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METHOD FOR THE PRODUCTION OF A CONTAINER WITH IMPROVED CLOSURE MEANS

The present invention relates to a method for the production of containers for consumer goods having a housing and a lid movable relative to the housing. Methods according to the present invention find particular application in the production of containers for smoking articles, such as cigarettes.

It is known to package elongate smoking articles and other consumer goods in containers formed from folded laminar blanks. Elongate smoking articles, such as cigarettes and cigars, are commonly sold in hinge-lid packs having a box for housing the smoking articles and a lid connected to the box about a hinge line extending across the back wall of the container. 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. Such packs are typically constructed from laminar cardboard blanks. In use, the lid is pivoted about the hinge line to open the pack and so gain access to the smoking articles held in the box.

In many cases, it is important to ensure that the lid remains in the closed position during normal handling, so that, for example, the consumer goods do not accidentally get exposed or fall out of the container. For smoking articles it can be particularly important that the lid remains tightly shut in the closed position, so that the freshness of the articles can be preserved.

Various mechanisms have been proposed for improving the interaction between the lid and the box of such containers, and in particular, for reducing the chances of the lid inadvertently moving away from the closed position during normal handling. For example, retention cuts may be provided on the inner frame for interacting with the lid. Alternatively, a temporary adhesive may be provided on the lid or the box. However, such mechanisms deteriorate and become less effective after several repetitions of opening and closing of the lid. This can be particular problematic for containers containing smoking articles, where a consumer may need to open and close the lid on multiple occasions each time they access an individual smoking article.

Furthermore, where an adhesive is provided on the lid or box loose material from the consumer goods – such as loose tobacco material from a smoking article – can become undesirably stuck to the adhesive during use of the container. This can result in an undesirable appearance of the container and a less effectively functioning closing mechanism. This can also create a gap that can allow air to pass into the container when the lid is in a closed position, which can result in an undesired change in the moisture level of the consumer goods

In addition, the incorporation of an adhesive between the lid and the box may cause problems during high speed manufacture of containers. It will typically be most convenient to incorporate any adhesive regions onto the laminar blanks for forming the container, prior to the steps of assembly of the container. However, it is important to prevent the adhesive from undesirably adhering the laminar blanks to each other or to the apparatus during processing and assembly steps. This may be a particular problem when it is desired to incorporate an adhesive

on a surface which is on the underside of the laminar blank as the laminar blank moves through the apparatus.

It would be desirable to provide a novel method for the production of containers having improved closure means, without significant modification of existing container design or packaging equipment and techniques.

According to the present invention, there is provided a method for the production of a container for consumer goods, the container comprising a housing with an opening for accessing the consumer goods; a lid connected to the housing and movable relative to the housing between a closed position in which the lid covers the opening and an open position in which the opening is uncovered. The method according to the present invention comprises: providing at least one laminar blank, the at least one laminar blank comprising a lid portion for forming at least a part of the lid and a housing portion for forming at least a part of the housing, wherein the lid portion has a first surface and the housing portion has a second surface and wherein the first surface and the second surface are arranged such that in the assembled container the first surface is disposed adjacent to the second surface when the lid is in the closed position; providing a micro suction structure on the second surface of the housing portion for securing the second surface to the first surface when the lid is in the closed position, the micro suction structure comprising a micro suction layer for affixing to the second surface and an adhesive layer of a pressure sensitive adhesive overlying the micro suction layer; assembling the container from the at least one laminar blank; and contacting the micro suction structure on the second surface with the first surface to adhere the adhesive layer of the micro suction structure to the first surface, such that the micro suction structure is transferable from the second surface to the first surface upon first opening of the lid during use of the container.

The present invention therefore provides a novel method for the production of a container incorporating an improved closure means in the form of a micro suction structure.

The term "micro suction structure" is used herein to refer to the laminate structure formed with the micro suction layer and the adhesive layer. The laminate structure may optionally comprise additional layers. The micro suction structure is typically provided in the form of a sheet like laminate material.

The term "micro suction layer" is used herein to refer to a layer formed of a flexible material having a plurality of micro cavities on the external surface of the material. The walls of the micro cavities are deformable, such that, when the external surface of the material is pressed against a contact surface, a sealed environment of reduced pressure is formed between the walls of the cavities and the contact surface. This provides a suction force between the walls of the cavities and the contact surface.

The micro cavities may have a diameter of from 5 microns to 300 microns. The material may be formed of an expanded resin having a plurality of internal air bubbles. The layer may have a thickness of from 30 microns to 500 microns.

