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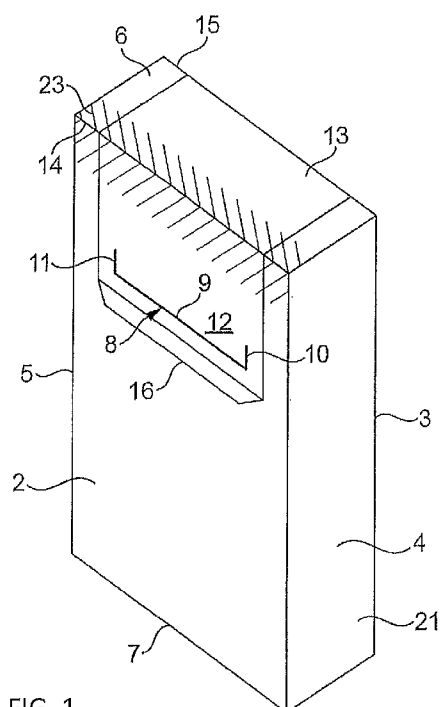


FIG. 1

(57) Abstract: A wrapped bundle comprising a barrier material (21) wrapped about a group of tobacco industry products is disclosed. The wrapped bundle comprises at least a partial vacuum within the wrapped bundle that causes a surface of the wrapped bundle to bow, the bowed surface comprising an openable section (20) provided in the barrier material. The wrapped bundle further comprises a label (13) adhered by an adhesive to the barrier material to cover the openable section of the barrier material. The label (13) is peelable away from the barrier material to lift the openable section and create an extraction opening in the barrier material. The label has a total label thickness less than or equal to 95 micrometres.



A Wrapped Bundle

Technical Field

The present invention relates to a wrapped bundle comprising a flexible barrier
5 material sealably wrapped about a group of tobacco industry products.

Background

Cigarette packs are known to have a re-closable label that is provided on a wrapped
bundle of cigarettes. Pulling the label exposes an extraction opening for retrieving the
10 cigarettes. The label includes a region of pressure sensitive adhesive that allows the
label to be re-positioned over the extraction opening and held in place.

Summary

According to an embodiment of the present invention there is provided a wrapped
15 bundle comprising a barrier material sealably wrapped about a group of tobacco
industry products; wherein the wrapped bundle further comprises at least a partial
vacuum within the wrapped bundle that causes a surface of the wrapped bundle to bow,
the bowed surface comprising an openable section provided in the barrier material; the
wrapped bundle further comprising a label adhered by an adhesive to the barrier
20 material to cover the openable section of the barrier material, wherein the label is
peelable away from the barrier material to lift the openable section and create an
extraction opening in the barrier material; and wherein the label has a total label
thickness less than or equal to 95 micrometres.

25 The label may comprise a polymer material.

The polymer material may comprise any of: biaxially orientated polypropylene,
orientated polypropylene or polyethylene.

30 The total label thickness may be equal to or greater than 30 micrometres.

The total label thickness may be less than or equal to 75 micrometres.

The total label thickness may be less than or equal to 70 micrometres.

The total label thickness may be less than or equal to 65 micrometres.

The total label thickness may be less than or equal to 60 micrometres.

5 The total label thickness may be less than or equal to 55 micrometres.

The total label thickness may be less than or equal to 50 micrometres.

10 The adhesive may be configured to provide a bond strength between one of the adhesive and the barrier material or the adhesive and the label greater than or equal to 2N/25mm.

15 The adhesive may be configured to provide a bond strength between one of the adhesive and the barrier material or the adhesive and the label greater than or equal to 5N/25mm.

20 The adhesive may be configured to provide a bond strength between one of the adhesive and the barrier material or the adhesive and the label greater than or equal to 7N/25mm.

The adhesive may be configured to provide a bond strength between one of the adhesive and the barrier material or the adhesive and the label less than or equal to 12N/25mm.

25 The adhesive may be configured to provide a bond strength between one of the adhesive and the barrier material or the adhesive and the label less than or equal to 10N/25mm.

30 The label may comprise a laminate.

The label may comprise a single layer of polymer material.

