

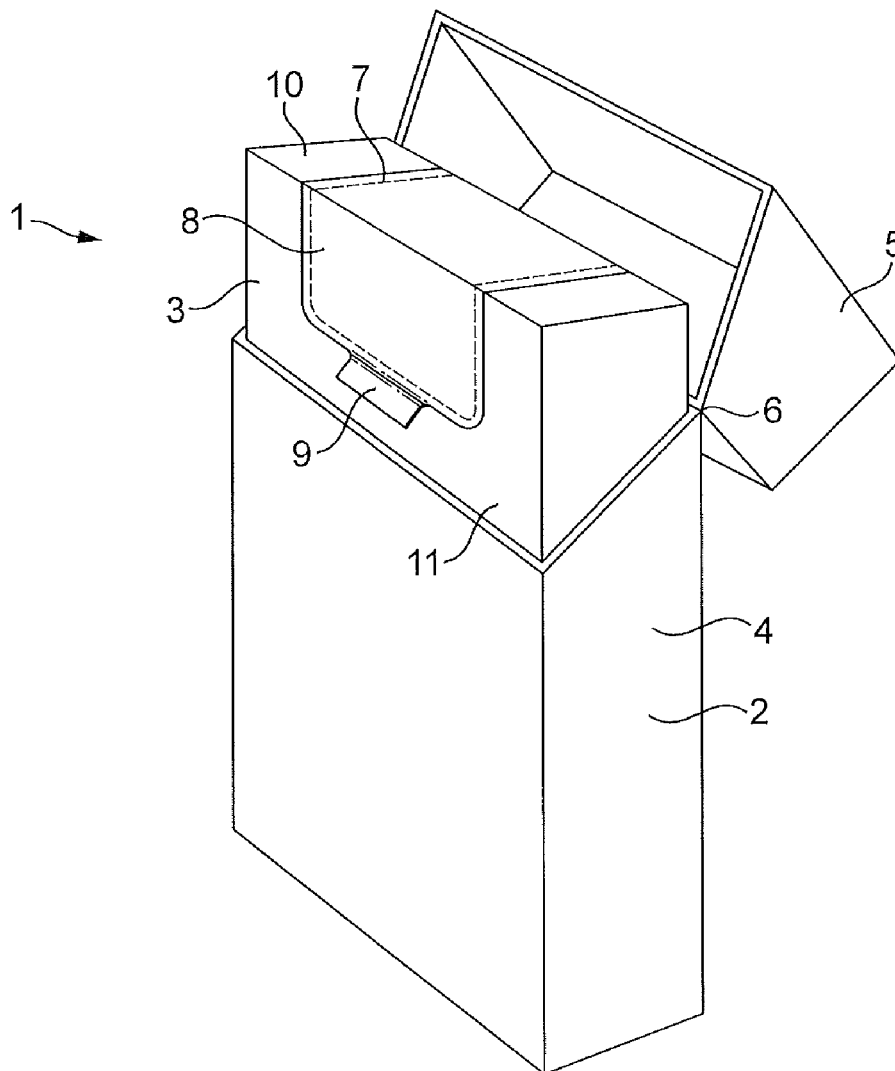
(43) **Pub. Date:** **Mar. 30, 2017**

Publication Classification

ABSTRACT

A smoking article pack has an openable enclosure with a partial vacuum therein. The smoking article also has a support member for smoking articles, the support member being located within the enclosure.

