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| (51) International Patent Classification:
<i>B65D 5/66</i> (2006.01)
<i>B65D 5/56</i> (2006.01) | (72) Inventor: THOMPSON, Keenan Michael; Avenue de Rhodanie 50, 1007 Lausanne (CH). |
| (21) International Application Number:
PCT/EP2024/051385 | (74) Agent: HGF LIMITED; 1 City Walk, Leeds, Yorkshire LS11 9DX (GB). |
| (22) International Filing Date:
22 January 2024 (22.01.2024) | (81) Designated States (<i>unless otherwise indicated, for every kind of national protection available</i>): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW. |
| (25) Filing Language:
English | |
| (26) Publication Language:
English | |
| (30) Priority Data:
23153526.1 26 January 2023 (26.01.2023) EP | |
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(54) Title: PACKAGING CONTAINER WITH DYNAMIC OPEN AND CLOSE FEATURE

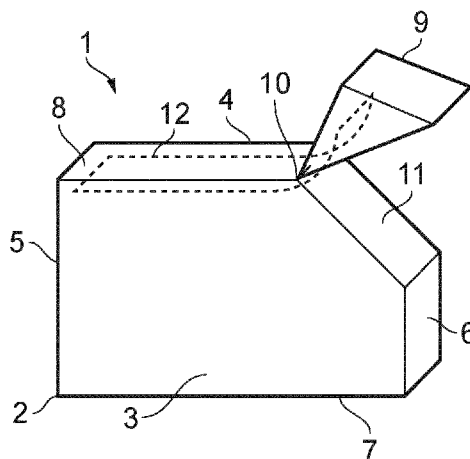


FIG. 2

(57) Abstract: A packaging container for consumer goods, the packaging container comprising: a substantially cuboid box made of cardboard, the cuboid box having a front wall, a rear wall, a left side wall, a right side wall, a bottom wall, and a top wall, wherein at least the front wall and the rear wall are substantially planar; wherein a corner portion of the cuboid box, comprising at least a part of the top wall, part of either one or other but not both of the left side wall or the right side wall adjoining the part of the top wall, and part of at least one of the front wall or the rear wall adjoining the part of the top wall and the part of either one or other but not both of the left side wall or the right side wall, is configured to hinge between closed and open positions about a hinge line extending across the top wall from the front wall to the rear wall so as to permit access to an interior of the cuboid box; wherein the top wall comprises a bistable member having first and second stable configurations; wherein the bistable member extends across the hinge line and is configured to bias the corner portion into the closed position in the first stable configuration and to bias the corner portion into the open position in

(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

- *with international search report (Art. 21(3))*
- *in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE*

the second stable configuration; wherein the top wall comprises a first flap that extends between the front wall and the rear wall; and wherein the bistable member is formed by a curvature in the first flap.

PACKAGING CONTAINER WITH DYNAMIC OPEN AND CLOSE FEATURE

The present disclosure relates to a packaging container for consumable good such as, but not limited to, rod-shaped aerosol generating articles such as tobacco-based heat-not-burn sticks. The present disclosure also relates to a blank for such a packaging container.

It is known to package rod-shaped aerosol generating articles and other consumable goods in containers formed from folded laminar blanks. Rod-shaped aerosol generating articles, such as heat-not-burn sticks, as well as cigarettes and cigars, are commonly sold in hinge lid packs having a box portion for housing the articles and a lid portion connected to the box portion about a hinge line extending across the back wall of the container. Such packs are typically constructed from one-piece laminar cardboard blanks. In use, the lid portion is pivoted about the hinge line to open the pack and so gain access to the articles held in the box portion. In order for a consumer to access the articles, or other consumable goods, held in the box portion, the consumer typically holds the box portion in one hand and uses the other hand to pivot the lid portion about the hinge line and to remove an article from the box portion. The lid portion is then pivoted back to reclose the pack. The material of construction of the hinge, especially when it is integrally formed with the container and lid, typically biases in favour of one or other of the open or the closed position. This may hinder the smooth removal of the articles from within the container or may prevent complete and effective closing of the container after opening. Where the container is a hinged lid pack of the flip-top™ type, the inner frame of such a container may become visible when the container is not entirely closed, the so called "smiling" effect.

Packaging for consumable goods in the tobacco industry has special requirements. For example, the consumable goods should be kept in a stable environment to reduce drying out. In addition, the packaging should be attractive and ergonomically designed for user satisfaction and ease of use.

It is known, for example from WO 2017/148801, to provide a packaging container comprising a box portion connected to a lid portion by way of a hinge portion. An elastomeric biasing member is connected between the box portion and the lid portion across the hinge portion, and is configured to urge the lid portion into a closed configuration relative to the box portion, or to urge the lid portion into an open configuration relative to the box portion, depending on an angle by which the lid portion is moved about the hinge portion.

It is known, for example from WO 2014/206939, to provide a packaging container comprising a box portion connected to a lid portion by way of a hinge portion. The rear face of the box portion and the rear face of the lid portion both have a convex curvature, and the hinge portion is defined by a curved line. When a user presses the convex rear face of the box portion inwardly, the rear face of the box portion may snap to a concave configuration, and this will change the curvature of the curved line of the hinge portion and cause the lid portion to snap backwards into an open position.

It is known, for example from US 2005/0199517, to provide a packaging container comprising a box portion connected to a lid portion by way of a hinge portion. A mechanical sound member is formed at the hinge portion by way of a bistable member. The bistable member is defined by forming a pair of slits across the hinge portion.

It would be desirable to provide an improved packaging container for consumer goods, which allows a consumer easy access to the consumer goods within the packaging container.

According to a first aspect of the present invention, there is provided a packaging container for consumer goods, the packaging container comprising:

- a substantially cuboid box made of cardboard, the cuboid box having a front wall, a rear wall, a left side wall, a right side wall, a bottom wall, and a top wall, wherein at least the front wall and the rear wall are substantially planar;

- wherein a corner portion of the cuboid box, comprising at least a part of the top wall, part of either one or other but not both of the left side wall or the right side wall adjoining the part of the top wall, and part of at least one of the front wall or the rear wall adjoining the part of the top wall and the part of either one or other but not both of the left side wall or the right side wall, is configured to hinge between closed and open positions about a hinge line extending across the top wall from the front wall to the rear wall so as to permit access to an interior of the cuboid box;

- wherein the top wall comprises a bistable member having first and second stable configurations;

- wherein the top wall comprises a first flap that extends between the front wall and the rear wall; and

- wherein the bistable member is formed by a curvature in the first flap.

In certain existing packaging containers, for example as disclosed in WO 2014/206939, a rear face of the packaging container has a convex curvature. Packaging containers of this type may not pack efficiently for transport and storage. Moreover, the packaging container of WO 2014/206939 requires a curved hinge line between the box portion and the lid portion, and this complicates manufacture and assembly.

The packaging container of the present disclosure has a substantially planar front wall and a substantially planar rear wall, and can thus be efficiently packed with other such packaging containers for transport and storage. In particular, the rear wall and the front wall do not have a convex curvature. Moreover, no fold lines or hinge lines need to be curved, reducing manufacturing complexity.

Embodiments of the present disclosure do not require an elastomeric biasing member, and can thus be cheaper and simpler to manufacture.

In contrast to known packaging containers, for example as disclosed in US 2005/0199517, there is no requirement for slits to be formed across a hinge line between a box portion and a lid

portion. Such slits can lead to tears in the packaging container, and can weaken the connection between the box portion and the lid portion.

By configuring a corner portion of the cuboid box to hinge between closed and open positions about a hinge line extending across the top wall from the front wall to the rear wall so as to permit access to an interior of the cuboid box, there is provided a lid geometry that is particularly suited for use with a bistable member so as to obtain a positive opening and closing action.

When the corner portion is in the closed position, the bistable member is in its first stable configuration. Accordingly, if the corner portion is lifted up slightly by a user, it will be biased back to the closed position, and will automatically return to the closed position when released. This helps to ensure that the packaging container stays closed when carried in a pocket or handbag, and helps to keep the contents of the packaging container fresh by reducing exposure to air.

However, if the corner portion is lifted beyond a predetermined angle about the hinge line, the bistable member will snap into its second stable configuration, and the corner portion will be biased into the open position. This opening action is satisfying to the user, and also maximises the opening of the packaging container so as to facilitate access to the contents of the packaging container.

When the user has taken a consumer good from the packaging container, the user can push the corner portion back towards the closed position. Initially, the corner portion will be biased towards the open position, but upon moving past a predetermined angle about the hinge line, the bistable member will be caused to snap from the second stable configuration back to the first stable configuration, thus urging the corner portion into the closed position again.

The cuboid box is made of cardboard. In contrast to plastics materials, cardboard is relatively cheap and is more environmentally-friendly, since it can easily be recycled and may be biodegradable.

The corner portion may comprise part of both the front wall and the rear wall. The part of the front wall and the part of the rear wall are corner portions of the respective front wall and rear wall. The part of the front wall may be the same size as the part of the rear wall. Alternatively, the part of the front wall may be larger in area than the part of the rear wall. Alternatively, the part of the front wall may be smaller in area than the part of the rear wall. The part of the front wall may have the same shape as the part of the rear wall. The part of the front wall may have a triangular shape. The part of the rear wall may have a triangular shape. The part of the front wall may have a triangular shape that is congruent to a triangular shape of the part of the rear wall. The part of the front wall may have a triangular shape that is similar to a triangular shape of the part of the rear wall. The part of the front wall and the part of the rear wall may have shapes other than triangular. For example, one or other or both of the part of the front wall and the part of the rear wall may have a polygonal shape with more than three sides. In other example, one of the sides

of one or other or both of the part of the front wall and the part of the rear wall may be curved rather than straight. However, straight sides are generally preferred for ease of manufacture.

The corner portion may comprise part of only one of the front wall and the rear wall. The part of only one of the front wall and the rear wall is a corner portion of the respective front wall and rear wall. The part of only one of the front wall and the rear wall may have a triangular shape. The part of only one of the front wall and the rear wall may have a shape other than triangular. For example, the part of only one of the front wall and the rear wall may have a polygonal shape with more than three sides. In other example, one of the sides may be curved rather than straight. However, straight sides are generally preferred for ease of manufacture.

The hinge line may be substantially perpendicular to the front wall and the rear wall. This is applicable to embodiments where the corner portion comprises parts of both the front wall and the rear wall and where the hinge line can extend across the top wall in a direction perpendicular to the front wall and the rear wall. Alternatively, the hinge line may extend across the top wall at an oblique angle to the front wall and the rear wall. This is applicable to embodiments where the corner portion comprises differently-sized parts of both the front wall and the rear wall, or part of only one of the front wall and the rear wall.

The hinge line may extend in a direct line between the front wall and the rear wall. In the context of the present disclosure, a “direct line” is a line that does not have any corners or discontinuities. In embodiments where the top wall of the cuboid box has a curvature between the front wall and the rear wall, the “direct line” may follow the curvature of the top wall.

The hinge line may extend in an indirect line between the front wall and the rear wall. In the context of the present disclosure, an “indirect line” is a line that has at least one corner or discontinuity. In embodiments where the top wall of the cuboid box has a curvature between the front wall and the rear wall, the “indirect line” may follow the curvature of the top wall.

The bistable member is formed by a curvature in the top wall between the front wall and the rear wall. The curvature may be a convex curvature when the corner portion is in the closed position. The curvature may be a concave curvature when the corner portion is in the closed position. The curvature may be a continuous curvature. In the context of the present disclosure, a “continuous curvature” is a smooth curvature without any kinks or discontinuities. Alternatively, the curvature may be a discontinuous curvature. In the context of the present disclosure, a “discontinuous curvature” is a curvature including kinks or discontinuities. For example, a discontinuous curvature may comprise a plurality of straight sections that are angled relative to each other.

The top wall comprises a first flap that extends between the front wall and the rear wall and the bistable member is formed by a curvature in the first flap. The bistable member may thus be formed by the cardboard of the top wall of the cuboid box.

