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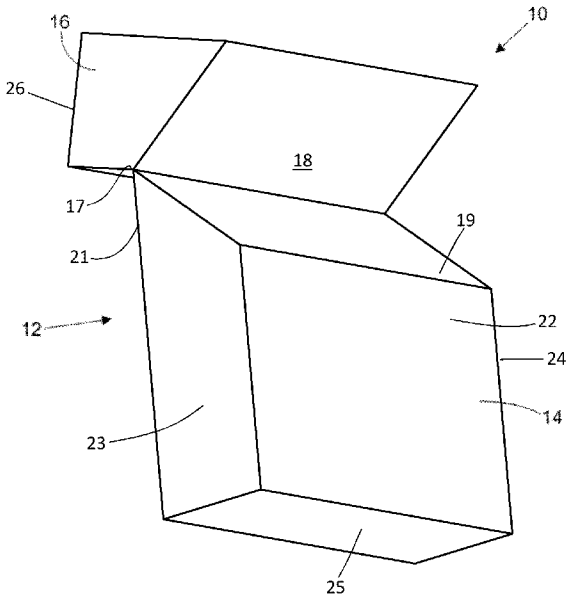

FIG. 1

(57) Abstract: The invention relates to a method of making a container for consumer goods, the method comprising: - forming a first multi-layer, the first multi-layer comprising a first cellulose based layer and a first polymeric layer; - folding the first multi-layer to form a package comprising a lid portion and a box portion, the box portion and the lid portion being divided by an opening line, the lid portion being hinged to the box portion, the package defining a housing for the consumer goods, wherein the first multi-layer is so folded that the first polymeric layer is provided on an outer side of the first cellulose based layer; - forming an outer wrapper, the outer wrapper comprising a second cellulose based layer and a second polymeric layer; - wherein one of the first polymeric layer and second polymeric layer is a moisture barrier layer and the other of the first polymeric layer and second polymeric layer is a heat sealable layer; - wrapping the package with the outer wrapper, the outer wrapper covering, at least in part, the opening line, wherein the wrapping is

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made so that the second polymeric layer is provided on an inner side of the second cellulose based layer; - heating the package and the outer wrapper, to seal the outer wrapper on the package, forming the container.

METHOD TO MAKE A CONTAINER FOR CONSUMER GOODS AND CONTAINER FOR CONSUMER GOODS

The present invention relates to a method to make a container and to a container for consumer goods. The container is preferably used to contain elongated objects, such as aerosol-generating articles.

It is known to pack cigarettes and more in general aerosol-generating article in carton boxes which are overwrapped with a biaxially oriented polypropylene film (BOPP film), in other words with a plastic film. This solution has been an industry standard since several decades.

However, plastic packaging may be detrimental for the environment for the likelihood of littering as well as for the use of non-renewable resources and the potential impact on global warming.

It is therefore desirable to have a packaging solution that contains less plastic than the available ones. At the same time, the packaging solution for aerosol-generating articles preferably provides product protection from moisture intake or loss. Indeed, too much or not enough moisture in the aerosol generating articles may alter the smoking experience of the user.

Furthermore, the packaging for aerosol-generating articles is preferably "tamper safe", that is, preferably it is evident whether the packaging has been already opened.

There is therefore a need for a method to make a container and a container for consumer goods, adapted to contain - among others - aerosol-generating articles, which has a reduced plastic content with respect to the prior art containers. There is also a need for a method to make a container and a container for consumer goods, adapted to contain - among others - aerosol-generating articles, where it is evident whether the container has been already opened.

According to an aspect, the invention relates to a method of making a container for consumer goods. The method may comprise: forming a first multi-layer, the first multi-layer comprising a first cellulose based layer and a first polymeric layer. The method may comprise: folding the first multi-layer to form a package, the package defining a housing for the consumer goods, wherein the first multi-layer is so folded that the first polymeric layer is provided on an outer side of the first cellulose based layer. The method may comprise: forming an outer wrapper, the outer wrapper comprising a second cellulose based layer and a second polymeric layer. The method may comprise: one of the first polymeric layer and second polymeric layer is a moisture barrier layer and the other of the first polymeric layer and second polymeric layer is a heat sealable layer. The method may comprise: wrapping the package with the outer wrapper, wherein the wrapping is made so that the second polymeric layer is provided on an inner side of the second cellulose based layer. The method

may comprise: heating the outer wrapper to seal the outer wrapper on the package. In this way, the container is formed.

In order to form the container according to the invention, a first multi-layer is formed. The first multi-layer comprises a first cellulose based layer and a first polymeric layer. The first cellulose based layer is a layer comprising cellulose material. Preferably, the first cellulose based layer is a paper layer or a paperboard layer, that is, a layer made of paper or paperboard.

The first polymeric layer is a moisture barrier layer, or a heat sealant layer, or both.

For purposes of the present invention, a moisture barrier layer is a layer that has a water vapour or moisture transmission rate (VWTR) of equal to or less than 20 grams/(square meter) per 24 hours at 38 degrees Celsius and 90 percent relative humidity when determined by ISO 2528: 1995 or ASTM F3299. Preferably, a moisture barrier layer of a container of the present invention has a WVTR of less than 10 grams/(square meter) per 24 hours at 38 degrees Celsius and 90 percent relative humidity.

A heat sealable layer is a layer capable of fusion bonding by conventional indirect heating means which generates sufficient heat on at least one film contact surface for conduction to a contiguous film contact surface and formation of a bond interface between the surfaces without loss of the film integrity. The bond interface between contiguous layers preferably has sufficient physical strength to withstand the packaging process and subsequent handling. Heat sealable layers may be designed to meet different conditions of expected use and various heat sealable layers' formulations are known in the art and may be employed with the present invention.

If the first polymeric layer is a sealable layer, it is furthermore preferably a heat sealable layer optimised for bonding with the second polymeric layer. The characteristics of the first polymeric material, if it has heat sealant properties, are preferably such that its characteristics of being heat sealable are optimised to bond with the second polymeric layer.

The heat sealable layer has preferably a melting point measured according to differential scanning calorimetry (DSC) lower than 100 degrees Celsius. More preferably, the heat sealable layer has preferably a melting point measured according to DSC lower than 80 degrees Celsius.

The first polymeric layer and the first cellulose based layer are attached to each other to form the first multi-layer. Any technique can be used to attach, preferably permanently, the first cellulose based layer and the first polymeric layer together. The first polymeric layer may be glued onto a surface of the first cellulose based layer. The first polymeric layer may be coated on a surface of the first cellulose based layer. Preferably, the first polymeric layer and the first cellulose based layer cover the same area. Preferably, the first polymeric layer

and the first cellulose based layer have the same dimensions. Preferably, the first polymeric layer and the first cellulose based layer are congruent.

The first cellulose based layer and the first polymeric layer are preferably permanently attached one to the other and they substantially form a "blank". The blank preferably has the standard shape in this industry, for example it forms a rectangular sheet of multi-layered material.

The first multi-layer, for example, the blank, is then folded in order to create a package. The way in which the blank is folded depends on the desired geometrical shape of the package. For example, typically, the package has the form of a parallelepiped. Preferably, the blank is folded in such a way that the package is closed, that is, it defines a completely closed inner volume, separated from the surroundings. The inner volume defined by the package is preferably completely separated from the outside. In the inner volume, the consumer goods are preferably stored.

Furthermore, the blank is folded in such a way that a surface of the first cellulose based layer defines an inner surface of the package and a surface of the first polymeric layer defines an outer surface of the package. Further layers may be covering the first cellulose layer or the first polymeric layer, but in any case, the first cellulose based layer is located inwardly with respect to the first polymeric layer.

When closed to form a package defining the inner volume, the first multi-layer may control relative humidity within the inner volume. This takes place in case the first polymeric layer is a moisture barrier layer. Preferably, the box can be opened and closed, as detailed below. Preferably, the relative humidity in the inner volume is within a given desired range. The desired range is the range of relative humidity optimal for the consumer goods stored in the inner volume. When the box is opened to access one or more consumer goods stored in the inner volume, the relative humidity of the inner volume begins to equilibrate with the external environment and may cause the relative humidity of the inner volume to deviate from the desired range. If the box is closed, the moisture barrier layer may help in restoring a desired humidity level within the desired range. This is particularly advantageous when one or more consumer goods remain in the package after opening and closing.

Preferably, the package comprises a package front wall, a package left side wall, a package right side wall, a package back wall, a package top wall and a package bottom wall. The package defines an inner surface and an outer surface.

Preferably, the first cellulose based layer includes the inner surface of the package . Preferably, the first polymeric layer comprises the outer surface of the package. Preferably, the inner surface of the package is a free surface of the first cellulose based layer. Preferably, the outer surface of the package is a free surface of the first polymeric layer.

A second multi-layer is formed, having the function of an outer wrapper. The outer wrapper comprises a second cellulose based layer and a second polymeric layer. The definition of

second cellulose based layer is the same as the first cellulose based layer, so that the second cellulose based layer is a layer comprising cellulose material. Preferably, the second cellulose based layer is a paper layer or a paperboard layer, that is, a layer made of paper or paperboard.

The second polymeric layer is a moisture barrier layer, or a heat sealable layer, or both. If the first polymeric layer is a moisture barrier layer, then the second polymeric layer is a heat sealable layer, or the second polymeric layer is both a heat sealable layer and a moisture barrier layer. If the first polymeric layer is a heat sealable layer, then the second polymeric layer is a moisture barrier layer, or the second polymeric layer is both a moisture barrier layer and a heat sealable layer. If the first polymeric layer is both a heat sealable layer and a moisture barrier layer, the second polymeric layer is a moisture barrier layer, or a heat sealable layer, or both.

The definition of heat sealable layer and moisture barrier layer are the same used with respect to the first polymeric layer.

If the second polymeric layer is a heat sealable layer, it is furthermore preferably a heat sealable layer optimized for bonding with the first polymeric layer. The characteristics of the second polymeric layer, if it has heat sealant properties, are such as the characteristics of being heat sealable are optimised to bond with the first polymeric layer.

The heat sealable layer has preferably a melting point measured according to differential scanning calorimetry (DSC) lower than 100 degrees Celsius. More preferably, the heat sealable layer has preferably a melting point measured according to DSC lower than 80 degrees Celsius.

The second cellulose based layer and the second polymeric layer are permanently attached one to the other. They preferably substantially form a "blank". The blank has preferably the standard shape in this industry, for example it forms a rectangular sheet of multi-layered material.

The second polymeric layer and the second cellulose based layer are attached to each other to form a second multi-layer, called outer wrapper. Any technique can be used to attach, preferably permanently, the second cellulose based layer and the second polymeric layer together. The second polymeric layer may be glued onto a surface of the second cellulose based layer. The second polymeric layer may be coated on a surface of the second cellulose based layer. Preferably, the second polymeric layer and the second cellulose based layer cover the same area. Preferably, the second polymeric layer and the second cellulose based layer have the same geometrical dimensions. Preferably, the second polymeric layer and the second cellulose based layer are congruent.

The second multi-layer is wrapped around the outer surface of the package. Preferably, the second multi-layer covers the outer surface of the package completely. Preferably, no portion of the outer surface of the package can be seen from the outside when the package

is wrapped by the outer wrapper. The wrapping is performed in such a way that the second polymeric material is on an inner side with respect to the second cellulose based layer and the second cellulose based layer is on an outer side with respect to the second polymeric layer. Thus, the second cellulose layer may define an inner surface and an outer surface. The outer surface is preferably free, while the inner surface is covered by the second polymeric layer.

In this way, a wrapped package is formed. The wrapping preferably takes place folding the blank of the outer wrapper around the package in order to cover the whole outer surface of the package with the outer wrapper. The resulting geometrical shape of the wrapped package is substantially identical or very similar to the geometrical shape of the package. The outer wrapper is folded around the package in such a way that contact is made between the walls of the package and the outer wrapper. Preferably, the outer wrapper is in contact with all walls of the package. Preferably, the outer wrapper is in contact with the package front wall, the package left side wall, the package right side wall, the package back wall, the package top wall and the package bottom wall.

