

IMPROVED BLANK FOR FORMING A CONTAINER WITH NON-SQUARE EDGES

The present invention relates to a blank for forming containers for consumer goods, which find particular application for holding elongate consumer goods, such as smoking articles (for example cigarettes). In more detail, the invention relates to a blank and method
5 for forming parallelepiped-shaped containers having non-square corners, such as round or bevelled corners.

Smoking articles such as cigarettes and cigars are usually provided in soft-pack packs or hard-pack packs, such as flip-top boxes or hinge-lid boxes. These typically have a box part having a box front wall, a box rear wall, box side walls and a box base. They also usually
10 have a lid part with a lid front wall, a lid rear wall, lid side walls and a lid top side. The lid part is typically hinged to the box part along a hinge line extending across a back wall of the container. For hard-pack packs, it is known to round off or chamfer certain corners of the box and lid to give the container a distinctive appearance. This has typically been achieved in the past by providing creasing lines or scoring lines in the blank at the areas forming the
15 edges of the container. These lines allow the blank to be folded in such a way that the corner does not sharply bend but instead progressively bends between two adjacent walls.

For forming a container having bevelled or rounded edge portions and a certain maximum height, width and depth, the blank used for forming a square-edge container with the same maximum height, width and depth needs to be modified. In particular, the width of
20 blank panels that form planar container walls connected by a bevelled or rounded edge portion needs to be reduced with respect to the width of the blank panels forming corresponding adjacent planar walls in the square-edge container. This is not only because of shape constraints, but also because, when the blank is folded to form a container certain pairs of blank panels are at least partly superimposed and affixed to each other to form walls of the
25 container. This is the case of the blank side panels which are to form the side walls of the container. Thus, it is desirable that the inner blank panels do not interfere with a bevelled or rounded edge portion. Otherwise, this interference may hinder the automated folding operation and ultimately alter the shape of the bevelled or rounded edges of the container, thus potentially affecting the finish and general look of the container.

As a result, the overall width of a blank for forming a container having bevelled or
30 rounded edge portions and a certain maximum height, width and depth is generally reduced with respect to the width of a blank for forming a square-edge container with the same maximum height, width and depth. Thus, a packing machine needs to undergo significant modifications in order to be able to receive and fold one such modified blank to form a
35 container. This causes an increase in machine downtime, which is clearly undesirable, and generally entails additional manufacturing costs. Further, every time that even small changes

are made to the shape of the blank or container, new machine adjustments typically become necessary.

Besides, forming scoring or creasing lines to form bevelled or rounded edge portions in the container adds further complexity to the manufacturing process and can also result in the container having a weakened strength. In addition, in some cases, the visual and tactile perception of the container may be impacted, in that the outer surface of the rounded corners is not entirely smooth and can include ridges or ripples from where the creasing has occurred.

It would therefore be desirable to provide a blank for manufacturing a container for consumer goods that overcomes the drawbacks described above. In particular, it would be desirable to provide blank for manufacturing a container for consumer goods that makes the design, production and assembly process easier and more flexible. From a manufacturing standpoint, it would be particularly desirable to provide one such blank that can be folded by a conventional packing machine without requiring major structural modifications.

According to the present invention, there is provided a laminar blank for forming a container for consumer articles. The laminar blank has a thickness (T) and comprises a bottom wall panel for forming a bottom wall of the container and a top wall panel for forming a top wall of the container. Further, the laminar blank comprises a rear wall panel for forming at least part of a rear wall of the container and a front wall panel for forming at least a part of a front wall of the container. In addition, the laminar blank comprises two first side panels extending from the rear wall panel and two second side panels extending from the front wall panel, such that, when the container is assembled from the laminar blank, the first and the second side panels overlap to form at least part of left and right side walls of the container. The first side panels or the second side panels or both are connected to the respective one of the rear wall panel and the front wall panel by modified edge portions. Each of the modified edge portions has an inner and an outer surface, and the inner surfaces of the modified edge portions define respective ablation areas. Each ablation area comprises one or more ablated zones having a residual thickness that is less than the thickness (T) of the laminar blank. The laminar blank further comprises at least one pair of dust flaps extending from the first side panels or the second side panels or both, such that, when the container is assembled from the laminar blank, the flaps in a pair overlap the bottom wall panel to form the bottom wall or the top wall panel to form the top wall. Each dust flap in the at least one pair of dust flaps comprises a main flap portion depending along a fold line from a respective first or second side panel and a side flap portion extending laterally from the flap main portion beyond a peripheral edge of the respective first or second side panel.