35 According to another embodiment of the present invention there is provided a wrapped bundle comprising a barrier material wrapped about a group of tobacco industry products; wherein the wrapped bundle further comprises at least a partial vacuum within the wrapped bundle that causes a surface of the wrapped bundle to bow, the

5 bowed surface comprising an openable section provided in the barrier material; the wrapped bundle further comprising a label adhered by an adhesive to the barrier material to cover the openable section of the barrier material, wherein the label is peelable away from the barrier material to lift the openable section and create an extraction opening in the barrier material; wherein the label comprises a flexible laminate material having a first layer and a second layer adhesively joined to each other; and wherein each of the first layer and the second layer has a thickness less than or equal to 35 micrometres.

10 One or each of the first and second layers may comprise a polymer material.

One or each of the first and second layers may comprise any of: biaxially orientated polypropylene, orientated polypropylene or polyethylene.

15 One or each of the first layer and the second layer may have a thickness less than or equal to 33 micrometres.

One or each of the first layer and the second layer may have a thickness less than or equal to 30 micrometres.

20

The adhesive may be configured to provide a bond strength between one of the adhesive and the barrier material or the adhesive and the label greater than or equal to 2N/25mm.

25 The adhesive may be configured to provide a bond strength between one of the adhesive and the barrier material or the adhesive and the label greater than or equal to 5N/25mm.

30 The adhesive may be configured to provide a bond strength between one of the adhesive and the barrier material or the adhesive and the label greater than or equal to 7N/25mm.

35 The adhesive may be configured to provide a bond strength between one of the adhesive and the barrier material or the adhesive and the label less than or equal to 12N/25mm.

The adhesive may be configured to provide a bond strength between one of the adhesive and the barrier material or the adhesive and the label less than or equal to 10N/25mm.

- 5 According to another embodiment of the invention there is provided a tobacco industry pack comprising the wrapped bundle of any of claims 1 to 19.

According to another embodiment of the invention there is provided a wrapper comprising a blank of barrier material for wrapping about a group of tobacco industry
10 products to form a wrapped bundle, the wrapper further comprising a label adhered to the barrier material by an adhesive to cover an openable section in the barrier material, the label having a total label thickness less than or equal to 95 micrometres..

According to another embodiment of the invention there is provided a wrapper
15 comprising a blank of barrier material for wrapping about a group of tobacco industry products to form a wrapped bundle, the wrapper further comprising a label adhered to the barrier material by an adhesive to cover an openable section in the barrier material, wherein the label comprises a flexible laminate material having a first layer and a second layer adhesively joined to each other; and wherein each of the first layer and the
20 second layer has a thickness less than or equal to 35 micrometres.

Brief Description of the Drawings

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

- 25 FIG. 1 shows a wrapped bundle of tobacco industry products;
FIG. 2 shows an opened wrapped bundle of tobacco industry products;
FIG. 3 shows an inner frame for a wrapped bundle of tobacco industry products;
FIG. 4 shows a schematic diagram of a process for making a wrapped bundle of tobacco industry products;
30 FIG. 5 shows a wrapped bundle of tobacco industry products having fin seals;
FIG. 6 shows an alternative schematic diagram of a process for making a wrapped bundle of tobacco industry products;
FIG. 7 shows a smoking article pack containing the wrapped bundle of tobacco industry products of any previous FIG.;
35 FIG. 8 shows a pack containing the wrapped bundle of tobacco industry products of any of FIGS. 1 to 6, with the tab attached to the lid;

FIG. 9 shows a second example of a pack containing the wrapped bundle of tobacco industry products of any of FIGS. 1 to 6, with the tab attached to the lid;

FIG. 10 shows a cross section of a label of the wrapped bundle according to an embodiment of the invention; and

5 FIG.11 shows a wrapper for forming a wrapped bundle.

Detailed Description

FIG. 1 shows a wrapped bundle 1 of tobacco industry products according to an embodiment of the invention. In this embodiment, the tobacco industry products are
10 cigarettes.

The wrapped bundle 1 comprises a flexible barrier material 21 that has been wrapped around a group of cigarettes, for example 20 cigarettes, so that the smoking articles are received in an enclosure formed by the barrier material 21. However, it will be
15 appreciated that the wrapped bundle 1 may contain any number of cigarettes, for example 10 or 14 cigarettes. The cigarettes are elongate cylindrical articles and are arranged in rows such that the overall shape of the wrapped bundle 1 is substantially cuboid, or parallelepiped.

20 The wrapped bundle 1 comprises a front face 2, a rear face 3, opposing side faces 4, 5 and opposing upper and lower end faces 6, 7. The wrapped bundles 1 shown in the accompanying drawings have square edges, but it will be appreciated that the edges may be rounded or otherwise shaped according to the shape of the contents of the wrapped bundle 1.