Heat is then applied to the package wrapped by the second multi-layer. Preferably, heat is applied from the outside of the wrapped package. Preferably, both heat and pressure are applied to the wrapped package. The heat or pressure or both seals the second polymeric layer onto the outer surface of the package, for example onto the first polymeric layer. Preferably, the heat applied to the outer wrapper is such that the first polymeric layer or the second polymeric layer reaches a temperature lower than 100 degrees Celsius, more preferably lower than 80 degree Celsius. Preferably, the pressure applied to the outer wrapper is comprised between 1 kiloPascal and 100 kiloPascal.

The material of the second polymeric layer or of the first polymeric layer or of both partially melts in order to seal itself on the package or on the outer wrapper.

After the application of heat or pressure or both, the container according to the invention is formed. The container is the wrapped package after heat or pressure or both is applied, so that the outer wrapper is permanently attached to the package.

After the application of heat or pressure or both, the outer wrapper is permanently attached to the package and it is not possible to remove the same without deforming or damaging the container.

Preferably, the container comprises a container front wall, a container left side wall, a container right side wall, a container back wall, a container top wall and a container bottom wall. These walls corresponds to the wrapped package front wall, wrapped package left side wall, wrapped package right side wall, wrapped package back wall, wrapped package top wall and wrapped package bottom wall, respectively. The container has an inner surface and an outer surface. The container inner surface is the inner surface of the package.

Preferably, the first cellulose based layer comprises the inner surface of the container. Preferably, the second cellulose based layer comprises the outer surface. Preferably, the inner surface of the container is a free surface of the first cellulose based layer. Preferably, the outer surface of the container is a free surface of the second cellulose based layer.

The first polymeric layer and the second polymeric layer may be formed by the same polymeric material. For example, the first polymeric layer and the second polymeric layer may be formed by a polymeric material that has both heat sealing and moisture barrier properties.

The first polymeric layer and the second polymeric layer may be formed by two different polymeric materials. In this way, the heat sealable or moisture barrier properties can be optimized for each layer.

The first cellulose based layer and the second cellulose based layer may be formed by the same cellulose based material.

Once wrapped, the outer surface of containers realized 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. Being the outer surface of the container made of cellulose based material; printing on it is easy and can be done according to standard techniques in the art.

Furthermore, other elements may be part of the container formed according to the method of the invention. For example, the container may include an inner package containing the consumer goods, such as the aerosol-generating article. The inner package may be located inside the package. Preferably, the inner package is 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 container according to the invention has a recyclability equal to or better than current packaging solutions. Equal or less amount of plastic is used and equal or more amount of cellulose based material is used in the realization of the container of the invention when compared with cellulosed based containers wrapped with a transparent plastic film.

At the same time, because the second cellulose based layer forms substantially the outer surface of the container, the consumer perceives the container as having an increased eco-friendliness. Further, if any indicia are provided on the outer surface of the second cellulose based layer, such as registration marks, these can still be easily formed according to standard processes.

The presence of a layer having moisture barrier properties allows to protect the consumer goods from a too high or too low moisture levels.

Containers according to the invention are easy to manufacture and do not require any substantial modification of the existing packing apparatus. In particular, there is

substantially no need to modify the folding process for forming the package using the blank of the first multi-layer or the format of the packing machine handling the blank.

According to another aspect, the invention relates to a container for consumer goods. The container comprises a package comprising a box portion and a lid portion, the package defining a housing for the consumer goods, the lid portion being hinged to the box portion by a hinge line, an opening line separating the box portion and the lid portion outside the hinge line, the box portion and the lid portion being formed by folding a first multi-layer blank. The first multi-layer blank preferably comprises: a first cellulose based layer. The first multi-layer blank preferably comprises: a first polymeric layer provided on an outer side of the first cellulose based layer. The container also preferably comprises an outer wrapper wrapped and sealed on the package and covering at least partly the opening line. The outer wrapper preferably comprises: a second cellulose based layer. The outer wrapper preferably comprises: a second polymeric layer provided on an inner side of the second cellulose based layer. Preferably, one of the first polymeric layer and second polymeric layer is a moisture barrier layer and the other of the first polymeric layer and second polymeric layer is a heat sealable layer.

It is preferred that containers for consumer goods have a lid portion in order to easily access the consumer goods contained inside the container. The lid portion is movable between the closed position and the open position. When the lid portion is in the closed position, the container defines a closed housing of the consumer goods. Further, when the lid portion is in the open position, the housing containing the consumer goods is accessible.

In known solutions, a container having a lid portion may not provide tamper proof evidence, in other words it is difficult to assess when the container has been opened for the first time.

According to the invention, a container is formed as detailed by the first aspect of the invention and having the advantages already outlined in the previous aspect. In addition, the container of the invention is also tamper-proof, because in order to open the lid portion, the outer wrapper needs to be broken.

The package is formed by folding the first multi-layer blank. The first multilayer blank may include an opening line and a hinge line so constructed that, when the blank is folded to form the package, the package is divided in a lid portion and a box portion by the opening line and by the hinge line. Preferably, the hinge line and the opening line are contiguous. Preferably, the opening line and the hinge line form a closed loop on the package outer surface. Preferably, the opening line includes a first end and a second end. Preferably, the hinge line includes a first end and a second end. Preferably, the first end of the hinge line touches (is in contact to) the first end of the opening line. Preferably, the second end of the hinge line touches the second end of the opening line.

The opening line may be an opening cut or a first weakened line. The opening cut may be formed by the edge of the lid portion closing on the box portion. The lid portion remains

tightly closed against the box portion due to the presence of the outer wrapper which keeps the lid portion closed on the box portion.

The first weakened line may be continuous or discontinuous (for example, perforated). Further, the first weakened line may be formed using any suitable technique or combination of techniques, for example, laser cutting or mechanical cutting (for example, die cutting or kiss cutting).

Preferably, the first multi-layer has a total thickness given by the sum of the thickness of the first polymeric layer and of the first cellulose based layer. The first weakened line may have any suitable depth in a direction transverse to the inner and outer surfaces of the first cellulose based layer and first polymeric layer. Preferably, the first weakened line has a depth that is at least about 90 percent of a total thickness of the first multi-layer. More preferably, the first weakened line has a depth that is about 100 percent of the total thickness of the first multi-layer, that is, it is a cut. Any suitable percentage of material can remain along the first weakened line.

Preferably, the lid portion comprises a lid front wall, a lid left side wall, a lid right side wall, a lid back wall, and a lid top wall. The lid portion has an inner surface and an outer surface.

Preferably, the box portion comprises a box front wall, a box left side wall, a box right side wall, a box back wall, and a box top wall. The box portion has an inner surface and an outer surface.

Preferably, the hinge line is realized on the back wall of the package. The hinge line divides the back wall of the package into two parts: the back wall of the lid portion and the back wall of the box portion. Preferably, the hinge line is formed parallel to the bottom wall of the package.

The front wall of the package also preferably comprises a segment of the opening line. The opening line divides the front wall of the package into two parts: the front wall of the lid portion and the front wall of the box portion. Preferably, the segment of the opening line is realized parallel to the bottom wall of the package.

The left side wall and right side wall of the package also preferably include each a segment of the opening line. Preferably, each segment of the opening line on the side walls connect the hinge line on the back wall to the segment of the opening line on the front wall of the package. The opening line divides each of the side walls of the package into two parts: the left (right) side wall of the lid portion and the left (right) side wall of the box portion.

The opening line on the side walls may form an angle with the back wall different from 90 degrees. The segment of the opening line on the right side wall and left side wall of the package is thus preferably not parallel to the bottom wall of the package. Preferably, the height of the hinge line is different from the height of the segment of the opening line on the front wall of the package.

When the package is wrapped by the outer wrapper, which is then heated and sealed onto the package, the outer wrapper becomes an integral part of the package, forming the container of the invention. The outer wrapper cannot be separated from the package without damaging both outer wrapper and package.

The outer wrapper covers at least partially the opening line. Preferably, the outer wrapper covers the opening line completely. The outer wrapper preferably covers the opening line and the hinge line. Thus, in order to open the lid portion from the box portion and access the consumer goods stored in the housing defined by the package, the outer wrapper has to be broken because it covers at least partly the opening line. The outer wrapper needs to be broken in order to allow the movement of the lid portion from the closed position to the opened position. The opening line is the edge of the lid portion.

In case the opening line includes the first weakened line, both the first weakened line and the outer wrapper are preferably teared or broken when the container is opened.

The position where most probably the outer wrapper breaks if a force is applied to separate the box portion from the lid portion is in the neighbourhood of the opening line. The package opens at the opening line. When the outer wrapper is broken, the lid portion may move rotating around the hinge line, opening the package. At the beginning of this movement, the lid portions breaks the outer wrapper that covers at least partly the opening line.

Due to the breakage of the outer wrapper, it is impossible to hide the fact that the container has been at least opened once after manufacturing. Furthermore, the outer wrapper cannot be exchanged, because it is permanently sealed onto the package. In this way, the user buying the container according to the invention can be assured that the container has never be opened if he sees no damage in the outer wrapper. Consequently, the user can be sure that no one has tampered with the consumer goods present therein after they have been inserted in the package.

In the following, the lid portion wrapped with the outer wrapper after the tearing of the same, that is, after the "first opening", is called the lid of the container, and the box portion wrapped with the outer wrapper after the tearing of the same, that is, after the "first opening", is called the box of the container.

Preferably, the step of heating the package and the outer wrapper comprises: heating the package and the outer wrapper while applying pressure, to seal the outer wrapper on the package. Preferably, in order to properly seal the outer wrapper onto the package, both heat and pressure are applied, so that the first polymeric layer and the second polymeric layer bond together.

Preferably, the method comprises: folding the first multi-layer to form a package comprising a lid portion and a box portion, the box portion and the lid portion being divided by a opening line, the lid portion being hinged to the box portion. Preferably, the method

comprises: wrapping the box portion and the lid portion with the outer wrapper, the outer wrapper covering, at least in part, the opening line. Preferably, the method comprises: heating the wrapped outer wrapper to seal the outer wrapper on the package. A package having a lid portion and a box portion is preferably realised. The lid portion and box portion are divided by an opening line. The advantages of this configuration have been already outlined with reference to an aspect of the invention and are not repeated herewith.

Preferably, the opening line comprises a first weakened line.

Preferably, the method comprises the step of: covering the opening line with the outer wrapper completely. The outer wrapper covers the opening line in all its extension. For example, the opening line extends on the front wall and left and right side walls of the package. The outer wrapper thus wraps the package covering its front wall and left side wall and right side wall. Preferably, the outer wrapper covers the whole outer surface of the package. A better control of humidity and structural integrity of the resulting container is obtained. Preferably, the step of forming an outer wrapper comprises the step of forming an outer wrapper including a third polymeric layer.

More preferably, the first cellulose based layer defines an inner surface and an outer surface. Preferably, the step of forming a first multi-layer comprises: coating the outer surface of the first cellulose based layer with the first polymer layer. More preferably, the method comprises the step of coating the whole outer surface of the first cellulose based layer with the first polymer layer. Among the possible techniques to form a multi-layer in which the various layers of the multi-layer form an integral body, coating is the preferred one, for its reliability and relatively easy execution. Due to the tensile strength of the first polymeric layer, the blank formed by the first multi-layer may contain less cellulose based material than a blank for cigarettes packages realized according to the prior art.

During the coating of the first cellulose based layer with the material forming the first polymeric layer, preferably care is taken to prevent the formation of pin-holes and other defects that may negatively affect the moisture barrier performance or heat sealing properties of the coated material. The formation of defects can be minimized by carefully selecting the application technique, the drying conditions and the rheology of the applied dispersion of polymers. In particular, techniques such as rod coating, slot die coating and curtain coating allow to prepare polymer layers with reduced defects hence enhanced barrier properties. It is however possible to apply satisfactory coatings also using printing techniques such as flexographic printing or gravure coating. In case of these latter techniques, the coating is preferably applied by multiple layers until reaching the desired thickness of the first polymeric layer. In fact, each subsequent layer or step in printing allows to fill the defects of pin-holes left during the previous coating step. The coating made of the first polymeric material may be cast on the first cellulose based layer, for example a paper or paperboard sheet, from the molten state using well- known techniques in the field

such as hot melt coating or extrusion coating. Details on these processes can be found for example in "The Definitive Processing Guide and Handbook" Plastics Design Library Editor, 2014, Pages 551-554 (https://doi.org/10.1016/B978-1-4377-3481-2.00047-8).

