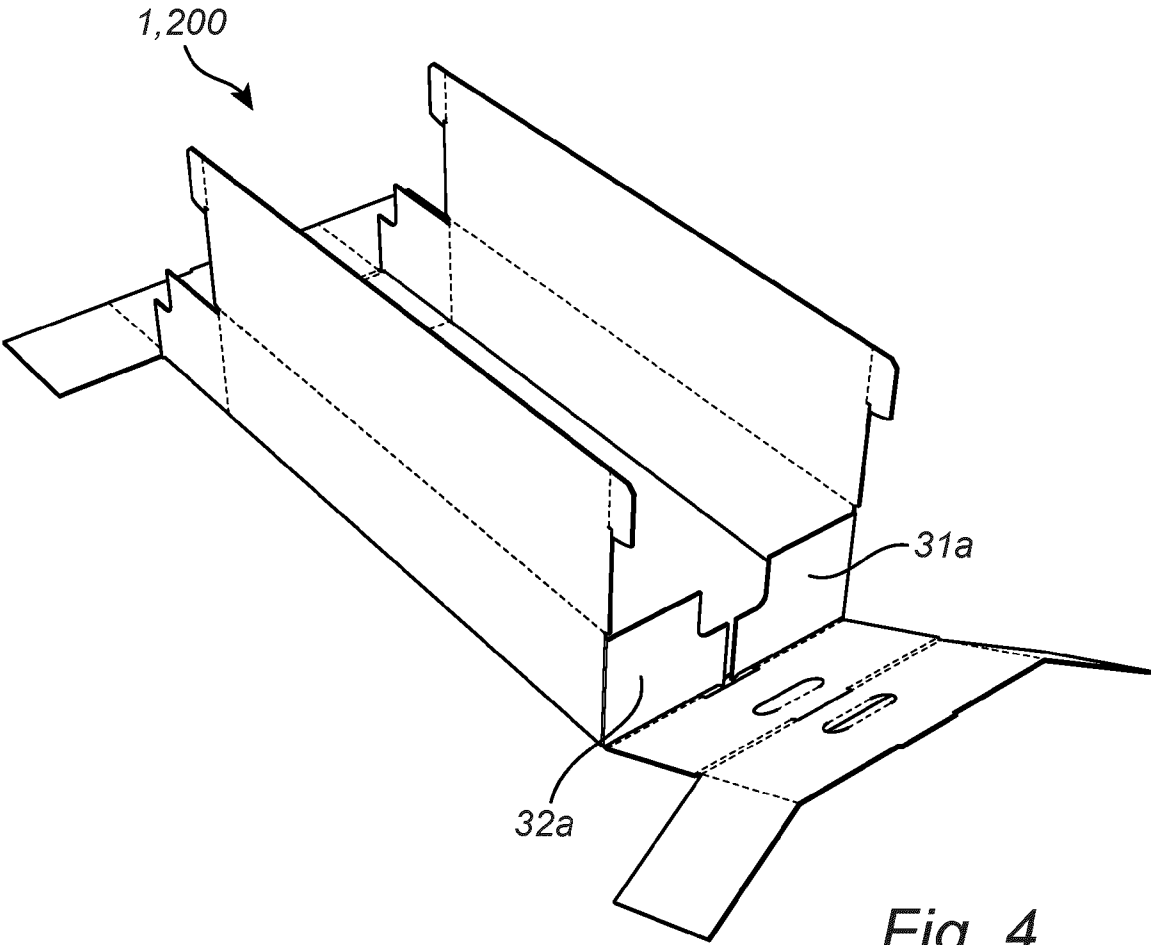


Fig. 3



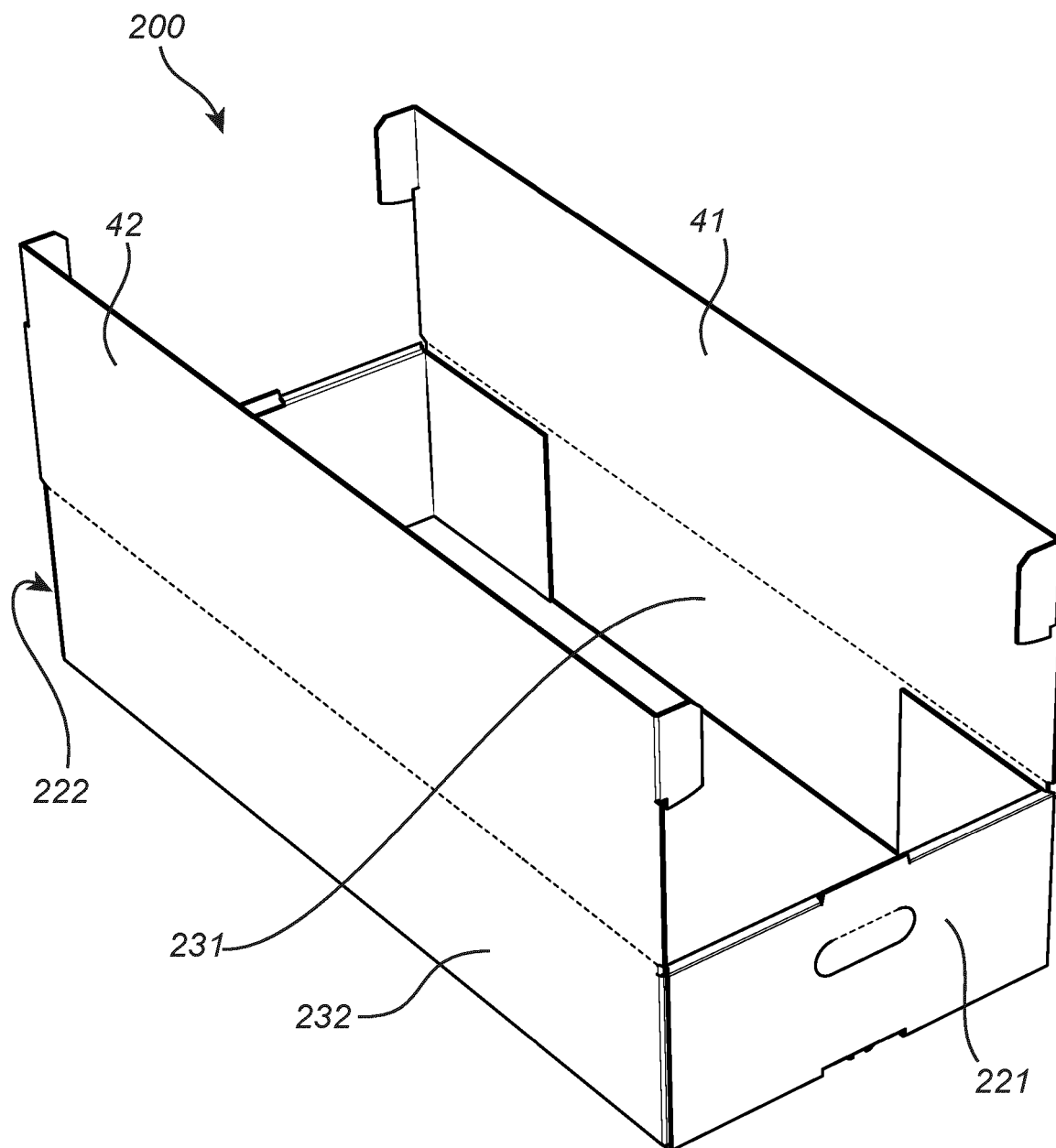


Fig. 6

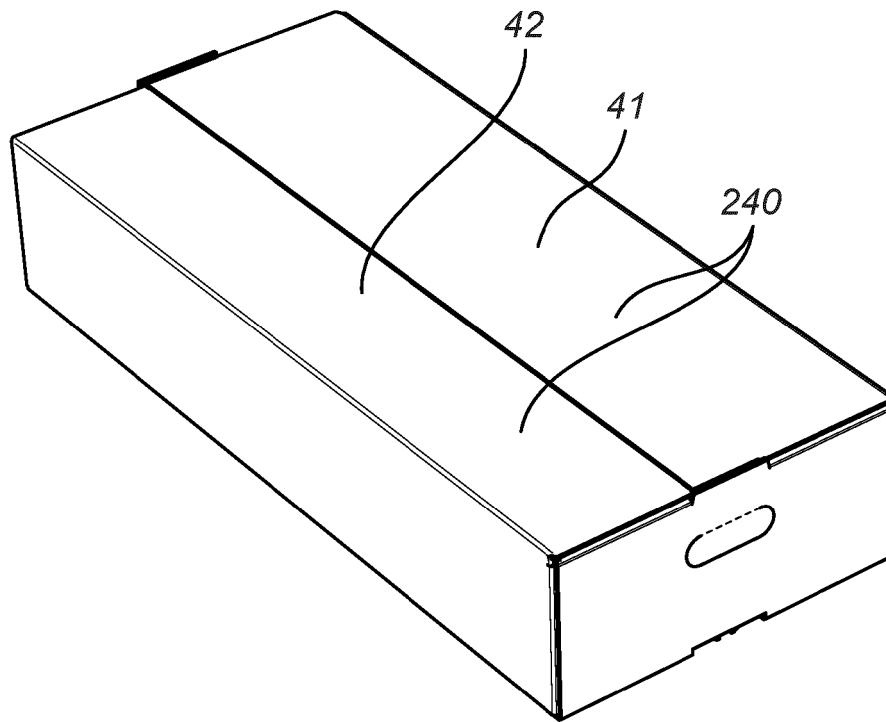


Fig. 7

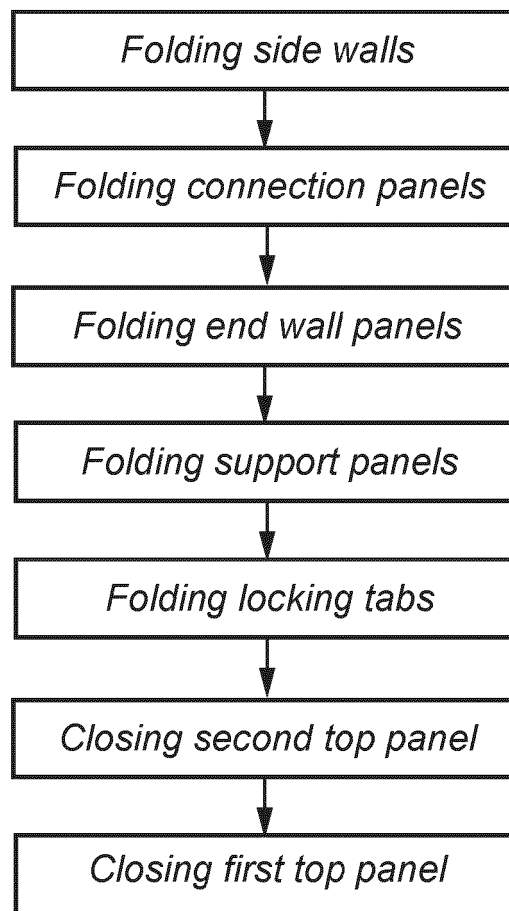


Fig. 8



EUROPEAN SEARCH REPORT

Application Number

EP 24 19 7959

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	FR 2 651 482 A1 (CARTONAJES SANTTORROMAN SA [ES]) 8 March 1991 (1991-03-08) * figure 1 *	1-14	INV. B65D5/00 B65D21/02
A	US 2018/273238 A1 (WAGNER BRENT [US] ET AL) 27 September 2018 (2018-09-27) * figures 6,7 *	1-14	
A	US 2005/145687 A1 (CONWAY DOYLE A [US]) 7 July 2005 (2005-07-07) * figure 20 *	1-14	
A	US 4 770 339 A (WEIMER CHARLES P [US]) 13 September 1988 (1988-09-13) * figure 1 *	1-14	
