(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
5 January 2017 (05.01.2017)

WIPO | PCT

(10) International Publication Number
WO 2017/001563 A1

(51) International Patent Classification:
B65D 5/42 (2006.01) *B65D 85/10* (2006.01)

(21) International Application Number:
PCT/EP2016/065311

(22) International Filing Date:
30 June 2016 (30.06.2016)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
15174673.2 30 June 2015 (30.06.2015) EP

(71) Applicant: **PHILIP MORRIS PRODUCTS S.A.** [CH/CH]; Quai Jeanrenaud 3, CH-2000 Neuchâtel (CH).

(72) Inventor: **SLOOFF, Arjen Hamilcar**; Reumersweg 7, 3291 AH Rhenen (NL).

(74) Agent: **NEVETT, Duncan**; Reddie & Grose LLP, 16 Theobalds Road, London, Greater London WC1X 8PL (GB).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, 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, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, 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, 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))*

WO 2017/001563 A1

(54) Title: CONTAINER HAVING IMPROVED FLATNESS

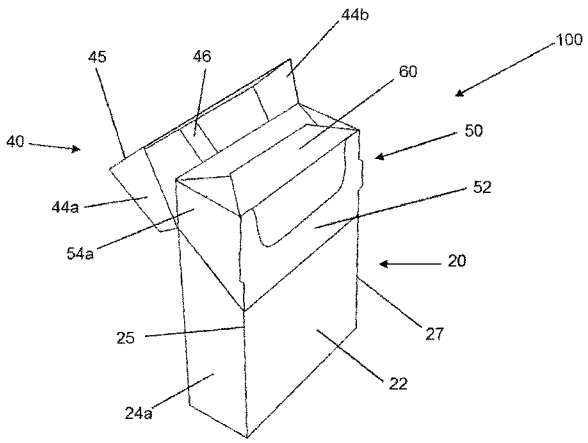

Figure 1

(57) Abstract: A container for consumer articles, the container being at least partially formed from a laminar blank having a thickness (T), the container comprising: a top wall; a bottom wall; a front wall extending from the top wall to the bottom wall; aback wall extending from the top wall to the bottom wall; a first side wall extending from a first side of the top wall to a first side of the bottom wall, and from a first side of the back wall to a first side of the front wall; and a second side wall extending from a second side of the top wall to a second side of the bottom wall, and from a second side of the back wall to a second side of the front wall. Each side wall is connected to the front wall or the back wall by a respective edge portion having an inner and an outer surface. The inner surface of each of said edge portions is provided with a single ablated line having a minimum residual thickness (RT) of from about 15 percent to about 50 percent of the thickness (T) of the blank, and an ablated width (X) of from about 0.1 millimetres to about 0.5 millimetres, as measured transversely to the longitudinal direction of the respective edge portion, such that each of the container front wall and the container back wall is substantially planar.

CONTAINER HAVING IMPROVED FLATNESS

The present invention relates to a container for consumer goods and to a blank for forming such container, which find particular application for holding elongate consumer goods, such as smoking articles (for example cigarettes). The present invention also relates to a method for forming such containers.

It is known to package elongate aerosol-generating articles and other consumer goods in containers formed from folded laminar blanks. Elongate aerosol-generating articles, such as cigarettes and cigars, are commonly sold in hinge-lid packs having a box for housing the aerosol-generating articles and a lid connected to the box about a hinge line extending across the back wall of the container. The front and side walls of the box typically abut the corresponding front and side walls of the lid when the lid is closed. The hinge-lid pack may also comprise an inner frame secured to an inner surface of the box, the inner frame having front and side walls against which the lid closes. In use, the lid is pivoted about the hinge line to open the pack and so gain access to the aerosol-generating articles held in the box. Generally, the hinge line across the back wall of the container is higher than the line of abutment between the front wall of the box and the front wall of the lid. As a consequence, the line of abutment between the box and lid side walls typically slopes diagonally downwards from the back of the container to the front.