The first flap may be integrally connected to one or other of the front wall or the rear wall by way of a fold line, and the first flap may be connected to the other of the front wall or the rear wall by adhesion. The adhesion may be achieved by glue or adhesive tape.

The top wall may further comprise a second flap, disposed underneath the first flap, integrally connected to the other of the front wall or the rear wall by way of a fold line. In some embodiments, the second flap does not have a curvature. In other embodiments, the second flap has a curvature that complements the curvature of the first flap.

The provision of a second flap may help to maintain an integrity of the bistable member through reinforcement.

Alternatively, the top wall may comprise a first flap that extends from one of the front wall or the rear wall towards but not all the way to the other of the front wall or the rear wall, and the bistable member is formed by a curvature in the first flap.

The top wall may further comprise a second flap, disposed underneath the first flap, integrally connected to the other of the front wall or the rear wall by way of a fold line. In some embodiments, the second flap does not have a curvature. In other embodiments, the second flap has a curvature that complements the curvature of the first flap. An edge of the first flap may be connected to the second flap by adhesion.

Where the bistable member is formed by a curvature in the top wall between the front wall and the rear wall, whether by way of a single first flap or by way of a first flap and a second flap, it will be understood that the bistable member may comprise or consist of cardboard.

Preferably, the bistable member formed by the curvature in the top wall has sufficient resilience to enable the corner portion of the cuboid box to be snapped reliably between the open and closed positions a sufficient number of times to allow all of the consumer goods to be removed, one by one, from the packaging container. For example, where the consumer goods are elongate smoking articles such as heat-not-burn sticks, it is common for a packaging container to contain 20 such articles. Accordingly, it is advantageous for the bistable member to be configured to be snapped reliably between open and closed positions at least 40 times, thus ensuring proper operation at least until the packaging container has been emptied of its contents one by one.

The bistable member may additionally comprise one or more coating layers on at least one surface of the bistable member. The one or more coating layers may be formed on a concave surface of the bistable member. The one or more coating layers may comprise layers of varnish. The one or more coating layers may comprise layers of glue. The provision of one or more coating layers may provide additional reinforcement to the bistable member. The provision of one or more coating layers may promote a more pronounced transition between the first stable configuration and the second stable configuration as the corner portion is moved between open and closed positions about the hinge line. The one or more coating layers may have elastomeric properties

to promote a more pronounced transition between the first stable configuration and the second stable configuration.

In addition to, or as an alternative to, the bistable member being formed by the cardboard of the top wall, the bistable member may comprise or consist of metal or polymer. Although less desirable in terms of manufacturing cost and environmental impact, the use of metal or polymer to form at least part of the bistable member may provide more reliable and longer lasting operation.

The bistable member may be a laminated member. The bistable member may comprise a laminate of metal and cardboard. The bistable member may comprise a laminate of metal and polymer. The bistable member may comprise a laminate of polymer and cardboard.

The bistable member may be configured to generate an audible click when transitioning between the first stable configuration and the second stable configuration. An audible click provides confirmation to a user that the corner portion of the cuboid box has successfully transitioned from the closed position to the open position or from the open position to the closed position.

Preferably, the hinge line does not comprise any slits. In particular, there is no requirement for slits to be formed across the hinge line, for example to define locking tabs or biasing tabs or the like. The presence of slits across a hinge line can lead to problems of tearing or weakening of the hinge line.

In some embodiments, all fold lines between the respective walls of the packaging container are straight lines. This is advantageous because it is easier to fold along straight lines than along curved lines.

The packaging container may be shaped and dimensioned to contain rod-shaped aerosol-generating articles.

According to a second aspect of the present invention, there is provided a laminar cardboard blank for forming a packaging container for consumer goods, the blank comprising:

- a front wall portion;
- a left side wall portion; and
- a rear wall portion;

wherein the left side wall portion is defined between the front wall portion and the rear wall portion by a pair of substantially parallel fold lines;

a first bottom wall flap depending from a bottom of the front wall portion by way of a fold line and a second bottom wall flap depending from a bottom of the rear wall portion by way of a fold line;

a first right side wall flap depending from a left end of the rear wall portion by way of a fold line and a second right side wall flap depending from a right end of the front wall portion by way of a fold line;

a first top wall flap depending from a top of the rear wall portion by way of a fold line and a second top wall flap depending from a top of the front wall portion by way of a fold line;

wherein one of the first top wall flap and the second top wall flap extends further from its respective rear wall portion or front wall portion than the other of the first top wall flap and second top wall flap, and wherein the one of the first top wall flap and the second top wall flap is provided with an extension flap depending from an edge of the one of the first top wall flap and the second top wall flap remote from the respective rear wall portion or front wall portion by way of a fold line;

wherein each of the first right side wall flap, the second right side wall flap and at least one of the front wall portion or the rear wall portion is provided with a cut so as to define, when the laminar blank is folded into a box shape, a corner portion configured to hinge between closed and open positions about a hinge line extending across a top wall formed by the first top wall flap and the second top wall flap; and

wherein when the one of the first top wall flap and the second top wall flap that extends further from its respective rear wall portion or front wall portion than the other of the first top wall flap and second top wall flap is folded over the other of the first top wall flap and second top wall flap so as to form a top wall, the one of the first top wall flap and the second top wall flap that extends further from its respective rear wall portion or front wall portion than the other of the first top wall flap and second top wall flap assumes a curved configuration with the extension flap adhered to the respective rear wall portion or front wall portion.

The laminar cardboard blank of the second aspect may be folded and assembled into the packaging container of certain embodiments of the first aspect.

The laminar cardboard blank is of particular relevance to embodiments of the first aspect where the bistable member is made of cardboard and formed by at least one of the flaps defining the top wall of the packaging container.

It is to be understood that the hinge line extending across the top wall need not be defined in the laminar cardboard blank by a pre-formed fold line. The hinge line may first be physically formed after assembly of the laminar cardboard blank into a packaging container and upon first opening of the packaging container by a user moving the corner portion from the closed position to the open position. However, it is also possible for the hinge line to be defined by a pre-formed fold line in the laminar cardboard blank.

All of the fold lines may be straight lines. It is easier to form straight fold lines than curved fold lines. It is easier to fold about straight fold lines than to fold about curved fold lines.

A surface of the one of the first top wall flap and the second top wall flap that extends further from its respective rear wall portion or front wall portion than the other of the first top wall flap and second top wall flap may be provided with one or more coating layers.

The surface with the one or more coating layers may be concave.

The one or more coating layers may comprise layers of varnish. The one or more coating layers may comprise layers of glue. The provision of one or more coating layers may provide additional reinforcement to the bistable member. The provision of one or more coating layers may help to maintain the concave curvature of the one of the first top wall flap and the second top wall flap that extends further from its respective rear wall portion or front wall portion than the other of the first top wall flap and second top wall flap, thereby to function as a bistable member when the laminar cardboard blank is folded and assembled into a packaging container. The bistable member promotes a pronounced transition between the first stable configuration and the second stable configuration as the corner portion is moved between open and closed positions about the hinge line. The one or more coating layers may have elastomeric properties to promote a more pronounced transition between the first stable configuration and the second stable configuration.

The one of the first top wall flap and the second top wall flap that extends further from its respective rear wall portion or front wall portion than the other of the first top wall flap and second top wall flap may assume a convex curved configuration with the extension flap adhered to the respective rear wall portion or front wall portion.

The one of the first top wall flap and the second top wall flap may extend from its respective rear wall portion or front wall portion by a first distance. The other of the first top wall flap and the second top wall flap may extend from its respective front wall portion or rear wall portion by a second distance. The first distance may be from 5% to 50% greater than the second distance. The first distance may be from 10% to 30% greater than the second distance.

The extension flap may extend from its fold line by an appropriate distance. Preferably, this distance will be at least 1mm to 2mm so as to allow sufficient adhesive to be applied to the extension flap so as to ensure good adhesion to the relevant front wall portion or rear wall portion to which the extension flap is adhered when the laminar cardboard blank is assembled to form a packaging container. The distance may be as great as a height of the relevant front wall portion or rear wall portion to which the extension flap is adhered when the laminar cardboard blank is assembled to form a packaging container. The distance may be from 1mm to 5mm so as to allow sufficient adhesive to be applied while not using an unnecessary excess amount of cardboard in the extension flap.

The laminar cardboard blank may be made of cardboard with a thickness of 0.2mm to 0.4mm. The laminar cardboard blank may be made of cardboard with a thickness of about 0.25mm.

As used herein, the term "bistable member" refers to an elongate member having first and second portions separated from each other by a hinge line, and configured to assume a first, stable configuration when the first and second portions are angled relative to each other about the hinge line by less than a predetermined angle, and to assume a second, stable configuration

when the first and second portions are angled relative to each other about the hinge line by more than the predetermined angle.

As used herein, the term “continuous curvature” means a smooth curvature without any kinks or discontinuities.

As used herein, the term “direct line” means a line that does not have any corners or discontinuities.

As used herein, the term “discontinuous curvature” means a curvature including at least one kink or discontinuity.

As used herein, the term “fold line” refers to a line about which one part of a laminar cardboard blank is folded relative to another part of the laminar cardboard blank when the cardboard blank is assembled into a packaging container. A fold line may be pre-scored before folding.

As used herein, the term “hinge line” refers to a line about which one element or part of one element hinges relative to another element or another part of the same element. A hinge line need not be a pre-folded or pre-scored line, but may be formed by a user when first hinging the one element or part of one element relative to another element or another part of the same element.

As used herein, the term “indirect line” means a line that has at least one corner or discontinuity.

The invention is defined in the claims. However, below there is provided a non-exhaustive list of non-limiting examples. Any one or more of the features of these examples may be combined with any one or more features of another example, embodiment, or aspect described herein.

Example Ex1: A packaging container for consumer goods, the packaging container comprising:

a substantially cuboid box made of cardboard, the cuboid box having a front wall, a rear wall, a left side wall, a right side wall, a bottom wall, and a top wall, wherein at least the front wall and the rear wall are substantially planar;

wherein a corner portion of the cuboid box, comprising at least a part of the top wall, part of either one or other but not both of the left side wall or the right side wall adjoining the part of the top wall, and part of at least one of the front wall or the rear wall adjoining the part of the top wall and the part of either one or other but not both of the left side wall or the right side wall, is configured to hinge between closed and open positions about a hinge line extending across the top wall from the front wall to the rear wall so as to permit access to an interior of the cuboid box;

wherein the top wall comprises a bistable member having first and second stable configurations; and

wherein the bistable member extends across the hinge line and is configured to bias the corner portion into the closed position in the first stable configuration and to bias the corner portion into the open position in the second stable configuration.

Example Ex2: The packaging container according to Example Ex1, wherein the corner portion comprises part of both the front wall and the rear wall.

Example Ex3: The packaging container according to Example Ex1, wherein the corner portion comprises part of only one of the front wall and the rear wall.

Example Ex4: The packaging container according to Example Ex1 or Ex2, wherein the hinge line is substantially perpendicular to the front wall and the rear wall.

Example Ex5: The packaging container according to any one of Examples Ex1 to Ex3, wherein the hinge line extends in a direct line between the front wall and the rear wall.

Example Ex6: The packaging container according to any one of Examples Ex1 to Ex5, wherein the hinge line extends in an indirect line between the front wall and the rear wall.

Example Ex7: The packaging container according to any preceding Example, wherein the bistable member is formed by a curvature in the top wall between the front wall and the rear wall.

Example Ex8: The packaging container according to Example Ex7, wherein the curvature is a convex curvature when the corner portion is in the closed position.

Example Ex9: The packaging container according to Example Ex7, wherein the curvature is a concave curvature when the corner portion is in the closed position.

Example Ex10: The packaging container according to any one of Examples Ex7 to Ex9, wherein the curvature is a continuous curvature.

Example Ex11: The packaging container according to any one of Examples Ex7 to Ex9, wherein the curvature is a discontinuous curvature.

Example Ex12: The packaging container according to any one of Examples Ex7 to Ex11, wherein the top wall comprises a first flap that extends between the front wall and the rear wall and wherein the bistable member is formed by a curvature in the first flap.