Preferably, the step of forming an outer wrapper comprises: forming an outer wrapper including a third polymer layer. Preferably, if the second polymer layer is a heat sealable layer, then the third polymer layer is a moisture barrier layer. Alternatively, if the second polymer layer is a moisture barrier layer, then the third polymer layer is a heat sealable layer. In this way, the moisture barrier properties or the attachment between the outer wrapper and the package are improved because the provision of more than one layer allows to enhance moisture barrier or sealability performances or both by using specialized compositions in each layer between second polymeric layer and third polymeric layer (for example, one layer between second polymeric layer and third polymeric layer as an optimal moisture barrier layer, and another layer between second polymeric layer and third polymeric layer is selected for optimal sealability).

Preferably, the second cellulose based layer defines an inner surface and an outer surface, and wherein the first polymeric layer is a heat sealable layer, and forming the outer wrapper comprises: coating the inner surface of the second cellulose based layer with the second polymeric layer. Preferably, forming the outer wrapper also comprises: coating an inner surface of the second polymeric layer with the third polymer layer. In this way, two heat sealable layers (the third polymeric layer and the first polymeric layer) are in contact when the outer wrapper wraps the package. In this way, the sealing of the outer wrapper onto the package is optimized. Preferably, the coating of the second cellulose based layer by the second polymer layer is performed according to the preferred characteristics described with reference to the coating of the first cellulose based layer by the first polymeric layer.

Preferably, the method comprises: folding the first multi-layer to form a package comprising a lid portion and a box portion, the box portion and the lid portion being divided by an opening line, the lid portion being hinged to the box portion. Preferably, the method comprises: wrapping the box portion and the lid portion with the outer wrapper, the outer wrapper covering, at least in part, the opening line. Preferably, the method comprises: forming a second weakened line on the portion of the outer wrapper covering the opening line. More preferably, the method comprises: opening the lid portion by tearing or breaking the second weakened line. In order to properly open the lid portion and access the consumer goods stored in the package, it is preferred to have an easy opening which allows the user to perform the opening without applying to much force. Furthermore, due to the fact that the outer wrapper covers at least in part the opening line, it is preferred that the needed tearing or breaking of the outer wrapper is somewhat controlled. For this purpose, a second weakened line is formed on the outer wrapper. Preferably, the second weakened line is formed on the outer surface of the outer wrapper. Preferably, the second weakened line

follows the extension of the opening line. In a front view, the second weakened line is positioned at the same height as the opening line. In a left side view and in a right side view, the second weakened line is positioned at the same height as the opening line. In this way, when a force is applied to the container in order to open the lid portion, the force required to break or tear the outer wrapper at the second weakened line is lower than the force required to break or tear the outer wrapper without the presence of the second weakened line. In addition, the outer wrapper tears or breaks in a controlled way and the aesthetic of the opened container is improved.

Preferably, the opening line comprises the first weakened line. More preferably, the method comprises: opening the lid portion by tearing or breaking the opening line and the second weakened line. In case the opening line is a weakened line, with the same movement the user breaks or tears both the first weakened line and the second weakened line.

Preferably, the second weakened line may be manufactured by any suitable partial cutting process of the second cellulose based layer (that is, the cutting process cuts less that 100% of the thickness of the second cellulose based layer or the cutting process cuts less than 100% of the width of the second cellulose based layer, when in the unfolded condition). After the partial cutting, the second polymeric layer is applied to the second cellulose based layer.

This second weakened line may be made on the outer wrapper preferably before the wrapping of the package by the outer wrapper.

Preferably, the second weakened line is formed on the second cellulose based layer before it is coated by the second polymeric layer or third polymeric layer. Alternatively, the second weakened line is formed on the second cellulose based layer when the latter is already coated by the second polymeric layer or by the third polymeric layer or both.

Preferably, the method comprises: printing indicia regarding the consumer goods or the manufacturer of the consumer goods on the second cellulose based layer. More preferably, the method comprises printing indicia regarding the consumer goods or the manufacturer of the consumer goods on an outer surface of the second cellulose based layer. Preferably, the container defines an outer surface. Preferably, the outer surface of the container is formed by an outer surface of the second cellulose based layer. Preferably, the outer surface of the container is made of paper or paperboard. Standard printing techniques can be therefore used to print any indicia on this outer surface. The printing cannot be easily removed and it remains substantially unaltered for a long period of time. This for example allows health warnings to be printed on the container without the risk that they can be easily removed (the outer wrapper cannot be removed from the package after sealing).

Preferably, the step of forming a first multi-layer or forming an outer wrapper comprises forming the moisture barrier layer from an emulsion or dispersion of: a copolymer of styrene and acrylic esters, and wax. Preferably, the step forming a first multi-layer or

forming an outer wrapper comprises forming the moisture barrier layer from an emulsion or dispersion of: a copolymer of styrene and butadiene, and wax. Preferably, the step forming a first multi-layer or forming an outer wrapper comprises forming the moisture barrier layer from an emulsion or dispersion of: a copolymer of ethylene and vinyl acetate, and wax. Preferably, the step forming a first multi-layer or forming an outer wrapper comprises forming the moisture barrier layer from an emulsion or dispersion of: a copolymer of ethylene and acrylic or methacrylic acid, and wax. Preferably, the step forming a first multi-layer or forming an outer wrapper comprises forming the moisture barrier layer from an emulsion or dispersion of: a polymer or copolymer of ethylene with propylene, 1-butene, isobutene, 1-octene, 1-hexene, norbornene, and wax. Preferably, the forming a first multi-layer or forming an outer wrapper comprises forming the moisture barrier layer from an emulsion or dispersion of wax and two or more of: a copolymer of styrene and acrylic esters, a copolymer of styrene and butadiene, a copolymer of ethylene and vinyl acetate, a copolymer of ethylene and acrylic or methacrylic acid, a polymer or copolymer of ethylene with propylene, 1-butene, isobutene, 1-octene, 1-hexene, norbornene. Preferred waxes are paraffins, microcrystalline waxes or hydrocarbon waxes. The addition to a wax in a certain amount into one or more of the polymers or copolymers above listed decreases the moisture permeability of the polymers or copolymers. This is for example detailed in US 4117199. Example of these possible compositions may be found for instance in US 2580050, US 2595911, US 2945398 or EP 0688793.

Preferably, in weight, the content of wax is comprised between 5 percent and 15 percent with respect to the polymer or copolymer. In this way, suitable moisture barrier properties are obtained and a good emulsion is achieved.

In case of an extrusion coating process, wherein the cellulose based layer (either the first cellulose based layer or the second cellulose based layer or both) is coated by the polymeric layer (either the first polymeric layer, or the second polymeric layer, or the third polymeric layer), polymers such as Low-density polyethylene (LDPE), medium-density polyethylene (MDPE), high-density polyethylene (HDPE) are preferred as material forming the first polymeric layer, or the second polymeric layer, or the third polymeric layer. To achieve an outer wrapper having an acceptable compromise of moisture barrier and heat sealing properties, the outer wrapper preferably comprises a multilayer coating including a layer of LDPE and a layer of HDPE. As an example, a multilayer coating made of 5 grams per square meter (gsm) of LDPE, 10 gsm of HDPE, for moisture barrier purposes, and 5 gsm of ethylene acrylic acid copolymers as sealable layer is used to coat the second cellulose based layer.

Furthermore, the moisture barrier performance of the HDPE, MDPE or LDPE layers may be increased by blending them with hydrocarbon waxes obtained from petrol refining.

The definitions of LDPE, MDPE and HDPE herein used are those according to ASTM D0883-20B (Standard Terminology Relating to Plastics) and are as follows: the density of LDPE is comprised between 0.910 grams per cubic centimetre (g/cm^3) and 0.925 grams per cubic centimetre (g/cm^3); the density of HDPE is higher than or equal to 0.941 grams per cubic centimetre (g/cm^3) or greater; the density of MDPE is comprised between 0.926 grams per cubic centimetre (g/cm^3) and 0.940 grams per cubic centimetre (g/cm^3).

Preferably, the step of forming a first multi-layer or forming an outer wrapper comprises forming the heat sealable layer from an emulsion or dispersion of: a copolymer of ethylene. Preferably, the step of forming a first multi-layer or forming an outer wrapper comprises forming the heat sealable layer from an emulsion or dispersion of: a copolymer of methacrylic acid. Preferably, the step of forming a first multi-layer or forming an outer wrapper comprises forming the heat sealable layer from an emulsion or dispersion of: a copolymer of an ester of acrylic or methacrylic acid. Preferably, the step of forming a first multi-layer or forming an outer wrapper comprises forming the heat sealable layer from an emulsion or dispersion of two or more from: a copolymer of ethylene, a copolymer of methacrylic acid, a copolymer of an ester of acrylic or methacrylic acid. Preferred examples of polymers for the manufactuting of the heat sealable layer are ethylene based copolymers, such as but not limited to copolymers of ethylene with acrylic acid, or methacrylic acid or their esters such as methyl, ethyl, butil, ethyl-hexyl acrylate or methacrylate. These polymers have the desired heat sealability at the temperatures of interest. These polymers are also preferred because they may have a high flow-ability when in the molten state. The flowability of a material can be expressed in terms of MFI (melt flow index) at 190 degrees Celsius (°C) and 2.16 kilograms (kg) of applied force (ASTM D1238). Preferred heat sealable layers have a MFI above 100 grams/min, more preferably above 200 grams/min. MFI may give an indication of rheology of the heat sealable layer. The higher the MFI, the higher the flowability at reduced shear rate (in this case, the shear rate is the pressure applied during sealing). This means that for achieving good sealing of the outer wrapper on the package at relatively low pressure high MFI is preferred. The lower the applied pressure is, the higher the MFI preferably is.

Preferably, the outer wrapper comprises a third polymeric layer. More preferably, one between the second polymeric layer and the third polymeric layer is a heat sealable layer and the other between the second polymeric layer and the third polymeric layer is a moisture barrier layer. In this way, each layer between the second polymeric layer and the third polymeric layer can have its characteristics (for example, heat sealability or moisture barrier) optimised.

Preferably, the third polymer layer is located on an inner side of the second polymer layer. This configuration is preferred when the third polymer layer is a heat sealable layer and the second polymeric layer is the moisture barrier layer. In this way, two heat sealable layers,

the first polymeric layer and the third polymeric layer, are in contact with each other and a good sealing may be obtained when heat, pressure or both is applied to the outer wrapper wrapping the package.

Preferably, the outer wrapper comprises a second weakened line formed on the portion of the outer wrapper covering the opening line. Preferably, the second weakened line is formed on the outer surface of the outer wrapper.

Preferably, the second cellulose based layer has a first thickness and the second weakened line includes an etched line having a depth not greater than 80 percent of the first thickness. Preferably, the second weakened line is realized on the second cellulose base layer only. Preferably, the second weakened line is not deep enough to form an etching also on the second polymeric layer or third polymeric layer. This is in particular relevant in case the second polymeric layer or the third polymeric layer has heat sealable properties, so that a substantially uniform seal can be obtained when heat is applied. In case the second polymeric layer or third polymeric layer has moisture barrier properties, an etching would cause an area with possible moisture free exchange. Preferably, the first thickness of the second cellulose based layer is comprised between 30 micrometers and 60 micrometers. Preferably, the depth of the second weakened line is at least 50 percent of the first thickness. Preferably, the depth of the second weakened line is comprised between 50 percent to 80 percent of the thickness of the second cellulose based layer. In this way an easy opening of the container is possible and the properties of the second polymeric layer are not hindered.

Preferably, the thickness of the first cellulose based layer is comprised between 200 micrometers and 400 micrometers.