25 The wrapped bundle 1 is made from a barrier material 21 which is sealed around the smoking articles to form an enclosure.

The barrier material 21 of the wrapped bundle 1 is made from a gas-impermeable
30 material. The material may be impermeable to oxygen to prevent ingress of oxygen into the wrapped bundle 1. Also, a gas-impermeable material will prevent movement of moisture through the barrier material, so the moisture content within the wrapped bundle 1 remains the same and is not affected by external conditions.

35 The barrier material 21 may comprise a single layer of material. Alternatively, the barrier material 21 may comprise a laminate material of two or more layers, for

example three layers. Each layer of the barrier material 21 may comprise a polymer (for example polypropylene), a metal foil, a metallised foil or other flexible material suitable for packaging.

5 In one example, the barrier material 21 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.

10

In other examples, the barrier material 21 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.

15 An openable section 20 is provided in the wrapped bundle 1 and extends from the front face 2 of the wrapped bundle 1, over a front end edge 14 of the wrapped bundle 1, and onto the upper end face 6 of the wrapped bundle 1. The openable section 20 is separable from the remaining barrier material 21 to provide an extraction opening 17 for the removal of cigarettes 18 from the bundle 1.

20

An adhesive label 13 is adhered to the outside of the wrapped bundle 1 such that it covers the openable section 20. The adhesive label 13 may also extend over a rear end edge 15 of the wrapped bundle 1 onto the rear face 3 of the wrapped bundle 1, as shown in FIG. 1.

25

Also shown in FIG. 1, the adhesive label 13 comprises a pull tab 16. When a user pulls the pull tab 16 of the adhesive label 13 in a direction away from the front face 2 of the wrapped bundle 1 the adhesive label 13 peels off the front face 2 of the wrapped bundle 1. As the adhesive label 13 is peeled from the front face, the openable section 20
30 remains attached to the adhesive label 13, as shown in FIG. 2, to reveal the extraction opening 17.

35

In an unillustrated embodiment, the openable section 20 may be delimited by a line of weakening formed in the barrier material 21, such as a line of perforations or a score line. The line of weakening ensures that the openable portion 20 becomes separated from the remainder of the barrier material 21 when the adhesive label is peeled back as

described above. It is therefore important that the adhesive label 13 is adhered to the wrapped bundle 1 with sufficient strength that the line of weakening is broken as the adhesive label is peeled back.

5 Alternatively, and as illustrated in FIGS. 1 and 2, the wrapped bundle 1 may be provided with a starting cut 8 in the barrier material 21. In the illustrated embodiments, the barrier material 21 is at least partially cut through in a 'U' shape on the front face 2 of the wrapped bundle 1. The starting cut 8 comprises a first cut line 9
10 4, 5, and second and third cut lines 10, 11 extending from the ends of the first cut line 9 towards the upper end face 6 of the wrapped bundle 1. Therefore, the starting cut 8 defines a tab of material 12 enclosed by the first, second and third cuts 9, 10, 11.

It will be appreciated that the starting cut 8 may comprise other shapes. For example,
15 the starting cut 8 may be a single curved cut shaped such that the ends of that cut are directed towards the upper end face 6 of the wrapped bundle 1.

The adhesive label 13 is adhered to the outside of the wrapped bundle 1 such that it covers and seals the starting cut 8. Therefore, when a user pulls the pull tab 16 of the
20 adhesive label 13 in a direction away from the front face 2 of the wrapped bundle 1 the adhesive label 13 peels off the front face 2 of the wrapped bundle 1 and pulls on the tab of material 12 formed by the starting cut 8.

As the tab of material 12 is pulled, tears propagate through the barrier material 21,
25 starting from the ends of the second and third cuts 10, 11 and propagating in the direction of the second and third cuts 10, 11, towards the upper end face 6 of the wrapped bundle 1. As the pull tab 16 is pulled the tears propagate in the front face 2 of the barrier material 21, over the front end edge 14 of the wrapped bundle 1 and across the upper end face 6 of the wrapped bundle 1.

30 Depending on the arrangement and extent of the adhesive label 13, and how far the user pulls the pull tab 16, the tears may propagate to a point on the upper end face 6 of the wrapped bundle 1, or to the rear end edge 15 of the wrapped bundle 1, or over the rear end edge 15 and onto the rear face 3 of the wrapped bundle 1.