The microsuction structure provides an effective closure means for securing the lid in the closed position relative to the housing. Because the microsuction structure relies on the use of negative pressure for providing a closing force, rather than, for example, chemical adhesion, the microsuction structure is less likely to deteriorate and become less effective after several repetitions of opening and closing of the lid.

Methods according to the invention are particularly suitable for the production of containers for consumer goods, where the lid is hinged to the housing and pivots relative to the housing between a closed position in which the lid covers the opening and an open position in which the opening is uncovered. This is because the pivoting movement on opening of the container can result in the microsuction layer being peeled away from the contact surface without any noticeable resistance to the user of the container. On the other hand, when the lid is pivoted into the closed position relative to the housing the microsuction layer can form a strong engagement with its contact surface and thereby provide an effective retaining means, without requiring any extra or different closing action to be undertaken by the user of the container.

The methods of the present invention provide a novel way of incorporating the microsuction structure into the desired position on the container without the need for significant modification of existing equipment and methods for assembly of the container. In the methods according to the invention, a container is assembled from at least one laminar blank and the assembled container is provided with a microsuction structure between overlapping surfaces of the lid and housing, which is capable of securing the lid in the closed position between uses.

During the production method, the microsuction structure is provided on the second surface on the housing portion of the at least one laminar blank and is adhered to the second surface by means of the microsuction layer. However, the microsuction structure is adapted so that it is transferable to the first surface on the lid when the lid is moved to the open position for the first time. During the production method, the first surface of the lid portion is brought into contact with the adhesive layer of the microsuction structure and the microsuction structure becomes adhered to the first surface by means of the pressure sensitive adhesive. The bond formed between the pressure sensitive adhesive and the first surface must be stronger than the bond between the microsuction layer and the second surface such that when the lid is opened for the first time, the microsuction layer remains affixed to the first surface on the lid and is pulled away from the second surface on the housing.

This enables the microsuction structure to be initially provided in a position on the housing which is more convenient from a manufacturing point of view, before being transferred upon first opening of the container into a position on the opposed surface of the lid, which may be a more preferable position during use.

For example, it may be more convenient to provide the microsuction structure on the second surface of the housing during production of the container, where the second surface is on the top side of the laminar blank whilst the first surface is on the underside. The "top side" of the

laminar blank refers to the side of the laminar blank which faces upwards during the movement of the laminar blank through the assembly apparatus whilst the “underside” of the laminar blank faces downwards. The underside of the laminar blank will typically be the side of the laminar blank that provides the printed outer surfaces of the container and this side will often be in contact with the surface of the conveyor during manufacture.

In certain preferred embodiments of the invention, the first surface is defined on a panel of the lid portion of the at least one laminar blank for forming an inner panel of a front wall of the assembled lid and the second surface is defined on a panel of the housing portion of the at least one laminar blank for forming a panel of a front wall of the assembled housing. The container formed by the method of such embodiments therefore incorporates the micro suction structure between the lid front wall and the housing front wall. After the first opening of the lid of the container, the micro suction structure is provided at the preferred position on the inner panel of the lid front wall. However, during assembly of the container, the surface of the inner panel of the lid front wall will typically be on the underside of the lid portion of the laminar blank and it is therefore not desirable to provide the micro suction structure in this position during production, for the reasons set out above. The method of the present invention instead provides the micro suction structure on the second surface of the housing, which overlaps with the first surface in the assembled container to enable the transfer of the micro suction structure upon first opening of the container.

The containers produced by the methods of the present invention comprise a housing and a lid connected to the housing, as described above. Preferably, the housing comprises a box having a box front wall, a box back wall, box side walls and a box bottom wall, wherein the top of the box comprises the opening for accessing consumer goods. In certain embodiments, the second surface having the micro suction structure is a wall of the box, for example, the box front wall. In such embodiments, the lid must be adapted such that in the closed position the first surface of the lid overlaps with the second surface on the box. For example, where the second surface is provided on the front wall of the box, the lid is adapted such that the lid front wall partially overlaps the box front wall and the first surface is provided on the inner surface of the lid front wall.

Such containers may optionally be formed from a single laminar blank incorporating both the lid portion with the first surface and the housing portion with the second surface.

However, particularly preferably, the housing further comprises an inner frame mounted within the box wherein the second surface of the housing is located on the inner frame. In such containers, the walls of the inner frame extend beyond the top edges of the corresponding walls of the box at the opening of the housing so that when the lid is in the closed position, the walls of the lid overlie the corresponding walls of the portion of the inner frame extending above the box. The second surface is defined on this portion of the inner frame extending above the box.