Preferably, the thickness of the first polymeric layer is less than 10 micrometers, more preferably less than 5 micrometers.

Preferably, the second weakened line is formed on the second cellulose based layer before coating by the second polymeric layer. Preferably, the second weakened line is formed on the outer wrapper before wrapping the package with the outer wrapper.

Preferably, the moisture barrier layer comprises: a copolymer of styrene and acrylic esters, and wax. Preferably, the moisture barrier layer comprises: a copolymer of styrene and butadiene, and wax. Preferably, the moisture barrier layer comprises: a copolymer of ethylene and vinyl acetate, and wax. Preferably, the moisture barrier layer comprises: a copolymer of ethylene and acrylic or methacrylic acid, and wax. Preferably, the moisture barrier layer comprises: a polymer or copolymer of ethylene with propylene, 1-butene, isobutene, 1-octene, 1-hexene, norbornene, and wax. Preferably, the moisture barrier layer comprises wax and two or more of: a copolymer of styrene and acrylic esters, a copolymer of styrene and butadiene, a copolymer of ethylene and vinyl acetate, a copolymer of

ethylene and acrylic or methacrylic acid, a polymer or copolymer of ethylene with propylene, 1-butene, isobutene, 1-octene, 1-hexene, norbornene.

Preferred waxes are paraffins, microcrystalline waxes or hydrocarbon waxes.

Preferably, the wax includes paraffins, microcrystalline wax or hydrocarbon wax. The wax may include a combination of one or more of paraffins, microcrystalline waxes or hydrocarbon waxes.

Preferably, the heat sealable layer comprises: a copolymer of ethylene. Preferably, the heat sealable layer comprises: a copolymer of methacrylic acid. Preferably, the heat sealable layer comprises: a copolymer of an ester of acrylic or methacrylic acid. Preferably, the heat sealable layer comprises two or more of: a copolymer of ethylene, a copolymer of methacrylic acid, a copolymer of an ester of acrylic or methacrylic acid. Preferred examples of polymers for the manufacturing of the heat sealable layer are ethylene based copolymers, such as but not limited to copolymers of ethylene with acrylic acid, or methacrylic acid or their esters such as methyl, ethyl, butil, ethyl-hexyl acrylate or methacrylate.

In an embodiment of the present invention, the heat sealable layer is made from a dispersion of Ethylene Acrylic Acid Copolymer (EAA) modified with paraffin wax. A suitable EAA copolymer is Primacor 5980I mechanically dispersed in water and partially neutralized with ammonia, this dispersion may include up to 10 percent in total weight of paraffin wax with respect to EAA. A preferred paraffin wax has a melting point of 60 degrees Celsius.

Such water dispersions can be prepared by mechanical high shear mixing in hot water up to 35 percent – 40 percent solid content (the ratio between the solid components and the total weight of the dispersion).

Preferably, the first polymeric layer and the third polymeric layer are realized in the same material. Preferably, the first polymeric layer and the third polymeric layer have the same physical and chemical properties. Preferably, the first polymeric layer and the third polymeric layer are heat sealable layers.

Preferably, the first cellulose based layer has a basis weight comprised between 180 grams per square meter (gsm) and 270 grams per square meter (gsm). Preferably, the weight per square meter of the first cellulose based layer is higher than the weight per square meter of the second cellulose based layer. The first cellulose based layer has a weight per square meter comparable or lower than that of a cellulose layer used to form standard packages for cigarettes known in the art. The rigidity and the mechanical properties of the container according to the invention are preferably similar to those of a cigarette packages known in the art. The "loss" of rigidity due to a lower weight per square meter is compensated by the presence of the first polymeric layer.

Preferably, the second paper material layer has a basis weight comprised between 40 grams per square meter and 60 grams per square meter. The second cellulose based sheet

included in the outer wrapper is preferably relatively light, because it does not have to give structural stability to the container.

Preferably, the first polymeric layer has a basis weight comprised between 4 grams per square meter and 10 grams per square meter, more preferably between 4 grams per square meter and 6 grams per square meter.

Preferably, the third polymeric layer has a basis weight comprised between 4 grams per square meter and 10 grams per square meter between 4 grams per square meter and 10 grams per square meter.

Preferably, the second polymeric layer has a basis weight comprised between 5 grams per square meter and 12 grams per square meter.

The polymeric layers are selected to have a weight that is enough to achieve the desired heat sealability or moisture barrier properties.

Preferably, the heat sealable layer has a melting point measured according to differential scanning calorimetry (DSC) is lower than 100 degrees Celsius. More preferably, the heat sealable layer has a melting point measured according to differential scanning calorimetry (DSC) is lower than 80 degrees Celsius. A temperature is the claimed range allows to obtain an optimal seal with the materials forming the container without damaging the same.

Preferably, the heat sealable layer has a melting flow index at 190 degrees Celsius and 2.16 kilograms of applied force above 100 grams per minute.

Containers realized according to the invention find particular application as containers for elongate aerosol-generating articles such as, for example, cigarettes, cigars, cigarillos or other aerosol generators that rely on heating rather than burning tobacco, for example through an electrical heat source or carbon heat source. 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 aerosol generating articles. Alternatively, other consumer goods may be housed inside the container.

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 aerosol-generating articles. The aerosol-generating articles may be arranged in different collations, depending on the total number of aerosol-generating articles.

Containers formed according to the invention may be in the shape of a rectangular parallelepiped, with right-angled longitudinal and right-angled transverse edges. Alternatively, the container may comprise one or more rounded longitudinal edges, rounded transverse edges, bevelled longitudinal edges or bevelled transverse edges, or combinations thereof. Alternatively, the container may have a non-rectangular transversal cross section, for example polygonal such as triangular or hexagonal, semi-oval or semi-circular.

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 aerosol-generating articles housed inside the container.

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 (comprising the hinge between box and lid).

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.

Where the container comprises aerosol-generating articles, the container may further comprise waste-compartments (for example for ash or butts) or other consumer goods, for example matches, lighters, extinguishing means, breath-fresheners or electronics. The other consumer goods may be attached to the outside of the container, contained within the container along with the aerosol-generating articles, in a separate compartment of the container or combinations thereof.

The term "inner surface" is used throughout the specification to refer to the surface of a component of the assembled container that is facing towards the interior of the container, for example towards the consumer goods, when the container is in the closed position. The term "outer surface" is used throughout the specification to refer to the surface of a component of the container that is facing towards the exterior of the container. For example, the front wall of the container has an inner surface that is facing the inside of the container and the consumer goods, and an outer surface facing away from the consumer goods. It should be noted that the inside or outside surface is not necessarily equivalent to a certain side of a blank used in the assembly of the container. Depending on how the blank is folded around the consumer goods, areas that are on the same side of the blank can either face towards the inside or the towards the outside of the container.

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 an access opening of the container at the top 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 back wall of the outer hinge-lid container is the wall comprising the hinge line.

The term "width" is used to describe the dimension of an element, such as a panel of a blank or a wall of a container as measured in the transverse direction.

The term "panel" is used throughout this specification to refer to a portion of the blank that is used to form a wall in the assembled container. A panel may depend along one or more fold lines from one or more other panels.

The term "fold line" refers to a fold between two adjacent panels. When forming the container, adjacent panels are folded along their common fold line, which may come to define an edge of the container or of a portion of the container.

In the assembled container a "wall" may be formed of one or of several overlying panels. Where there are several overlying panels, these may be attached to each other, for example by means of an adhesive. Further, a wall may be formed from two or more abutting or overlapping panels.

The term "height" is used to describe the dimension of one such element as measured in a direction perpendicular to the width of the element. When describing an element of the blank, reference is generally made to the element in the flat state of the blank.

The term "thickness" is used herein to refer to the minimum distance measured between two opposite surfaces of the sheet blank or of a layer of the sheet blank. In practice, the distance at a given location is measured along a direction locally perpendicular to the opposite surfaces.

The "thickness" of layer will generally be substantially constant over the layer (flat profile). However, local variations may be possible where portions of the sheet blank are, for example, embossed, debossed, weakened, and so forth.

The term "hinge line" refers to a line about which the lid may be pivoted in order to open the hinge-lid housing. A hinge line may be, for example, a fold line or a score line in the panel forming the back wall of the container.

The term "weakened line" is used herein to describe a portion of a surface of the container or package (or the blank from which the container or package is formed) wherein the structural strength of the material, from which the container or package (or blank) is formed has been weakened by any suitable technique, for example with respect to bending, folding or tearing along the line of weakness. For example, a line of weakness may be formed as a scoring line, a creasing line, an ablation line, or a perforation line. Lines of weakness can be created by removal of material, by displacement of material, by compression of material, by locally reducing the forces that hold the material together, such as by breaking fibres in a fibrous material, as well as by combinations of all the above. A

line of weakness may be straight, curved, segmented or continuous or a combination thereof. In many instances, a line of weakness is used to assist in positioning a fold line in a blank. A line of weakness can also be used to strengthen the material in a direction perpendicular to the line of weakness, for example by compression. Further, a line of weakness can be used for decorative purpose.

The term "scoring line" is used to describe a line formed by partially cutting into the material of the blank. A scoring line may be formed by removing material from the blank (in which case the scoring line forms a groove or trough in the blank). As an alternative, a scoring line may be formed without removing any material from the blank, typically involving a partial sideways displacement and compression of material, caused by a knife with a non-zero thickness penetrating the material. The depth of the scoring line will be less than the thickness of the blank.

The term "creasing line" is used to describe a line formed by displacing a portion of the material vertical to the plane of the blank, forming a groove or trough in the blank. The displacement may involve compression and typically involves the use of a compression tool, such as a roller. Alternatively, or in addition, the material in the creasing line may be displaced so as to at least partially protrude from the opposite side of the blank. Generally, no material is removed when a creasing line is formed.

The term "ablation line" is used to describe a line formed by removing material from a surface of the blank to a predetermined depth by way of ablation (for example, by way of a laser beam or a blade).

The term "perforated line" is used to describe a line or sequence of discrete holes or slots in the blank. The holes may be formed by pushing an object through the blank. This may result in material being removed from the blank, for example by punching. Alternatively, the holes could be created without removing material, and instead simply using the object to push the material outwardly from the centre of the hole. As another alternative, the holes may be formed by way of a laser beam.

The term "fold line" is used to describe any line of a blank about which the blank is folded. The fold line may be defined by a line of weakness to assist with the folding action. Alternatively, a fold can be formed without the presence of a weakened line, depending for example on the pliability of the blank material and other material characteristics.

In the framework of the present invention, paper is a sheet of material produced by mechanically and/or chemically processing cellulose fibres in water. The cellulose fibres may derive from wood, rags, grasses or other vegetable sources. The water is then drained, for example through fine mesh, leaving the fibre evenly distributed on the surface, followed by pressing and drying. The sheet of paper may also comprise in addition to the pulp also fillers, and additives. The used pulp can be bleached or unbleached and obtained from a variety of processes. Among those, suitable pulp types are hardwood kraft pulp, softwood

kraft pulp, sulfite pulp or other chemical pulp, mechanical pulp, thermomechanical pulp, chemi-thermomechanical pulp, or other types of mechanical pulp, recycled paper pulp can also be used. For the purpose of this invention, thermomechanical pulp, chemi-thermomechanical pulp (CTMP), chemical pulp or their blends, are preferred.

As used herein, aerosol-forming article is any article that generates an inhalable aerosol when an aerosol-forming substrate is heated. The term includes articles that comprise an aerosol-forming substrate that is heated by an external heat source, such as an electric heating element. An aerosol-forming article may be a non-combustible aerosol-forming article, which is an article that releases volatile compounds without the combustion of the aerosol-forming substrate. An aerosol-forming article may be a heated aerosol-forming article, which is an aerosol-forming article comprising an aerosol-forming substrate that is intended to be heated rather than combusted in order to release volatile compounds that can form an aerosol. The term includes articles that comprise an aerosol-forming substrate and an integral heat source, for example a combustible heat source.

Aerosol-forming articles according to the present invention may be in the form of filter combustible cigarettes or other smoking articles in which tobacco material is combusted to form smoke.