May 28, 2014 (GB) 1409459.3



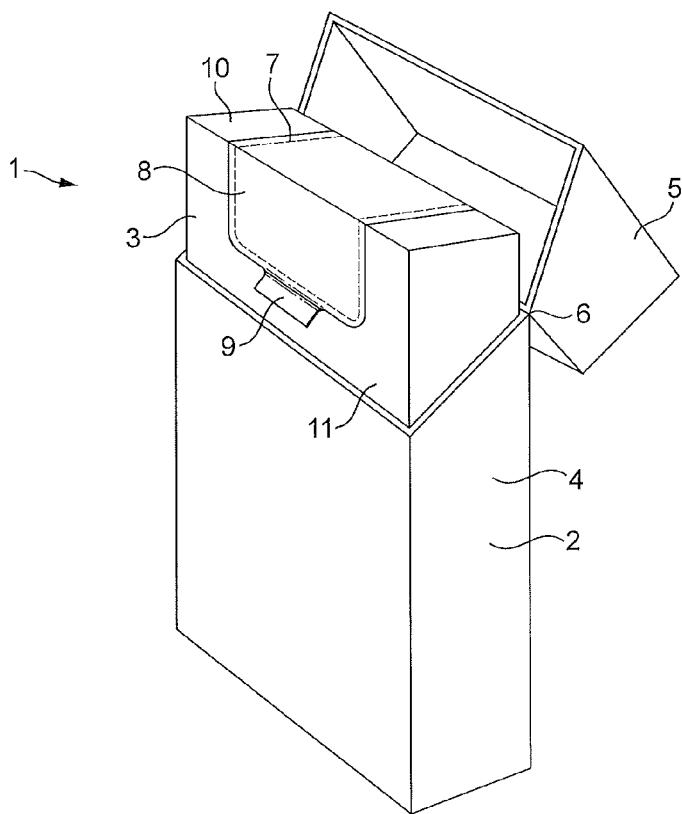


FIG. 1

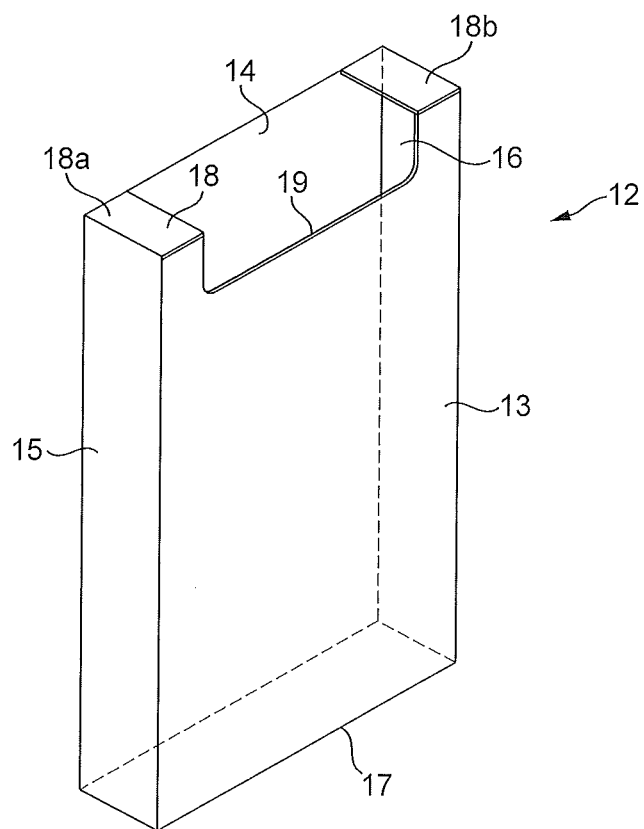


FIG. 2

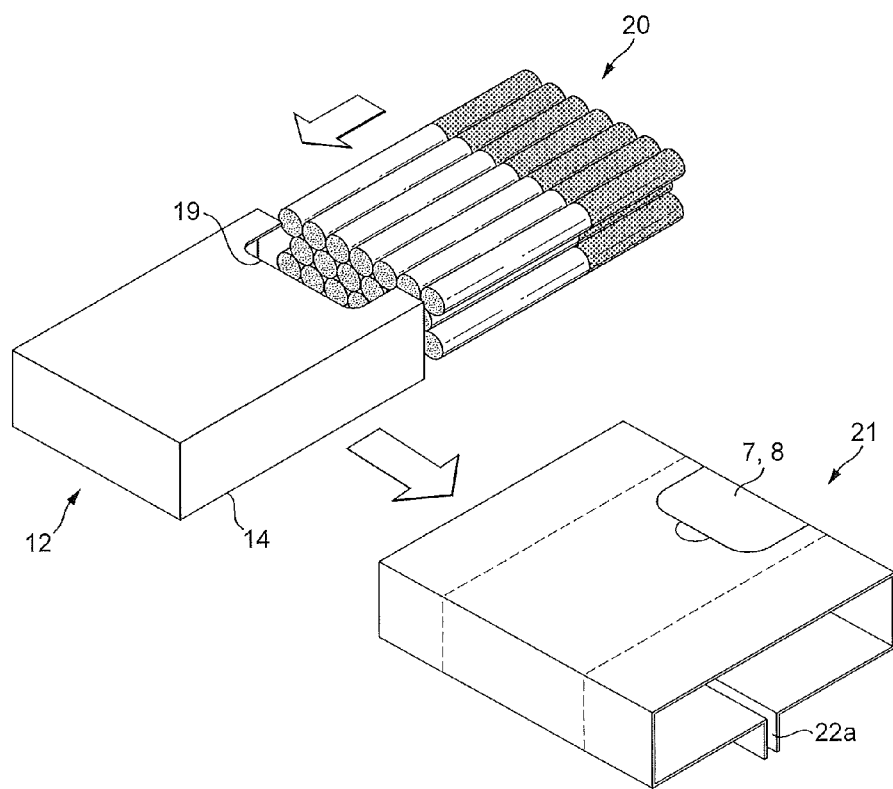


FIG. 3

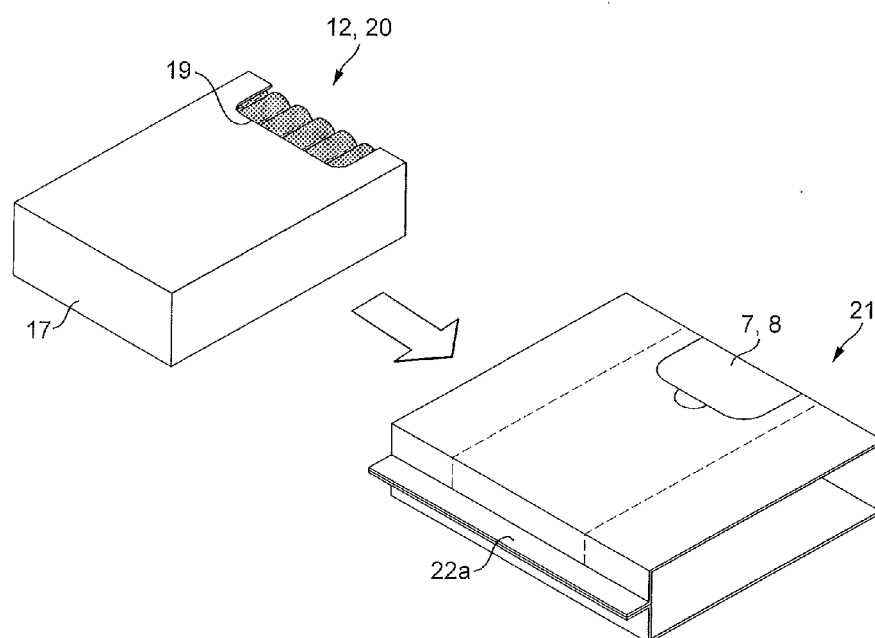


FIG. 4

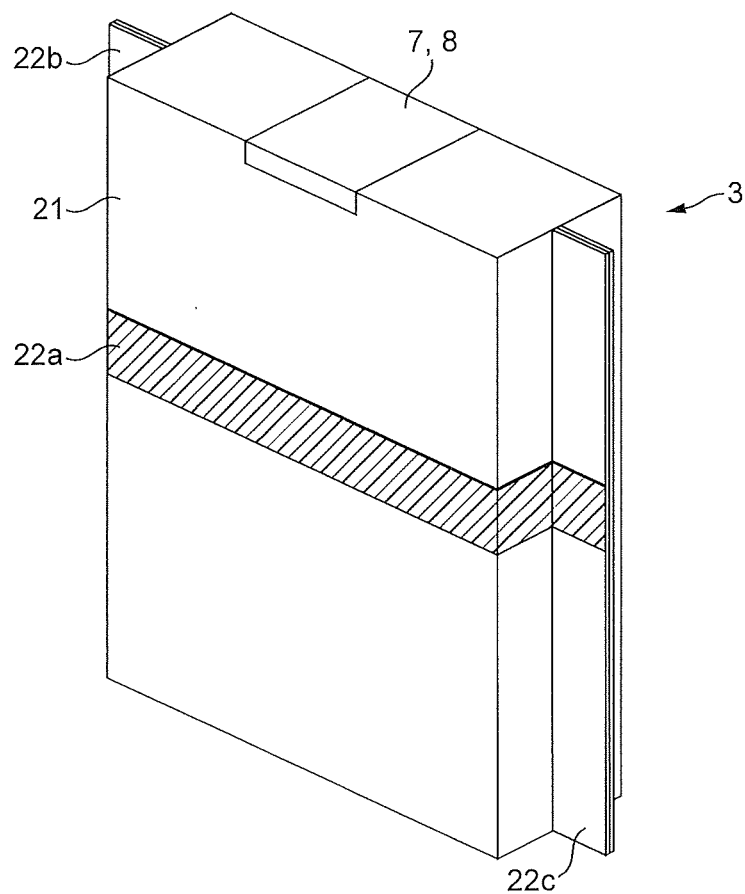


FIG. 5

SMOKING ARTICLE PACK

FIELD OF THE INVENTION

[0001] This invention relates to a smoking article pack.

BACKGROUND

[0002] Packs of cigarettes comprise a wrapped bundle of cigarettes received in a hinged-lid pack. The wrapped bundle of cigarettes has a foil wrapper that at least partially surrounds a plurality of cigarettes. Once the hinged-lid has been opened, a part of the foil wrapper can be removed to give access to the cigarettes.

SUMMARY

[0003] According to the present invention, there is provided a smoking article pack comprising an openable enclosure having a partial vacuum therein, and a support member for smoking articles, the support member being located within the enclosure.

[0004] The smoking article pack may comprise a hinged-lid pack, wherein the enclosure is located in the hinged-lid pack.

[0005] The enclosure may comprise a barrier material. The barrier material may comprise a laminate material. The barrier material may comprise a polymer material and a metallic material.

[0006] The enclosure may comprise one or more seals. The one or more seals may comprise fin seals.