Preferably, the second surface is defined on the inner frame front wall. Alternatively or in addition, the second surface may be defined on an inner frame side wall.

In methods according to the invention, the step of providing at least one laminar blank therefore preferably comprises providing: a first laminar blank comprising the lid portion and a box portion for forming a box of the housing; and a frame laminar blank for forming an inner frame of the housing, wherein the frame laminar blank comprises the second surface with the microsuction structure. Additionally, the step of assembling the container comprises assembling the inner frame from the frame laminar blank, assembling a box from the box portion of the first laminar blank and mounting the inner frame in the box.

In such preferred embodiments, the microsuction structure is provided on the surface of the frame laminar blank and is retained in this position during the production of the container. However, when the lid of the container is opened for the first time, the microsuction structure is transferred to the inner surface of the lid, where it remains during further use of the container. In this position on the inside of the lid, the microsuction structure has a low visibility to the consumer, thereby providing a highly discrete closure means to the container.

The provision of the microsuction structure on the frame laminar blank has several advantages over providing the microsuction structure on the first laminar blank for forming the box and the lid. Firstly, this method avoids the need to provide the microsuction structure on the underside of the first laminar blank, where the surface of the inner panel of the lid front wall will typically be positioned. Instead, the microsuction structure is provided on the top side of the frame laminar blank, which forms the outer surfaces of the assembled inner frame.

Secondly, if the microsuction structure was provided on the first laminar blank, the additional thickness of the first laminar blank in the region of the microsuction structure would adversely affect the ability to be able to securely stack a plurality of the first laminar blanks during production, as is often required. This is far less likely to be a problem with the frame laminar blanks, since the frame laminar blanks are typically cut from a reel during production, as described in more detail below, and are therefore not required to be stacked.

In methods according to preferred embodiments of the invention as described above, the microsuction structure is provided on the second surface on the frame laminar blank with the microsuction layer securing the microsuction structure to the second surface. The adhesive layer overlies the microsuction layer and is exposed at the top surface of the inner frame. The microsuction structure may be incorporated onto the second surface of the frame laminar blank at various points during the manufacture and processing of the frame laminar blank. Preferably, where the frame laminar blanks are cut from a reel, the microsuction structure is incorporated upstream of the cutting of the frame laminar blank from the reel. This enables the assembly process to be carried out substantially without modification.

Preferably, the step of providing the at least one laminar blank comprises: providing a reel of an inner frame sheet material for forming the frame laminar blank, the inner frame sheet

material having a plurality of spaced apart micro suction structures applied to the top side of the inner frame sheet material; and cutting a frame laminar blank comprising a micro suction structure from the reel.

In such methods, the micro suction structures are applied to the top side of the inner frame sheet material before it is wound onto the reel. This is carried out offline from the assembly process so that the micro suction structures are already in place on the reel when it is provided on the production line. The frame laminar blanks can therefore simply be cut straight from the reel and conveyed to the assembly line in a conventional manner.

In methods where the micro suction structures are provided on the reel of the inner frame sheet material, the bottom side of the inner frame sheet material is preferably provided with a layer of a release lacquer to enable the bottom side of the inner frame sheet material to separate from any underlying micro suction structures on the reel as the inner frame sheet material is drawn from the reel. The release lacquer prevents a bond from forming between the exposed adhesive layer on the surface of the micro suction structures and the bottom side of the inner frame sheet that is wound over the adhesive layer. Suitable release lacquers may be water based or solvent based.

As an alternative to providing the micro suction structures on the reel of the inner frame sheet material, the step of providing the at least one laminar blank may comprise: providing a reel of an inner frame sheet material, applying a micro suction structure to the top side of the inner frame sheet material downstream of the reel; and cutting a frame laminar blank with the micro suction structure applied from the inner frame sheet material.

In such methods, the micro suction structures are provided as the inner frame sheet material is unwound from the reel, in an inline process. Preferably, the micro suction structure is applied prior to cutting of the frame laminar blank from the inner frame sheet material. However, the micro suction structure may alternatively be provided downstream of the cutting step.

Methods according to all embodiments of the present invention preferably further comprise the step of providing a coating layer on the second surface under the micro suction layer in order to increase the smoothness of the second surface. It can be preferable for the second surface to have a surface smoothness of 1.2 micrometres or less as measured in accordance with ISO 8791-4, preferably a surface smoothness of 0.8 micrometres or less as measured in accordance with ISO 8791-4. This can improve the interaction between the micro suction layer and the second surface of the laminar blank, and thereby improve the retention of the micro suction structure on the second surface during the steps of assembling the container from the at least one laminar blank. The improved interaction will also optimise the seal between the micro suction layer and the second surface during use of the container after the micro suction structure has been transferred onto the first surface.