Preferably, the aerosol-forming article may be substantially cylindrical in shape. The aerosol-forming article may be substantially elongated. The aerosol-forming article may have a length and a circumference substantially perpendicular to the length. The aerosol-forming article may have a total length between about 30 millimetres and about 100 millimetres. The aerosol-forming article may have an external diameter between about 5 millimetres and about 12 millimetres.

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

Example Ex1: A method of making a container for consumer goods, the method comprising:

- forming a first multi-layer, the first multi-layer comprising a first cellulose based layer and a first polymeric layer;
- folding the first multi-layer to form a package, the package defining a housing for the consumer goods, wherein the first multi-layer is so folded that the first polymeric layer is provided on an outer side of the first cellulose based layer;
- forming an outer wrapper, the outer wrapper comprising a second cellulose based layer and a second polymeric layer;
- wherein one of the first polymeric layer and second polymeric layer is a moisture barrier layer and the other of the first polymeric layer and second polymeric layer is a heat sealable layer;

- wrapping the package with the outer wrapper, wherein the wrapping is made so that the second polymeric layer is provided on an inner side of the second cellulose based layer;
- heating the package and the outer wrapper to seal the outer wrapper on the package, forming the container.

Example Ex2: The method according to Ex1, wherein heating the package and the outer wrapper comprises:

- heating the package and the outer wrapper while applying pressure, to seal the outer wrapper on the package.

Example Ex3: The method according to Ex 1 or Ex2, comprising:

- folding the first multi-layer to form a package comprising a lid portion and a box portion, the box portion and the lid portion being divided by an opening line, the lid portion being hinged to the box portion;
- wrapping the box portion and the lid portion with the outer wrapper, the outer wrapper covering, at least in part, the opening line;
- heating the package and the wrapped outer wrapper to seal the outer wrapper on the package.

Example Ex4: The method according to Ex3, wherein the opening line comprises a first weakened line.

Example Ex5: The method according to Ex3 or Ex4, comprising the step of:

- covering the opening line with the outer wrapper completely.

Example Ex6: The method according to one or more of Ex1 – Ex5, wherein the first cellulose based layer defines an inner surface and an outer surface and wherein forming a first multi-layer comprises:

- coating the outer surface of the first cellulose based layer with the first polymer layer.

Example Ex7: The method according to one or more of Ex1 – Ex6, wherein the step of forming an outer wrapper comprises the step of forming an outer wrapper including a third polymeric layer.

Example Ex8: The method according to Ex7, wherein the second polymeric layer defines an inner surface and an outer surface, the second cellulose based layer defines an inner surface and an outer surface, and wherein the first polymeric layer is a heat sealable layer, and forming the outer wrapper comprises:

- coating the inner surface of the second cellulose based layer with the second polymer layer; and
- coating an inner surface of the second polymer layer with the third polymer layer.

Example Ex9: The method according to one or more of Ex1 – Ex8, comprising:

- folding the first multi-layer to form a package comprising a lid portion and a box portion, the box portion and the lid portion being divided by an opening line, the lid portion being hinged to the box portion;
- wrapping the box portion and the lid portion with the outer wrapper, the outer wrapper covering, at least in part, the opening line;
- forming a second weakened line on the portion of the outer wrapper covering the opening line.

Example Ex10: The method according to Ex9, comprising:

- opening the lid portion by tearing or breaking the second weakened line.

Example Ex11: The method according to Ex10 and Ex4, comprising:

- opening the lid portion by tearing or breaking the first weakened line and the second weakened line.

Example Ex12: The method according to one or more of Ex1 – Ex11, comprising:

- printing indicia regarding the consumer goods or the manufacturer of the consumer goods on the second cellulose based layer.

Example Ex13: The method according to one or more of Ex1 – Ex12, wherein forming a first multi-layer or forming an outer wrapper comprises forming the moisture barrier layer from an emulsion or dispersion of one or more of:

- a copolymer of styrene and acrylic esters;
- a copolymer of styrene and butadiene;
- a copolymer of ethylene and vinyl acetate;
- a copolymer of ethylene and acrylic or methacrylic acid;
- a polymer or copolymer of ethylene with propylene, 1-butene, isobutene, 1-octene, 1-hexene, norbornene;

and a wax.

Example Ex14: The method according to one or more of Ex1 – Ex13, wherein forming a first multi-layer or forming an outer wrapper comprises forming the heat sealable layer from an emulsion or dispersion of one or more of:

- a copolymer of ethylene;
- a copolymer of methacrylic acid;
- a copolymer of an ester of acrylic acid or methacrylic acid.

Example Ex15: A container for consumer goods, the container comprising:

- a package comprising a box portion and a lid portion, the package defining a housing for the consumer goods, the lid portion being hinged to the box portion by a hinge line, an opening line separating the box portion and the lid portion outside the hinge line, the box portion and the lid portion being formed by folding a first multi-layer blank comprising:
  - a first cellulose based layer;

- a first polymeric layer provided on an outer side of the first cellulose based layer;

- an outer wrapper wrapped and sealed on the package and covering at least partly the opening line, the outer wrapper comprising:
  - a second cellulose based layer;
  - a second polymeric layer provided on an inner side of the second cellulose based layer;
- wherein one of the first polymeric layer and second polymeric layer is a moisture barrier layer and the other of the first polymeric layer and second polymeric layer is a heat sealable layer.

Example Ex16: The container according to Ex15, wherein the opening line comprises a first weakened line.

Example Ex17: The container according to Ex15 or Ex16, wherein the outer wrapper comprises a third polymer layer.

Example Ex18: The container according to Ex17, wherein the third polymer layer is located on an inner side of the second polymer layer.

Example Ex19: The container according to Ex17 or Ex18, wherein the third polymer layer is a heat sealable layer.

Example Ex20: The container according to one or more of Ex15 - Ex19, wherein the outer wrapper comprises a second weakened line formed on the portion of the outer wrapper covering the opening line.

Example Ex21: The container according to Ex20 or the method according to Ex6, wherein the second cellulose based layer has a first thickness and the second weakened line includes an etched line having a depth not greater than 80 percent of the first thickness.

Example Ex22: The container according to one or more of Ex15 – Ex21, wherein the moisture barrier layer comprises one or more of:

- a copolymer of styrene and acrylic esters,
- a copolymer of styrene and butadiene,
- a copolymer of ethylene and vinyl acetate,
- a copolymer of ethylene and acrylic or methacrylic acid;
- a polymer or copolymer of ethylene with propylene, 1-butene, isobutene, 1-octene, 1-hexene, norbornene;

and a wax.

Example Ex23: The container according to Ex22, wherein the wax includes paraffins, microcrystalline wax or hydrocarbon wax.

Example Ex24: The container according to Ex22 or Ex23, or the method according to Ex13, wherein, in weight, the content of wax is comprised between 5 percent and 15 percent with respect to the weight of the polymer or copolymer.

Example Ex25: The container according to one or more of Ex15 – Ex24, wherein the heat sealable layer comprises one or more copolymer of:

- ethylene;
- acrylic or methacrylic acid;
- an ester of acrylic or methacrylic acid.

Example Ex26: The method according to one or more of Ex1 – Ex14 or the container according to one or more of Ex15 – Ex25, wherein the first cellulose based layer has a basis weight comprised between 180 grams per square meter and 270 grams per square meter.

Example Ex27: The method according to one or more of Ex1 – Ex14 or the container according to one or more of claims Ex15 – Ex28, wherein the second paper material layer has a basis weight comprised between 40 grams per square meter and 60 grams per square meter.

Example Ex28: The method according to one or more of Ex1 – Ex14 or the container according to one or more of Ex15 – Ex27, wherein the first polymeric layer has a basis weight comprised between 4 grams per square meter and 10 grams per square meter.

Example Ex29: The method according to one or more of Ex1 – Ex14 or the container according to one or more of Ex15 – Ex28, wherein the third polymeric layer has a basis weight comprised between 4 grams per square meter and 10 grams per square meter.

Example Ex30: The method according to one or more of Ex1 – Ex14 or the container according to one or more of Ex15 – Ex29, wherein the second polymeric layer has a basis weight comprised between 5 grams per square meter and 12 grams per square meter.

Example Ex31: The method according to one or more of Ex1 – Ex14 or the container according to one or more of Ex15 – Ex30, wherein the heat sealable layer has a melting point measured according to differential scanning calorimetry (DSC) lower than 100 degrees Celsius.

Example Ex32: The method according to one or more of Ex1 – Ex14 or the container according to one or more of Ex15 – Ex31, wherein the heat sealable layer has a melting flow index at 190 degrees Celsius and 2.16 kilograms of applied force above 100 grams per minute.

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

- Figure 1 is a perspective schematic view of a component of a container according to the invention;
- Figure 2 is a front view of an element of the component of the container of figure 1;
- Figure 3 is an enlarged side view of the element of the component of figure 2;
- Figure 4 is a front view of an element of another component of the container according to the invention;
- Figure 5 is an enlarged side view of the element of figure 2;

- Figures 6 – 13 are perspective views of steps of the method for the realization of the container of figure 1;
- Figure 14 is a graph showing comparative tests between the container of the invention and prior art container in a first condition;
- Figure 15 is a graph showing comparative tests between the container of the invention and prior art container in a first condition;
- Fig. 16 is a schematic enlarged view of a detail of Fig. 6; and
- Fig. 17 is a schematic enlarged view of a detail of Fig. 7.

Figure 1 shows a package 10 in accordance with the present invention. The package 10 has the shape of a rectangular parallelepiped and includes a box portion 14 and a lid portion 16. The parallelepiped defines a back wall 21, a front wall 22, a left side wall 23, a right side wall 24, a bottom wall 25 and a top wall 26.

The lid portion 16 is hinged about a hinge line 17 extending across a back wall of the parallelepiped and is pivotable between an open position (shown in Figure 1) and a closed position. Further, the package 10 defines a housing or inner volume 18 containing for example a group of aerosol generating articles (not shown in the drawings). When the package 10 is closed, the lid portion 16 and the box portion 14 defines an opening line 19 which is the separation line between the lid portion and box portion. The opening line 19 is the geometrical continuation of the hinge line 17. The opening line 19 is formed on the left side wall 23, right side wall 24 and on the front wall 22.

In a different embodiment (not depicted), the opening line is not a cut, it is for example perforated, and therefore the package cannot be opened (that is, the lid portion 16 cannot rotate around the hinge line, unless the opening line is broken).

The package 10 is formed from a sheet blank 100 depicted in figure 2 and 3. As illustrated in the lateral view of figure 3, the sheet blank 100 comprises a first cellulose based layer 30 comprising a cellulosic material and a first polymeric layer 31 having either heat sealing properties, or moisture barrier properties, or both. The first polymeric layer 31 is provided on an outer side of the first cellulose based layer 30. In more detail, the first cellulose based layer 30 is formed from a sheet of a paper-based material. Preferably, the first polymeric layer is a heat sealable layer. Preferably, the first cellulose based layer 30 has a weight comprised between 180 gsm and 270 gsm. Preferably, the first polymeric layer 31 has a weight comprised between 4 gsm and 10 gsm.

The sheet blank 100 is folded in such a way that the first cellulose based layer 30 is the inner layer and the first polymeric layer 31 is the outer layer of the package 10.

The package 10 formed by suitably folding the sheet blank 100 is then wrapped using an outer wrapper in order to form a container 1 (shown in figure 13) to contain consumer goods (not shown) for containing aerosol generating articles.

The outer wrapper is formed from a sheet blank 101 depicted in figure 4 and 5. As illustrated in figure 5, the sheet blank 101 comprises a second cellulose based layer 40 comprising a second cellulosic material, a second polymeric layer 41 having either heat sealing properties, or moisture barrier properties, or both, and a third polymeric layer 42 having either heat sealing properties, or moisture barrier properties, or both. The second polymeric layer 41 is provided on an inner side of the second cellulose based layer 40. The third polymeric layer 42 is provided on an inner side of the second polymeric layer 41. In more detail, the second cellulose based layer 40 is formed from a sheet of a paper-based material. Preferably, the third polymeric layer is a heat sealable layer and the second polymeric layer is a moisture barrier layer. Preferably, the second cellulose based layer 40 has a weight comprised between 40 gsm and 60 gsm. Preferably, the third polymeric layer has a weight comprised between 4 gsm and 10 gsm. Preferably, the second polymeric layer has a weight comprised between 6 gsm and 12 gsm. Preferably, the thickness of the second cellulose based layer is comprised between 30 micrometers and 50 micrometers.