Example Ex13: The packaging container according to Example Ex12, wherein the first flap is integrally connected to one or other of the front wall or the rear wall by way of a fold line, and wherein the first flap is connected to the other of the front wall or the rear wall by adhesion.

Example Ex14: The packaging container according to Example Ex12 or Ex13, wherein the top wall further comprises a second flap, disposed underneath the first flap, integrally connected to the other of the front wall or the rear wall by way of a fold line.

Example Ex15: The packaging container according to Example Ex14, wherein the second flap does not have a curvature.

Example Ex16: The packaging container according to Example Ex14, wherein the second flap has a curvature that complements the curvature of the first flap.

Example Ex17: The packaging container according to any one of Examples Ex7 to Ex11, wherein the top wall comprises a first flap that extends from one of the front wall or the rear wall towards but not all the way to the other of the front wall or the rear wall, and wherein the bistable member is formed by a curvature in the first flap.

Example Ex18: The packaging container according to Example Ex17, wherein the top wall further comprises a second flap, disposed underneath the first flap, integrally connected to the other of the front wall or the rear wall by way of a fold line.

Example Ex19: The packaging container according to Example Ex18, wherein the second flap does not have a curvature.

Example Ex20: The packaging container according to Example Ex18, wherein the second flap has a curvature that complements the curvature of the first flap.

Example Ex21: The packaging container according to any one of Examples Ex18 to Ex20, wherein an edge of the first flap is connected to the second flap by adhesion.

Example Ex22: The packaging container according to any preceding Example, wherein the bistable member is made of cardboard.

Example Ex23: The packaging container according to Example Ex22, wherein the bistable member additionally comprises one or more coating layers on at least one surface of the bistable member.

Example Ex24: The packaging container according to Example Ex23, wherein the one or more coating layers are formed on a concave surface of the bistable member.

Example Ex25: The packaging container according to Example Ex23 or Ex24, wherein the one or more coating layers comprise layers of varnish.

Example Ex26: The packaging container according to any one of Examples Ex23 to Ex25, wherein the one or more coating layers comprise layers of glue.

Example Ex27: The packaging container according to any one of Examples Ex1 to Ex11, wherein the bistable member is made of metal.

Example Ex28: The packaging container according to any one of Examples Ex1 to Ex11, wherein the bistable member is made of polymer.

Example Ex29: The packaging container according to any one of Examples Ex1 to Ex11, wherein the bistable member is a laminated member.

Example Ex30: The packaging container according to Example Ex29, wherein the bistable member comprises a laminate of metal and cardboard.

Example Ex31: The packaging container according to Example Ex29, wherein the bistable member comprises a laminate of metal and polymer.

Example Ex32: The packaging container according to Example Ex29, wherein the bistable member comprises a laminate of polymer and cardboard.

Example Ex33: The packaging container according to any preceding Example, wherein the bistable member is configured to generate an audible click when transitioning between the first stable configuration and the second stable configuration.

Example Ex34: The packaging container according to any preceding Example, wherein the hinge line does not comprise any slits.

Example Ex35: The packaging container according to any preceding Example, wherein all fold lines between the respective walls of the packaging container are straight lines.

Example Ex36: The packaging container according to any preceding Example, shaped and dimensioned to contain rod-shaped aerosol-generating articles.

Example Ex37: A laminar cardboard blank for forming a packaging container for consumer goods, the blank comprising:

- a front wall portion;

- a left side wall portion; and

- a rear wall portion;

wherein the left side wall portion is defined between the front wall portion and the rear wall portion by a pair of substantially parallel fold lines;

- a first bottom wall flap depending from a bottom of the front wall portion by way of a fold line and a second bottom wall flap depending from a bottom of the rear wall portion by way of a fold line;

- a first right side wall flap depending from a left end of the rear wall portion by way of a fold line and a second right side wall flap depending from a right end of the front wall portion by way of a fold line;

- a first top wall flap depending from a top of the rear wall portion by way of a fold line and a second top wall flap depending from a top of the front wall portion by way of a fold line;

wherein one of the first top wall flap and the second top wall flap extends further from its respective rear wall portion or front wall portion than the other of the first top wall flap and second top wall flap, and wherein the one of the first top wall flap and the second top wall flap is provided with an extension flap depending from an edge of the one of the first top wall flap and the second top wall flap remote from the respective rear wall portion or front wall portion by way of a fold line;

wherein each of the first right side wall flap, the second right side wall flap and at least one of the front wall portion or the rear wall portion is provided with a cut so as to define, when the laminar blank is folded into a box shape, a corner portion configured to hinge between closed and open positions about a hinge line extending across a top wall formed by the first top wall flap and the second top wall flap; and

wherein when the one of the first top wall flap and the second top wall flap that extends further from its respective rear wall portion or front wall portion than the other of the first top wall flap and second top wall flap is folded over the other of the first top wall flap and second top wall

flap so as to form a top wall, the one of the first top wall flap and the second top wall flap that extends further from its respective rear wall portion or front wall portion than the other of the first top wall flap and second top wall flap assumes a curved configuration with the extension flap adhered to the respective rear wall portion or front wall portion.

Example Ex38: The laminar blank according to Example Ex37, wherein all of the fold lines are straight lines.

Example Ex39: The laminar blank according to Example Ex37 or Ex38, wherein a surface of the one of the first top wall flap and the second top wall flap that extends further from its respective rear wall portion or front wall portion than the other of the first top wall flap and second top wall flap is provided with one or more coating layers.

Example Ex40: The laminar blank according to Example Ex39, wherein the surface with the one or more coating layers is concave.

Example Ex41: The laminar blank according to Example Ex39 or Ex40, wherein the one or more coating layers comprise layers of varnish.

Example Ex42: The laminar blank according to Example Ex39 or Ex40, wherein the one or more coating layers comprise layers of glue.

Example Ex43: The laminar blank according to any one of Examples Ex37 to Ex42, wherein the one of the first top wall flap and the second top wall flap that extends further from its respective rear wall portion or front wall portion than the other of the first top wall flap and second top wall flap assumes a convex curved configuration with the extension flap adhered to the respective rear wall portion or front wall portion.

Example Ex44: The laminar blank according to any one of Examples Ex37 to Ex43, wherein the one of the first top wall flap and the second top wall flap extends from its respective rear wall portion or front wall portion by a first distance.

Example Ex45: The laminar blank according to Example Ex44, wherein the other of the first top wall flap and the second top wall flap extends from its respective front wall portion or rear wall portion by a second distance.

Example Ex46: The laminar blank according to Example Ex45, wherein the first distance is from 5% to 50% greater than the second distance.

Example Ex47: The laminar blank according to Example Ex45, wherein the first distance is from 10% to 30% greater than the second distance.

Examples will now be further described with reference to the figures in which:

Figure 1 shows a packaging container in a closed configuration;

Figure 2 shows the packaging container of Figure 1 in an open configuration;

Figure 3 shows a detail of a bistable member incorporated in the packaging container of Figures 1 and 2;

Figure 4 shows the bistable member of Figure 3 in a first configuration;

Figure 5 shows the bistable member of Figure 3 in a second configuration;
Figure 6 shows a bistable member with a perpendicular hinge line;
Figure 7 shows a bistable member with a non-perpendicular hinge line;
Figure 8 shows a bistable member with a discontinuous hinge line;
Figure 9 shows bistable members with curved hinge lines;
Figure 10 shows a cross section through a bistable member with a layer or layers of varnish or glue on the underside of the bistable member;
Figure 11 shows a laminar cardboard blank;
Figures 12 to 14 show a folding process for the laminar cardboard blank of Figure 11;
Figure 15 shows a packaging container formed from the laminar cardboard blank of Figure 11;
Figure 16 shows a cross section through a top part of the packaging container of Figure 15;
Figure 17 shows an alternative packaging container;
Figure 18 shows a cross section through a top part of the packaging container of Figure 17;
Figure 19 shows an alternative bistable member;
Figure 20 shows a cross section through a top part of a packaging container incorporating the bistable member of Figure 19;
Figure 21 shows another alternative packing container;
Figure 22 shows another alternative packing container; and
Figures 23 and 24 show another alternative packing container.

Figures 1 and 2 show a packaging container 1 for consumer goods (not shown). The packaging container 1 comprises a substantially cuboid box 2 made out of cardboard. The cuboid box 2 has a front wall 3, a rear wall 4, a left side wall 5, a right side wall 6, a bottom wall 7, and a top wall 8. At least the front wall 3 and the rear wall 4 are substantially planar. In the embodiment shown, the front wall 3 and the rear wall 4 are substantially parallel to each other.

A corner portion 9 of the cuboid box 2 is configured to hinge between a closed position (Figure 1) and an open position (Figure 2) about a hinge line 10 extending across the top wall 8 from the front wall 3 to the rear wall 4 so as to permit access to an interior 11 of the cuboid box 2.

The corner portion 9 of the embodiment shown in Figures 1 and 2 comprises a part of the top wall 8, part of the right side wall 6 adjoining the part of the top wall 8, a corner part of the front wall 3 and a corner part of the rear wall 4 each adjoining the part of the top wall 8 and the part of the right side wall 6.

The top wall 8 comprises a bistable member 12 having first and second stable configurations, shown in more detail in Figures 3 to 5.

The bistable member 12 extends across the hinge line 10 and is configured to bias the corner portion 9 into the closed position in the first stable configuration and to bias the corner portion 9 into the open position in the second stable configuration.

In the embodiment shown in Figures 1 and 2, the corner portion 9 comprises corner parts of both the front wall 3 and the rear wall 4.

In the embodiment shown in Figures 1 and 2, the hinge line 10 is substantially perpendicular to the front wall 3 and the rear wall 4. Moreover, the hinge line 10 extends in a direct line between the front wall 3 and the rear wall 4.

In the embodiment of Figure 22, the corner portion 9 has a generally triangular prismatic form factor.

Figures 3 to 5 show the bistable member 12 in more detail. As shown in Figure 3, in the first stable configuration, the bistable member 12 may have a convex curvature in a direction from the front wall 3 toward the rear wall 4 when viewed from above the top wall 8. The bistable member 12, in the first stable configuration as shown in Figure 3, may take the general form of a segment of a substantially cylindrical surface. The bistable member 12 shown in Figure 3 has a first part P1 and a second part P2. When the second part P2 is hinged about the hinge line 10 relative to the first part P1, for example as shown in Figures 3 and 4, it can be seen that initially, below a predetermined angle α_{flat} , the curvature of the second part P2 will remain convex, with the retraction forces exerted by the edges of the bistable member 12 at the hinge line 10 urging the second part P2 to return to the first stable configuration shown in Figure 3. Accordingly, if the second part P2 is in the corner portion 9 of the cuboid box 2 and the first part P1 is in the top wall 8 of the cuboid box 2 not within the corner portion 9, it can be seen that lifting the corner portion 9 by an angle less than α_{flat} means that the retractions forces will urge the corner portion 9 to return to the closed position when released. However, if the second part P2 is hinged about the hinge line 10 relative to the first part P1 beyond the predetermined angle α_{flat} , the curvature of the second part P2 will flip from convex to concave, while the curvature of the first part P1 remains convex, and the retraction forces exerted by the edges of the bistable member 12 at the hinge line 10 will urge the second part P2 to move to the second stable configuration shown in Figure 4. With the second part P2 in the corner portion 9 of the cuboid box 2, this means that the corner portion 9 is urged into the open position as shown in Figure 2.

In certain embodiments, transition of the bistable member 12 from the first stable configuration to the second stable configuration as the second part P2 bends through the predetermined angle α_{flat} will be accompanied by an audible click sound.