The term "modified edge portion" is used herein to refer to an edge portion of the container having a non-square shape as viewed in cross-section. This may for example refer to a "curved edge portion", that is an edge portion of the container having an arc-like shape

as viewed in cross-section. By the term "arc-like" reference is made to any non-straight line, including circular arc, parabolic arc, hyperbolic arc, elliptical arc, etc. Further, this may for example refer to a "bevelled edge portion", that is an edge portion of the container that has, as viewed in cross-section, a substantially straight shape forming an angle between 0 and 90 degrees with the adjacent walls of the container.

The term "ablation area" is used herein to refer to the minimum area of the blank that encloses all ablated zones on the curved edge portion.

The term "ablated zone" is used herein to refer to an area of the modified edge portion from which material has been ablated (e.g. removed by means of a laser beam or a blade) from a surface of the laminar blank or container. Accordingly, the residual thickness of an ablated zone is less than the thickness (T) of the laminar blank. Preferably, an ablated zone is provided as a groove within the blank. This may be formed with a linear ablation tool, such as a laser or a blade. In embodiments where all the ablated zones are defined by parallel grooves within the blank, the area of the ablation area may be regarded as the area enclosing all the grooves on the curved edge portion. Thus, in those embodiments, the width of the ablation area may be regarded as extending transversely to the grooves, from the first to the last of the grooves on the curved edge portion.

The term "residual thickness" is used herein to refer to the minimum distance measured between two opposite surfaces of the laminar blank or of a wall of the container formed from the blank. In practice, the distance at a given location is measured along a direction locally perpendicular to the opposite surfaces. The "residual thickness" of an ablated zone may be constant over the ablated zone if material is removed homogeneously substantially all over the ablated zone (flat profile). Alternatively, the residual thickness of the ablated zone may vary across a width of the ablated zone, if material is removed non-homogeneously over the ablated zone (e.g. V-shaped, U-shaped grooves).

As used herein, the terms "front", "back", "upper", "lower", "top", "bottom" and "side", refer to the relative positions of portions of containers according to the invention and components thereof. When describing containers according to the present invention, these terms are used irrespective of the orientation of the container being described. In the case of a hinge-lid container, the back wall of the container is the wall comprising the hinge line about which the lid is pivotable.

The term "inner surface" is used throughout the specification to refer to the side of a portion of the blank that, once the container is assembled, faces towards the interior of the container, for example towards the consumer goods, when the container is in the closed position. Likewise, the term "outer surface" is used throughout the specification to refer to the side of a portion of the blank that, once the container is assembled, faces towards the exterior of the container.

The term "spring-back force" is a known term of art for referring to a particular property of a laminar blank. It is sometimes referred to as 'the crease recovery' and means the force (N) required to hold a scored sample that is folded at 90 degrees for a 15-second period. The measurement is made at the end of the 15-second period. The spring-back force of a portion of a laminar blank can be measured using a known PIRA Crease and Board Stiffness Tester (commercially available for example from Messmer and Buchel, UK). As is known in the art, to measure the spring-back force of a curved edge portion of a container, a sample of the portion to be tested should first be removed from the laminar blank. For round corner packs, for the purposes of the present invention the spring-back force of a pack is assessed using a sample measuring 38 ± 1 millimetres by 38 ± 0.5 millimetres, with the corner forming portion being positioned 21 ± 0.5 millimetres from one side of the blank. The blank should be conditioned at 22 degrees Celsius and 60 percent relative humidity for at least 24 hours prior to testing.

In contrast to known blanks for forming containers with non-square corners, according to the present invention material is removed by ablation at specific locations within the connecting edge portions of the blank destined to form corners of the container. In addition, each dust flap in a pair of dust flaps extending from the blank side panels comprises a main flap portion, which depends along a fold line from a respective side panel, and a side flap portion, which extends laterally from the flap main portion beyond a peripheral edge of the respective first or second side panel.

Thus, the overall width of the blank is increased by an amount corresponding to twice the width of one such side flap portion. This at least partly compensates the reduction in the width of the blank panels forming the front/rear and side walls of the container, compared with a blank for forming a squared-edge container of substantially the same maximum width and depth, that is dictated by the desired shape of the container.