[0007] The support member may at least partially surround smoking articles on at least 3 sides. Alternatively, the support member may at least partially surround smoking articles on at least 5 sides.

[0008] The support member may comprise a box to receive smoking articles. The box may at least partially surround smoking articles on six sides. The box may comprise an opening.

[0009] The enclosure may comprise an openable access aperture that is aligned with an opening in the support member. The openable access aperture may be re-closable.

[0010] The support member may comprise a card material.

[0011] Smoking articles may be located within the enclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

[0013] FIG. 1 shows a smoking article pack;

[0014] FIG. 2 shows a support sleeve;

[0015] FIG. 3 shows a first example of a process for forming a wrapped bundle;

[0016] FIG. 4 shows a second example of a process for forming a wrapped bundle; and,

[0017] FIG. 5 shows a wrapped bundle.

DETAILED DESCRIPTION

[0018] FIG. 1 shows a pack of smoking articles 1 that has a hinged-lid pack 2 and a wrapped bundle 3 of smoking articles. The hinged-lid pack 2 has a body 4 and a lid 5 that is hingedly attached to the body 4 about a hinge 6. The wrapped bundle 3 is received within the hinged-lid pack 2

and the lid 5 can be rotated about the hinge 6 to expose an end part of the wrapped bundle 3.

[0019] As shown in FIG. 1, the wrapped bundle 3 has an access aperture 7 formed at the end of the wrapped bundle 3, which is exposed when the lid 5 is opened. The access aperture 7 is covered by a label 8 which can be opened by pulling on a tab 9, which peels the label 8 back to expose the access aperture 7 and give access to smoking articles within the wrapped bundle 3.

[0020] The access aperture 7 extends across an end 10 and partially into a front wall 11 of the wrapped bundle 3. When the access aperture 7 is open, the ends of some of the smoking articles are accessible and can be grasped for removing them from the pack 1.

[0021] The wrapped bundle 3 is made from a barrier material which is sealed around the smoking articles to form an enclosure. This enclosure is sealed from the outside atmosphere prior to the label 8 being opened for the first time.

[0022] In some examples, the label 8 is formed from the barrier material of the wrapped bundle 3. The barrier material may comprise two or more layers of material, for example a laminate material. One of these layers may overlap around the edges of the label 8 and be adhered to the barrier material, to create a sealed label. Peeling the label 8 back will break this adhesive and expose the access aperture 7.

[0023] Alternatively or additionally, the label 8 is at least partially attached to the edges of the access aperture 7, so that opening the label 8 tears a part of the barrier material to create the access aperture 7. In this case, the label 8 can be formed by at least partially cutting the barrier material prior to wrapping the barrier material around the smoking articles.