In order to form the container 1, the outer wrapper formed by blank sheet 101 is wrapped around the package 10 as shown in figure 6 – 13.

First, on the blank sheet 101, a second weakened line 45 is formed. The second weakened line 45 is formed on the blank sheet 101 in such a way that, when the black sheet 101 is wrapped around the package 10, the second weakened line 45 is congruent to the opening line 19, as it is visible in figures 11 - 13.

The second weakened line 45 may be manufactured with a laser scoring process or partial mechanical cutting of the paper over its thickness without damaging the sealable and moisture barrier layers.

The second weakened line 45 is formed on the second cellulose based layer 40. The scoring is done on the side of the second cellulose based layer 40 which becomes the outer surface of the container 1. The depth of the scoring is controlled in order not to impact the moisture barrier properties of the second polymeric layer 41.

Considering the scoring tolerances for both laser and mechanical processes and to have good functionality (ease of opening), the scoring depth is preferably between 50 percent to 80 percent of the thickness of the second cellulose based layer. For laser scoring 1000 watts CO_2 laser may be used. Beam control of the laser may take place through a scanner. Process may be reel-to-reel with speed of 200 meters/minute.

In case of mechanical scoring, a rotary cutting unit may be used. The operation is performed inserting the second cellulose based layer between knife of the cutting unit and a blind counter roller. Distance between knife and counter roller is between 15 micrometers to 30 micrometers depending on the substrate.

The sheet blank 101 of the outer wrapper is put in abutment with the right side wall 24 of the package 10 (see figure 6). The sheet blank 101 is positioned in such a way that the

third polymeric layer 42 contacts the first polymeric layer at the right side wall 24. The third polymeric layer 42 is thus the inner layer of the outer wrapper and the second cellulose based layer 40 is the outer layer of the outer wrapper.

The enlarged view in figure 16 shows how blank 101 is applied to package 10, putting the blanck into contact with the package. Two fold lines 102, 103 are formed in the sheet blank 101, corresponding to the location of the two corners 27, 28 formed between the back wall 21 and the right side wall 24 and the front wall 22 and the right side wall 24, respectively. This is depicted in figure 7. The sheet blank 101 is then compressed against the side wall 24 as depicted by the arrows in the inlet of figure 17.

The blank sheet 101 is then folded at the two fold lines 102, 103, so that the front wall 22 and back wall 21 of the package 10 are also in contact with the outer wrapper. This is depicted in figure 8.

The package 10 is then preferably re-oriented in order to facilitate wrapping, for example the left side wall 23 may now face upwards, as shown in figure 9.

Two additional fold lines are then formed in the sheet blank 101, fold lines 104, 105, corresponding to the location of the two corners 29, 51 formed between the back wall 21 and the left side wall 23 and the front wall 22 and the left side wall 23, respectively. The sheet blank 101 is then folded at the two fold lines 104, 105 and two opposite flaps of the sheet blank overlaps on the left side wall 23. This is depicted in figure 10. A panel of sheet blank 101 is formed thus on the left side wall 23, right side wall 24, front wall 22 and back wall 21 of package 10. In this way, the whole opening line 19 and the hinge line 17 are covered by the outer wrapper.

The package 10 and outer wrapper are then preferably re-oriented, so that the front wall 22 now faces upwards, as in figure 11.

The sheet blank 101 is then folded in a known manner in order to cover top wall 26 and bottom wall 25 of the package 10. This is shown in figure 12 and 13. In figure 13, the whole package 10 is covered by the outer wrapper, which form a panel on each wall of the package 10. The second weakened line 45 is located congruent to the opening line 19 located underneath.

Heat and pressure is applied to fix and join the outer wrapper to the package 10. For example, a temperature of 110 degrees Celsius, and a pressure of 1 Newton persquare centimetre (N/cm^2) are applied for a time of 100 milliseconds. These conditions provides a satisfactory seal and high adhesion.

Example 1 Outer wrapper

A first embodiment of sheet blank 101 is given.

The second cellulose based layer 40 is a 45 gsm paper layer.

The 45 gsm paper is coated with 10 gsm of wax modified styrene acrylic dispersion using a rod coater, forming the second polymeric layer 41.

The used dispersion is provided by Trueb Chemie under the trade name TB16. This dispersion is diluted with water to obtain a solid content of 40 percent.

The coating is dried with a convection oven at a temperature not exceeding 90 degrees Celsius and sheet blank 101 is formed.

Instead of TB16, dispersions comprised of a paraffin wax having a melting point of 60 degrees Celsius (°C) and a styrene acrylate latex obtained from the emulsion polymerization of styrene, butyl-acrylate, ethyl-hexyl metacrylate and acrylic acid can be used as the second polymeric layer. Preferred copolymers comprise 60-80 mol% of Styrene and up to 20% of acrylic esters.

The paraffin wax can be added either during the emulsion polymerization or on a premade emulsion, a typical wax content is 10 percent. Preferably, wax is below 15 percent with respect to polymer content because higher content of wax may lead to unstable dispersions.

The resulting coated paperboard has a moisture permeability comprised between 20-30 g/m2/atm/day measured at 38 degrees Celsius and 90RH according to ASTM F3299.

Example 2 Outer wrapper

The sheet blank 101 of Example 1 is prepared.

An additional 4-5 gsm coating layer is applied on the second polymer layer for enhanced sealability and barrier. This coating is the third polymer layer and is formed by a dispersion of a low molecular weight ethylene acrylic acid copolymer (Primacor 5980I). This coating is applied from a water dispersion comprised of Primacor 5980I and 10 percent wt of wax (with respect to Primacor 5980I). The used dispersion had a solid content of 35 percent.

The drying of the resulting multi-layer comprising the second cellulose based layer, the second polymer layer and the third polymer layer is made at a temperature of 80 degrees Celsius in a convection oven.

Example 3 Outer wrapper

A 45 gsm calendered paper, as the second cellulose based layer, is coated with 10 gsm of a second polymer layer material described as follows.

A wax modified styrene acrylic dispersion is formed as described in example 1.

To this dispersion, inorganic pigments such as Kaolin, Vermiculite, Calcium Carbonate ($CaCO_3$) are added to reach a 50/50 ratio by weight of pigment/polymer dispersion. The inorganic pigments may improve the moisture barrier properties of the so formed polymeric layer.

Water is added to keep the total solid content of the resulting dispersion below 55% wt.

The resulting coated paper formed by the second cellulose based layer and second polymeric layer has a moisture permeability comprised between 20-35 g/m2/atm/day measured at 38 degrees Celsius and 90RH according to ASTM F3299.

An additional 4-5 gsm sealable coating layer is applied for enhanced sealability and barrier. This coating as third polymeric layer is described in Example 2.

Blank sheet 101 according to Examples 2-3 may be printed with Brand information, health warnings and design on the uncoated surface of the second cellulose based layer.

The second cellulose based layer is laser scored to allow easy opening and tamper evidence. Care must be taken to have a laser scoring (etching) that will not cut more than 80 percent of the second cellulose based layer's thickness, thus avoiding to damage the moisture barrier and sealable layers.

Example 4 – first multi-layer

A 180-270 gsm paperboard is used as the first cellulose based layer.

The 180-270 gsm paperboard is coated with 10 gsm of wax modified styrene acrylic dispersion on the surface intended for the outer side of the package, forming the first polymeric layer. This dispersion is formed as described in Example 1.

This sheet blank 100 may be lacquered according to standard techniques in the field of cigarette packaging. Standard lacquering in a coating with a polymer layer which does not have heat sealable or moisture barrier properties. The basis weight of the standard lacquering layer is less than 4 gsm.

The resulting multi-layer has a moisture permeability comprised between 10-20 g/m2/ day measured at 38 degrees Celsius and 90RH according to ASTM F3299.

Example 5 – first multi-layer

A 180-220 gsm paperboard is used as the first cellulose based layer.

The 180-220 gsm paperboard is coated with 10 gsm of wax modified styrene acrylic dispersion realized according to Example 1, forming the first polymeric layer.

The resulting multi-layer has a moisture permeability between 10-20 g/m2/atm/day measured at 38C and 90RH according to ASTM F3299.

An additional 4-5 gsm coating layer is applied for enhanced sealability and barrier and it comprises a dispersion of a low molecular weight ethylene acrylic acid copolymer (Primacor 5980I from SK Chemicals). This coating is applied from a water dispersion the same and 10% wt of wax (with respect to Primacor 5980I). The used dispersion had a solid content of 35%. This layer, a forth polymeric layer, is applied on the first polymeric layer.

Preferred polymers from which a water dispersion is made to form the first polymeric layer or the third polymeric layer or both with heat sealable properties are:

Tradename	**Description**	**Use**
Primacor 5980I	Copolymer of ethylene and acrylic acid	Moisture Barrier Layer with excellent sealability. Especially if mixed with paraffin

TECSEAL E-799/35	Waterborne EAA-copolymer dispersion containing paraffin	Moisture Barrier Layer with excellent sealing properties
Aquaseal X-2258	Aqueous dispersion of ethylene copolymer and paraffin wax	Moisture Barrier and sealing layer

Preferred polymers from which a water dispersion is made to form the second polymeric layer with moisture barrier properties are:

Tradename	**Description**	**Use**
TECRYL PB-16	Waterborne styrene acrylate-copolymer dispersion containing paraffin	Moisture Barrier Layer, limited sealing properties
Aquaseal X-2088	Propylene Copolymer Dispersion, can be combined with paraffin	Moisture Barrier and sealing layer
Aquaseal X-2200	Aqueous dispersion of ethylene copolymer	Moisture Barrier and sealable layer

These polymers are to be combined with a wax.

Comparative Examples

Comparative Examples have been made comparing the performances of the container 1 according to the invention with the following:

Comparative container A (BOPP film): 20 cigarettes hinge lid packages formed by a lacquered 180-270 gsm paperboard and wrapped with 16 microns BOPP film. This container A is represented as a dashed line in the figures 14 and 15.

Comparative container B (No Film): 20 cigarettes hinge lid packages formed by a lacquered 180-270 gsm paperboard without wrapping film (no barrier). This container B is represented as a dotted line in the figures 14 and 15.

Container of the invention (Paper Barrier): 20 cigarettes packages were prepared with hinge lid packages made of the sheet blank 100 of Example 4, and wrapped with sheet blank 101 realized according to Example 2. This container C is represented as a continuous line in the figures 14 and 15.

Containers A and B and the container C of the invention were placed in climatic chambers to simulate extreme environmental conditions (called in the drawings and in the following Jungle and Desert), humidity uptake or loss was monitored via Oven Volatiles Method.

The graphs of figures 14 and 15 show that the containers according to the invention have a moisture intake or loss similar to comparative container A (cigarettes packed in BOPP film). Oven Volatiles (OV in the drawings) were measured according to method: DETERMINATION OF MOISTURE CONTENT (OVEN VOLATILES) OF TOBACCO AND TOBACCO PRODUCTS, CORESTA Recommended Method No. 76 (published in July 2017 https://www.coresta.org/sites/default/files/technical_documents/main/CRM_76-July2017. The results are shown in figure 14 and 15.

In figure 14, the conditions "jungle" are applied. The containers A, B and container C of the invention are kept at a temperature of 32 degrees Celsius and a relative humidity of 85 percent. In the container B, the moisture in the container immediately increases. Container A and container C of the invention, as shown by the solid line and dashed line, have a very similar behaviour, that is the oven volatiles slowly increase within 90 days.

In figure 15, the conditions "desert" are applied. The containers A, B and of the invention are kept at a temperature of 43 degrees Celsius and a relative humidity of 15 percent. In the container B, the moisture in the container immediately disappears. Container A and container of the invention, as shown by the solid line and dashed line, have a very similar behaviour, that is the oven volatiles slowly decrease within 90 days.