Accordingly, a container can conveniently be formed from one such blank by a conventional packing machine for assembling a squared-edge container. On the one hand, the provision of ablation areas including ablated (for example, by laser ablation) zones to form the non-square corners of the container advantageously reduces the force required for folding the blank. On the other hand, the corrected overall width of the blank makes it advantageously possible for the blank to be received in, and folded by, a conventional packing machine without the need to make any major modification.

The present invention is particularly advantageous when forming rounded corners, because, when forming the ablated zones by laser ablation, the outer surface of the blank is unaffected by the ablation process, the resulting outer surface of the container is smooth upon visual and tactile inspection on the part of the consumer. Further, because this smooth, surface can be obtained with a relatively small number of ablated zones, and therefore with

limited material removal, even in the case of containers with rounded corners, the strength of the container may advantageously be adjusted, so that appearance and resistance of the container are both improved.

Advantageously, the blank may be manufactured by precisely removing material from the round corner portion with a linear ablation tool (e.g. laser, blade). Repeated passages of the ablation tool over a given portion of the blank results in the removal of a greater percentage of material, that is in a reduced residual thickness.

Further, if the overall size (in terms of maximum width and depth) of a container is not significantly altered, the Applicant has advantageously found that it is easy to adapt the blank according to invention to form containers having different shapes, such that no major modifications of the packing machine are required.

In its most general terms, a laminar blank according to the present invention is adapted to form a container with non-squared edges. The blank comprises two first side panels extending from the rear wall panel and two second side panels extending from the front wall panel, such that, when the container is assembled from the laminar blank, the first and the second side panels overlap to form at least part of left and right side walls of the container. At least one of the first side panels and the second side panels are connected to the respective one of the rear wall panel and the front wall panel by modified edge portions. The modified edge portions have an inner and an outer surface, and the inner surfaces define respective ablation areas. Each ablation area comprises one or more ablated zones with a residual thickness that is less than the thickness (T) of the laminar blank.

Further, the blank comprises at least one pair of dust flaps extending from the first side panels or the second side panels or both, such that, when the container is assembled from the laminar blank, the flaps in a pair overlap the bottom wall panel to form the bottom wall or the top wall panel to form the top wall. Each dust flap in the at least one pair of dust flaps comprises a main flap portion depending along a fold line from a respective first or second side panel and a side flap portion extending laterally from the flap main portion beyond a peripheral edge of the respective first or second side panel.

Each ablation area has a length (L) in the longitudinal direction of the modified edge portion and a width (w) that extends transversely to the length (L) across the modified edge portion. Preferably, in each dust flap in the at least one pair of dust flaps the side flap portion extends beyond the peripheral edge of the respective first or second side panel by at least about 25 percent of the width (w) of the ablation area. More preferably, in each dust flap in the at least one pair of dust flaps the side flap portion extends beyond the peripheral edge of the respective first or second side panel by at least about 35 percent of the width (w) of the ablation area.

In addition, or as an alternative, in each dust flap of the at least one pair of dust flaps, the side flap portion preferably extends beyond the peripheral edge of the respective first or second side panel by less than about 75 percent of the width (w) of the ablation area (A). More preferably, in each dust flap of the at least one pair of dust flaps, the side flap portion preferably extends beyond the peripheral edge of the respective first or second side panel by less than about 65 percent of the width (w) of the ablation area (A). Most preferably, in each dust flap of the at least one pair of dust flaps, the side flap portion preferably extends beyond the peripheral edge of the respective first or second side panel by less than about 55 percent of the width (W) of the ablation area (A).

Preferably, the laminar blank is for forming a container having a maximum width (W) and a maximum depth (D), wherein the width (w) of the ablation area is at least about 0.025 times ($W + 2D$), where W is the maximum width of the container and D is the maximum depth of the container. In addition, or as an alternative, the laminar blank is for forming a container having a maximum width and a maximum depth, wherein the width (w) of the ablation area is preferably less than about 0.07 times ($W + 2D$), where W is the maximum width of the container and D is the maximum depth of the container. More preferably, the width (w) of the ablation area is less than about 0.06 times ($W + 2D$).