35

The above described pulling of the adhesive label 13 and tearing of the barrier material 21 creates the extraction opening 17, as shown in FIG. 2.

5 The starting cut 8 reduces the initial force required to open the wrapped bundle 1, as the initial separation of the barrier material 21 is already provided by the starting cut 8.

10 In the above example, the wrapped bundle 1 is provided with a convenient means for opening the wrapped bundle 1 – the adhesive label 13, which causes the barrier material 21 to tear on first opening to create the extraction opening 17. The enclosure is sealed from the outside atmosphere prior to the adhesive label 13 being opened for the first time. The starting cut 8 reduces the force required to open the extraction opening 17 because the initial lifting of the adhesive label 13 from the wrapped bundle 1 does not result in breaking of any of the barrier material 21. Once the initial lifting is complete, the starting cut 8 helps to control the direction in which the barrier material 21 is torn or broken.

15 The adhesive label 13 may be adhered to the wrapped bundle 1 at least partially with pressure sensitive adhesive.

20 As shown in FIG. 1 and FIG. 2, the edges of the adhesive label 13 are offset from the cut lines 9, 10, 11 of the starting cut 8 and are therefore offset from the edges of the openable section 20 in the barrier material 21 after first opening of the wrapped bundle 1. Likewise, in embodiments that comprise a line of weakening, the edges of the adhesive label 13 are offset outwardly from the line of weakening.

25 Therefore, the label 13 comprises an overlapping region 19 that surrounds the openable section 20. This overlapping region 19 of the adhesive label 13 may be provided with pressure sensitive adhesive so that the adhesive label 13 can be repositioned over the extraction opening 17 and the pressure sensitive adhesive will re-adhere to the barrier material 21 and hold the adhesive label 13 in place over the extraction opening 17.

30 The adhesive label 13 may be provided entirely with pressure sensitive adhesive, or may include a region of permanent adhesive in addition to the pressure sensitive adhesive.

The openable section 20 of the barrier material 21, which has been separated from the wrapped bundle 1 to form the extraction opening 17, remains adhered to the adhesive label 13 as shown in FIG. 2.

5 The openable section 20 may be attached to the adhesive label 13 by pressure sensitive adhesive, or by a region of permanent adhesive provided between the openable section 20 and the adhesive label 13. If the openable section 20 is attached to the adhesive label 13 by pressure sensitive adhesive then the pressure sensitive adhesive may have an increased coating weight in the region of the openable section 20 to prevent the
10 openable section 20 from detaching from the adhesive label 13 during use.

Therefore, the adhesive label 13 and the openable section 20 of the barrier material 21 form a re-usable cover flap 22 for closing the extraction opening 17 after first opening. The pressure sensitive adhesive on the overlapping region 19 of the adhesive label 13 is
15 used to releasably hold the cover flap 22 to the barrier material 21.

A part of the adhesive label 13 may be permanently adhered to the barrier material 21, so that the cover flap 22 is retained on the wrapped bundle 1 and can not be completely removed. For example, the cover flap 22 may be permanently adhered to the rear face 3
20 of the wrapped bundle 1.

In combination with the adhesive label 13 covering the starting cut 8 or line of weakening, the front face 2, upper end face 6 and rear face 3 of the wrapped bundle 1 are therefore sealably closed prior to first opening by pulling on the pull tab 16.
25

The seal between the barrier material 21 and the adhesive label 13 is sufficient to prevent ingress of air through the seal into the enclosure within the wrapped bundle 1 prior to the adhesive label 13 being opened for the first time.

30 According to the invention, a partial vacuum is provided within the enclosure formed in the wrapped bundle 1 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.

35

The wrapped bundle 1 is sufficiently sealed to allow low pressure to be maintained in enclosure within the wrapped bundle 1 until the wrapped bundle 1 is opened.

Therefore, the barrier material 21 of the wrapped bundle 1 is impermeable to air. The enclosure within the wrapped bundle 1 may be hermetically sealed.

5

In another embodiment of the invention an inner frame 24 is provided, as shown in FIG. 3. The inner frame 24 holds the cigarettes 18 (see FIG. 2) and is wrapped by the barrier material 21 to form the wrapped bundle 1 shown in FIGS. 1 and 2. In other words, the inner frame 24 may be positioned between the cigarettes 18 and the barrier material 21.

