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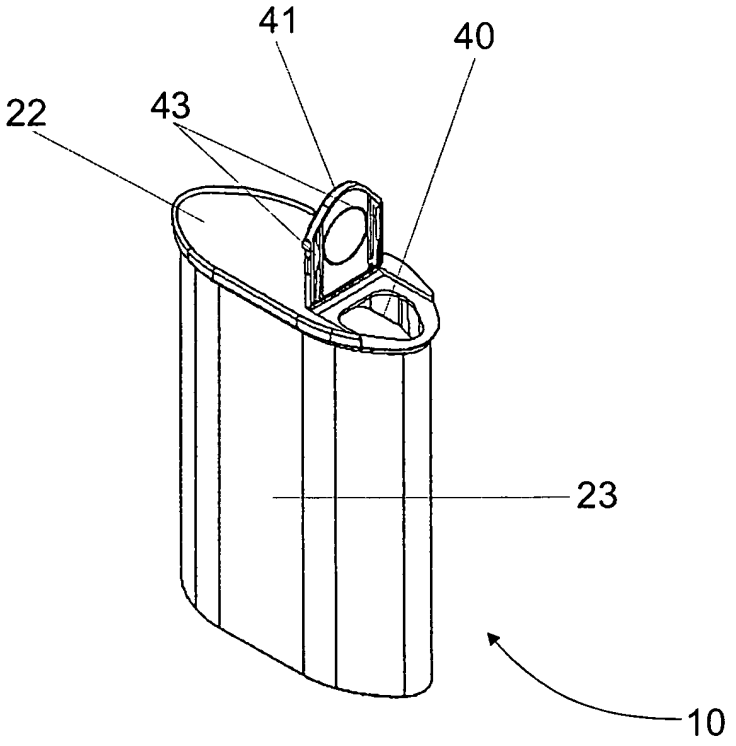
(54) Freshness-preserving pack for oblong articles

(57) The invention provides a pack (10) with increased gas pressure inside the pack (10) compared to the gas pressure surrounding the pack (10). The pack (10) contains one or more oblong articles, such as elongate tobacco products, in particular cigarettes.

Fig. 1



EP 1 637 469 A1

Description

[0001] The invention relates to freshness-preserving packs. Such packs are particularly suitable for oblong articles, in particular for elongate tobacco products.

[0002] Various types of packs are used to preserve the freshness of products, whose quality may suffer, for example, from exposure to air or light, loss of moisture or flavor, or the absorption of unpleasant odors. Known means to preserve the freshness of such products include, for example, wrapping the pack contents in an internal plastic bag, or over wrapping the pack with a suitable filmic barrier material. For example, cigarette packs are commonly provided with a cellophane or polypropylene overwrapper. Prior art documents disclosing packs designed to prolong shelf life and preserve the freshness of the packaged products include the following:

[0003] WO 99/28212 A1 describes a re-sealable rigid pack of smoking articles with a barrier material sealed around the pack. The rigid pack has a potential or actual access aperture extending from its top face into the front face of the pack. The barrier material has a line of severance or weakening defining a flap, which is in register with the access aperture.

[0004] EP 0 392 737 A1 discloses a freshness-preserving container of the hinge-lid type. The container comprises a mechanical freshness-preserving means between an inward facing surface of the lid front wall and an outward facing surface of the container front wall. Said means creates a clicking sound on closing of the container to indicate the freshness-preserving feature to the user.

[0005] GB 1 447 233 A1 discloses an air-impermeable tubular pack made of a rectangular blank consisting of a multi-layer air-impermeable material.

[0006] DE 27 43 048 A1 discloses a pack made from multi-layer pre-cut sheets, wherein the pre-cut sheets provide folding flaps, which can be connected to each other by means of heat or pressure. The outer surface of the pack consists of aluminum foil. The pack cannot be resealed.

[0007] There still is a need for improved packs which maintain the freshness of the packaged contents, in particular before the first opening of the pack. It is desirable that upon the first opening of the pack the user or the consumer has a means to check on the freshness-preserving qualities and integrity of the pack.