In practice, the maximum width (W) and the maximum depth (D) of the container shall substantially correspond to the maximum distance between the side walls of the container, and the maximum distance between the front and rear walls of the container, respectively. In many embodiments having a substantially quadrangular or rectangular cross-section, the maximum width (W) and the maximum depth (D) of the container shall substantially correspond to the maximum dimensions of the top or bottom wall of the container.

Preferably, in each dust flap of the at least one pair of dust flaps, the side flap portion extends beyond the peripheral edge of the respective first or second side panel by a length (E) such that the effective overall maximum width of the laminar blank substantially equals ($W + 2D$), where W is the maximum width of the container and D is the maximum depth of the container.

The skilled person shall appreciate that, when a blank is designed with a view to making a container with maximum dimensions W and D , the reference container is typically a conventional, fully squared parallelepiped container. This geometry corresponds to a blank with an effective overall width of $W+2D$. Thus, the cooperating guides in a conventional packing machine shall be set substantially at a distance corresponding to that effective overall width. In containers according to the present invention where the side flap portion extends beyond the peripheral edge of the respective first or second side panel by a length (E) as defined above, the side flaps are particularly adapted to compensate for the reduction in width of front/rear and side panels to accommodate for the rounded/bevelled connecting edge

portions that becomes necessary to accommodate for the rounded/bevelled connecting edge portions. In practice, this approximates a condition wherein the sum given by $W^* + 2D^* + 2A + 2E$, wherein:

($W^* + 2D^*$) is the width of the rear/front panel in the blank for forming a container with non-squared edges and which is less than the maximum width W ;

$2A$ is the overall width of edge portions and ablation areas; and

$2E$ is the overall width of the side flap portions;

substantially equals $(W + 2D)$.

Preferably, each of the ablation lines has a residual thickness of at least about 5 percent of the thickness (T) of the blank. More preferably, each of the ablation lines has a residual thickness of at least about 10 percent of the thickness (T) of the blank. Even more preferably, each of the ablation lines has a residual thickness of at least about 15 percent of the thickness (T) of the blank. In addition, or as an alternative, each of the ablation lines has preferably a residual thickness of less than about 50 percent of the thickness (T) of the blank. More preferably, each of the ablation lines has a residual thickness of less than about 40 percent of the thickness (T) of the blank. Even more preferably, each of the ablation lines has preferably a residual thickness of less than about 30 percent of the thickness (T) of the blank. In some particularly preferred embodiments, each of the ablation lines has preferably a residual thickness of about 20 percent of the thickness (T) of the blank.

In some embodiments, at least one ablation area comprises a plurality of ablated zones, with all said ablated zones extending in parallel in the longitudinal direction of the respective edge portion.

In some embodiments, at least one ablation area comprises only a first and a second ablated zone extending in parallel in the longitudinal direction of the respective edge portion. Each ablated zone is arranged proximate to a respective one of the rear panel and first side panel or a respective one of the front panel and second side panel.

In some embodiments, at least one ablation area comprises ablated zones that define a repetitive or non-repetitive pattern. For example, the ablated zones may define a mesh pattern.

In some embodiments, at least one ablation area comprises one or more ablated zones, each extending along a curved trajectory that substantially follows the longitudinal direction of the respective edge portion.

Preferably, each ablated zone has an ablated width (WA) of at least about 0.01 millimetres, more preferably of at least about 0.05 millimetres, even more preferably of at least about 0.1 millimetres. In addition, or as an alternative, each ablated zone has an ablated width (WA) of less than about 0.4 millimetres, preferably less than about 0.3 millimetres, even more preferably less than about 0.2 millimetres. In some preferred embodiments, each ablated

zone has an ablated width (WA) of from about 0.01 millimetres to about 0.4 millimetres, more preferably of from about 0.05 to about 0.2 millimetres.

Preferably, the blank has a spring-back force of less than about 10 milliNewton metres between any two panels that are connected by a modified edge portion.

5 Blanks according to the present invention find application for the manufacture of containers for consumer goods, in particular elongate consumer goods such as smoking articles. However, they can also be used for several other types of consumer goods. In particular, a container may be formed from a blank according to the present invention, wherein the laminar blank forms at least a part of the container comprising a box portion having a box
10 front wall, a box rear wall and box side walls extending between the box front wall and the box rear wall, and wherein the modified edge portions connect at least one of the box front wall and the box rear wall to the box side walls. As an alternative, a container may be formed from a blank according to the present invention, wherein the laminar blank forms at least a part of the container comprising a lid portion having a lid front wall, a lid rear wall and lid side walls
15 extending between the lid front wall and the lid rear wall, and wherein the modified edge portions connect at least one of the lid front wall and the lid rear wall to the lid side walls.