10

The inner frame 24 comprises a front wall 25, a rear wall 26, opposing side walls 27, 28, a bottom wall 29 and a top wall 30, that correspond to the front face 2, rear face 3, opposing side faces 4, 5 and upper and lower end faces 6, 7 of the wrapped bundle 1 once the inner frame 24 is wrapped in the barrier material 21. The inner frame 24 also comprises an aperture 31 formed in the end wall 30 and front wall 25 that is aligned with the above described extraction opening 17 after first opening of the wrapped bundle 1, as shown in FIG. 2.

15

In this example, the aperture 31 in the inner frame 24 extends partially across the top wall 30 and front wall 25 of the inner frame 24, i.e. corresponding to the front and upper end faces 2, 6 of the wrapped bundle 1. Therefore, when the extraction opening 17 is formed it is aligned with the aperture 31 in the inner frame 24.

20

The inner frame 24 provides additional strength and supports the cigarettes 18. Moreover, if the wrapped bundle 1 is provided with a reduced internal pressure, for example a partial vacuum, then the inner frame 24 helps protect the cigarettes 18 against the crushing force of the atmospheric pressure acting on the outside of the wrapped bundle 1.

25

30

In some examples, the aperture 31 in the inner frame 24 is sized and positioned such that, after creating the extraction opening 17 in the barrier material 21 by pulling the adhesive label 13, at least some edges of the aperture 31 lie within the extraction opening 17.

35

When a reduced pressure is provided within the wrapped bundle 1, i.e. a partial vacuum, the barrier material 21 and adhesive label 13 are pushed inwards towards the cigarettes 18 by the atmospheric pressure outside of the wrapped bundle 1. In this case, the barrier material 21 may deform to the shape of the contents of the wrapped bundle 1.

As a reduced pressure is provided within the wrapped bundle, it has been found that conventional adhesive labels 13 have a tendency to pull away from the wrapped bundle 1 as the barrier material 21 deforms to conform to the shape of the contents of the wrapped bundle 1. This effect is particularly prevalent over the upper end face 6 of the bundle 1, front edge 14 and along the front face 2 where, due to the extraction opening 17 in the inner frame 24, there is no underlying support causing the barrier material 21 to bow inwards.

Therefore, according to the invention the adhesive label 13 comprises a flexible material configured to conform to the deformed surfaces of the wrapped bundle 1 to prevent detachment of the label 14 from the barrier material 21 due to the deformed surfaces. Specifically, the adhesive label 13 is required to conform to the barrier material 21 in the regions where there is no inner frame 24 support, namely over the extraction opening 17 in the inner frame 24. To achieve this, the adhesive label 13 has a total label thickness less than or equal to 95 micrometres.

In one embodiment, the adhesive label 13 comprises a polymer sheet, for example of biaxially orientated polypropylene, orientated polypropylene or polyethylene.

In a preferable embodiment, the adhesive label 13 has a total label thickness in the range of 30 micrometres to 95 micrometres. In other embodiments, the adhesive label 13 may have a total label thickness in the range of 30 micrometres to 75 micrometres; or 30 micrometres to 65 micrometres; or 30 micrometres to 55 micrometres; or 30 micrometres to 50 micrometres.

In one embodiment, shown in FIG. 10, the adhesive label 13 comprises a laminate having a first layer 32 and a second layer 33.

In one embodiment, one or each of the first and second layers 32, 33 are layers of orientated polypropylene adhesively joined to each other, in which each of the first

layer 32 and the second layer 33 is less than or equal to 35 micrometres thick. In other embodiments, each of the first layer 32 and second layer 33 is less than or equal to 33 micrometres thick; or less than or equal to 30 micrometres thick.

5 It shall be appreciated that orientated polypropylene comprises chain molecules that are individually orientated in the same direction. As a result, orientated polypropylene is stronger in a first direction parallel to the orientation of the chain molecules than it is in direction perpendicular to the orientation of the chain molecules. Therefore, it is preferable that the first layer 32 and second layer 33 of polypropylene in the laminate
10 are orientated perpendicular to each other with respect to the direction of the chain molecules of the respective layers 32, 33. This ensures that the laminate has good strength in all directions.

The orientated polypropylene laminate of the adhesive label 13 may further comprises a
15 layer of printed ink 34 between the first layer 32 and the second layer 33 of orientated polypropylene.