In general, it is considered desirable to ensure that a tight line of abutment is formed between corresponding walls on the lid portion and the box portion. That is, it is normally desirable to ensure that corresponding walls on the lid and box lie in substantially the same plane, when the lid is in the closed position, so that they appear as continuous walls of the container. However, typically, hinge-lid containers are formed from laminar blanks having a plurality of mechanical creasing lines that define the fold lines of the blank. The creasing lines help the blank to be folded at certain locations during manufacture, but also create stress across one or more walls of the assembled container. This is particularly noticeable on major walls of the container, such as the front wall or back wall, and can often lead to a visual or tactile bowing effect on such walls. This can give the container an undesirable appearance. This can also result in a container that does not rest steadily on a flat surface, i.e. a container that can pivot or move on a flat surface, in response to minimal external force.

It would therefore be desirable to provide a container for consumer goods that has an improved look, with an improved flat front wall or flat back wall. It would also be desirable to provide a container that will rest steadily on a flat surface, i.e. a container that will not pivot or move in response to minimal external force. Furthermore, it would be desirable to provide a method and blank for manufacturing such a container for consumer goods, which do not

require any major modification of existing packing apparatus, or use of complex additional components.

According to a first aspect of the present invention, there is provided a container for consumer articles, the container being at least partially formed from a laminar blank having a thickness (T), the container comprising: a top wall; a bottom wall; a front wall extending from the top wall to the bottom wall; a back wall extending from the top wall to the bottom wall; a first side wall extending from a first side of the top wall to a first side of the bottom wall, and from a first side of the back wall to a first side of the front wall; and a second side wall extending from a second side of the top wall to a second side of the bottom wall, and from a second side of the back wall to a second side of the front wall. Each side wall is connected to the front wall or the back wall by a respective edge portion having an inner surface and an outer surface. The inner surface of each of said edge portions is provided with a single ablated line having a minimum residual thickness (RT) of from about 15 percent to about 50 percent of the thickness (T) of the blank, and an ablated width (X) of from about 0.1 millimetres to about 0.5 millimetres, as measured transversely to the longitudinal direction of the respective edge portion. As such, each of the container front wall and the container back wall is substantially planar.

In contrast to known blanks/containers, where a mechanical roller is used to create creasing or fold lines, material is removed by ablation at specific locations on the inner surface of portions of the blank that are destined to form edge portions of the container of the present invention. The provision of an ablated (for example, by laser ablation) line to form each such edge portion of the container, advantageously reduces the force required for folding the blank about said edge portion. This can allow the container to be conveniently formed from one such blank by a conventional packing machine. In addition, because the outer surface of the blank is unaffected by the ablation process, the resulting outer surface of the container does not exhibit localised ridges or ripples at the ablation line location (as would be the case with mechanical creasing lines).

Advantageously, the present inventors have found that by removing material from the inner surface of the blank, the folded portions of the blank will impart less stress at the edge portions of the container. As a result, major walls of the container, such as the front and back walls of the container, will not tend to be deformed into a general bowed shape, and will remain substantially flat and planar throughout the use of the container.

The blank of the present invention may advantageously be manufactured by precisely removing material from the edge portion with a linear ablation tool (for example, a laser or a blade). A laser is a particularly preferred ablation tool, as it is non-invasive and can be digitally programmed for improved flexibility of design. In particular, use of a laser as the ablation tool can allow for a wide variety of ablation profiles and configurations, with minimal adjustment of

the laser tool being needed. 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. Thus, the manufacturing process can be simplified. Laser ablation may be obtained using any suitable equipment, preferably a 1000Watt CO2 laser as commercially available from DIAMOND, e.g. the E-1000. Ablation may be obtained in the machine direction of the laminar blank or in the cross direction of the laminar blank.

If the overall size (maximum width and depth) of a container is not significantly altered, 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.

Preferably, the ablated width (X) of each ablation line is at least about 0.2 millimetres. More preferably, the ablated width of each ablation lines is at least about 0.3 millimetres. In addition, or as an alternative, the ablated width of each ablation lines is preferably less than about 0.45 millimetres. In some preferred embodiments, the ablated width of each ablation lines is from about 0.2 millimetres to 0.45 millimetres, more preferably from about 0.3 millimetres to 0.4 millimetres.