[0008] It is an object of the present invention to meet this and other needs.

[0009] The present invention provides a pack comprising an article or a plurality of articles, in particular one or more oblong articles, which pack is pressurized before the first opening. In said unopened and sealed state, the pack is substantially gas-impermeable. Preferably, the first opening of the pack creates an appropriate sound which is indicative of the freshness-preserving qualities and the integrity of the pack.

[0010] In the context of the present invention the term 'pressurized pack' means that before the first opening the pressure inside the pack is greater than the pressure outside the pack, that is atmospheric pressure. The atmospheric pressure may vary, for example between about 900 and about 1080 mbar at sea level. Preferably, the pressure difference is sufficiently high to generate an audible sound on the first opening of the pack. Advantageously, the pressure inside the pack is at least about 50 mbar above the pressure outside the pack, that is the relevant atmospheric pressure, preferably above 1130 mbar. On the other hand, the pressure inside the pack should be low enough that a decrease in atmospheric pressure, for example during transportation to another location, does not result in bursting of the pack. Preferably, the pressure inside the pack is less than about 500 mbar above atmospheric pressure (for an atmospheric pressure of 1000 mbar the pressure inside the pack is then less than about 1500 mbar). A pressure difference of between about 100 mbar and about 250 mbar (between the inside pressure and an atmospheric pressure of 1000 mbar) is particularly preferred.

[0011] The pressure difference between the inside and the outside of the pack is attained by feeding the pack (including its contents) with a suitable gas, including for example argon, carbon dioxide and nitrogen. Preferably, the gas is an inert gas. The most preferred gas is nitrogen. Advantageously, the packs are at least partially evacuated before being filled with said gas. Preferably, the packs are evacuated to at least 50 percent.

[0012] The packs of the invention have excellent freshness-preserving qualities over a prolonged period of time, in particular before the first opening of the pack, thus efficiently maintaining the quality of the packaged article or articles. For example, the desired moisture content or humidity level as well as the unique flavor of the packaged article or articles are substantially preserved until the pack is opened for the first time. The exchange between the pack contents and adverse external factors, such as air, light or unpleasant odors, is avoided. The pack content is effectively protected from drying out, from losing its original flavor or from taking on other flavors. One advantage of the packs provided herein is that an overwrapper and an inner foil is redundant.

[0013] The packs according to the invention comprise a bottom part, a top part and a web or sleeve forming the body or the main part of the pack and enveloping the content. The three parts are connected to each other such that the pack is substantially gas-impermeable (and preferably light-impermeable) and has the desired freshness preserving properties. While it is envisioned that the bottom part or the top part, or both, may be formed by the web, it is preferred that the three parts are structurally distinct and separate parts before their integration into the pack. Optionally, the pack may further comprise an inner frame.

[0014] Typically, the bottom part provides for a gas-inlet means which is available during manufacture of the pack. Such gas-inlet means is suitable for feeding the

gas into the pack and for establishing the desired pressure inside the pack. Suitable gas-inlet means are known in the art and include, for example, a valve, or, preferably, a small hole, which is completely closed, preferably sealed, after the gas-filling process has been completed. The small hole may be provided by fill port, for example a small tube. It is preferred that the gas-inlet means is unobtrusive on the finished pack.

[0015] Advantageously, the top part includes at least one actual or potential aperture which allows a packaged article to be removed by the consumer. An example for an actual aperture is a lid, for example a hinged lid, which allows for repeated opening and closing of the pack. A potential aperture is an aperture which is created by the user upon the first opening of the pack and may be defined by a line of weakening or severance, or by a removable or re-sealable label. Advantageously, the pack aperture or apertures are designed such that they do not compromise the freshness-preserving qualities of the pack.

[0016] The bottom part, the top part and the web are each made from materials which are substantially gas-impermeable and, if constituting distinct parts, which can be combined to provide for a substantially gas-impermeable pack. Methods for the suitable combination of the pack components are known in the art and include, for example, sealing, in particular heat sealing or induction sealing. Preferably, the increased pressure inside such gas-impermeable pack is substantially retained over a prolonged period of time, preferably for at least six months, more preferably for at least one year. Furthermore, the materials must be of sufficient strength including rigidity, stiffness and thickness so that the pack does neither inappropriately balloon when it is pressurized nor should it 'collapse' when the pressure is withdrawn. Preferably, the packs of the invention display a rigidity and stability which are similar to that of conventional hinge-lid packs made from cardboard.