Blanks according to the present invention may be formed from any suitable material or combination of materials, including, but not limited to, cardboard, paperboard, plastic, metal, or combinations thereof. Preferably, the blank is a laminar cardboard blank having a weight
20 of between about 100 grams per square metre and about 350 grams per square metre. In preferred embodiments, the blank has a thickness of from about 200 to about 400 micrometres, more preferably from 250 micrometres to 350 micrometres.

A container formed from a blank according to the present invention may optionally comprise an outer wrapper, which is preferably a transparent polymeric film of, for example,
25 high or low density polyethylene, polypropylene, oriented polypropylene, polyvinylidene chloride, cellulose film, or combinations thereof and the outer wrapper is applied in a conventional manner. The outer wrapper may include a tear tape. In addition, the outer wrapper may be printed with images, consumer information or other data.

Further, the consumer articles may be provided within one such container in the form
30 of a bundle wrapped in an inner package formed of metal foil or metallised paper. The inner package material may be formed as a laminate of a metallised polyethylene film, and a liner material. The liner material may be a super-calendered glassine paper. In addition, the inner package material may be provided with a print-receptive top coating. The inner package has an access opening through which consumer goods can be removed when a lid of the container
35 is in a respective open position.

The blank is preferably for forming a rectangular parallelepiped container comprising two wider walls spaced apart by two narrower walls. A hinge lid container formable from a

blank according to the container shall typically comprise two longitudinal rounded or bevelled edges on the front wall, and/or two longitudinal rounded or bevelled edges on the back wall. These may optionally be in combination with one or more rounded or bevelled transverse edges.

5 Where the container comprises bevelled edges, preferably the bevelled edges have a width of between about 1 mm and about 10 mm, preferably between about 2 and about 6 mm.

Containers according to the invention find particular application as packs for elongate smoking articles such as, for example, cigarettes, cigars or cigarillos. It will be appreciated that through appropriate choices of the dimensions thereof, containers according to the invention may be designed for different numbers of conventional size, king size, super-king size, slim or super-slim cigarettes. Alternatively, other consumer goods may be housed inside the container.

Through an appropriate choice of the dimensions, containers according to the invention may be designed to hold different total numbers of smoking articles, or different arrangements of smoking articles. For example, through an appropriate choice of the dimensions, containers according to the invention may be designed to hold a total of between ten and thirty smoking articles. The smoking articles may be arranged in different collations, depending on the total number of smoking articles. Containers formed from blanks according to the present invention may hold smoking articles of the same type or brand, or of different types or brands. In addition, both filter-less smoking articles and smoking articles with various filter tips may be contained, as well as smoking articles of differing length (for example, between about 40 mm and about 180 mm), diameter (for example, between about 4 mm and about 9 mm). Preferably, the dimensions of the container are adapted to the length of the smoking articles, and the collation of the smoking articles. Typically, the outer dimensions of the container are between about 0.5 mm to about 5 mm larger than the dimensions of the bundle or bundles of smoking articles housed inside the container. The length, width and depth of containers according to the invention may be such that the resultant overall dimensions of the container are similar to the dimensions of a typical disposable pack of twenty cigarettes.

Thus, it shall be appreciated that the total number and the arrangement of the smoking articles within the container shall generally directly impact the maximum width and depth of the container and, correspondingly the geometric features of certain blanks according to the invention as described above. In particular, in certain preferred embodiments, the size of the side portions of the dust flaps can be selected such as to ensure that the container can accommodate a predetermined number of smoking articles in a given arrangement. Accordingly, the skilled person shall appreciate how the present invention provides a valuable

and versatile tool for designing and manufacturing containers suitable to receive substantially any number of smoking articles in any given arrangement.

Preferably, containers according to the invention have a height of between about 60 mm and about 150 mm, more preferably a height of between about 70 mm and about 125 mm, wherein the height is measured from the bottom wall to the top wall of the container.

Preferably, containers according to the invention have a width of between about 12 mm and about 150 mm, more preferably a width of between about 70 mm and about 125 mm, wherein the width is measured from one side wall to the other side wall of the container.