Due to the forces resulting from the bistable stressed structure of the bistable member 12, intermediary shapes other than the first and second stable configurations are generally transitory and quickly resolve into the first and second stable configurations. The reason for this is that the energy released by a part of the bistable element 12 when it reaches one of the stable

configurations converts into kinetic energy of the propagation of the shape change towards the respective first or second stable state. Put another way, the potential energy of the bistable member 12 is at a maximum when the second part P2 is at or near the predetermined angle α_{flat} relative to the first part P1. As the second part P2 then moves to either the first or second stable configuration (closed or open position), at least a portion of the potential energy is converted into kinetic energy so as to conserve the total amount of energy in the system. When the kinetic energy runs longitudinally along the bistable member 12 in the top wall 8 and reaches an end of the top wall 8, for example in the form of a vibration, and is reflected at the end of the top wall 8, this can generate a click sound. An empty space 13 formed in the top wall 8 under the curvature of the bistable member 12 may act as a sound box, and the vibration caused by conversion of potential energy into kinetic energy may resonate in the empty space 13 so as to enhance the click sound.

In order to transition from the first stable configuration to the second stable configuration, it is necessary to provide energy to the bistable member 12 in the top wall 8. This is achieved by way of a user doing work to open or close the corner portion 9 of the cuboid box 2.

In addition to, or instead of, generating an audible click sound, transitioning from the first stable configuration to the second stable configuration may be accompanied by a satisfying haptic sensation as the second part P2 moves through the predetermined angle α_{flat} relative to the first part P1.

The bistable member 12 may function as an aid to opening and closing the corner portion 9 of the cuboid box 2.

The bistable member 12 may act to maintain the corner portion 9 of the cuboid box 2 in a stable fully open position or a stable fully closed position. If the corner portion 9 of the cuboid box 2 is at other positions, it will tend to resolve its position to either the fully open position or the fully closed position depending on the angle of opening. Maintaining the corner portion 9 of the cuboid box 2 in the fully closed position may be advantageous in order to keep the packaging container 1 properly closed when in a user's pocket or handbag. Keeping the packaging container 1 properly closed can help to reduce deterioration of the contents of the packaging container 1 due to exposure to air.

By promoting a binary fully open or fully closed position of the corner portion 9 of the cuboid box 1, the bistable member 12 may help to make it highly obvious to a user that the corner portion 9 is not closed, and may therefore encourage the user to close the corner portion 9 before putting the packaging container 1 into a pocket or handbag.

In preferred embodiments, the bistable member 12 is formed from or consists of cardboard. The bistable member 12 may be formed from or consist of the same cardboard material as the rest of the cuboid box 2. Making the bistable member 12 out of cardboard, for instance the same

cardboard as the rest of the cuboid box 2, results in easier and cheaper manufacture, and results in a product that is easily recycled or substantially biodegradable.

Alternatively, the bistable member 12 may be made of metal or polymer.

The bistable member 12 may be a laminated member.

The bistable member 12 may comprise a laminate of metal and cardboard, or a laminate of metal and polymer, or a laminate of polymer and cardboard, or a laminate of cardboard, polymer and metal. For example, the bistable member 12 may comprise a laminate of cardboard and polymer, with the polymer layer or layers being elastomeric. The polymer layer or layers may have a shorter longitudinal dimension than the cardboard layer or layers. The polymer layer or layers may have a shorter transverse dimension than the cardboard layer or layers. The polymer layer or layers may have a shorter longitudinal dimension and a shorter transverse dimension than the cardboard layer or layers. The polymer layer or layers may be laminated to the cardboard layer or layers in a stretched state so as to promote curvature of the laminated bistable member 12 about its longitudinal axis. This can provide additional potential energy as the bistable member 12 transitions between first and second stable configurations, thus resulting in a more pronounced transition. In another example, the bistable member 12 may comprise a layer of cardboard laminated between first and second layers of elastomeric polymer. The first layer of elastomeric polymer may have a shorter longitudinal dimension than the cardboard layer, and the second layer of elastomeric polymer may have a shorter transverse dimension than the cardboard layer.

In some embodiments, the bistable member 12 may comprise a laminate of at least two cardboard layers. A first of the cardboard layers may be slightly shorter longitudinally than a second of the cardboard layers. The second of the cardboard layers may be slightly shorter transversely than the first of the cardboard layers. This can help to promote curvature of the laminated bistable member 12 about its longitudinal axis. This can provide additional potential energy as the bistable member 12 transitions between first and second stable configurations, thus resulting in a more pronounced transition.

Figure 6 shows a detail of a top wall 8 of a cuboid box 2 configured as a bistable member 12 with convex curvature. The first part P1 and the second part P2 are divided by a hinge line 10. In this embodiment, the hinge line 10 is substantially perpendicular to a longitudinal axis of the bistable member 12. Accordingly, when incorporated in the top wall 8 of the cuboid box 2, the hinge line 10 is substantially perpendicular to the front wall 3 and the rear wall 4. The hinge line 10 extends directly across the top wall 8 without any corners or discontinuities. This arrangement is appropriate for the packaging container 1 as shown, for example, in Figures 1 and 2.

Alternatively, as shown in Figure 7, the hinge line 10 may extend directly across the top wall 8 in a direction that is not perpendicular to the longitudinal axis of the bistable member 12. In the example shown, when incorporated in the top wall 8 of the cuboid box 2, the hinge line 10 may

extend at an angle of about 120° to the front wall 3 and at a complementary angle of about 60° to the rear wall 3. This arrangement is appropriate for the packaging container 1 as shown, for example, in Figures 22, 23 and 24.

Figure 8 shows a variation where the hinge line 10 extends indirectly across the top wall 8. In the illustrated example, the hinge line 10 has a corner or discontinuity 14. This arrangement may provide for an enhanced transition between first and second stable configurations.

Figure 9 shows variations where the hinge line 10 is not a straight line, but instead has a curvature relative to the longitudinal axis of the bistable member 12. The curvature may be convex relative to the second part P2 or concave relative to the second part P2.

Figure 10 shows a cross section through a bistable member 12 comprising a cardboard top wall 8 and one or more layers 15 of varnish or glue on a concave underside of the cardboard top wall 8. The one or more layers 15 of varnish or glue may be elastomeric. The one or more layers 15 of varnish or glue may help to promote curvature of the bistable member 12 about its longitudinal axis. This can provide additional potential energy as the bistable member 12 transitions between first and second stable configurations, thus resulting in a more pronounced transition.

Figure 11 shows a laminar cardboard blank 20 for forming a packaging container for consumer goods. The blank 20 comprises a front wall portion 21, a left side wall portion 22, and a rear wall portion 23. The left side wall portion 22 is defined between the front wall portion 21 and the rear wall portion 23 by a pair of substantially parallel fold lines 24, 25. The blank 20 further comprises a first bottom wall flap 26 depending from a bottom of the front wall portion 21 by way of a fold line 27 and a second bottom wall flap 28 depending from a bottom of the rear wall portion 23 by way of a fold line 29. The blank 20 further comprises a first right side wall flap 30 depending from a left end of the rear wall portion 23 by way of a fold line 31 and a second right side wall flap 32 depending from a right end of the front wall portion 21 by way of a fold line 33. The blank 20 further comprises a first top wall flap 34 depending from a top of the rear wall portion 23 by way of a fold line 35 and a second top wall flap 36 depending from a top of the front wall portion 21 by way of a fold line 37. One of the first top wall flap 34 and the second top wall flap 36 (in the illustrated example, the second top wall flap 36) extends further from its respective rear wall portion 23 or front wall portion 21 (in the illustrated example, the front wall portion 21) than the other of the first top wall flap 34 and second top wall flap 36. The one of the first top wall flap 34 and the second top wall flap 36 (in the illustrated example, the second top wall flap 36) is provided with an extension flap 38 depending from an edge of the one of the first top wall flap 34 and the second top wall flap 36 (in the illustrated example, the second top wall flap 36) remote from the respective rear wall portion 23 or front wall portion 21 (in the illustrated example, front wall portion 21) by way of a fold line 39. Each of the first right side wall flap 30, the second right side wall flap 32 and at least one of the front wall portion 21 or the rear wall portion 23 (in the

illustrated example, both of the front wall portion 21 and the rear wall portion 23) is provided with a cut 40 so as to define, when the laminar blank 20 is folded into a box shape, a corner portion configured to hinge between closed and open positions about a hinge line extending across a top wall formed by the first top wall flap 34 and the second top wall flap 36. The blank 20 is configured such that, when the one of the first top wall flap 34 and the second top wall flap 36 (in the illustrated example, the second top wall flap 36) that extends further from its respective rear wall portion 23 or front wall portion 21 (in the illustrated example, the front wall portion 21) than the other of the first top wall flap 34 and second top wall flap 36 is folded over the other of the first top wall flap 34 and second top wall flap 36 (in the illustrated example, the first top wall flap 34) so as to form a top wall, the one of the first top wall flap 34 and the second top wall flap 36 (in the illustrated example, the second top wall flap 36) that extends further from its respective rear wall portion 23 or front wall portion 21 (in the illustrated example, the front wall portion 21) than the other of the first top wall flap 34 and second top wall flap 36 (in the illustrated example, the first top wall flap 34) assumes a curved configuration with the extension flap 38 adhered to the respective rear wall portion 23 or front wall portion 21 (in the illustrated example, the rear wall portion 23).

In Figure 11, the second bottom wall flap 28, the first right side wall flap 30 and the extension flap 28 are provided with adhesive (shown in hatching) to enable the blank 20 to be assembled into a packaging container 1.

In the example shown in Figure 11, it will be noted that all of the fold lines 24, 25, 27, 29, 31, 33, 35, 37 and 39 are substantially straight lines. Straight fold lines are easier to form than curved fold lines. It is easier to fold about a straight fold line than about a curved fold line.

A surface of the one of the first top wall flap 34 and the second top wall flap 36 (in the illustrated example, the second top wall flap 36) that extends further from its respective rear wall portion 23 or front wall portion 21 (in the illustrated example, the front wall portion 21) than the other of the first top wall flap 34 and second top wall flap 36 (in the illustrated example, the first top wall flap 34) may be provided with one or more coating layers as described above in relation to Figure 10. The surface with the one or more coating layers may be concave.

When the blank 20 is assembled into a packaging container, the one of the first top wall flap 34 and the second top wall flap 36 (in the illustrated example, the second top wall flap 36) that extends further from its respective rear wall portion 23 or front wall portion 21 (in the illustrated example, the front wall portion 21) than the other of the first top wall flap 34 and second top wall flap 36 (in the illustrated example, the first top wall flap 34) may assume a convex curved configuration with the extension flap 38 adhered to the respective rear wall portion 23 or front wall portion 21 (in the illustrated example, the rear wall portion 23).

The one of the first top wall flap 34 and the second top wall flap 36 (in the illustrated example, the second top wall flap 36) may extend from its respective rear wall portion 23 or front wall portion 21 (in the illustrated example, the front wall portion 21) by a first distance, d_1 . The

other of the first top wall flap 34 and the second top wall flap 36 (in the illustrated example, the first top wall flap 34) may extend from its respective front wall portion 21 or rear wall portion 23 (in the illustrated example, the rear wall portion 23) by a second distance, d2. The first distance d1 is greater than the second distance d2. The first distance d1 may be from 5% to 50% greater than the second distance d2. The first distance d1 may be from 10% to 30% greater than the second distance d2.

The width of the extension flap 38 measured from its fold line 39 may be selected as required so as to ensure good adhesion to the respective front wall portion 21 or rear wall portion 23 (in the illustrated example, the rear wall portion 23). Preferably, the width of the extension flap 38 is from 1mm to 5mm, which provides enough space for a glue line.

The blank 20 may be made of standard packaging cardboard having a thickness of between 0.2mm to 0.4mm, for example 0.25mm.