[0017] The web is filmic packaging material of sufficient rigidity and thickness to allow for the desired pack properties, in particular the retention of the gas inside the pack. Suitable materials are commercially available. Preferably, the web is a multi-layer film including at least one plastic material, for example a polyolefin. Preferably, the web has a thickness of between about 100 to about 400 microns. Preferably, the web has a metallic appearance. The web may be printed, embossed, labeled or otherwise decorated as desired or required. Preferably, the web has a low gloss effect.

[0018] Preferably, the pack of the invention contains one or more oblong articles. Preferably, the oblong article or articles exhibit a solid structure and have a length to width ratio of at least about 3 to about 1. It is preferred that the length to width ratio is between about 5 to about 1 and to about 20 to about 1. Preferred oblong articles are elongate tobacco products, such as cigars, cigarillos or cigarettes. The most preferred packs of the invention contain cigarettes.

[0019] In a preferred embodiment, the present invention provides a pack including one or more oblong articles, which is pressurized before the first opening, and wherein the bottom part is formed by a first end cap having a dependent flange, the top part is formed by a second end cap having a dependent flange, and the web or sleeve is wrapped over and attached to the depending flanges of the first and the second end cap. Advantageously, each flange extends over a portion of the one or more oblong articles in the pack.

[0020] The first end cap provides for a gas-inlet means, preferably in the form of a sealable integral fill port as described above. The second end cap includes an actual aperture covered by an integral hinged lid, optionally with a click-close feature. Before the first opening, a heat-sealable lid underneath the hinge lid ensures substantial gas-impermeability. This lid is advantageously made from a heat-sealable foil, such as a coated aluminum foil, and is peelable, that means it is intended to be removed by the user upon the first opening of the pack. Subsequently, the integral hinge lid allows opening and closing of the pack. Advantageously, the actual aperture in the second end cap extends over less than about half of the surface of the second end cap, preferably over less than about a third.

[0021] The caps may have any suitable shape, for example, they may be substantially oval, round or cornered. It is readily understood that the shape of the end caps will determine the final shape of the pack. Therefore, the shape of the end caps is selected in accordance with the desired shape of the pack. While the end caps may have different shapes, it is preferred that they have the same or a similar shape. Advantageously, the caps are designed to facilitate collation retention if the pack content is composed of a plurality of oblong articles, for example between about 10 and about 20 cigarettes. This may include the inclusion of ribs in the bottom and/or the top part. Preferably, the end caps are made from the same material. A preferred material is a plastic, in particular a hard plastic, which is rigid enough to provide appropriate stability to the pack. The material is selected such that it facilitates the attachment of the web to end caps by means of a conventional sealing method, for example by heat sealing or induction sealing. Advantageously, the plastic material is a polyethylene or a polypropylene. The end caps can be made using conventional processes, such as injection molding. If desired, the end caps may be colored or have a special surface finish. Preferably, the end caps are substantially light impermeable.

[0022] The web is wrapped over at least part of the depending flanges of the end caps forming a tube-like or sleeve-like structure. It is crucial that the attachment of the web to both end caps is substantially gas-impermeable and the materials of the components are selected such as to meet this requirement. Preferably, the web has a multilayer structure comprising at least one layer of a plastic material, such as a polyolefin, in particular polyethylene (PE) or polypropylene (PP). For example,

suitable multilayer structures include three-layer films, including laminates, with a polyolefin forming the outer layers. Preferably, the web is metallic, including aluminum, for example, and substantially light-impermeable. Particularly preferred web materials are three-layer films, preferably laminates, having the structure PE/AL/PE or PP/AL/PP. Another suitable web material is a co-extrusion coated aluminum foil. The web is sufficiently stiff or rigid and thick such that it substantially does not crinkle when the pressure is withdrawn from the pack upon the first opening. Preferably, the web is printed and does not easily scratch off.