The coating layer may comprise a layer of a varnish, such as an ultraviolet (UV) cured varnish. The varnish may be easy to apply locally to the second surface. This means that

significant modification of the remainder of the container is not necessary, in order to ensure that second surface has a desired smoothness of 1.2 micrometres or less. Alternatively, the coating layer may be applied over substantially the entire surface of the housing portion of the laminar blank.

During the contacting step of methods of the present invention, the micro suction structure on the second surface is contacted with the first surface to adhere the adhesive layer of the micro suction structure to the first surface. This is an essential step to ensure that the micro suction structure is transferable onto the first surface during first opening of the lid. The method of the invention must be carried out such that during the contacting step the first surface of the lid portion has sufficient contact with the pressure sensitive adhesive of the adhesive layer that a bond is formed. The contacting step may be optimised by applying a force on the first surface in the direction of the micro suction structure.

Preferably, sufficient contact is made between the first surface and the adhesive layer of the micro suction structure during the steps of folding the lid portion and the housing portion of the at least one laminar blank to assemble the container. In a standard assembly process, the pressure applied by the guide elements that are used to fold the at least one laminar blank will typically be sufficient to achieve the necessary bond between the first surface and the adhesive layer, without significant modification of the assembly apparatus. However, it may be possible to slightly increase the pressure applied to the first surface through some minor modification of the guide elements, for example, by tilting them at a greater angle relative to the lid surface.

Additional force may be applied on the first surface when the container is overwrapped, for example, where the filled and assembled container is shrink wrapped with a transparent outer wrapper. Preferably, methods according to the invention further comprise the step of overwrapping the assembled container of consumer goods.

Preferably, in methods according to the present invention, the micro suction structure is provided on the second surface by means of one or more labels. This can be a convenient and practical means of applying the micro suction structure to the second surface of the at least one laminar blank.

Where the micro suction structure is provided in the form of a label, preferably the label has a height of between about 6 millimetres and about 15 millimetres, more preferably between about 8 millimetres and about 12 millimetres, wherein the height of the label corresponds to the dimension of the label in a vertical direction.

Preferably, the step of assembling the container comprises assembling the at least one laminar blank around a wrapped bundle of smoking articles.

In certain preferred embodiments of the invention, the first surface of the at least one laminar blank onto which the micro suction structure is transferable upon first opening of the container is embossed in order to raise at least a part of the first surface relative to the surrounding

surface of the container. This may advantageously enhance contact between the microsuction structure and the second surface, in order to provide an optimised seal.

Where embossments are provided, the depth of the embossments is preferably between about 20 micrometres and about 100 micrometres, more preferably between about 30 micrometres and about 70 micrometres, most preferably between about 30 micrometres and about 50 micrometres. Preferably, at least about 50 percent of the first surface is covered by embossments, more preferably at least about 75 percent of the first surface and most preferably about 100 percent of the first surface.

The microsuction structure for application to the second surface of the at least one laminar blank during methods according to the invention will now be described in further detail. As set out above, the microsuction structure comprises a microsuction layer which becomes affixed to the second surface during the production method and an adhesive layer of a pressure sensitive adhesive overlying the microsuction layer.

Preferably, the microsuction structure has a total thickness of less than about 300 micrometres, more preferably a thickness of less than about 150 micrometres, even more preferably a thickness of less than about 50 micrometres. Preferably, the microsuction structure has a thickness of at least about 20 micrometres, more preferably at least about 60 micrometres. Ensuring that the thickness of the microsuction structure is within the aforementioned ranges, eliminates the need for significant modification of the container dimensions.

Suitable pressure sensitive adhesives for forming the adhesive layer include water based adhesives and solvent based adhesives. Preferably, the adhesive layer is formed from a water based adhesive.

Preferably, the peel strength of the pressure sensitive adhesive on the first surface is between about 10 Newtons and about 20 Newtons. This corresponds to the force that would be required to peel the microsuction structure away from the first surface. As described above, the peel strength of the pressure sensitive adhesive on the first surface needs to be greater than the peel strength of the microsuction layer on the second surface, so that the microsuction structure is transferable upon first opening of the lid. Preferably, the peel strength of the microsuction layer on the second surface is between about 0.5 Newtons and about 4 Newtons.