Figures 12 to 15 show steps in the assembly of the cardboard blank 20 into a packaging container 1. Figure 12 shows the front wall portion 21 being folded about fold line 24 so as to be at about 90° to the rear wall portion 23. Figure 13 shows the rear wall portion 23 being folded about fold line 25 so as to come towards the front wall portion 21. Figure 13 also shows the first and second bottom wall flaps 26, 28 being folded about their respective fold lines 27, 29, the first and second right side wall flaps 30, 32 being folded about their respective fold lines 31, 33, and the first and second top wall flaps 34, 36 being folded about their respective fold lines 35, 37. Figure 14 shows the almost-fully assembled cardboard blank 20, with the second top wall flap 36 and its extension flap 38 remaining free. As shown in Figure 15, the packaging container 1 made out of the cardboard blank 20 is completed by adhering the extension flap 39 to the rear wall portion 23 so as to promote a curvature in the top wall 8 formed by the second top wall portion 36. In Figure 15, as well as the reference numerals from Figure 11, reference numerals from Figures 1 to 3 have also been included so as to indicate which parts are equivalent.

Figure 16 shows a cross-section through the assembled packaging container 1 of Figure 15, showing how the second top wall flap 36 folds over the first top wall flap 34 in a curved manner, and how the extension flap 38 is adhered to the rear wall portion 23 by way of adhesive 41. The empty space 13 that can act as a soundbox is also indicated.

Figures 17 and 18 show an alternative implementation, where the second top wall flap 36 does not extend fully across the first top wall flap 34, but instead is formed into the desired curved shape and adhered to the first top wall flap 34 along a longitudinal line extending generally parallel to the front wall portion 21 and the rear wall portion 23. In this implementation, only a portion of the width of the top wall 8 is used to form the bistable member 12.

Figure 19 shows an alternative bistable member 12, for example formed of cardboard. Rather than being smoothly curved about its longitudinal axis, the alternative bistable member 12 has a discontinuous curvature, in this case formed by fold lines 50 and 51.

Figure 20 shows a cross-section through an assembled packaging container 1 with a bistable member 12 of the type shown in Figure 19 having a discontinuous curvature formed by a fold line 51 in the second top wall flap 36. The free edge of the second top wall flap 36 is adhered to the first top wall flap 34 as shown

Figure 21 shows a packaging container 1 comprising a cuboid box 2 with a corner portion 9 as previously described. In this example, the corner portion 9 may be urged by the bistable member 12 into a closed position in which the corner portion 9 is partially contained within the cuboid box 2. This may serve as an anti-tamper indicator. For example, an unopened packaging container 1 of consumer goods, when purchased, may have the corner portion 9 connected to the right side wall 6, front wall 3 and rear wall 4 by perforated lines, and the packaging container 1 may appear as shown in Figure 1. When a user opens the packaging container 1 for the first time, they may push up the corner portion 9 to the open position and in doing so may tear the perforated lines. When the corner portion 9 is moved back to the closed position, the bistable member may urge the corner portion 9 into the position shown in Figure 21, where a lower lip of the corner portion 9 is received inside the cuboid box 2. This closed position of the corner portion 9 is readily distinguishable from the unopened configuration shown in Figure 1. Accordingly, if a consumer buys a packaging container 1 of consumer goods and the corner portion 9 is in the closed position as shown in Figure 21, the consumer will immediately know that the packaging container 1 has been opened before purchase, and the consumer can reject the packaging container 1 as not containing fresh consumer goods.

Figure 22 shows an alternative packaging container 1 for consumer goods (not shown). The packaging container 1 comprises a substantially cuboid box 2 made out of cardboard. The cuboid box 2 has a front wall 3, a rear wall 4, a left side wall 5, a right side wall 6, a bottom wall 7, and a top wall 8. At least the front wall 3 and the rear wall 4 are substantially planar. In the embodiment shown, the front wall 3 and the rear wall 4 are substantially parallel to each other.

A corner portion 9 of the cuboid box 2 is configured to hinge between a closed position and an open position about a hinge line 10 extending across the top wall 8 from the front wall 3 towards the rear wall 4 so as to permit access to an interior of the cuboid box 2.

The corner portion 9 of the embodiment shown in Figure 22 comprises a part of the top wall 8, part of the left side wall 5 adjoining the part of the top wall 8, and a corner part of the front wall 3 adjoining the part of the top wall 8 and the part of the left side wall 5.

The top wall 8 comprises a bistable member 12 having first and second stable configurations as hereinbefore described.

The bistable member 12 extends across the hinge line 10 and is configured to bias the corner portion 9 into the closed position in the first stable configuration and to bias the corner portion 9 into the open position in the second stable configuration.

In the embodiment shown in Figure 22, the corner portion 9 comprises a corner part of the front wall 3 but not a corner part of the rear wall 4.

In the embodiment shown in Figure 22, the hinge line 10 is not perpendicular to the front wall 3 and the rear wall 4. For example, the hinge line 10 may be angled to the front wall 3 and the rear wall 4 at complementary angles of 60° and 120° . The hinge line 10 illustrated in Figure 22 extends in a direct line between the front wall 3 and the rear wall 4, but it will be understood that the hinge line 10 may also extend in a curved line or an indirect line as hereinbefore described.

In the embodiment of Figure 22, the corner portion 9 has a generally tetrahedral form factor.

Figures 23 and 24 show an alternative packaging container 1 for consumer goods (not shown). The packaging container 1 comprises a substantially cuboid box 2 made out of cardboard. The cuboid box 2 has a front wall 3, a rear wall 4, a left side wall 5, a right side wall 6, a bottom wall 7, and a top wall 8. At least the front wall 3 and the rear wall 4 are substantially planar. In the embodiment shown, the front wall 3 and the rear wall 4 are substantially parallel to each other.

A corner portion 9 of the cuboid box 2 is configured to hinge between a closed position and an open position about a hinge line 10 extending across the top wall 8 from the front wall 3 to the rear wall 4 so as to permit access to an interior of the cuboid box 2.

The corner portion 9 of the embodiment shown in Figures 23 and 24 comprises a part of the top wall 8, part of the right side wall 6 adjoining the part of the top wall 8, a corner part of the front wall 3 and a corner part of the rear wall 4 each adjoining the part of the top wall 8 and the part of the right side wall 6.

The top wall 8 comprises a bistable member 12 having first and second stable configurations as hereinbefore described.

The bistable member 12 extends across the hinge line 10 and is configured to bias the corner portion 9 into the closed position in the first stable configuration and to bias the corner portion 9 into the open position in the second stable configuration.

In the embodiment shown in Figures 23 and 24, the corner portion 9 comprises corner parts of both the front wall 3 and the rear wall 4, but in contrast to the embodiment of Figures 1 and 2, the corner parts of the both the front wall 3 and the rear wall 4 are not equally sized. The corner parts of both the front wall 3 and the rear wall 4 may have the same general shape (in the illustrated embodiment, both are triangular).

The hinge line 10 is not perpendicular to the front wall 3 and the rear wall 4. For example, the hinge line 10 may be angled to the front wall 3 and the rear wall 4 at complementary angles of 60° and 120° . The hinge line 10 illustrated in Figures 23 and 24 extends in a direct line between the front wall 3 and the rear wall 4, but it will be understood that the hinge line 10 may also extend in a curved line or an indirect line as hereinbefore described.

In the embodiment of Figures 23 and 24, the corner portion 9 has an irregular pentahedral form factor.

The packaging container 1 of all embodiments may find particular utility as a packaging container for rod-shaped aerosol generating articles such as tobacco-based heat-not-burn sticks. The packaging container 1 may be sized and configured to contain a standard number of such articles when full, for example 20 or 10. The articles may be packed in an upright position so that they may be drawn from the packaging container 1 one-by-one through the opening exposed by lifting the corner portion 9 to the open position.

However, the packaging container 1 need not be limited to packaging rod-shaped aerosol generating articles such as tobacco-based heat-not-burn sticks, and may also find utility for packaging other consumer goods, such as confectionary, nuts, feminine hygiene products, foodstuffs, granular goods, and so forth.

For the purpose of the present description and of the appended claims, except where otherwise indicated, all numbers expressing amounts, quantities, percentages, and so forth, are to be understood as being modified in all instances by the term "about". Also, all ranges include the maximum and minimum points disclosed and include any intermediate ranges therein, which may or may not be specifically enumerated herein. In this context, therefore, a number A is understood as $A \pm 5\%$ of A. Within this context, a number A may be considered to include numerical values that are within general standard error for the measurement of the property that the number A modifies. The number A, in some instances as used in the appended claims, may deviate by the percentages enumerated above provided that the amount by which A deviates does not materially affect the basic and novel characteristic(s) of the claimed invention. Also, all ranges include the maximum and minimum points disclosed and include any intermediate ranges therein, which may or may not be specifically enumerated herein.

CLAIMS

1. A packaging container for consumer goods, the packaging container comprising:
 - a substantially cuboid box made of cardboard, the cuboid box having a front wall, a rear wall, a left side wall, a right side wall, a bottom wall, and a top wall, wherein at least the front wall and the rear wall are substantially planar;
 - wherein a corner portion of the cuboid box, comprising at least a part of the top wall, part of either one or other but not both of the left side wall or the right side wall adjoining the part of the top wall, and part of at least one of the front wall or the rear wall adjoining the part of the top wall and the part of either one or other but not both of the left side wall or the right side wall, is configured to hinge between closed and open positions about a hinge line extending across the top wall from the front wall to the rear wall so as to permit access to an interior of the cuboid box;
 - wherein the top wall comprises a bistable member having first and second stable configurations;
 - wherein the bistable member extends across the hinge line and is configured to bias the corner portion into the closed position in the first stable configuration and to bias the corner portion into the open position in the second stable configuration;
 - wherein the top wall comprises a first flap that extends between the front wall and the rear wall; and
 - wherein the bistable member is formed by a curvature in the first flap.
2. The packaging container according to claim 1, wherein the hinge line is substantially perpendicular to the front wall and the rear wall.
3. The packaging container according to claim 1 or 2, wherein the first flap is integrally connected to one or other of the front wall or the rear wall by way of a fold line, and wherein the first flap is connected to the other of the front wall or the rear wall by adhesion.
4. The packaging container according to any preceding claim, wherein the top wall further comprises a second flap, disposed underneath the first flap, integrally connected to the other of the front wall or the rear wall by way of a fold line.
5. The packaging container according to any preceding claim, wherein the first flap extends from one of the front wall or the rear wall towards but not all the way to the other of the front wall or the rear wall.

6. The packaging container according to any preceding claim, wherein the bistable member is made of cardboard.
7. The packaging container according to claim 6, wherein the bistable member additionally comprises one or more coating layers on at least one surface of the bistable member.
8. The packaging container according to claim 7, wherein the one or more coating layers comprise layers of varnish.
9. The packaging container according to any preceding claim, wherein the hinge line does not comprise any slits.
10. The packaging container according to any preceding claim, wherein all fold lines between the respective walls of the packaging container are straight lines.
11. The packaging container according to any preceding claim, shaped and dimensioned to contain rod-shaped aerosol-generating articles.
12. A laminar cardboard blank for forming a packaging container for consumer goods, the blank comprising:
 - a front wall portion;
 - a left side wall portion; and
 - a rear wall portion;wherein the left side wall portion is defined between the front wall portion and the rear wall portion by a pair of substantially parallel fold lines;
 - a first bottom wall flap depending from a bottom of the front wall portion by way of a fold line and a second bottom wall flap depending from a bottom of the rear wall portion by way of a fold line;
 - a first right side wall flap depending from a left end of the rear wall portion by way of a fold line and a second right side wall flap depending from a right end of the front wall portion by way of a fold line;
 - a first top wall flap depending from a top of the rear wall portion by way of a fold line and a second top wall flap depending from a top of the front wall portion by way of a fold line;wherein one of the first top wall flap and the second top wall flap extends further from its respective rear wall portion or front wall portion than the other of the first top wall flap and second top wall flap, and wherein the one of the first top wall flap and the second top wall flap is provided

with an extension flap depending from an edge of the one of the first top wall flap and the second top wall flap remote from the respective rear wall portion or front wall portion by way of a fold line;

wherein each of the first right side wall flap, the second right side wall flap and at least one of the front wall portion or the rear wall portion is provided with a cut so as to define, when the laminar blank is folded into a box shape, a corner portion configured to hinge between closed and open positions about a hinge line extending across a top wall formed by the first top wall flap and the second top wall flap; and

wherein when the one of the first top wall flap and the second top wall flap that extends further from its respective rear wall portion or front wall portion than the other of the first top wall flap and second top wall flap is folded over the other of the first top wall flap and second top wall flap so as to form a top wall, the one of the first top wall flap and the second top wall flap that extends further from its respective rear wall portion or front wall portion than the other of the first top wall flap and second top wall flap assumes a curved configuration with the extension flap adhered to the respective rear wall portion or front wall portion.