Preferably, containers according to the invention have a depth of between about 6 mm and about 150 mm, more preferably a depth of between about 12 mm and about 25 mm wherein the depth is measured from the front wall to the back wall of the container.

Preferably, the ratio of the height of the container to the depth of the container is in between about 0.3 to 1 and about 10 to 1, more preferably between about 2 to 1 and about 8 to 1, most preferably between about 3 to 1 and 5 to 1

Preferably, the ratio of the width of the container to the depth of the container is in between about 0.3 to 1 and about 10 to 1, more preferably between about 2 to 1 and about 8 to 1, most preferably between about 2 to 1 and 3 to 1.

Preferably, the ratio of the height of the lid back wall to the height of the box back wall of the outer sleeve is between about 0 to 1 (lid located at the top edge of the container) to about 1 to 1, more preferably, between about 1 to 5 and about 1 to 10, most preferably, between about 1 to 6 to about 1 to 8.

Preferably, the ratio of the height of the lid front wall of the outer sleeve to the height of the box front wall of the outer sleeve is between about 1 to 0 (lid covering the entire front wall) to about 1 to 10, more preferably, between about 1 to 1 and about 1 to 5, most preferably, between about 1 to 2 and about 1 to 3.

The surfaces of blanks according to the invention which correspond to exterior surfaces of containers may be printed, embossed, debossed or otherwise embellished with manufacturer or brand logos, trade marks, slogans and other consumer information and indicia.

Containers may be filled and assembled using conventional apparatus and methods, modified to implement the step of forming the ablated zones in the blank. The ablated zones may be produced using an ablation tool, such as a laser or a blade. A laser is particularly preferred as the ablation tool as it can allow for a wide variety of ablation profiles and configurations, with minimal adjustment of the laser tool being needed. For example, the laser may be repeatedly passed over a given portion of the blank to iteratively remove different amounts of material, allowing for a very finely controlled ablation profile. This is particularly beneficial if fine ablated zones are required, with narrow widths. It is possible to accurately

control the relative movement of the laser and the blank so as to form any type of pattern with varying removal intensity ("depth") over the ablation area.

The invention will be further described, by way of example only, with reference to the accompanying drawings in which:

5 Figure 1 depicts a sample portion of a laminar blank for use in determining the spring-back force of the blank;

 Figure 2 depicts an apparatus for determining the spring-back force of a blank;

 Figure 3 shows a schematic top view of a first embodiment of a blank in accordance with the present invention;

10 Figure 4 shows a schematic top view of a second embodiment of a blank in accordance with the present invention; and

 Figure 5 shows a schematic top view of a third embodiment of a blank in accordance with the present invention.

 Figure 3 is a view of a cardboard laminar blank 300 for forming a container for
15 consumer goods according to the invention. In Figure 3, solid lines indicate cut lines and dashed lines indicate fold lines.

 The blank 300 comprises a box blank portion 3001 for forming a box portion of the container, and a lid blank portion 3002 for forming a lid portion of the container. The box blank portion 3001 depends from the lid blank portion 3002 along hinge line 3003.

20 The box blank portion 3001 comprises a front wall panel 308, a rear wall panel 312 and a bottom wall panel 309. Two side wall panels 310 extend from front wall panel 308, two side wall panels 311 extend from rear wall panel 312, and two box dust flaps 313 extend from side wall panels 311. When the box portion of the container is assembled from the box blank portion 3001, the front wall panel 308 forms the container front wall, the rear wall panel 312
25 forms the container rear wall, the side wall panels 310, 311 overlap to form left and right side container walls, and the box dust flaps 313 overlap the bottom wall panel 309 to form the container bottom wall. The side wall panels 310, 311 are substantially the same size and shape as each other. When the container is formed, the side wall panels 310, 311 directly overlie each other with their free edges substantially aligned, such that the inner side wall
30 panel is barely visible. The box dust flaps 313 are smaller than the bottom wall panel 309. When the container is formed, the box dust flaps 313 lie inside the bottom wall panel 309. They provide additional structural support for the container bottom wall of the container but are not visible from the outside of the container.