[0023] Suitable machinery and technologies for making the packs according to the present invention are known to those skilled in the art. For example, a cigarette pack of the present invention may be manufactured as described herein below.

[0024] A cigarette collation is packaged in a pack which has two hard plastic ends and a web wrapped over the cigarettes and over the depending flanges of the end caps. The end cap forming the top of the pack includes a hinged lid for removal of the cigarettes by the user. A foil is applied to the hinged lid to be removed by the user when opening the pack. The web is sealed and air is evacuated from the pack which is then filled with nitrogen to provide the pressurized pack according to the invention.

[0025] The cigarettes are provided to a collation mandrel. While it is advantageous to fill several mandrels, for example three to six mandrels, simultaneously, the process is described for mandrel. The mandrel has a plurality of through holes arranged to define the shape of the collation to be packaged. Advantageously, the cigarettes a transferred from a hopper into the through holes one-by-one, for example by means of push rods. The collation is then transferred from the mandrel to a shaped pocket wherein the cigarettes are no longer spaced from one another and ready to have the packaging formed around them. The transfer to the shaped pockets is achieved via a set of parallel push rods. The filled shaped pockets are then moved to a pack filling station where the end caps are inserted over the ends of the cigarettes and the web is wrapped around the cigarette collation and the flanges of the end caps.

[0026] The web is provided from a web roll and transported via an assembly of tensioning rollers to a web preparation and cutting station. This station ensures that the web is cut to the correct length required for the pack. Formation of the web around the collation is achieved by first forming a web sleeve which is then slid over the collation and the end caps. The sleeve is formed by folding the suitably cut web around the mandrel and sealing it along its length. Any convenient sealing method may be used, for example gluing or heat sealing. The sleeve is then slid over the end caps and the cigarette collation and the ends of the sleeve are sealed against the ends of the caps. Any convenient type of sealing may be used, heat sealing being preferred. The air in the pack is then evacuated through a small hole or port in the bottom cap which port is also used to fill in the inert gas, preferably nitrogen. The hole is then sealed by heating and melting the surrounding plastic. The pressurized pack is then labeled, as desired.

[0027] Optionally, the packs of the invention include an inner frame which may add stability to the packs. Such inner frame may also be sued to divide the pack into separate, preferably two or three, compartments. The inner frame may be made of rigid materials, such as stiff paper, cardboard, laminate, metal, plastic, or combinations thereof. The use of cardboard is preferred.

[0028] The invention is now illustrated by way of an exemplary pack and with reference to the accompanying figure. The example shall not be construed to limit the invention which is limited only by the scope of the claims.

[0029] It is shown in

Fig. 1: a pack **10** for cigarettes in its opened state.

[0030] Fig. 1 shows a pack **10** used in the invention with a sleeve **23** and a top end cap **22.** The top end cap **22** comprises an access aperture **40** which is covered with the hinged lid **41.** Hinged lid **41** comprises nozzles **43** which create a clicking sound on opening and closing the pack **10.** The sleeve **23** is made of a filmic sheet.

Claims

1. Pack (10) comprising an oblong article or a plurality of oblong articles, which pack (10) is pressurized before the first opening.

2. Pack (10) according to claim 1, **characterized in that** before the first opening the pressure inside the pack (10) is greater than the pressure outside the pack (10).

3. Pack (10) according to any one of the preceding claims, **characterized in that** pressure inside the pack (10) is at least about 50 mbar, preferably less than about 500 mbar above the pressure outside the pack (10).

4. Pack (10) according to any one of the preceding claims, **characterized in that** the difference between the pressure inside the pack (10) and the pressure outside the pack (10) is about 100 mbar, preferably about 250 mbar.

5. Pack (10) according to any one of the preceding claims, **characterized in that** it is substantially gas-impermeable.

6. Pack (10) according to any one of the preceding claims, **characterized in that** the pressure difference between the inside and the outside of the pack

(10) is attained by feeding the pack (10) including its contents, preferably through a valve or a hole, which hole is preferably sealable, with a suitable gas, preferably an inert gas, preferably nitrogen.