[0024] In another example, the label 8 is separate and is attached to the wrapped bundle 3 such that it covers the access aperture 7. For example, the label 8 may be adhered to the barrier material around the access aperture 7.

[0025] Once the label 8 is opened it may be retained on the wrapped bundle 3. For example, the back edge (not shown) of the label 8 may remain attached to the wrapped bundle 3 after opening. In an alternative example, the label 8 may be detached from the wrapped bundle 3 on opening.

[0026] The label 8 may be re-closable, so that the label 8 can be repositioned over the access aperture 7 after first opening. Therefore, the label 8 may have a reusable adhesive that can be reattached to the barrier material after the label 8 has been opened for the first time.

[0027] Within the wrapped bundle 3, smoking articles are arranged in rows so that on opening the access aperture 7 the ends of the smoking articles can be grasped for removal from the wrapped bundle 3 and the pack 1.

[0028] In various embodiments of the present invention, a partial vacuum is provided within the enclosure formed in the wrapped bundle 3 to help preserve the flavour and freshness of the smoking articles. The partial vacuum can be created by evacuating at least some of the air from the enclosure. This partial vacuum may be provided by performing at least part of the pack assembly in a low-pressure environment.

[0029] The wrapped bundle 3 is sufficiently sealed to allow low pressure to be maintained in enclosure within the wrapped bundle 3 until the wrapped bundle 3 is opened. Preferably, the barrier material of the wrapped bundle 3 is

impermeable to air. The enclosure within the wrapped bundle 3 may be hermetically sealed.

[0030] The barrier material of the wrapped bundle 3 is made from a gas-impermeable material. The material may be impermeable to oxygen to prevent ingress of oxygen into the wrapped bundle 3. Also, a gas-impermeable material will prevent movement of moisture through the barrier material, so the moisture content within the wrapped bundle 3 remains the same and is not affected by external conditions.

[0031] In one example, the barrier material comprises a laminate material having a polymer, such as polypropylene or polyethylene, arranged as outer layers of the laminate material and a metallic foil, for example tin foil, aluminium or any other metallised coating, arranged as the inner layer of the laminate material, between two polymer layers.

[0032] In other examples, the barrier material may comprise a cellulose film and/or a polylactide (polylactic acid) material, which can be coated or laminated to improve the barrier and/or heat sealing properties of the material.

[0033] The seal between the barrier material and the label 8 is sufficient to prevent ingress of air through the seal into the enclosure within the wrapped bundle 3 prior to the label 8 being opened for the first time.

[0034] The barrier material is wrapped around a group of smoking articles so that the smoking articles are received in an enclosure formed by the barrier material. For example, twenty smoking articles can be arranged in three rows so that the cross-section of the group of smoking articles is approximately rectangular and the wrapped bundle 3 can be received in a substantially cuboid hinged-lid pack 2. However, it will be appreciated that the wrapped bundle 3 may have a different number of smoking articles and the smoking articles may have a different arrangement.

[0035] A support sleeve is provided around the group of smoking articles within the enclosure formed by the barrier material of the wrapped bundle 3. The support sleeve at least partially surrounds the smoking articles to prevent the smoking articles from becoming compressed, crushed or deformed when air is evacuated from the enclosure within the wrapped bundle 3.

[0036] When a partial vacuum is created in the enclosure of the wrapped bundle 3, the support sleeve resists the inward force acting on the barrier material and protects the smoking articles.

[0037] FIG. 2 shows one example of the support sleeve 12. In this example, the support sleeve 12 is a box with a substantially cuboid shape. Smoking articles are received in the box of the support sleeve 12 and so the group of smoking articles is at least partially surrounded on all sides.

[0038] The support sleeve 12 has five substantially complete sides: a front side 13; a rear side 14; two opposing sides 15, 16; and, a bottom side 17. The support sleeve 12 also has a top side 18 that extends partially across the top of the smoking articles.

[0039] As shown, an opening 19 is provided in the support sleeve 12 and this opening 19 extends across the top side 18 and partially into the front side 13 of the support sleeve 12. This opening 19 is aligned with the access aperture (7, see FIG. 1) of the wrapped bundle (3, see FIG. 1). Therefore, when the label (8, see FIG. 1) is peeled back the access aperture (7, see FIG. 1) and opening 19 are revealed, providing access to the smoking articles.