In another embodiment, one or each of the first and second layers 32, 33 are layers of biaxially orientated polypropylene adhesively joined to each other, in which each of the
20 first layer 32 and second layer 33 is less than or equal to 35 micrometres thick. In other embodiments each of the first layer 32 and second layer 33 is less than or equal to 33 micrometres thick; or less than or equal to 30 micrometres thick. As in the above embodiment, the biaxially orientated polypropylene laminate may further comprise a layer of printed ink 34 between the first 32 and second layer 33.

25 Unlike orientated polypropylene, biaxially orientated polypropylene comprises an equal proportion of chain molecules orientated in a first direction as in a second direction, the first and second directions being perpendicular to each other. This gives biaxially orientated polypropylene similar strength properties in all directions within the plane
30 of the sheet.

In another embodiment of the invention, each of the first and second layers 32, 33 are layers of polyethylene adhesively joined to each other, in which each of the first layer 32 and second layer 33 is no more than 35 micrometres thick. Preferably each of the first
35 layer 32 and second layer 33 is no more than 33 micrometres thick. More preferably each of the first layer 32 and second layer 33 is no more than 30 micrometres thick. As

in the above embodiment, the polyethylene laminate may further comprise a layer of printed ink 34 between the first 32 and second layer 33.

5 An additional layer of hot press laminating adhesive 35 is provided in between each of the first and second layers 32, 33 of the above mentioned laminate labels 13 to adhesively join the first layer 32 and second layer 33 to each other. The hot press laminating adhesive adds 3 to 5 micrometres the total thickness of the label 14.

10 In the above described embodiments, the pressure sensitive adhesive used to adhere the adhesive label 13 to the barrier material 21 has a bonding strength in the range of 2N/25mm and 15N/25mm. More preferably, the bonding strength is in the range of 5N/25mm to 12N/25mm. Even more preferably, the bonding strength is in the range of 7N/25mm to 10N/25mm.

15 It shall be appreciated that the bonding strength can be measured between the pressure sensitive adhesive and the barrier material 21 or between the pressure sensitive adhesive and the label 13. It is envisaged that in the former case the pressure sensitive adhesive remains attached to the label 13 when the label 13 is peeled back to reveal the extraction opening 17; and in the latter case, it is envisaged that the pressure sensitive
20 adhesive remains attached to the barrier material 21 when the label is peeled back to reveal the extraction opening 17.

It shall also be appreciated that the pressure sensitive adhesive is not included in the above stated thicknesses of the adhesive label 13. The stated thicknesses can be
25 determined using a digital micrometer, for example a Mercer, model 122D digital micrometer.

By providing an adhesive label 13 that comprises a biaxially orientated polypropylene, orientated polypropylene or polyethylene that is no more than 75 micrometres thick,
30 the adhesive label 13 is better able to conform to the bowed outer surface of the wrapped bundle 1. Furthermore, by providing a pressure sensitive adhesive with a bonding strength greater than or equal to 2N/25mm, the label 14 is less likely to become detached from the bowed surface of the wrapped bundle 1 following the application of a partial vacuum. Equally, by providing a pressure sensitive adhesive
35 less than or equal to 15N/25mm the force required to cause separation of the label 14

from the barrier material 21 on first opening is kept to a level considered acceptable to most users.

5 Suitable pressure sensitive adhesives can include, but are not limited to: water based acrylics, solvent based acrylics, UV curable adhesives or hot melt adhesives.

As described hereinafter, to form the wrapped bundle 1 the barrier material 21 is wrapped around a group of cigarettes 18 and sealably closed. The cigarettes 18 may first be placed within the inner frame 24 to support and protect the cigarettes 18, and
10 then the barrier material 21 can be wrapped around the inner frame 24 and group of cigarettes 18.

In one example, the edges of the barrier material 21 may be folded against the sides of the contents of the wrapped bundle 1, for example the inner frame 24, to form
15 overlapping flaps that are sealed to each other, for example by using adhesive, heat seal or ultrasonic welding.

In another example, shown in FIG. 4, the barrier material 21 may be folded around the inner frame 24, and the ends of the barrier material 21 may be fin sealed.
20

In particular, the cigarettes 18 can be placed into the inner frame 24, for example by folding the inner frame 24 around the group of cigarettes 18, and then the barrier material 21 can be wrapped around the inner frame 24 as shown.

25 Firstly, edges of the barrier material 21 can be fin sealed to each other to form a first fin seal 45 that means the barrier material 21 is tubular around the inner frame 24. Then, the ends of the tubular barrier material 21 can also be fin sealed together, to form second and third fin seals 46, 47, as shown in FIG. 5.