For the purpose of the present description and of the appended claims, except where otherwise indicated, all numbers expressing amounts, quantities, percentages, and so forth, are to be understood as being modified in all instances by the term "about". Also, all ranges include the maximum and minimum points disclosed and include any intermediate ranges therein, which may or may not be specifically enumerated herein. In this context, therefore, a number A is understood as A ± 10 percent of A. Within this context, a number A may be considered to include numerical values that are within general standard error for the measurement of the property that the number A represents. The number A, in some instances as used in the appended claims, may deviate by the percentages enumerated above provided that the amount by which A deviates does not materially affect the basic and novel characteristic(s) of the claimed invention. Also, all ranges include the maximum and minimum points disclosed and include any intermediate ranges therein, which may or may not be specifically enumerated herein.

Claims

1. A method of making a container for consumer goods, the method comprising:

- forming a first multi-layer, the first multi-layer comprising a first cellulose based layer and a first polymeric layer;
- folding the first multi-layer to form a package comprising a lid portion and a box portion, the box portion and the lid portion being divided by an opening line, the lid portion being hinged to the box portion, the package defining a housing for the consumer goods, wherein the first multi-layer is so folded that the first polymeric layer is provided on an outer side of the first cellulose based layer;
- forming an outer wrapper, the outer wrapper comprising a second cellulose based layer and a second polymeric layer;
- wherein one of the first polymeric layer and second polymeric layer is a moisture barrier layer and the other of the first polymeric layer and second polymeric layer is a heat sealable layer;
- wrapping the package with the outer wrapper, the outer wrapper covering, at least in part, the opening line, wherein the wrapping is made so that the second polymeric layer is provided on an inner side of the second cellulose based layer;
- heating the package and the outer wrapper, to seal the outer wrapper on the package, forming the container.

2. The method according to claim 1, wherein the first cellulose based layer defines an inner surface and an outer surface and wherein forming a first multi-layer comprises:

- coating the outer surface of the first cellulose based layer with the first polymer layer.

3. The method according to one or more of the previous claims, wherein forming an outer wrapper comprises forming an outer wrapper including a third polymeric layer.

4. The method according to claim 3, wherein the second cellulose based layer defines an inner surface and an outer surface, wherein the first polymeric layer is a heat sealable layer, and forming the outer wrapper comprises:

- coating the inner surface of the second cellulose based layer with the second polymer layer;
- coating an inner surface of the second polymer layer with the third polymer layer.

5. The method according to one or more of the preceding claims, comprising:

- forming a second weakened line on the portion of the outer wrapper covering the opening line.

6. The method according to one or more of the preceding claims, wherein forming a first multi-layer or forming an outer wrapper comprises forming the moisture barrier layer from an emulsion or dispersion of one or more of:

- a copolymer of styrene and acrylic esters;
- a copolymer of styrene and butadiene;
- a copolymer of ethylene and vinyl acetate;
- a copolymer of ethylene and acrylic or methacrylic acid;
- a polymer or copolymer of ethylene with propylene, 1-butene, isobutene, 1-octene, 1-hexene, norbornene;

and a wax.

7. The method according to one or more of the preceding claims, wherein forming a first multi-layer or forming an outer wrapper comprises forming the heat sealable layer from an emulsion or dispersion of one or more of:

- a copolymer of ethylene;
- a copolymer of methacrylic acid;
- a copolymer of an ester of acrylic acid or methacrylic acid.

8. A container for consumer goods, the container comprising:

- a package comprising a box portion and a lid portion, the package defining a housing for the consumer goods, the lid portion being hinged to the box portion by a hinge line, an opening line separating the box portion and the lid portion outside the hinge line, the box portion and the lid portion being formed by folding a first multi-layer blank comprising:
  - a first cellulose based layer;
  - a first polymeric layer provided on an outer side of the first cellulose based layer;
- an outer wrapper wrapped and sealed on the package and covering at least partly the opening line, the outer wrapper comprising:
  - a second cellulose based layer;
  - a second polymeric layer provided on an inner side of the second cellulose based layer;
- wherein one of the first polymeric layer and second polymeric layer is a moisture barrier layer and the other of the first polymeric layer and second polymeric layer is a heat sealable layer.

9. The container according to claim 8, wherein the outer wrapper comprises a third polymer layer.

10. The container according to claim 9, wherein the third polymer layer is a heat sealable layer.

11. The container according to one or more of claims 8 - 10, wherein the outer wrapper comprises a second weakened line formed on the portion of the outer wrapper covering the opening line.

12. The method according to one or more of claims 1 – 7 or the container according to one or more of claims 8 – 11, wherein the first cellulose based layer has a basis weight comprised between 180 grams per square meter and 270 grams per square meter.

13. The method according to one or more of claims 1 – 7 or the container according to one or more of claims 8 – 12, wherein the second paper material layer has a basis weight comprised between 40 grams per square meter and 60 grams per square meter.

14. The method according to one or more of claims 1 – 7 or the container according to one or more of claims 8 – 13, wherein the first polymeric layer or the third polymeric layer has a basis weight comprised between 4 grams per square meter and 6 grams per square meter, or wherein the second polymeric layer has a basis weight comprised between 5 grams per square meter and 12 grams per square meter.