[0040] The top side 18 of the support sleeve 12 shown in FIG. 2 comprises flaps 18a, 18b that are disposed either side

of the opening 19. These flaps 18a, 18b extend partially across the top side 18 of the support sleeve 12 and help to protect the smoking articles from any compression caused by the inward force acting on the barrier material when air is evacuated from the enclosure of the wrapped bundle (3, see FIG. 1) to provide a partial vacuum therein.

[0041] In another example, the support sleeve 12 may comprise a five sided box, which surrounds the group of smoking articles on five sides. For example, the support sleeve may have a front side, a rear side, two opposing sides and a bottom side, as per the example shown in FIG. 2. However, in this example, the support sleeve does not comprise flaps on the top side, which is open.

[0042] In an alternative example, the support sleeve 12 has three sides which surround the group of smoking articles on at least three sides. For example, the support sleeve may have a front side, which extends across the front of the group of smoking articles, and two opposing sides, that extend across the sides of the group of smoking articles. This 'U' shaped support sleeve provides rigidity to protect the smoking articles against the compression force caused by evacuating air from the enclosure within the wrapped bundle (3, see FIG. 1) to provide a partial vacuum therein.

[0043] In yet another example, any of the support sleeves 12 described above may also have a strut wall that extends across the enclosure within the wrapped bundle (3, see FIG. 1). For example, the strut wall may extend between opposing sides of the support sleeve 12. Referring to the example support sleeve 12 shown in FIG. 2, a strut wall may extend from the inside of the front side 13 to the rear side 14 of the support sleeve 12, dividing the space within the wrapped bundle (3, see FIG. 1). The strut wall will provide additional rigidity to resist the compressive force. If the support sleeve 12 includes a strut wall, then smoking articles can be arranged in two groups, one either side of the strut wall. Other embodiments may include multiple strut walls, in which case the smoking articles can be arranged in two or more groups as per the configuration of the strut walls.

[0044] The support sleeve 12 is made from a rigid or semi-rigid material that has sufficient strength to resist the compressive force acting inwardly on the enclosure when air is evacuated from the enclosure within the wrapped bundle (3, see FIG. 1) to provide a partial vacuum therein. For example, the support sleeve 12 may comprise card, multiple layers of card, plastics, or other suitable material. The material of the support sleeve 12 may be card of between 150 grams per square meter and 300 grams per square meter. The card may be coated or laminated, for example with a polymer, or tin or aluminium foil. The laminate will provide barrier properties and prevent the card from absorbing substances that may be present within the wrapped bundle (3, see FIG. 1).

[0045] During manufacture of the packs of smoking articles 1, a blank of the support sleeve 12 is folded around the group of smoking articles. Alternatively, the support sleeve 12 may be partially formed and the group of smoking articles can be pushed into the partially formed support sleeve 12.

[0046] In some examples, the blank of the support sleeve 12 may include flaps that are adhered to adjacent sides of the support sleeve 12, so that the support sleeve 12 retains its shape. The adhered flaps will increase the structural rigidity of the support sleeve 12.

[0047] The barrier material is then wrapped around the support sleeve 12 and the group of smoking articles, and the ends and edges of the barrier material are sealed to form the wrapped bundle (3, see FIG. 1).

[0048] The wrapped bundle (3, see FIG. 1) is then received in the hinged-lid pack (2, see FIG. 1). The hinged-lid pack (2, see FIG. 1) may be folded around the wrapped bundle (3, see FIG. 1), or the wrapped bundle (3, see FIG. 1) may be pushed into a partially formed hinged-lid pack (2, see FIG. 1).

[0049] FIGS. 3 and 4 show examples of how the barrier material 21 may be wrapped around the group of smoking articles 20 and support sleeve 12 to form the wrapped bundle (3, see FIG. 1).

[0050] As shown in FIG. 3, a group of smoking articles 20 is combined with a support sleeve 12, and this combination is in turn wrapped in a barrier material 21. The support sleeve 12 and smoking articles 20 may be combined by wrapping the support sleeve 12 at least partially around the group of smoking articles 20, depending on the construction of the support sleeve 12. Alternatively, the smoking articles 20 can be pushed into a partially formed support sleeve 12.