Preferably, after the microsuction structure has been transferred onto the first surface, the microsuction layer is exposed on the surface of the microsuction structure over a surface area of at least 1 centimetre squared, more preferably at least 3 centimetres squared. Preferably, the microsuction layer is exposed over a surface area of less than 10 centimetres squared. In some embodiments, this exposed area of the microsuction layer may correspond to the total surface area of the microsuction structure. In other embodiments, areas of the microsuction layer may be covered by an additional layer such that the microsuction layer is no longer exposed in these areas and cannot function to provide a seal between the microsuction structure and the contact surface.

Preferably, the microsuction structure is adapted such that after the microsuction structure has been transferred onto the first surface during use, the force required to separate the lid from the housing when the lid is in the closed position is less than about 15 Newtons. This can ensure that the container is still relatively easy to open when a consumer wishes to access the consumer goods.

Preferably, the force required to separate the lid from the housing when the lid is in the closed position is at least about 2 Newtons, more preferably at least about 5 Newtons. This can reduce the likelihood of the lid accidentally being opened during normal handling of the container, for example, when the container is in a consumer's pocket.

The housing and lid of containers produced by methods according to the invention may have any suitable structure and the at least one laminar blank for forming the containers may be adapted accordingly. As described above, the housing may comprise a box comprising: a box front wall, a box back wall, first and second box side walls, and a box bottom wall, wherein in the assembled container the second surface is located on the box front wall. The lid is typically connected to the box along a hinge line extending across the back wall of the container. In such containers, in the closed position of the lid, at least part of the lid front wall overlies the box front wall and the first surface of the lid is located on the inner surface of the lid front wall.

As used herein the terms "side", "top", "bottom", "front", "back" and other terms used to describe relative positions of the components of containers according to the invention refer to the container in an upright position with the lid at the top and the box bottom wall at the bottom. When describing containers according to the present invention, these terms are used irrespective of the orientation of the container being described.

Alternatively and preferably, the housing may comprise a box as defined above and an inner frame mounted within the box, wherein in the assembled container the second surface is located on the inner frame, as described above. In such containers, the walls of the inner frame extend beyond the top edges of the corresponding walls of the box at the opening of the housing so that when the lid is in the closed position, the walls of the lid overlie the corresponding walls of the portion of the inner frame extending above the box. The second surface is therefore provided in this portion of the inner frame extending above the box.

In any of containers described above in which the housing comprises a box, the lid may comprise a flap that is hinged to the box, the flap comprising a top flap portion that overlies the top of the box when the flap is in the closed position and a front flap portion that at least partly overlies the box front wall when the flap is in the closed position, wherein in the assembled container the first surface is located on the inner surface of the front flap portion. Preferably, the box comprises a top wall at least partially defining the opening for accessing the consumer goods, in which the opening extends across the top wall from the front edge and wherein the periphery of the opening is spaced apart from the rear edge and the side edges of the top wall so that the top wall extends around the rear and sides of the opening. Preferably, the opening also extends

part way down the box front wall from the front edge of the box top wall, and when the flap is in the closed position, the front flap portion overlies the part of the opening that extends part way down the box front wall and also overlies at least a part of the overlies the box front wall.

Alternatively, in any of the containers described above in which the housing comprises a box, the lid may comprise a lid front wall, a lid back wall, first and second lid side walls, and a lid top wall, and wherein in the assembled container the first surface is located on the inner surface of the lid front wall. Preferably, the lid front wall comprises a lid front wall outer panel defining the outer surface of the lid front wall, and a lid front wall under panel defining the inner surface of the lid front wall. In such an embodiment, the lid front wall under panel depends from and underlies the lid front wall outer panel.

The term "panel" is used herein to refer to a portion of the container formed from a single, continuous portion of material. A panel may depend along one or more fold lines from one or more other panels. The term "flap" refers to a panel that depends along only one fold line from only one other panel.

The term "wall" refers more generally to a facet of the container, and a wall may be formed from a single panel or flap, or a wall may be formed from two or more abutting or overlapping panels or flaps.

Containers produced by methods according to the present invention are preferably in the form of a hard-pack container which has a relatively rigid three dimensional structure.

Containers produced by methods according to the present invention find application for consumer goods, in particular elongate consumer goods such as smoking articles. 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.

The at least one laminar blank for producing containers by methods according to the 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 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.

The container is preferably a rectangular parallelepiped container comprising two wider walls spaced apart by two narrower walls. A hinge lid 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.

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

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

Figure 1 is a perspective view of a container produced by a method according to the present invention, after the first opening of the lid; and

Figure 2 is an enlarged partial cross-sectional view of the microsuction structure on the front wall of the inner frame blank of Figure 1 during manufacture (not to scale).