 The lid blank portion 3002 comprises a front wall panel 314, a rear wall panel 318 and
35 a top wall panel 320. Two side wall panels 316 extend from the front wall panel 314, two side wall panels 317 extend from the rear wall panel 318, and lid dust flaps 319 extend from the side wall panels 317. When the lid portion of the container is assembled from the lid blank

portion 3002, the front wall panel 314 forms the container front wall, the rear wall panel 318 forms the container rear wall, the side wall panels 316, 317 overlap to form right and left container side walls, and the lid dust flaps 319 overlap top wall panel 320 to form the lid top wall. The side wall panels 316, 317 are substantially the same size and shape as each other.

5 When the container is formed, the panels 316, 317 directly overlies each other with their free edges substantially aligned, such that the inner side wall panel is barely visible. The lid dust flaps 319 are smaller than the top wall panel 320. When the container is formed, the lid dust flaps 319 lie inside the top wall panel 320. They provide additional structural support for the container (lid) top wall, but are not visible from the outside of the container.

10 In either pair of dust flaps each dust flap 313, 319 comprises a main flap portion, which depends along a fold line from a respective side panel 311, 317, and a side flap portion extending laterally from the flap main portion beyond a peripheral edge of the respective side panel 311, 317. In more detail, in each dust flap 313, 319 of either pair of dust flaps, the side flap portion extends beyond the peripheral edge of the respective side panel 311, 317 by a
15 length (arrows E) such that the overall maximum width of the blank (arrow MAX) substantially equals $(W + 2D)$, where W is the maximum width of the container (arrow W) and D is the maximum depth of the container (arrow D).

The side panels 310, 311 are connected by modified edge portions 3100, 3110 to the front wall panel 308 and the rear wall panel 312, respectively. Each of the modified edge
20 portions 3100, 3110 has an inner and an outer surface. The inner surfaces of the modified edge portions define respective ablation areas A. Each ablation area A comprises a plurality of ablated zones (not shown), all the ablated zones extending in parallel in the longitudinal direction of the modified edge portion. The ablated zones have a residual thickness that is less than the thickness (T) of the laminar blank. In particular, the ablated zones have a
25 thickness that is about 20 percent of the thickness (T) of the laminar blank. Each ablated zone has a width of about 0.1 millimetres.

When the blank 300 is fed into a conventional packing machine for forming a parallelepiped hinged lid container having maximum width W and maximum depth D, the packing machine easily folds the blank to form a container with rounded edges that has the
30 same maximum width and depth, without requiring any substantial modification to the conventional packing machine.

In an alternative embodiment (not illustrated) each of the ablation areas of an identically sized and shaped laminar blank may comprise only a first and a second ablated zone extending in parallel in the longitudinal direction of the edge portion. When the laminar blank
35 of the alternative embodiment is fed into a conventional packing machine for forming a parallelepiped hinged lid container having maximum width W and maximum depth D, the packing machine easily folds the blank to form a container with bevelled edges that has the

same maximum width and depth, without requiring any substantial modification to the conventional packing machine.

The present invention therefore provides a single laminar blank that can be provided with a range of edge profiles and designs, and yet still capable of being assembled on a conventional packing machine, without requiring any substantial modification to said conventional packing machine. Figures 4 and 5 show further examples of edge designs that could be provided on the laminar blank of the present invention by means of ablation, whilst still allowing said blank to be formed on the same conventional packaging machine without requiring substantial modification to said machine. In particular, Figure 4 depicts a laminar blank 301 that is identical in size and shape to blank 300 shown in Figure 3, but in which each ablation area is provided with ablated zones 3115 that define a repetitive mesh pattern. Figure 5 depicts a laminar blank 302 that is identical in size and shape to blank 300 shown in Figure 3, but in which four ablation areas are respectively provided with ablated zones that each extend along a generally curved trajectory that substantially follows the longitudinal direction of the respective edge portion.