13. The laminar blank according to claim 12, wherein all of the fold lines are straight lines.

14. The laminar blank according to claim 12 or 13, wherein a surface of the one of the first top wall flap and the second top wall flap that extends further from its respective rear wall portion or front wall portion than the other of the first top wall flap and second top wall flap is provided with one or more coating layers.

15. The laminar blank according to claim 14, wherein the one or more coating layers comprise layers of varnish.

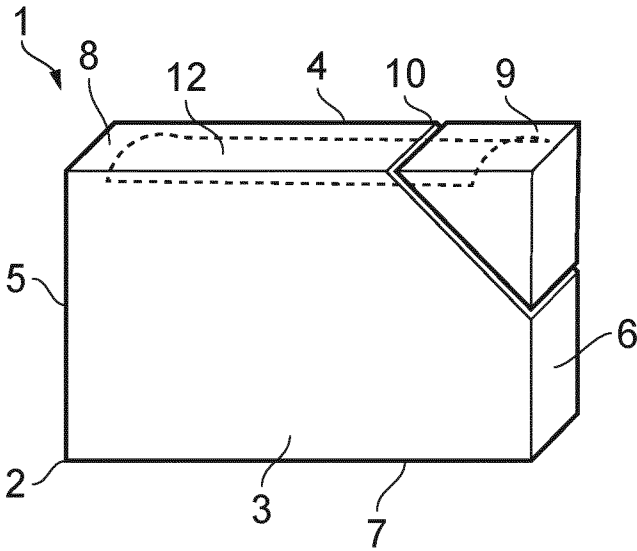


FIG. 1

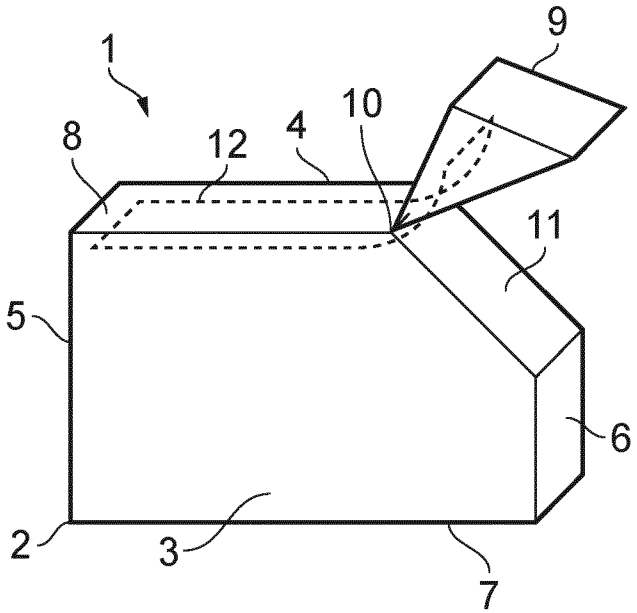


FIG. 2

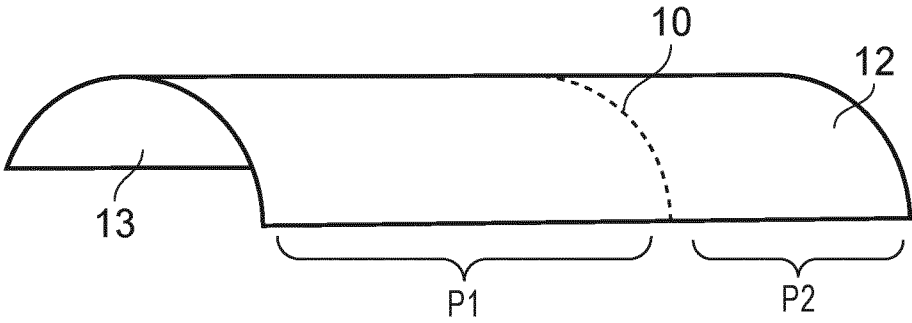