As noted above, the inner surface of each edge portion that connects the front wall or the back wall of the container to a respective side wall, is provided with a specific single ablation line to enable the front wall or back wall to have a substantially planar profile. This is particularly desirable for the front wall or the back wall, or for both the front wall and the back wall, since these typically form the largest walls of the container and hence would exhibit the most noticeable bowing effect were the container formed from a laminar blank having mechanical creasing lines. In some particularly preferred embodiments, all walls of the container are connected to an adjacent wall by an edge portion having a single ablated line on its inner surface with each such single ablated line having a minimum residual thickness (RT) of from about 15 percent to about 50 percent of the thickness (T) of the blank, and an ablated width (X) of from about 0.1 millimetres to about 0.5 millimetres. This can include transverse edge portions of the container, such as an edge portion connecting the top wall of the container with a side wall, front wall or back wall of the container. This can also include transverse edge portions of the container, such as an edge portion connecting the bottom wall of the container with a side wall, front wall or back wall of the container. This can advantageously help to minimize any bowing effect in the front wall, back wall, side walls, top wall and bottom wall of the container. Furthermore, this can allow all fold lines of the laminar blank to be formed using the same techniques, and can therefore result in improved manufacturing efficiencies.

Preferably, the thickness (T) of the laminar blank is from about 260 micrometres to about 340 micrometres. More preferably, the thickness (T) of the laminar blank is from about

300 micrometres to about 320 micrometres. The thickness (T) of the laminar blank can be measured in accordance with ISO 534:2011. Testing and conditioning at 23 degrees Celsius, 50% relative humidity according to ISO 187 two weeks after ablation.

The laminar blank preferably has a basis weight of from about 150 grams per square metre to about 350 grams per square metre, more preferably from 200 to 300 grams per square metre. The basis weight is calculated using ISO 536 and may vary from plus ten percent to minus ten percent, preferably from plus five percent to minus five percent.

A container according to any one of the preceding claims, wherein each side wall comprises two overlapping side wall panels, the overlapping side wall panels comprising an inner side wall panel connected to the container back wall by an edge portion having a single ablated line, and an outer side wall panel connected to the container front wall by an edge portion having a single ablated line. Preferably, the two overlapping side wall panels of each side wall are secured to each other by an adhesive.

Preferably, each side wall is orthogonal to the top wall, the bottom wall, the front wall and the back wall. That is, preferably, any edge portion connecting adjacent walls of the container form a substantially 90 degrees turning point between said adjacent walls.

Preferably, the laminar blank is a cellulose-fiber-based laminar blank. That is, preferably the laminar blank is formed from a cellulose-fiber based material, preferably plant-derived and more preferably wood-derived. The blank may contain at least 50 percent by weight, preferably at least 60 percent by weight, and even more preferably at least 70 percent by weight of cellulose fibers based on the total fiber content of the blank. Preferably, the laminar blank is formed from wood-fibers cardboard or paperboard. Alternatively, the cellulose-fiber based material may also contain other fibers, such as polymer fibers. The blank may be coated or uncoated and preferably is coated on both sides. The container may optionally comprise an outer wrapper, which is preferably a transparent polymeric film of, for example, 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.

Where the laminar blank is a cellulose-fiber-based laminar blank, the cellulose fibers of the blank may tend to be orientated in substantially the same direction. The direction of orientation is known as the “grain direction”. In some embodiments, the fibers are substantially orientated in a grain direction that is substantially perpendicular to the longitudinal direction of the edge portions that connect a side wall with a respective front wall or back wall of the container. In such embodiments, the fibers of the laminar blank could be expected to enhance the bowing effect of the front wall or back wall. However, the present inventor has

identified that the ablated lines of the present invention can act to reduce or negate any extra bowing effect created by the fibers of the laminar blank, and thereby allow such a container to be formed with little or no bowing effects on the container front wall or rear wall. In some other embodiments, the fibers are substantially orientated in a grain direction that is substantially parallel to the longitudinal direction of the edge portions that connect a side wall with a respective front wall or back wall of the container. In such embodiments, the fibers of the laminar blank should contribute less to any bowing effect of the front wall or back wall, and thus allow such a container to be formed with little or no bowing effects on the container front wall or rear wall.