7. Pack (10) according any one of the preceding claims, **characterized in that** it comprises a bottom part, a top part (22), and a web or sleeve (23).

8. Pack (10) according to claim 7, **characterized in that** the three parts are connected to each other.

9. Pack (10) according to any one of claims 7 to 8, **characterized in that** it further comprises an inner frame.

10. Pack (10) according to any one of claims 7 to 9, **characterized in that** the bottom part provides for a gas-inlet means.

11. Pack (10) according to any one of claims 7 to 10, **characterized in that** the top part (22) includes at least one actual or potential aperture (40).

12. Pack (10) according to any one of claims 7 to 11, **characterized in that** the bottom part is formed by a first end cap having a dependent flange, the top part (22) is formed by a second end cap having a dependent flange, and the web or sleeve (23) is wrapped over and attached to the depending flanges of the first and the second end cap.

13. Pack (10) according to claim 12, **characterized in that** each flange extends over a portion of the one or more oblong articles in the pack.

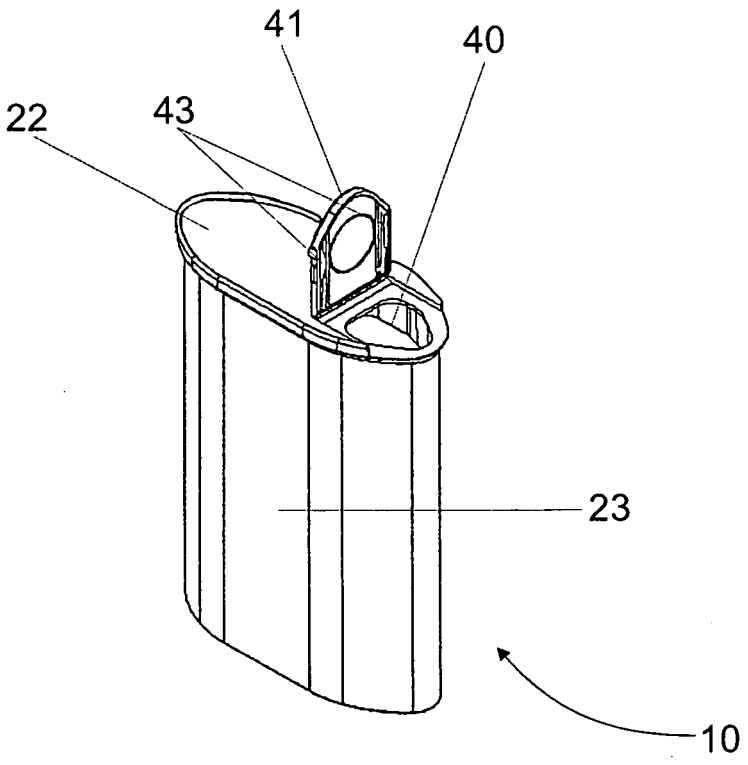
14. Pack (10) according to any one of claims 7 to 13, **characterized in that** the web (23) has a multilayer structure comprising at least one layer of a plastic material, preferably polyolefin, in particular polyethylene or polypropylene.

15. Pack (10) according to any one of the preceding claims, **characterized in that** the oblong articles are smokable articles, in particular cigarettes.

16. Process for manufacture of a pack (10) according to any of the preceding claims, **characterized in that**

- a cigarette collation is packaged in a pack (10), which pack (10) comprises two hard plastic ends and a web (23) wrapped over the cigarettes and over the depending flanges of the end caps, wherein the end cap forming the top (22) of the pack (10) includes a hinged lid (41),
- a foil is applied to said hinged lid (41),
- said web (23) is sealed,
- air is evacuated from said pack (10) through a hole,
- said pack (10) is then filled with nitrogen through said hole, and
- said hole is closed by sealing.

Fig. 1



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EUROPEAN SEARCH REPORT

Application Number
EP 04 02 2366

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	1 February 2005	Segerer, H

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Application Number
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3

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