FIG. 3

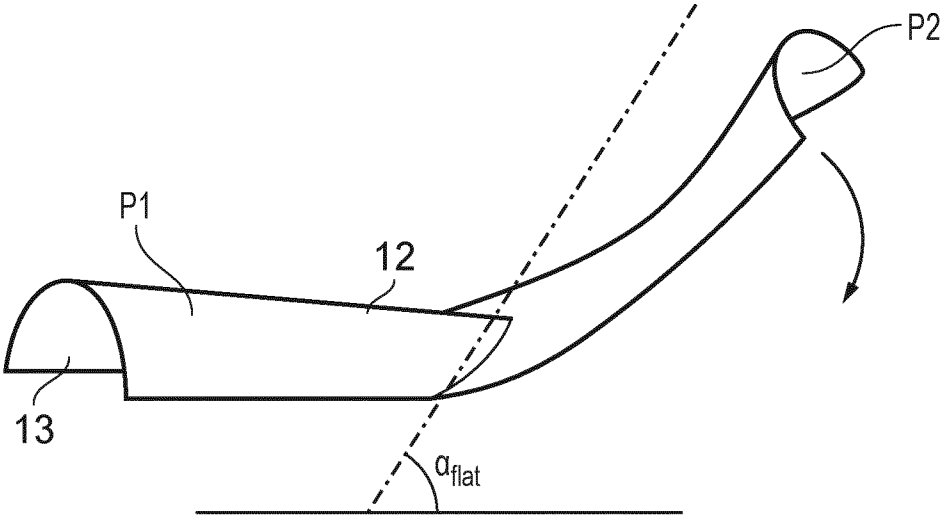


FIG. 4

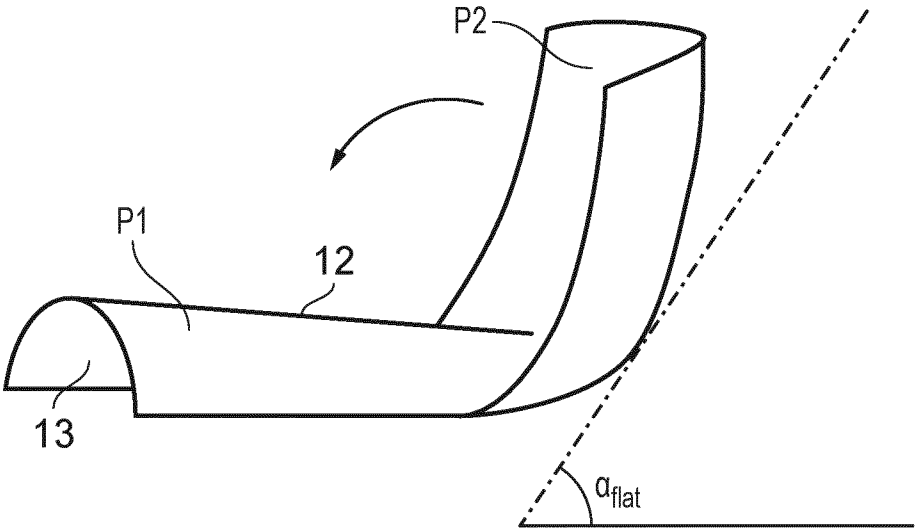


FIG. 5

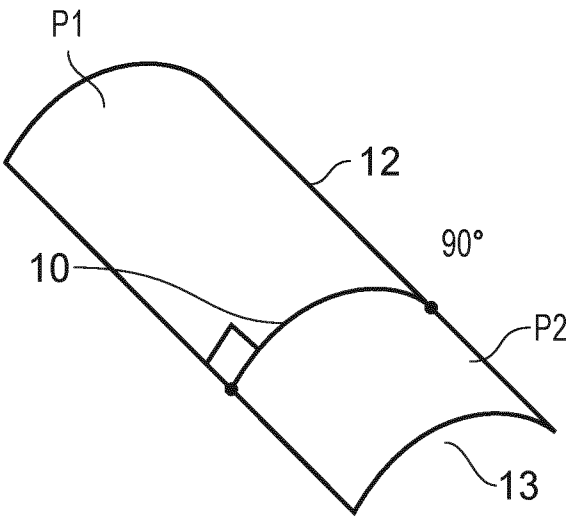


FIG. 6

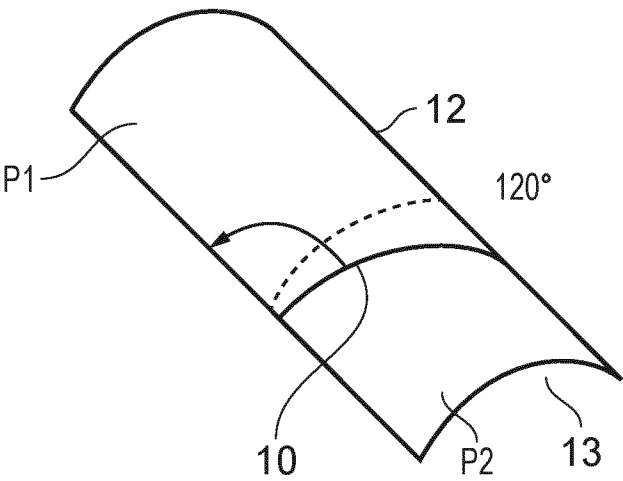


FIG. 7

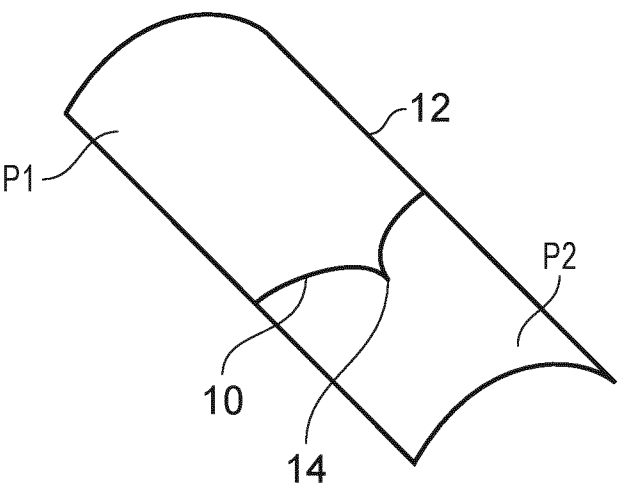


FIG. 8

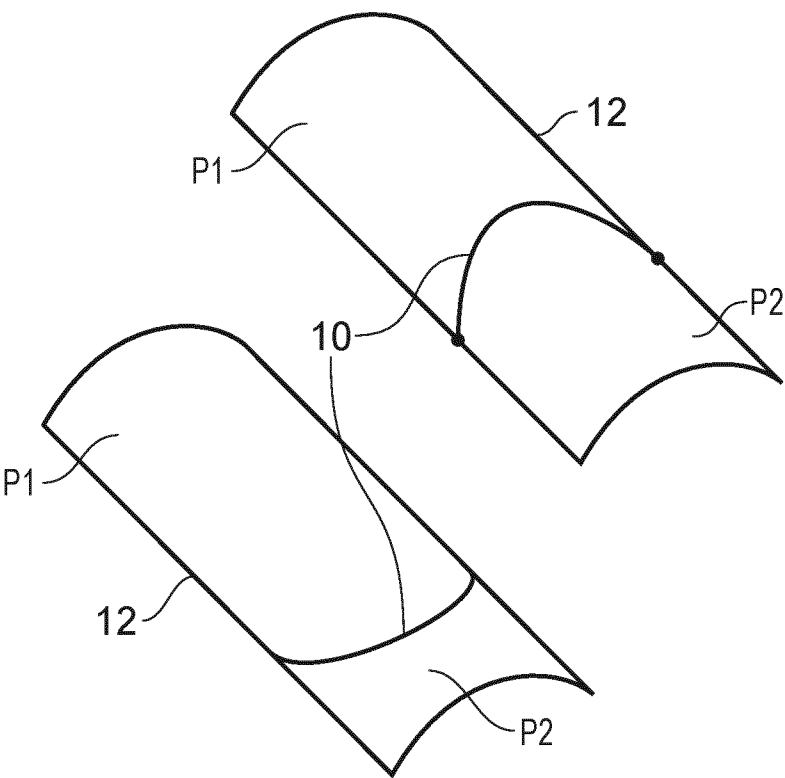


FIG. 9

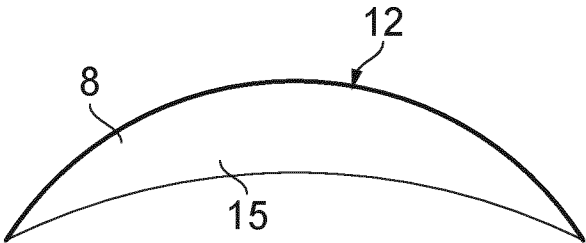


FIG. 10

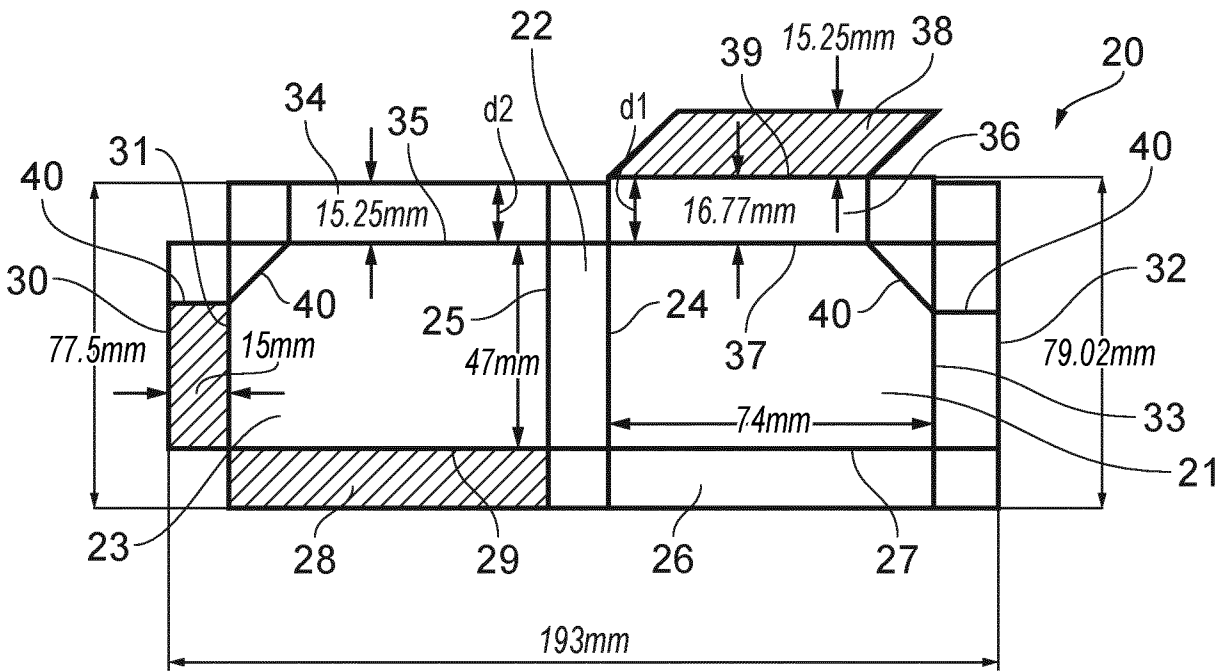


FIG. 11

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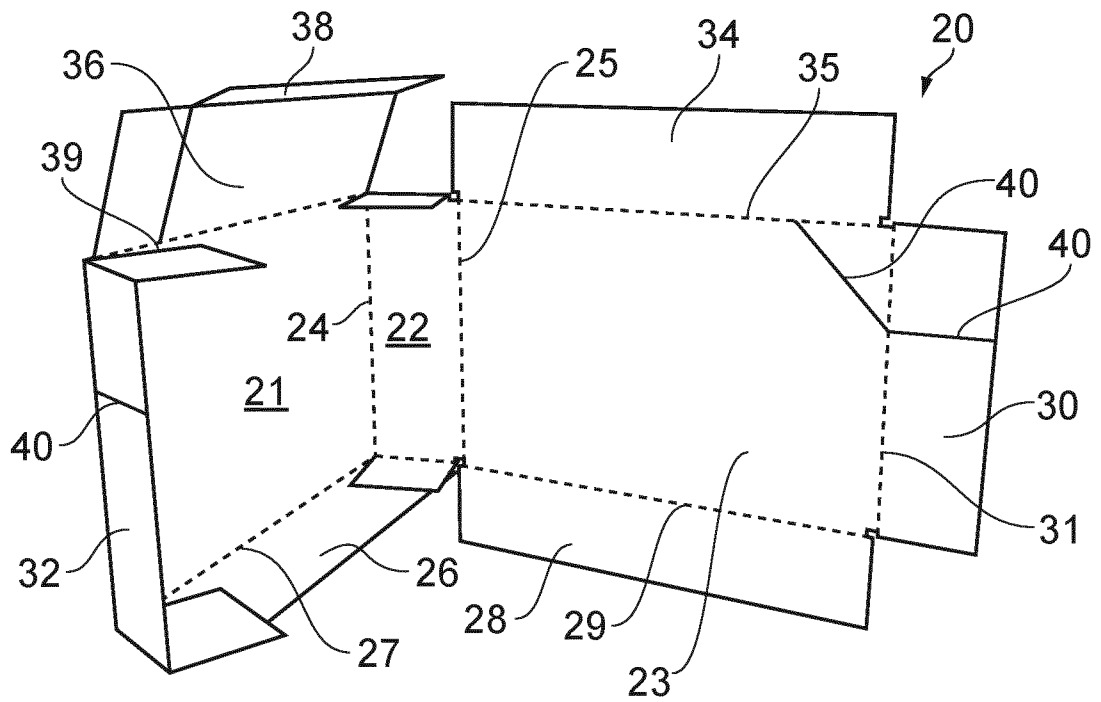


FIG. 12

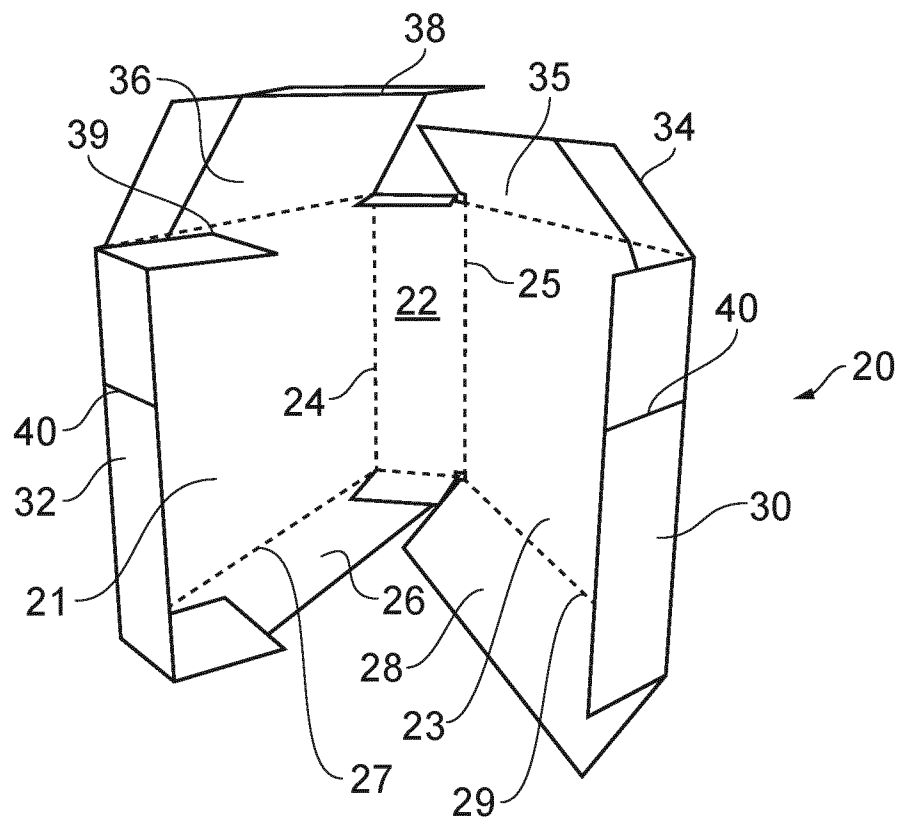


FIG. 13

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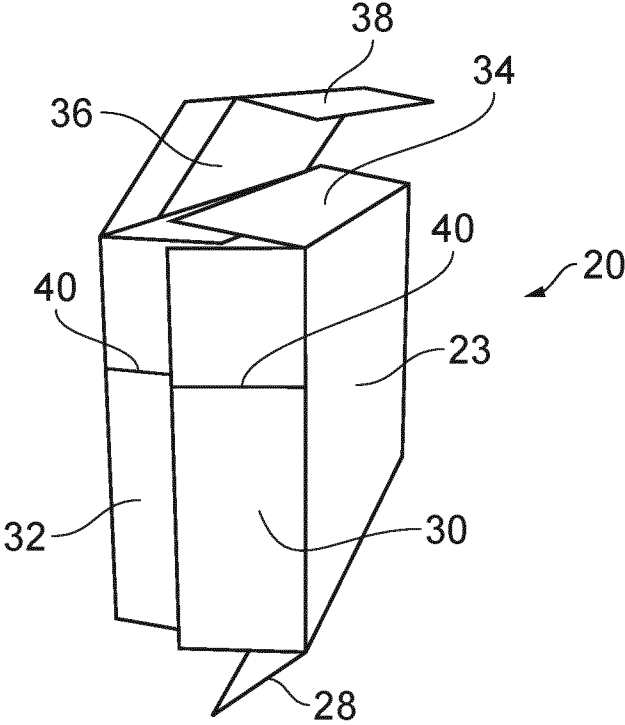