Preferably, the laminar blank has a stiffness in the bending direction of at least about 50 milliNewtons, preferably at least about 75 milliNewtons, most preferably at least about 90 milliNewtons, In addition, or in the alternative, the laminar blank has a bending stiffness of less than about 500 milliNewtons, preferably less than about 200 milliNewtons, more preferably less than about 160 milliNewtons. The laminar blank preferably has a bending stiffness from about 50 milliNewtons to about 200 milliNewtons. More preferably, the laminar blank has a stiffness in the machine direction of from about 75 milliNewtons to about 160 milliNewtons. Stiffness in the "bending direction" means that the bending stiffness is measured in the direction that the finished board is intended to be folded about the ablation zone.

Preferably, the laminar blank has a residual stiffness in the bending direction of at least 10, preferably at least 12, more preferably at least 15 and even more preferably at least 20 milliNewtons. More preferably, the laminar blank has a residual stiffness in the bending direction of from about 60 or less, preferably, 50 or less, even more preferably 40 or less milliNewtons.

Preferably, the laminar blank has a surface roughness of from about 0.5 micrometres to about 1.5 micrometres. More preferably, the laminar blank has a surface roughness of from about 0.75 micrometres to about 1.25 micrometres. The surface roughness may be measured in accordance with ISO 8791-4.

Preferably, the laminar blank has a surface strength of from about 0.25 metres per second to about 1 metre per second. More preferably, the laminar blank has a surface strength of from about 0.5 metres per second to about 0.8 metres per second. The surface roughness may be measured in accordance with ISO 3783.

Preferably, the container comprises a box portion comprising a box portion front wall, a box portion back wall, first and second box portion side walls, and a box portion bottom wall; and a lid portion depending along a hinge line from a top edge of the box portion, wherein the lid portion is moveable about the hinge line between an open position and a closed position.

Containers according to the present invention find application as containers for consumer goods, in particular elongate consumer goods such as smoking articles. Accordingly, in some preferred embodiments, there is provided a container, having any combination of the preferred features described above, and containing smoking articles. However, they can also be used for several other types of consumer goods, such as confectionary.

As noted above, containers according to the first aspect of the present invention can be advantageously formed (at least in part) by a folded laminar blank. Accordingly, according to a second aspect of the present invention, there is provided a laminar blank for forming a container for consumer articles, the laminar blank having a thickness (T) and defining a portion of the container comprising: a top wall; a bottom wall; a front wall extending from the top wall to the bottom wall; a back wall extending from the top wall to the bottom wall; a first side wall extending from a first side of the top wall to a first side of the bottom wall, and from a first side of the back wall to a first side of the front wall; and a second side wall extending from a second side of the top wall to a second side of the bottom wall, and from a second side of the back wall to a second side of the front wall. Each side wall is connected to the front wall or the back wall by a respective edge portion having an inner surface and an outer surface. The inner surface of each of said edge portions is provided with a single ablated line having a minimum residual thickness (RT) of from about 15 percent to about 50 percent of the thickness (T) of the blank, and an ablated width (X) of from about 0.1 millimetres to about 0.5 millimetres, as measured transversely to the longitudinal direction of the respective edge portion, such that each of the container front wall and the container back wall is substantially planar.

It shall be appreciated that any features described with reference to one aspect of the present invention are equally applicable to any other aspect of the invention.

The consumer articles may be provided within the container in the form 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 is in a respective open position.

The container is preferably a rectangular parallelepiped comprising two wider walls spaced apart by two narrower walls. Hinge lid containers according to the invention may be in the shape of a rectangular parallelepiped, with longitudinal and transverse edges.

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 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.

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

Containers according to the invention may be filled and assembled using conventional apparatus and methods, modified to include the step of forming ablated lines in the blank. Where portions of the container are defined by one or more ablated lines, the ablated lines 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. It is also beneficial if fine ablated lines 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 term "edge portion" is used herein to refer to the portion of the blank defining an edge between two adjacent walls of the container.

A "cellulose-fiber-based laminar blank" is used herein to refer to a laminar blank comprising at least 50 percent by weight of cellulose fibers, based on the total fiber content of the laminar blank. The cellulose-fiber-based laminar blank of the invention may include other types of fibers, such as polymer fibers.