Figure 1 shows a container 100 for consumer goods, which has been produced according to an embodiment of the present invention, where the container 100 is in an open condition. The container 100 contains a wrapped bundle of consumer goods 10, such as a bundle of cigarettes. The container has a lid 40 and a box 20 which are formed together from a single laminar blank.

The lid 40 has a first lid side wall 42, a second lid side wall 44, and a lid top wall 46. The lid 40 also has a lid front wall 48 and a lid back wall (not shown).

The box 20 has a box front wall 22, and a first box side wall 24. The box 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 (not shown).

An inner frame 50 is attached to the inside of the box 20 and includes a first inner frame side wall 54, a second inner frame side wall (not shown), and an inner frame front wall 52. The inner frame 50 is formed from a frame laminar blank.

Figure 1 shows the container 100 after first opening. A microsuction structure 60 (not visible in Figure 1) is provided on the inner surface of the lid front wall 48, which is configured to engage with the inner frame front wall 52 to retain the lid 40 in a closed position relative to the box 20. The microsuction structure 60 is provided in the form of a label which is adhered to a first surface of the inner surface of the lid front wall 48. The dashed line in Figure 1 indicates the second surface 64 of the inner frame front wall 52, with which the microsuction structure 60 is in contact when the lid 40 is in the closed position to secure the lid in the closed position. The first surface has a corresponding shape, size and position on the inner surface of the lid front wall 48.

The container 100 is produced by the following method according to the invention. A first laminar blank is provided comprising a lid portion for forming the lid 40 and a box portion for forming the box 20. A first surface for receiving the microsuction structure 60 is defined on the lid front wall under panel. A frame laminar blank is also provided for forming the inner frame 50 and a microsuction structure 60 is provided on a second surface 64 of the inner frame front wall panel.

Figure 2 shows a partial cross-sectional view of the microsuction structure in place on the inner frame front wall 52. As shown, the microsuction structure 60 comprises a microsuction layer

66 affixed to the second surface and an adhesive layer 68 of a pressure sensitive adhesive overlying the micro suction layer 66. A layer of a release lacquer 70 is provided on the underside of the frame laminar blank, as described in more detail below.

During the production process, the frame laminar blank is cut from a reel of an inner frame sheet material as the sheet material is unwound from the reel. The micro suction structure 60 has been previously applied onto the inner frame sheet material and is therefore present on the reel in an appropriate position. The provision of the layer of a release lacquer 70 ensures that the adhesive layer 68 does not permanently adhere to the underside of the overlying portion of the inner frame sheet material when the material is wound on the reel.

The container 100 is assembled from the first laminar blank and the frame laminar blank using conventional apparatus and techniques. During the assembly process the micro suction structure 60 on the second surface 64 of the inner frame front wall panel is contacted with the first surface on the lid front wall under panel to permanently adhere the adhesive layer 68 of the micro suction structure 60 to the first surface.

Upon first opening of the container 100 during use, the micro suction structure 60 is transferred from second surface 64 on the inner frame front wall 52 to the first surface on the inner surface of the lid front wall 48. The micro suction structure 60 remains in this position during subsequent use of the container 100.

To close the container after the first opening, the consumer pivots the lid 40 about the hinge relative to the box 20, until the inner surface of the lid front wall 48 is adjacent to the outer surface of the inner frame front wall 52. The application of pressure to the outer surface of the lid front wall 48 causes the micro suction layer 66 of the micro suction structure 60 on the inner surface of the lid front wall 48 to engage with the inner frame front wall 52 and thereby secure the lid 40 in the closed position.

CLAIMS

1. A method for the production of a container for consumer goods, the container comprising a housing with an opening for accessing the consumer goods; a lid connected to the housing and movable relative to the housing between a closed position in which the lid covers the opening and an open position in which the opening is uncovered, wherein the method comprises:

providing at least one laminar blank, the at least one laminar blank comprising a lid portion for forming at least a part of the lid and a housing portion for forming at least a part of the housing, wherein the lid portion has a first surface and the housing portion has a second surface and wherein the first surface and the second surface are arranged such that in the assembled container the first surface is disposed adjacent to the second surface when the lid is in the closed position;

providing a microsuction structure on the second surface of the housing portion for securing the second surface to the first surface when the lid is in the closed position, the microsuction structure comprising a microsuction layer affixed to the second surface and an adhesive layer of a pressure sensitive adhesive overlying the microsuction layer;

assembling the container from the at least one laminar blank; and

contacting the microsuction structure on the second surface with the first surface to adhere the adhesive layer of the microsuction structure to the first surface, such that the microsuction structure is transferable from the second surface to the first surface upon first opening of the lid during use of the container.