30 In this example, the fin sealed bundle 1 has the first fin seal 45 extending across the rear face 3 of the wrapped bundle 1, and the second and third fin seals 46, 47 extending along the opposing side faces 4, 5 of the wrapped bundle 1.

In another example, schematically shown in FIG. 6, the first fin seal 45 may be formed
35 across the lower end face 7 of the wrapped bundle 1 which is opposite to the upper end

face 6 having the adhesive label 13. The second and third fin seals 46, 47 can then be formed along the opposing side faces 4, 5 of the wrapped bundle 1.

5 In an alternative example, the first fin seal 45 may be formed across the front face 2 of the wrapped bundle 1, below the adhesive label 13.

As shown in FIG. 5, the fin seals 45, 46, 47 can be folded flat against the faces of the wrapped bundle 1.

10 A fin seal can be formed by pressing parts of the barrier material 21 together and applying heat and/or adhesive to join those parts of the barrier material 21 together. The heat may melt and/or fuse components of the barrier material 21 together.

15 A fin sealed wrapped bundle 1, as described above, will provide a strong hermetic seal capable of holding a pressure differential. For example, the interior of the wrapped bundle may be provided with a pressure below atmospheric pressure.

20 A reduced pressure, for example a partial vacuum, can be provided to the interior of the wrapped bundle 1. The wrapped bundle 1 may be provided with a one-way valve adapted to permit flow of air in one direction and not the other. The valve on the wrapped bundle 1 can then be provided with a low pressure source to move air out of the wrapped bundle 1. In another example a small aperture is provided in the barrier material 21 and the low pressure source is applied over the aperture to move air out of the wrapped bundle 1. Once a satisfactory differential pressure has been achieved, a
25 small amount of adhesive can be applied over the aperture to seal the bundle 1 and maintain the pressure differential.

30 Alternatively, the interior of the wrapped bundle 1 may be provided with a modified atmosphere, for example gas other than air, for example an inert gas. In one example, the wrapped bundle 1 may be provided with a nitrogen rich atmosphere therein.

Figure 7 shows a pack of smoking articles 1 that has a hinged-lid pack 2 and a wrapped bundle 3 of smoking articles. The various examples of wrapped bundles 1 described with reference to FIGS. 1 to 6, may be received within a hinged-lid pack 48 to provide a
35 pack of cigarettes.

Alternatively, the wrapped bundle 1 may be provided as packaging itself, without any further pack outer or lid.

5 The hinged-lid pack 2 has a body 4 and a lid 5 that is hingedly attached to the body 4 about a hinge 51. The hinged-lid pack 48 has a base portion 49 having a parallelepiped form and which is adapted to receive the wrapped bundle 1 such that the wrapped bundle 1 protrudes from the base portion 49. In this position, the adhesive label 13, in particular the pull tab 16, is accessible for opening the wrapped bundle 1 and providing access to the cigarettes within.

10

A lid 50 is hingedly connected to the base portion 49 about a hinge 51. The lid 50 is pivotable between a closed position, where the lid 50 covers the wrapped bundle 1, and an open position, where the wrapped bundle 1 is exposed. FIG. 7 shows the lid 50 in the open position, such that a user can grasp the pull tab 16 on the adhesive label 13
15 and pull to tear the barrier material 21 and form the extraction opening 17.

In further embodiments, a part of the adhesive label 13 may be attached to an inside face of the lid 50, such that operation of the lid 50 simultaneously operates the cover flap 22 on the wrapped bundle 1.

20

In particular, the tab 16 of the adhesive label 13 may be adhered to an inside face of the lid 50 so that when the lid 50 is pivoted about the hinge 51 into its open position, the tab 16 is pulled, thereby lifting the cover flap 22 and forming the extraction opening.

25 The outside surface of the tab 16 may be attached directly to the inside face 52 of the lid front wall 53, as shown in FIG. 8. Alternatively, the tab 16 may be folded back and then attached to the inside face 52 of the lid front wall 53, as shown in FIG. 9.

Fig. 11 shows a wrapper comprising the barrier material 21 and the label 13 for forming
30 the wrapped bundle 1 of any of the above described embodiments of the invention.

As used herein, the term 'pressure sensitive adhesive' means adhesives that are capable of being reused multiple times. That is, the adhesive is permanently tacky so that two components can be detached and reattached repeatedly.