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 closed. Thus, the inner surface is not directly visible for the consumer when the container is closed. 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 "ablated line" is used herein to refer to a line along the inner surface of the edge portion from which material has been ablated (for example, removed by means of a laser beam or a blade). Accordingly, the residual thickness of an ablated line is less than the thickness (T) of the laminar blank. The ablated line is preferably provided as a groove within the blank. This may be formed with a linear ablation tool, such as a laser or a blade.

The "thickness" (T) of the blank is the thickness of the blank after it has been manufactured, but before any ablation lines or creasing lines have been formed in the blank. That is, the thickness (T) of the blank is the thickness in any region of the blank not containing an ablated line or a crease line.

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 the ablated line may vary across a width of the ablated line, (e.g. V-shaped, U-shaped grooves).

The term "minimum residual thickness" is used herein to refer to the smallest value of "residual thickness" measured in an ablated line at a given location.

The residual thickness of each ablated line can be determined by using an Optical Profilometer for 2D Non-Contact Surface Metrology, such as the MicroSpy (RTM) Profile (commercially available from Fries Research & Technology GmbH, Bergisch Gladbach, Germany), or a 3D laser scanning confocal microscope, such as the VK-X series of microscopes commercially available from Keyence Corporation of America, New Jersey, United States of America. Preferably, several points of minimum residual thickness are measured over the length of an ablated line, whereas the points of measurement are evenly spread over the length of one ablated line and the arithmetic mean is calculated.

Even more preferably, to obtain the "minimum residual thickness" according to the present invention, five measurements, evenly spread over the length of an ablated line, are performed and then the arithmetic medium is calculated.

For example, if the length of the ablated line is 80 millimetres, the residual thickness is measured at both ends of the ablated line and at three further points distanced 20 millimetres, forty millimetres and sixty millimetres respectively from one end of the ablated line, preferably from the lower end of the ablated line.

The term "residual stiffness" is used to describe the stiffness of the residing laminar blank as measured over the minimum residual thickness of one given ablation line and is calculated using the stiffness in bending direction of the laminar blank multiplied by the

percentage of residual thickness. For example, if the stiffness in the bending direction of the non-ablated laminar blank is 100 milliNewton and the minimum residual thickness is 30 percent, then the residual stiffness in bending direction is 100 milliNewton multiplied by thirty percent equal 30 milliNewton. The stiffness of the laminar blank can be measured in accordance with ISO 2493, 15 degrees, for example by taking a sample of the blank material from a portion of the blank that is not scored or ablated (the sample may be printed or otherwise coated if it is in finished form).

Testing and conditioning at 23 degrees Celsius, 50% relative humidity according to ISO 187 two weeks after ablation.

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 the container is in an upright position with the access opening at the top of the container. In particular, where the container is a hinged lid container, this refers to the container being in an upright position with the lid in the closed position and the hinge line at the back of the container. When describing containers according to the present invention, these terms are used irrespective of the orientation of the container being described.

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

Figure 1 is a side view of a container for consumer goods, according to a first embodiment of the present invention, shown in an open configuration; and

Figure 2 is a side view of a container for consumer goods, according to a first embodiment of the present invention, shown in a closed configuration.

Figures 1 shows a perspective view of a container 100 according to a first embodiment of the present invention, where the container 100 is in an open condition. Figure 2 shows a perspective view of the container 100 of Figure 1, where the container 100 is in a closed condition. The container 100 contains a wrapped bundle of consumer goods 60, such as a bundle of cigarettes. The container is formed from a folded laminar blank and has a lid portion 40 and a box portion 20. The lid portion has a first lid side wall 44a, a second lid side wall 44b, and a lid top wall 46. The lid portion also has a lid front wall 42 and a lid back wall (not shown). The box portion 20 has a box front wall 22, and a first box side wall 24a. The box portion 20 also has a box bottom wall, a box back wall and a second box side wall (not shown). The lid 40 depends along a hinge line (not shown) from a top edge of the box back wall, and is movable about the hinge line between an open position (as shown in Figure 1) and a closed position (as shown in Figure 2). An inner frame 50 is attached to the inside of the box 20 and includes a first inner frame side wall (54a), a second inner frame side wall (not shown), and an inner frame front wall 52.