A	US 4 175 691 A (CORNELL WILLIAM F [US] ET AL) 27 November 1979 (1979-11-27) * figure 6 *	1-14	
A	WO 2021/111261 A1 (STORA ENSO OYJ [FI]) 10 June 2021 (2021-06-10) * figures 1,4 *	1-14	TECHNICAL FIELDS SEARCHED (IPC) B65D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 10 January 2025	Examiner Wimmer, Martin
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	

EPO FORM 1503 03.82 (P04C01)

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

EP 24 19 7959

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
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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2651482	A1	08-03-1991	ES 1011449 U	01-04-1990
			FR 2651482 A1	08-03-1991

US 2018273238	A1	27-09-2018	NONE	

US 2005145687	A1	07-07-2005	AR 051581 A1	24-01-2007
			AU 2005291999 A1	13-04-2006
			BR PI0516320 A	02-09-2008
			CA 2581756 A1	13-04-2006
			CN 101035716 A	12-09-2007
			EP 1799570 A1	27-06-2007
			US 2005145687 A1	07-07-2005
			WO 2006039473 A1	13-04-2006
			ZA 200702707 B	30-07-2008
			ZA 200709343 B	29-10-2008

US 4770339	A	13-09-1988	NONE	

US 4175691	A	27-11-1979	NONE	

WO 2021111261	A1	10-06-2021	EP 4069600 A1	12-10-2022
			SE 1951378 A1	04-06-2021
			WO 2021111261 A1	10-06-2021

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

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Patent documents cited in the description

- US 5139195 A [0005]