2. A method according to claim 1 wherein the first surface is defined on a panel of the lid portion of the at least one laminar blank for forming an inner panel of a front wall of the assembled lid and wherein the second surface is defined on a panel of the housing portion of the at least one laminar blank for forming a panel of a front wall of the assembled housing.

3. A method according to claim 1 or 2 wherein the step of providing at least one laminar blank comprises providing:

a first laminar blank comprising the lid portion and a box portion for forming a box of the housing; and

a frame laminar blank for forming an inner frame of the housing, wherein the frame laminar blank comprises the second surface with the microsuction structure,

wherein the step of assembling the container comprises assembling the inner frame from the frame laminar blank, assembling a box from the box portion of the first laminar blank and mounting the inner frame in the box.

4. A method according to claim 3 wherein the step of providing the at least one laminar blank comprises:

providing a reel of an inner frame sheet material for forming the frame laminar blank, the inner frame sheet material having a plurality of spaced apart micro suction structures applied to the top side of the inner frame sheet material; and

cutting a frame laminar blank comprising a micro suction structure from the reel.

5. A method according to claim 4 wherein the bottom side of the inner frame sheet material is provided with a layer of a release lacquer to enable the bottom side of the inner frame sheet material to separate from any underlying micro suction structures on the reel as the inner frame sheet material is drawn from the reel.

6. A method according to claim 3 wherein the step of providing the at least one laminar blank comprises:

providing a reel of an inner frame sheet material, applying a micro suction structure to the top side of the inner frame sheet material downstream of the reel; and

cutting a frame laminar blank with the micro suction structure applied from the inner frame sheet material.

7. A method according to any preceding claim further comprising the step of providing a coating layer on the second surface under the micro suction layer in order to increase the smoothness of the second surface.

8. A method according to any preceding claim wherein the step of contacting the micro suction structure on the second surface with the first surface further comprises the step of applying a force on the first surface in the direction of the micro suction structure.

9. A method according to any preceding claim wherein the micro suction structure is provided on the second surface by means of one or more labels.

10. A method according to any preceding claim wherein the first surface onto which the micro suction structure is transferable is embossed.

11. A method according to any preceding claim wherein the step of assembling the container comprises assembling the at least one laminar blank around a wrapped bundle of smoking articles.

12. A method according to any preceding claim further comprising the step of overwrapping the assembled container of consumer goods.