As can be seen from Figures 1 and 2, the first box side wall 24a is connected to the box front wall 22 by a first box edge portion 25, and the first lid side wall 44a is connected to the lid front wall 42 by a first lid edge portion 45. Furthermore, the second box side wall (not visible in Figures 1 and 2) is connected to the box front wall 22 by a second box edge portion 27, and the second lid side wall 44b is connected to the lid front wall 42 by a second lid edge portion 47.

The inner surface of each edge portion 25, 27, 45, 47 is provided with a single ablated line having a minimum residual thickness (RT) of from about 15 percent to about 50 percent of the thickness (T) of the blank, and an ablated width (X) of from about 0.1 millimetres to about 0.5 millimetres , as measured transversely to the longitudinal direction of the respective edge portion. This results in the container front wall (that is formed by the lid front wall 42 and box front wall 22) being substantially planar. This also results in the container back wall (that is formed by the lid back wall and box back wall) being substantially planar.

CLAIMS

1. A container for consumer articles, the container being at least partially formed from a laminar blank having a thickness (T), the container comprising:

a top wall;

a bottom wall;

a front wall extending from the top wall to the bottom wall;

a back wall extending from the top wall to the bottom wall;

a first side wall extending from a first side of the top wall to a first side of the bottom wall, and from a first side of the back wall to a first side of the front wall; and

a second side wall extending from a second side of the top wall to a second side of the bottom wall, and from a second side of the back wall to a second side of the front wall;

wherein each side wall is connected to the front wall or the back wall by a respective edge portion having an inner surface and an outer surface; and

wherein the inner surface of each of said edge portions is provided with a single ablated line having a minimum residual thickness (RT) of from about 15 percent to about 50 percent of the thickness (T) of the blank, and an ablated width (X) of from about 0.1 millimetres to about 0.5 millimetres, as measured transversely to the longitudinal direction of the respective edge portion, such that each of the container front wall and the container back wall is substantially planar.

2. A container according to claim 1, wherein the thickness (T) of the laminar blank is from about 260 micrometres to about 340 micrometres.

3. A container according to any one of the preceding claims, wherein the laminar blank has a basis weight of from about 150 grams per square metre to about 350 grams per square metre.

4. A container according to any one of the preceding claims, wherein each side wall comprises two overlapping side wall panels, the overlapping side wall panels comprising an inner side wall panel connected to the container back wall by an edge portion having a single ablated line, and an outer side wall panel connected to the container front wall by an edge portion having a single ablated line.

5. A container according to claim 4, wherein the two overlapping side wall panels of each side wall are secured to each other by an adhesive.

6. A container according to any one of the preceding claims, wherein each side wall is orthogonal to the top wall, the bottom wall, the front wall and the back wall.

7. A container according to any one of the preceding claims, wherein the laminar blank is a cellulose-fiber-based laminar blank.

8. A container according to claim 7, wherein the fibers of the laminar blank are substantially orientated in a grain direction that is substantially perpendicular to the longitudinal direction of the edge portions that connect a side wall with a respective front wall or back wall of the container.

9. A container according to any one of the preceding claims, wherein the laminar blank has a stiffness in the bending direction of from about 50 milliNewtons to about 500 milliNewtons.

10. A container according to any one of the preceding claims, wherein the laminar blank has a residual stiffness in the bending direction of from about 10 milliNewtons to about 60 milliNewtons.

11. A container according to any one of the preceding claims, wherein the laminar blank has a surface roughness of from about 0.5 micrometres to about 1.5 micrometres.

12. A container according to any one of the preceding claims, wherein the laminar blank has a surface strength of from about 0.25 metres per second to about 1 metre per second.

13. A container according to any one of the preceding claims comprising:
a box portion comprising a box portion front wall, a box portion back wall, first and second box portion side walls, and a box portion bottom wall; and
a lid portion depending along a hinge line from a top edge of the box portion, wherein the lid portion is moveable about the hinge line between an open position and a closed position.