CLAIMS

1. A laminar blank for forming a container for consumer articles, the container the laminar blank having a thickness (T) and comprising:
- 5 a bottom wall panel for forming a bottom wall of the container and a top wall panel for forming a top wall of the container;
- a rear wall panel for forming at least part of a rear wall of the container and a front wall panel for forming at least a part of a front wall of the container;
- 10 two first side panels extending from the rear wall panel and two second side panels extending from the front wall panel, such that, when the container is assembled from the laminar blank, the first and the second side panels overlap to form at least part of left and right side walls of the container;
- the first side panels or the second side panels or both being connected to the respective one of the rear wall panel and the front wall panel by modified edge portions;
- 15 each of the modified edge portions having an inner and an outer surface and the inner surfaces of the modified edge portions defining respective ablation areas; each ablation area comprising one or more ablated zones having a residual thickness that is less than the thickness (T) of the laminar blank;
- the laminar blank further comprising at least one pair of dust flaps extending from the first side
- 20 panels or the second side panels or both, such that, when the container is assembled from the laminar blank, the flaps in a pair overlap the bottom wall panel to form the bottom wall or the top wall panel to form the top wall;
- wherein each dust flap in the at least one pair of dust flaps comprises a main flap portion depending along a fold line from a respective first or second side panel and a side flap portion
- 25 extending laterally from the flap main portion beyond a peripheral edge of the respective first or second side panel;
- wherein each ablation area has a length (L) in the longitudinal direction of the modified edge portion and a width (A) that extends transversely to the length (L) across the modified edge portion; and
- 30 wherein, in each dust flap in the at least one pair of dust flaps the side flap portion extends beyond the peripheral edge of the respective first or second side panel by at least about 25 percent of the width (A) of the ablation area.
2. A laminar blank according to claim 1, wherein, in each dust flap of the at least one pair
- 35 of dust flaps, the side flap portion extends beyond the peripheral edge of the respective first or second side panel by less than about 75 percent of the width (A) of the ablation area (A).

3. A laminar blank according to any one of the preceding claims, wherein the laminar blank is for forming a container having a maximum width and a maximum depth; and wherein the width (A) of the ablation area is at least about 0.025 times $(W + 2D)$, where W is the maximum width of the container and D is the maximum depth of the container.

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4. A laminar blank according to any one of the preceding claims, wherein the laminar blank is for forming a container having a maximum width and a maximum depth; and wherein the width (A) of the ablation area is less than about 0.07 times $(W + 2D)$, where W is the maximum width of the container and D is the maximum depth of the container.

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5. A laminar blank according to any one of the preceding claims, wherein the laminar blank is for forming a container having a maximum width and a maximum depth; and wherein, in each dust flap of the at least one pair of dust flaps, the side flap portion extends beyond the peripheral edge of the respective first or second side panel by a length (E) such that the overall maximum width of the laminar blank substantially equals $(W + 2D)$, where W is the maximum width of the container and D is the maximum depth of the container.

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6. A laminar blank according to any one of the preceding claims, wherein each of the ablated zones has a residual thickness of at least about 50 percent of the thickness (T) of the laminar blank.

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7. A laminar blank according to any one of the preceding claims, wherein each of the one or more ablated zones has a residual thickness of less than about 95 percent of the thickness (T) of the laminar blank.

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8. A laminar blank according to any one of the preceding claims, wherein each ablation area comprises a plurality of ablated zones, all the ablated zones extending in parallel in the longitudinal direction of the edge portion.

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9. A laminar blank according to any one of claims 1 to 5, wherein each ablation area comprises only a first and a second ablated zone extending in parallel in the longitudinal direction of the edge portion; and wherein each ablated zone is arranged proximate to a respective one of the rear panel and first side panel or a respective one of the front panel and second side panel.

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10. A laminar blank according to any one of the preceding claims, wherein each ablated zone has an ablated width (WA) of from about 0.01 millimetres to about 0.4 millimetres.

11. A laminar blank according to any one of the preceding claims, wherein each ablated zone has an ablated width (WA) of from about 0.05 millimetres to about 0.2 millimetres.

12. A laminar blank according to any one of the preceding claims, wherein the blank has a spring-back force of less than about 10 milliNewton metres between any two panels that are connected by a modified edge portion.

13. A container obtainable by folding a laminar blank according to any one of the claims 1 to 12, wherein the laminar blank forms at least a part of the container comprising a box portion having a box front wall, a box rear wall and box side walls extending between the box front wall and the box rear wall, and wherein the modified edge portions connect at least one of the box front wall and the box rear wall to the box side walls.

14. A container obtainable by folding a laminar blank according to any one of the claims 1 to 12, wherein the laminar blank forms at least a part of the container comprising a lid portion having a lid front wall, a lid rear wall and lid side walls extending between the lid front wall and the lid rear wall, and wherein the modified edge portions connect at least one of the lid front wall and the lid rear wall to the lid side walls.