FIG. 14

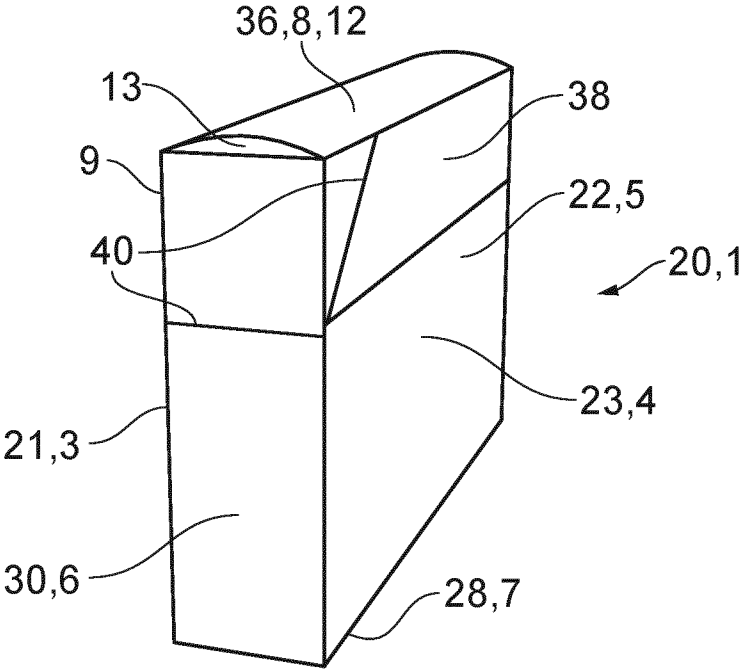


FIG. 15

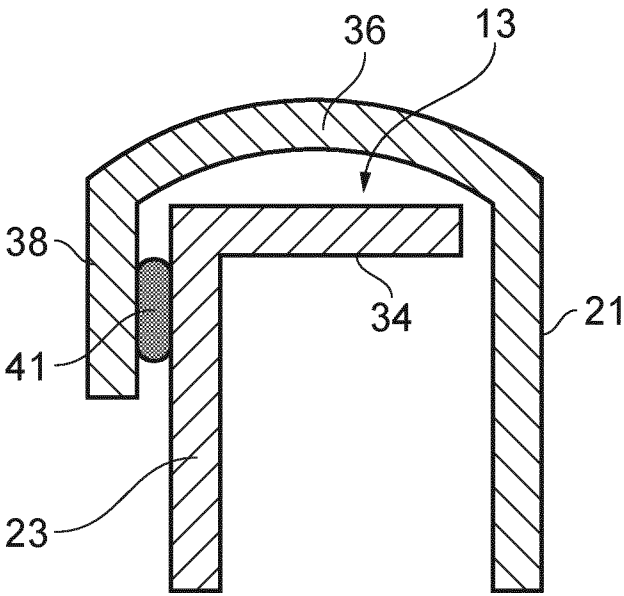


FIG. 16

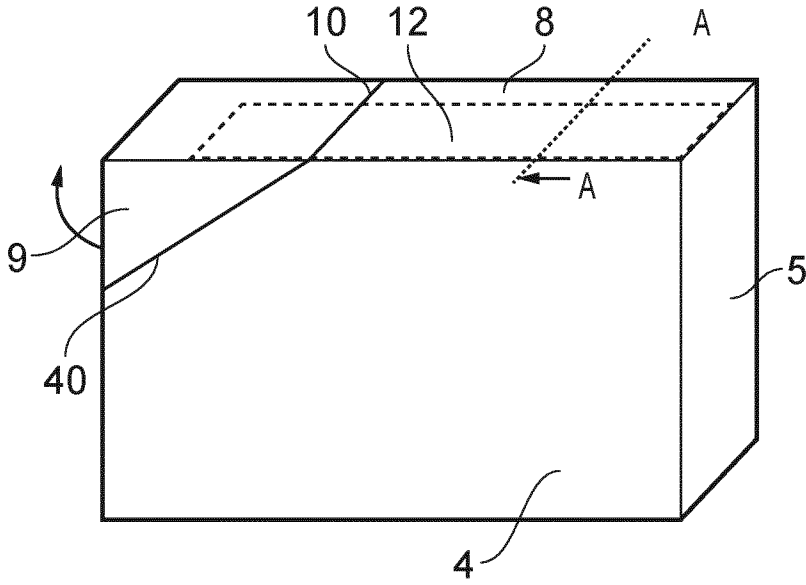


FIG. 17

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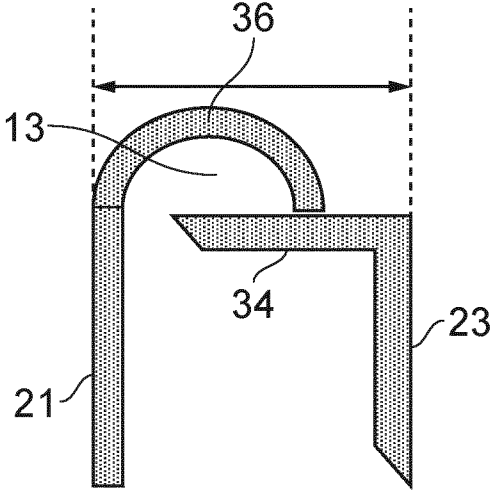


FIG. 18

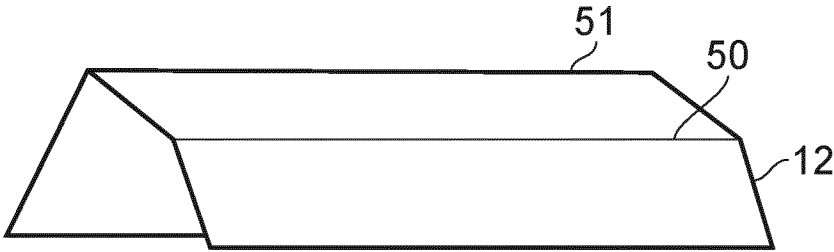


FIG. 19

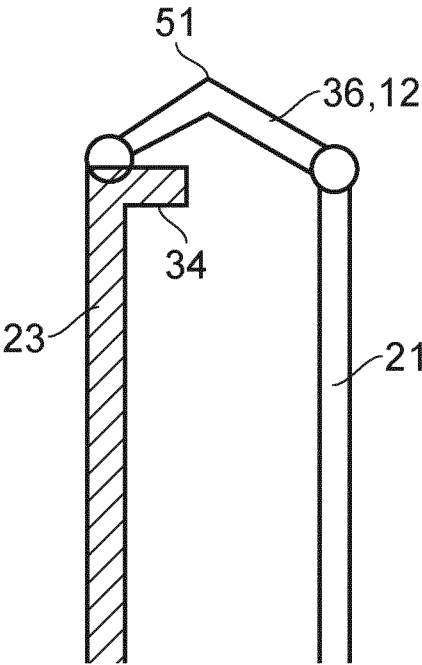


FIG. 20

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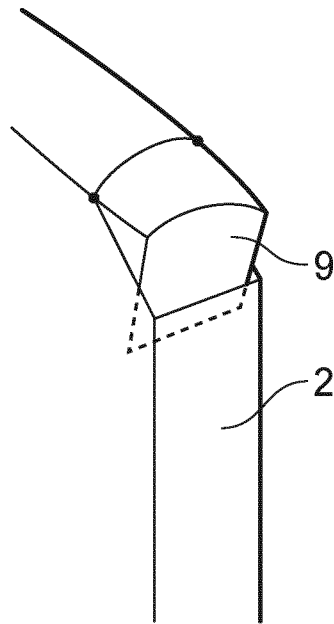


FIG. 21

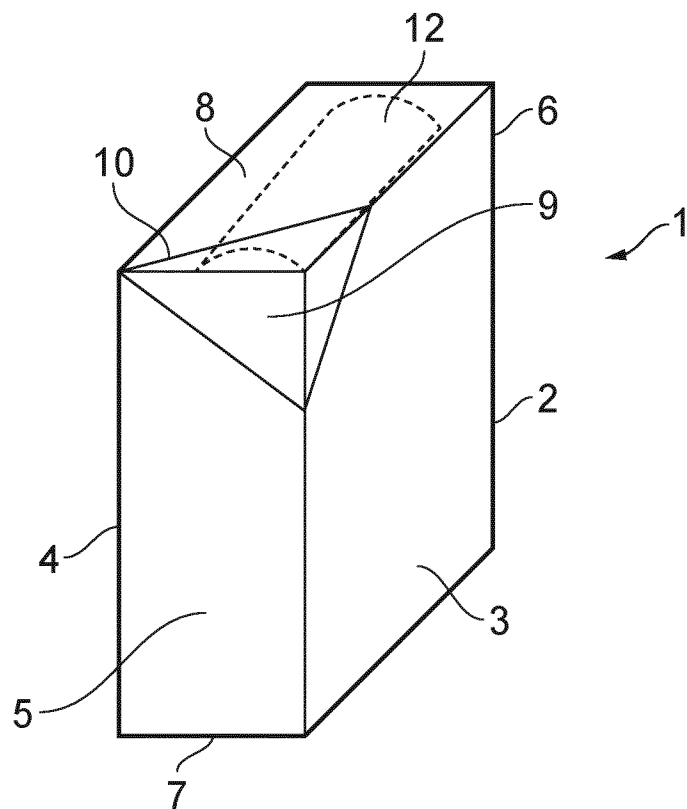


FIG. 22

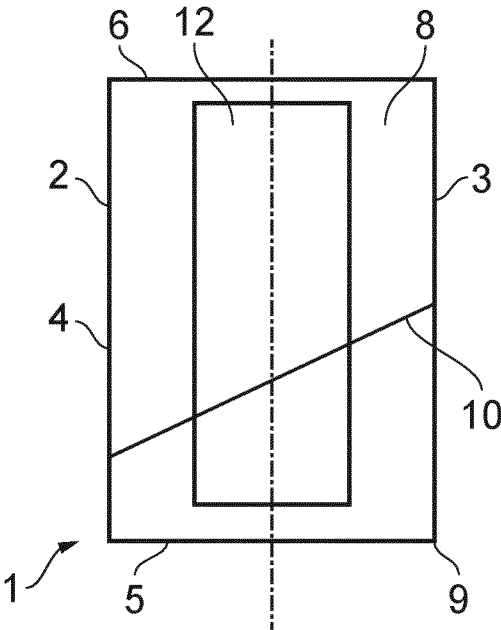


FIG. 23

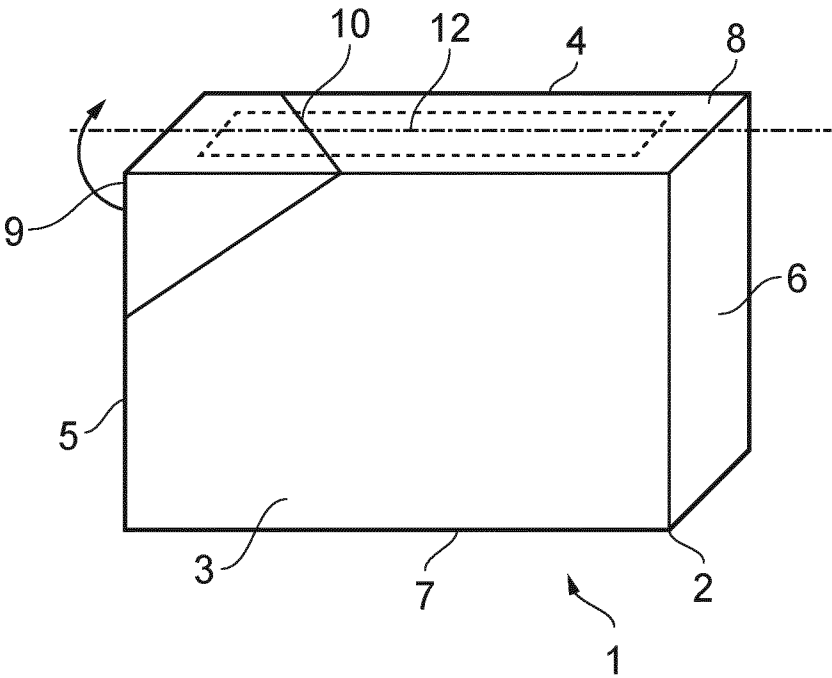


FIG. 24

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/051385

A. CLASSIFICATION OF SUBJECT MATTER INV. B65D5/66 B65D5/56 B65D85/10 ADD.				
According to International Patent Classification (IPC) or to both national classification and IPC				
B. FIELDS SEARCHED				
Minimum documentation searched (classification system followed by classification symbols) B65D				
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched				
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
A	US 2002/060240 A1 (WALSH JOSEPH C [US] ET AL) 23 May 2002 (2002-05-23) paragraphs [0002], [0003], [0029], [0032] - [0035]; figures 1-22 -----	1-15		
A	US 2 848 153 A (GEIGER SR CLARENCE H) 19 August 1958 (1958-08-19) column 4, line 42 - column 5, line 21; figures 1-11 -----	1-15		
A	US 1 903 104 A (FRANCESCO FORTUNA ET AL) 28 March 1933 (1933-03-28) page 1, lines 24-30 page 2, lines 97-123; figures 1-8 -----	1-15		
A	US 2019/092560 A1 (RUDOLF DAVID [CZ]) 28 March 2019 (2019-03-28) paragraphs [0004], [0011], [0074] - [0084]; figures 1-3 -----	1-15		
<table><tr><td>☐ Further documents are listed in the continuation of Box C.</td><td>☒ See patent family annex.</td></tr></table>			☐ Further documents are listed in the continuation of Box C.	☒ See patent family annex.
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Date of the actual completion of the international search 8 April 2024		Date of mailing of the international search report 24/04/2024		
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Gabrich, Katharina		

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2024/051385

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