14. A container according to any one of the preceding claims containing smoking articles.

15. A laminar blank for forming a container for consumer articles, the laminar blank having a thickness (T) and defining a portion of the container comprising:

a top wall;

a bottom wall;

a front wall extending from the top wall to the bottom wall;

a back wall extending from the top wall to the bottom wall;

a first side wall extending from a first side of the top wall to a first side of the bottom wall, and from a first side of the back wall to a first side of the front wall; and

a second side wall extending from a second side of the top wall to a second side of the bottom wall, and from a second side of the back wall to a second side of the front wall;

wherein each side wall is connected to the front wall or the back wall by a respective edge portion having an inner surface and an outer surface; and

wherein the inner surface of each of said edge portions is provided with a single ablated line having a minimum residual thickness (RT) of from about 15 percent to about 50 percent of the thickness (T) of the blank, and an ablated width (X) of from about 0.1 millimetres to about 0.5 millimetres, as measured transversely to the longitudinal direction of the respective edge portion, such that each of the container front wall and the container back wall is substantially planar.

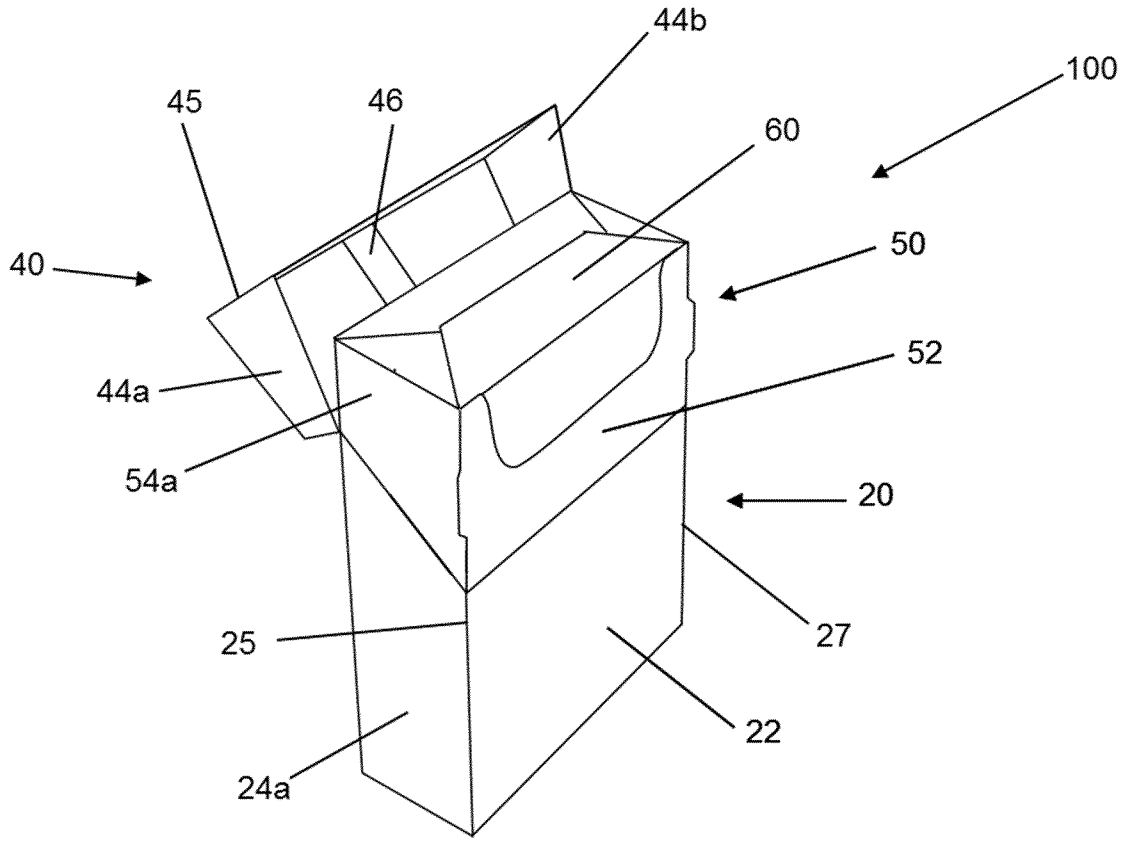

Figure 1

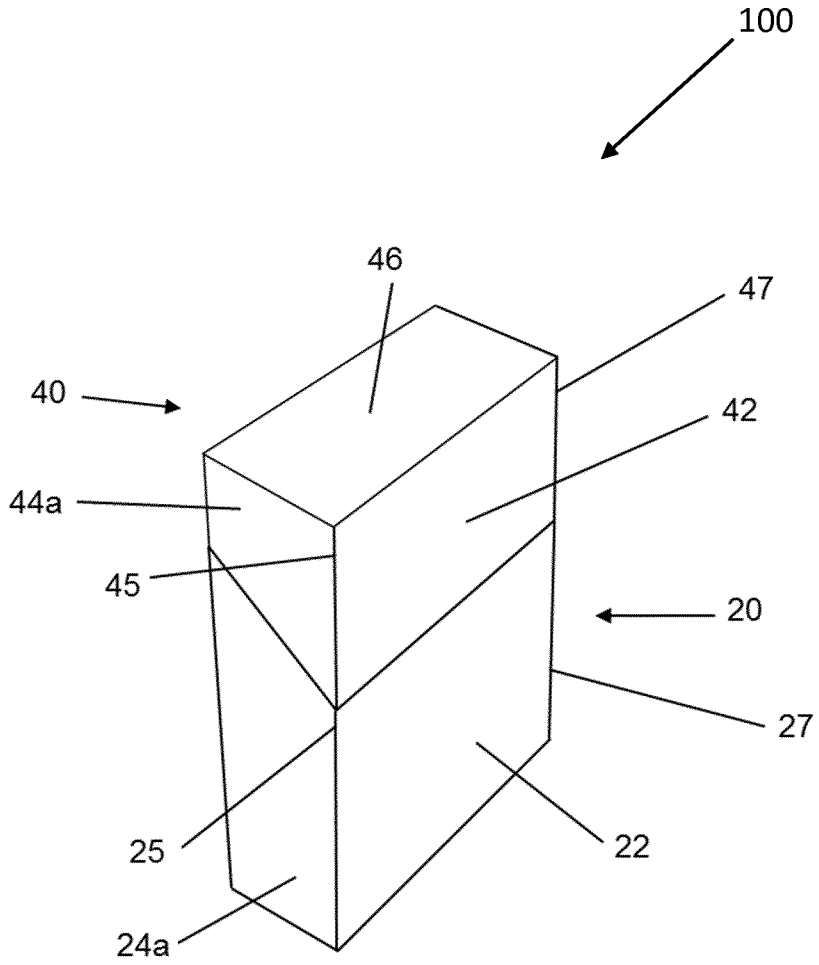

Figure 2