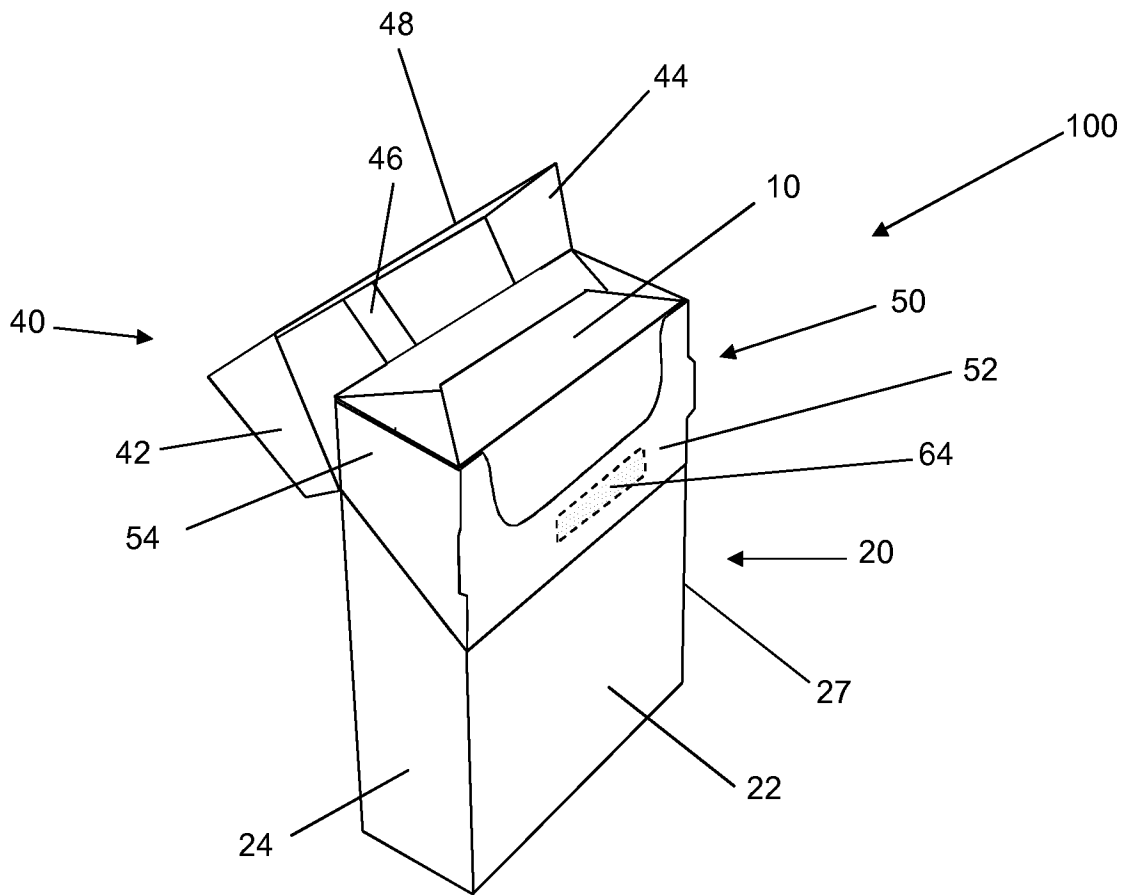


Figure 1

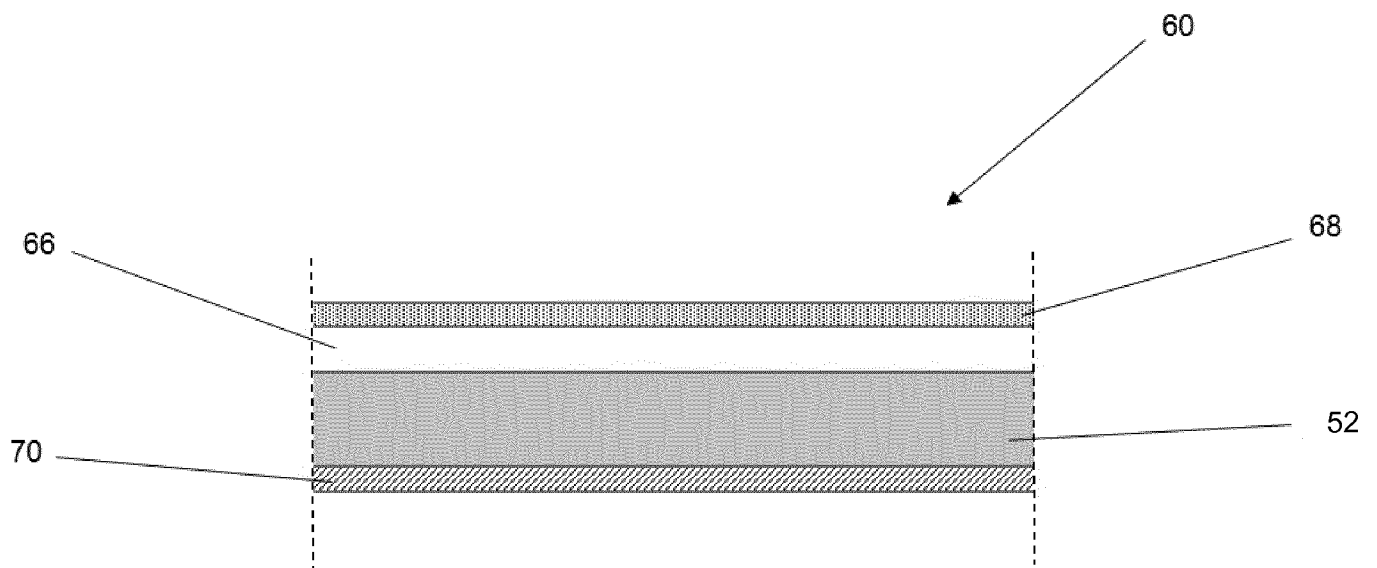


Figure 2

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2017/062705

A. CLASSIFICATION OF SUBJECT MATTER
 INV. B31B50/72
 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)
 B31B 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.
A	FR 2 345 355 A1 (JANOWSKI VALERY [FR]) 21 October 1977 (1977-10-21) page 1, line 24 - line 29 page 7, line 2 - line 14 figures 1,5	1-12
A	----- DE 10 2010 024630 A1 (FOCKE & CO [DE]) 22 December 2011 (2011-12-22) paragraphs [0035], [0038]; figures 1, 26 -----	1-12



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

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"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

17 July 2017

Date of mailing of the international search report

25/07/2017

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2017/062705

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2345355	A1	21-10-1977	NONE

DE 102010024630	A1	22-12-2011	DE 102010024630 A1
			22-12-2011
		EP 2399839	A1
			28-12-2011