[0051] The barrier material 21 is wrapped around the support sleeve 12 and fin seals 22 are formed to hold the barrier material 21 in place and provide an air-tight seal. In this way, the support sleeve 12 and the group of smoking articles 20 are located in an enclosure formed by the barrier material 21. The air-tight fin seals 22 allow a reduced pressure to be created in the enclosure within the wrapped bundle (3, see FIGS. 1) and therefore allows a partial vacuum to be maintained until the wrapped bundle (3, see FIG. 1) is opened.

[0052] In order to provide a partial vacuum within the enclosure defined by the barrier material 21, at least the final fin seal 22 may be formed while the group of smoking articles 20 is exposed to a low pressure environment, to cause evacuation of air from within the enclosure. For example, the final fin sealing operation could be performed in a reduced-pressure environment.

[0053] The barrier material 21 may have a pre-formed access aperture 7 and label 8, as described with reference to FIG. 1. As shown in FIGS. 3 and 4, the barrier material 21 is wrapped around the support sleeve 12 and smoking articles 20 such that the access aperture 7 is aligned with the opening 19 in the support sleeve 12.

[0054] As shown in FIGS. 3 and 4, the barrier material 21 can be wrapped around the support sleeve 12 and a first fin seal 22a can be formed between two ends of the barrier material 21.

[0055] In the example shown in FIG. 3, the first fin seal 22a is formed in a position adjacent to the rear side 14 of the support sleeve 12. After this first fin seal 22a has been made the barrier material 21 is essentially arranged as a tube around the support sleeve 12 and smoking articles 20.

[0056] In an alternative example, shown in FIG. 4, the barrier material 21 can be wrapped around the support sleeve 12 and smoking articles 20 to form a tube and the first fin seal 22a is formed adjacent to the bottom side 17 of the support sleeve 12, opposite to the access aperture 7 and label 8.

[0057] In the examples shown in both FIG. 3 and FIG. 4 the first fin seal 22a is formed in a position which is spaced from the opening 19 of the support sleeve 12 and therefore spaced from the access aperture 7 and label 8, so that the

operation of the label 8 to open the access aperture 7 is not affected by the first fin seal 22a.

[0058] When the barrier material 21 has been wrapped around the support sleeve 12 and a group of smoking articles 20 to form a tube, as shown in FIGS. 3 and 4, the ends of the tube of barrier material 21 are sealed together to form a sealed wrapped bundle (3, see FIG. 1) having an enclosure in which the smoking articles 20 and support sleeve 12 are received. The ends of the tube of barrier material 21 are also fin sealed.

[0059] FIGS. 3 and 4 show, in dotted lines, the extent of the support sleeve 12 within the tube of barrier material 21 once the first fin seal 22a has been formed. As shown, the tube of barrier material 21 is longer than the width of the support sleeve 12, and so the barrier material 21 extends past the sides of the support sleeve 12. The overhanging ends of the barrier material 21 are fin sealed to create the sealed wrapped bundle (3, see FIG. 1).

[0060] FIG. 5 shows the fin seals (22b, 22c) that are formed on the opposing sides of the wrapped bundle 3. As shown, the first fin seal 22a is folded against the support sleeve 12 and extends through each of the side fin seals 22b, 22c of the wrapped bundle 3. The side fin seals 22b, 22c can be folded against the opposing sides of the wrapped bundle 3 so that the wrapped bundle 3 can be tightly received in the hinged-lid pack (2, see FIG. 1), as previously described.

[0061] FIG. 5 shows the first fin seal 22a formed adjacent to the rear side of the support sleeve. However, it will be appreciated that the first fin seal 22a may alternatively be formed adjacent to the bottom side of the support sleeve, as described above with reference to FIG. 4, or in any other position in which the first fin seal 22a is spaced from the access aperture 7 and label 8.

[0062] The fin seals 22a, 22b, 22c can be made by attaching opposing portions of the barrier material 21 together. That is, as shown in FIGS. 3 and 4, the ends of the barrier material 21 are arranged so that they are directed in the same direction and are overlapping. The portions of barrier material 21 are then attached to each other using heat, adhesive, ultrasonic weld, or other means of attaching the barrier material together. The barrier material 21 may include a thermoplastic material or other means of adhesive that can be activated by, for example, heat and/or pressure.