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2016/065311

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D5/42 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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 2 141 091 A1 (JAPAN TOBACCO INC [JP]) 6 January 2010 (2010-01-06) the whole document	1-15
X	WO 2014/206939 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 31 December 2014 (2014-12-31) page 9, line 1 - line 2	3
A	US 4 955 531 A (GRABOYES HERMAN [US]) 11 September 1990 (1990-09-11) column 4, line 48 - line 55; figure 5	1
A	US 2003/047471 A1 (BRIZZI MARCO [IT]) 13 March 2003 (2003-03-13) figure 3c	1

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
1 August 2016	10/08/2016

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Ungureanu, Mirela

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2016/065311

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2141091 A1	06-01-2010	CA 2685144 A1	13-11-2008
		CN 101674989 A	17-03-2010
		EP 2141091 A1	06-01-2010
		ES 2573676 T3	09-06-2016
		HK 1136804 A1	12-07-2013
		JP 4883652 B2	22-02-2012
		KR 20090133117 A	31-12-2009
		MY 147134 A	31-10-2012
		TW 200906321 A	16-02-2009
		UA 91317 C2	12-07-2010
		US 2010044255 A1	25-02-2010
		WO 2008136299 A1	13-11-2008
WO 2014206939 A1	31-12-2014	NONE	
US 4955531 A	11-09-1990	US 4955531 A	11-09-1990
		WO 9204179 A1	19-03-1992
US 2003047471 A1	13-03-2003	CN 1292338 A	25-04-2001
		DE 10047447 A1	17-05-2001
		IT BO990501 A1	21-03-2001
		US 2003047471 A1	13-03-2003