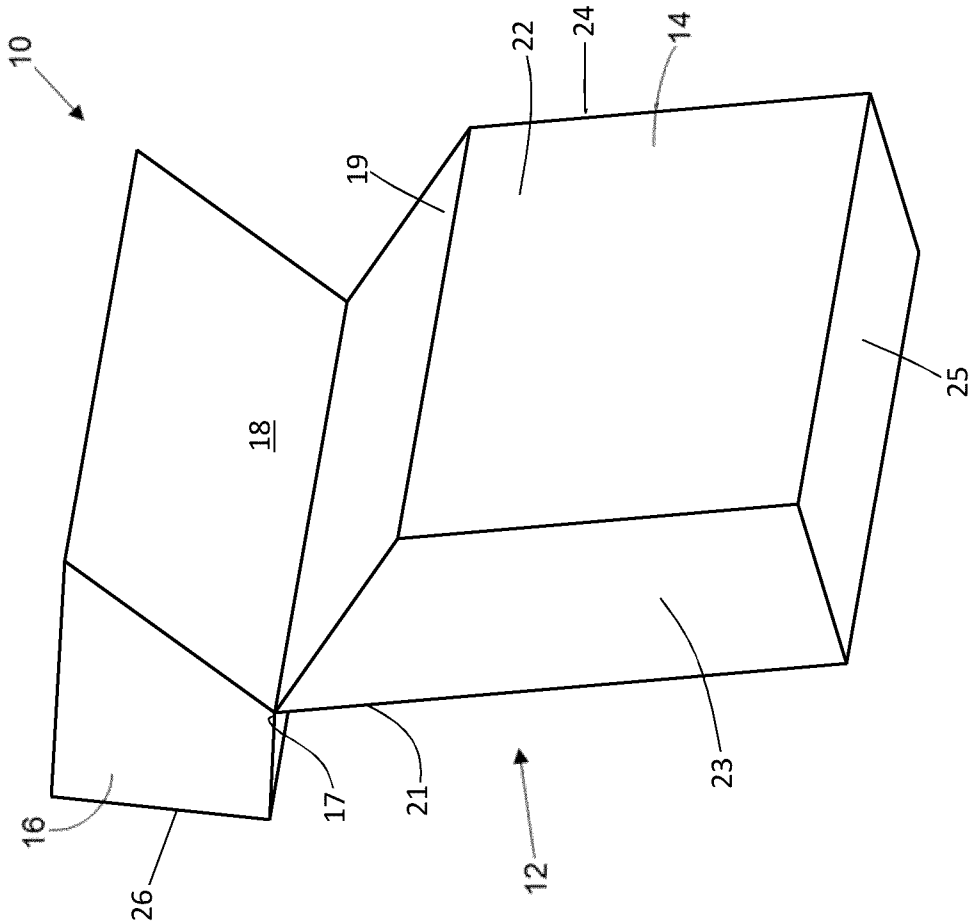

FIG. 1

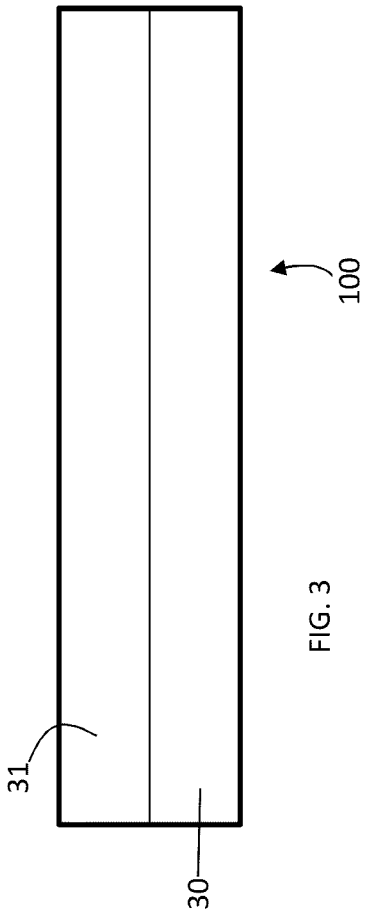

FIG. 3

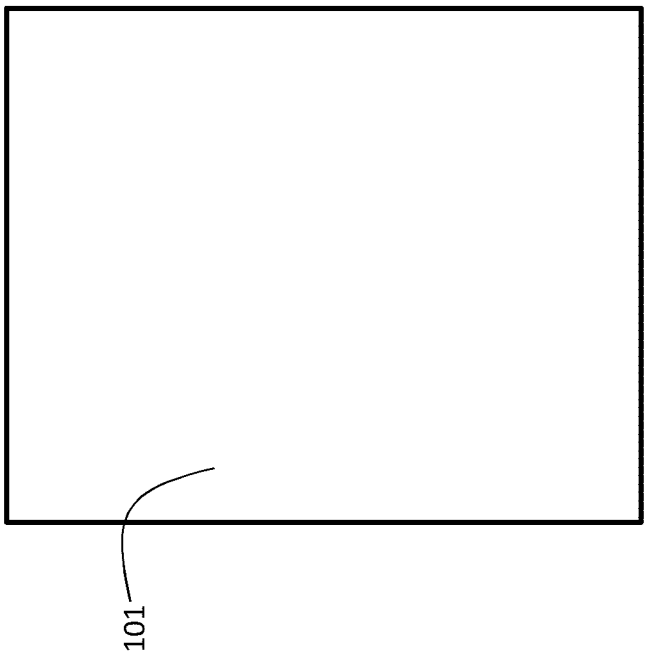

FIG. 4

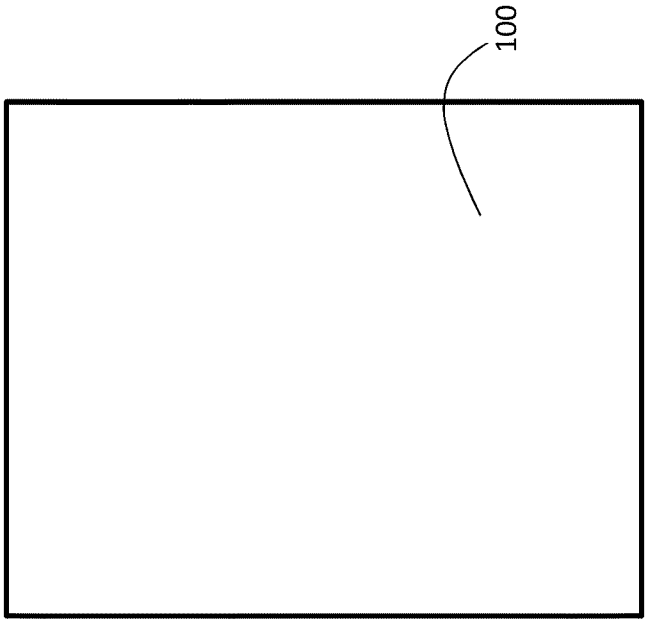

FIG. 2

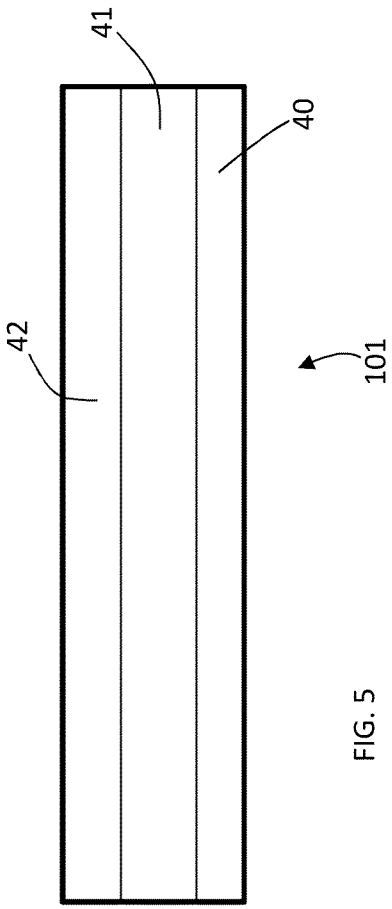

FIG. 5

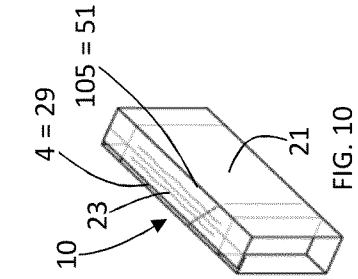

FIG. 10

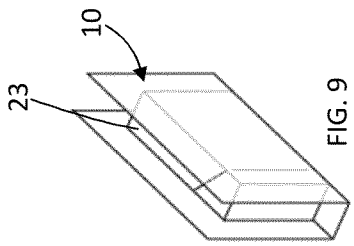

FIG. 9

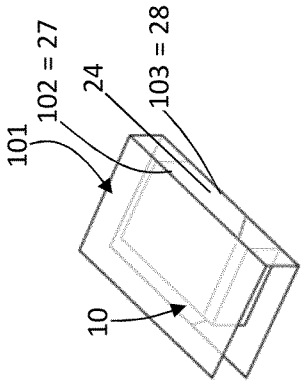

FIG. 8

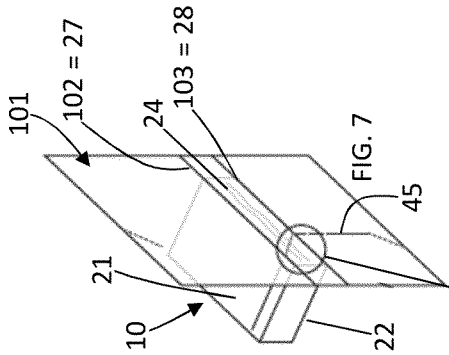

FIG. 7

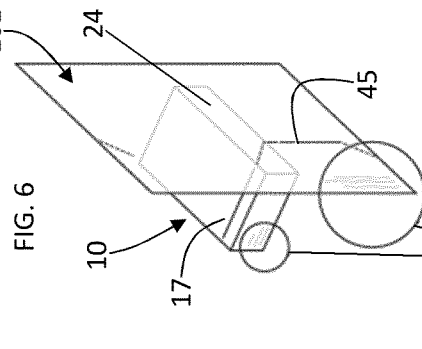

FIG. 6

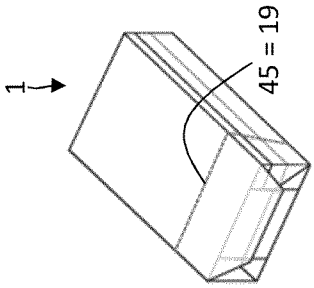

FIG. 13

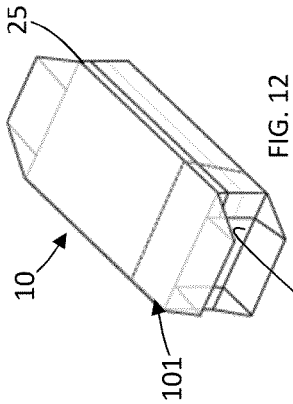

FIG. 12

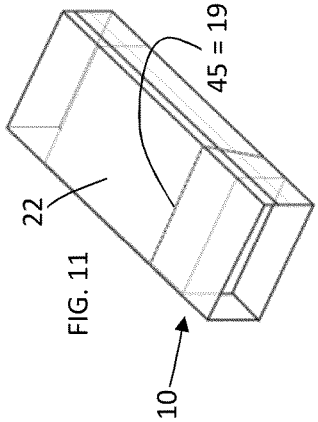

FIG. 11

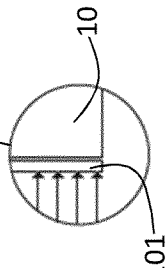

FIG. 17

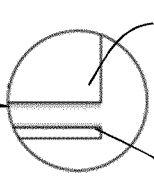

FIG. 16

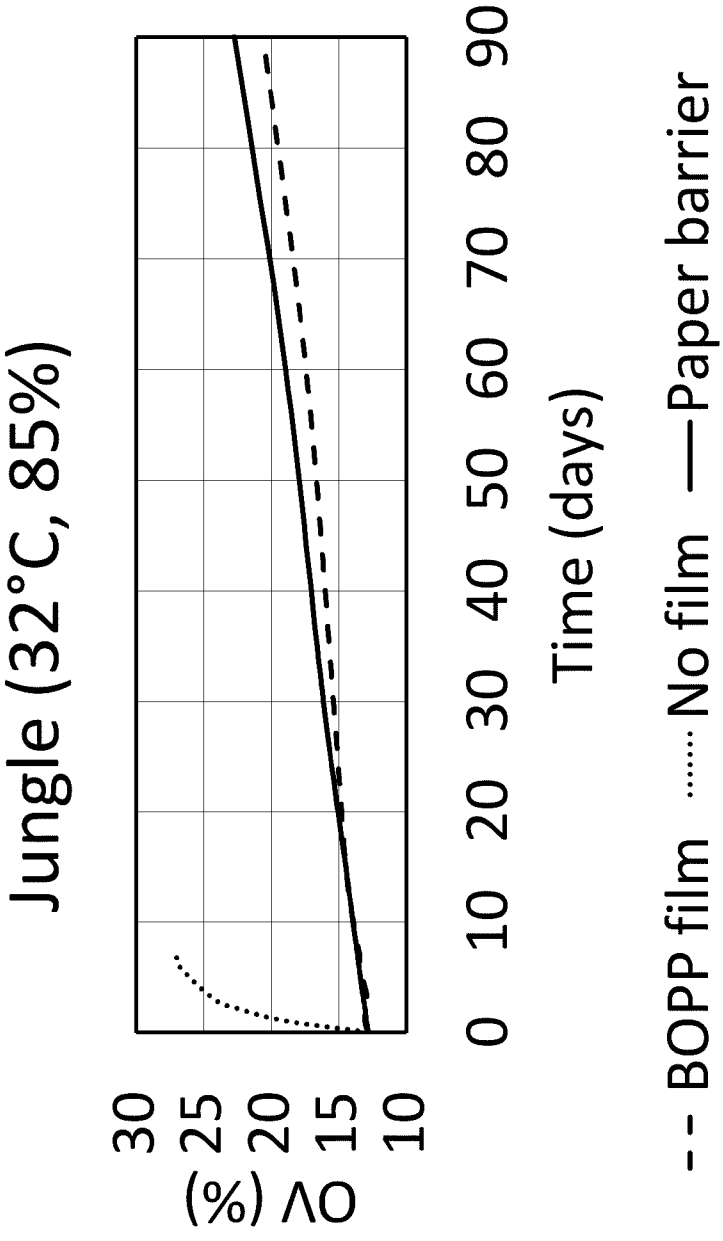
Jungle (32°C, 85%)
OV (%)
30
25
20
15
10
0
10
20
30
40
50
60
70
80
90
Time (days)
- - BOPP film ..... No film —Paper barrier

FIG. 14

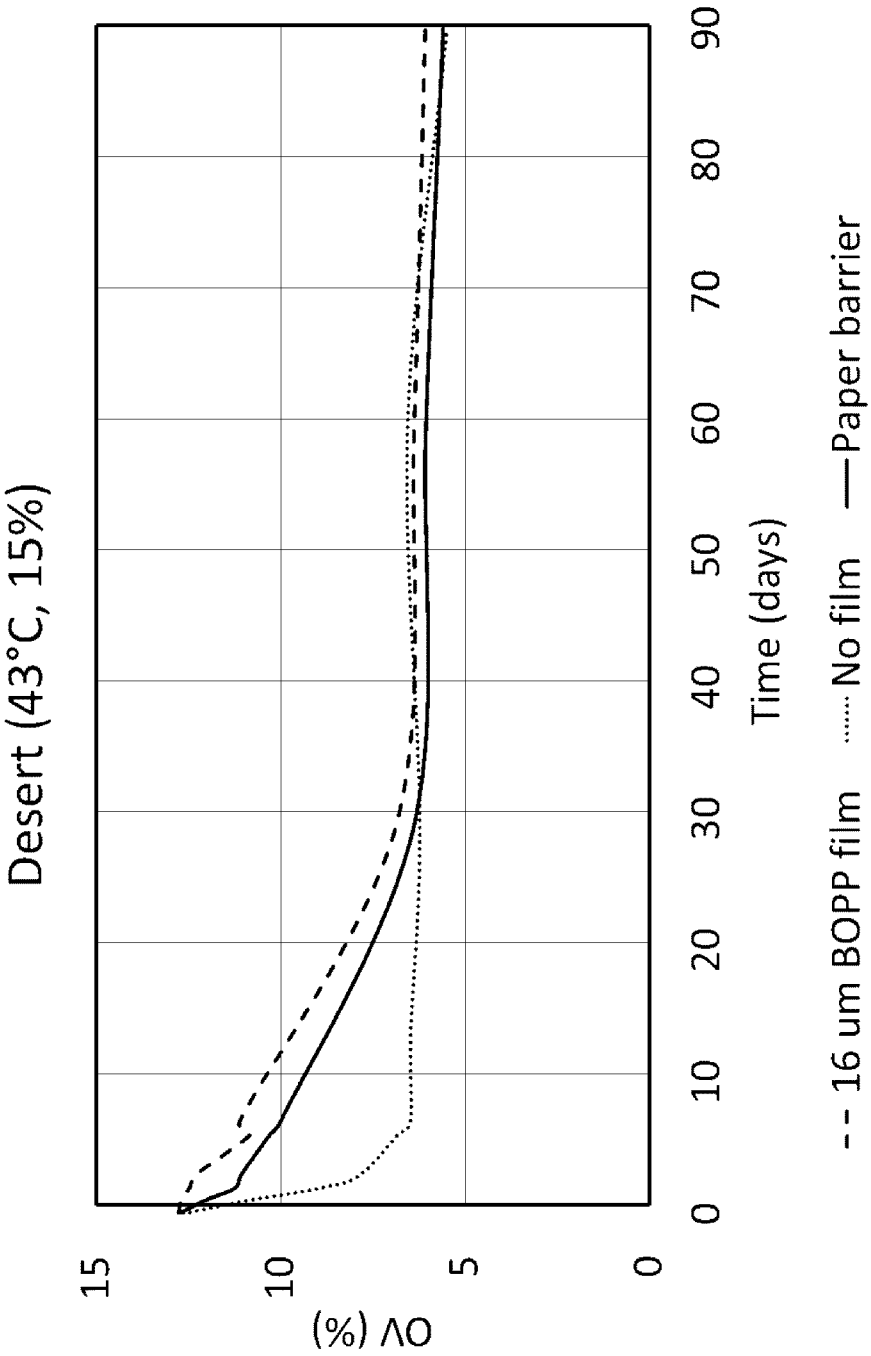
Desert (43°C, 15%)
OV (%)
15
10
5
0
0
10
20
30
40
50
60
70
80
90
Time (days)
- - 16 um BOPP film
..... No film
—Paper barrier

FIG. 15