[0063] In alternative examples, the sealed wrapped bundle 3 is formed using a process other than the fin seals 22a, 22b, 22c described with reference to FIGS. 3 to 5. For example, the barrier material 21 could be sealed by folding the ends against the sides of the support sleeve 12 and pressing them to create a seal. This may involve adhesive, heat, ultrasonic welds or other means of attaching the folded flaps of barrier material 21 together. In this case, the rigidity of the support sleeve 12 will reduce the likelihood of damaging the smoking articles while forming the seals.

[0064] As explained earlier, air is evacuated from the enclosure within the wrapped bundle 3 to form a partial vacuum therein. This may be performed by exposing the partially wrapped bundle 3 to a reduced-pressure environment prior to forming the final fin seal 22. It will also be appreciated that varying degrees of air may be evacuated from the enclosure within the wrapped bundle 3, but that the pressure within the wrapped bundle 3 will be reduced. It will also be appreciated that not only air may be evacuated from the enclosure within the wrapped bundle 3, and any gas that is present at that time can be evacuated.

[0065] In various examples, the partial vacuum within the enclosure of the wrapped bundle **3** has a pressure of less than 1 bar.

[0066] In some examples, the partial vacuum within the enclosure of the wrapped bundle **3** is less than 500 millibar, for example between 40 and 300 millibar. In other embodiments, the partial vacuum within the enclosure of the wrapped bundle **3** is less than 150 millibar, preferably about 80 millibar. However, it will be appreciated that the partial vacuum within the enclosure of the wrapped bundle **3** may be any value less than 1 bar.

[0067] As used herein, the term “smoking article” includes smokeable products such as cigarettes, cigars and cigarillos whether based on tobacco, tobacco derivatives, expanded tobacco, reconstituted tobacco or tobacco substitutes and also heat-not-burn products. The smoking article may be provided with a filter for the gaseous flow drawn by the smoker.

[0068] As used herein, the term “partial vacuum” means that pressure has been reduced by removing at least a part of the gas from within a space, for example the enclosure within the wrapped bundle (**3**, see FIG. 1).

[0069] In order to address various issues and advance the art, the entirety of this disclosure shows by way of illustration various embodiments in which the claimed invention(s) may be practiced and provide for superior smoking article pack. The advantages and features of the disclosure are of a representative sample of embodiments only, and are not exhaustive and/or exclusive. They are presented only to assist in understanding and teach the claimed features. It is to be understood that advantages, embodiments, examples, functions, features, structures, and/or other aspects of the disclosure are not to be considered limitations on the disclosure as defined by the claims or limitations on equivalents to the claims, and that other embodiments may be utilised and modifications may be made without departing from the scope and/or spirit of the disclosure. Various embodiments may suitably comprise, consist of, or consist essentially of,

various combinations of the disclosed elements, components, features, parts, steps, means, etc. In addition, the disclosure includes other inventions not presently claimed, but which may be claimed in future.

1. A smoking article pack comprising an openable enclosure having a partial vacuum therein, and a support member for smoking articles, the support member being located within the enclosure and the support member comprising a box to receive smoking articles, and wherein the box at least partially surrounds smoking articles on six sides to protect the smoking articles against crushing caused by the partial vacuum.

2. The smoking article pack of claim **1**, comprising a hinged-lid pack, wherein the enclosure is located in the hinged-lid pack.

3. The smoking article pack of claim **1** wherein the enclosure comprises a barrier material.

4. The smoking article pack of claim **3**, wherein the barrier material comprises a laminate material.

5. The smoking article pack of claim **3**, wherein the barrier material comprises a polymer material and a metallic material.

6. The smoking article pack of claim **1** wherein the enclosure comprises one or more seals.

7. The smoking article pack of claim **6**, wherein the one or more seals comprise fin seals.

8. The smoking article pack of claim **1** wherein the box comprises an opening.

9. The smoking article pack of claim **1** wherein the enclosure comprises an openable access aperture that is aligned with an opening in the support member.

10. The smoking article pack of claim **9**, wherein the openable access aperture is re-closable.

11. The smoking article pack of claim **1**, wherein the support member comprises a card material.

12. The smoking article pack of claim **1**, wherein smoking articles are located within the enclosure.

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