35

As used herein, the term ‘permanent adhesive’ means adhesives that are intended to strongly bond together two components such that they will not separate in normal use.

As used herein, the term “tobacco industry product” is to be understood as including
5 smoking articles comprising combustible smoking articles such as cigarettes, cigarillos, cigars, tobacco for pipes or for roll-your-own cigarettes, (whether based on tobacco, tobacco derivatives, expanded tobacco, reconstituted tobacco, tobacco substitutes or other smokable material), electronic smoking articles such as e-cigarettes, heating
10 devices that release compounds from substrate materials without burning such as tobacco heating products; and hybrid systems to generate aerosol from a combination of substrate materials, for example hybrid systems containing a liquid or gel or solid substrate.

In one embodiment, the tobacco industry product is a smoking article for combustion
15 selected from the group consisting of a cigarette, a cigarillo and a cigar.

In one embodiment, the tobacco industry product is a non-combustible smoking article.

20 In one embodiment the tobacco industry product is a heating device which releases compounds by heating, but not burning, a substrate material. The material may be for example tobacco or other non-tobacco products, which may or may not contain nicotine. In one embodiment the heating device is a tobacco heating device.

25 In another embodiment the tobacco industry product is a hybrid system to generate aerosol by heating, but not burning, a combination of substrate materials. The substrate materials may comprise for example solid, liquid or gel which may or may not contain nicotine. In one embodiment, the hybrid system comprises a liquid or gel
30 substrate and a solid substrate. The solid substrate may be for example tobacco or other non-tobacco products, which may or may not contain nicotine. In one embodiment the hybrid system comprises a liquid or gel substrate and tobacco.

The wrapper and bundle are described with reference to tobacco industry products, for example cigarettes. However, it will be appreciated that the wrapper may alternatively
35 be used to wrap a bundle of non-tobacco industry related products or articles. For example, food products, electronics or other consumer goods.

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 a superior wrapper for a group of tobacco industry products. 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.

Claims

1. A wrapped bundle comprising a barrier material wrapped about a group of tobacco industry products;
wherein the wrapped bundle further comprises at least a partial vacuum
5 within the wrapped bundle that causes a surface of the wrapped bundle to bow, the bowed surface comprising an openable section provided in the barrier material;
the wrapped bundle further comprising a label adhered by an adhesive to the barrier material to cover the openable section of the barrier material,
10 wherein the label is peelable away from the barrier material to lift the openable section and create an extraction opening in the barrier material;
and wherein the label has a total label thickness less than or equal to 95 micrometres.
- 15 2. The wrapped bundle of claim 1, wherein the label comprises a polymer material.
3. The wrapped bundle of claim 2, wherein the polymer material comprises any of: biaxially orientated polypropylene, orientated polypropylene or
20 polyethylene.
4. The wrapped bundle of any of claims 1 to 3, wherein the total label thickness is equal to or greater than 30 micrometres.
- 25 5. The wrapped bundle of any of claims 1 to 4, wherein the total label thickness is less than or equal to 75 micrometres.
6. The wrapped bundle of any of claims 1 to 4, wherein the total label thickness is less than or equal to 50 micrometres.
- 30 7. The wrapped bundle of any one of the proceeding claims, wherein the adhesive is configured to provide a bond strength between one of the adhesive

and the barrier material or the adhesive and the label greater than or equal to 2N/25mm.

8. The wrapped bundle of claim 7, wherein the adhesive is configured to
5 provide a bond strength between one of the adhesive and the barrier material or the adhesive and the label less than or equal to 12N/25mm.

9. The wrapped bundle of claim 7, wherein the adhesive is configured to
10 provide a bond strength between one of the adhesive and the barrier material or the adhesive and the label less than or equal to 10N/25mm.

10. The wrapped bundle of any preceding claim, wherein the label comprises a laminate material.

11. The wrapped bundle of any of claims 1 to 10, wherein the label comprises
15 a single layer of polymer material.

12. A wrapped bundle comprising a barrier material wrapped about a group
of tobacco industry products;

20 wherein the wrapped bundle further comprises at least a partial vacuum within the wrapped bundle that causes a surface of the wrapped bundle to bow, the bowed surface comprising an openable section provided in the barrier material;

the wrapped bundle further comprising a label adhered by an adhesive to
25 the barrier material to cover the openable section of the barrier material, wherein the label is peelable away from the barrier material to lift the openable section and create an extraction opening in the barrier material;

wherein the label comprises a flexible laminate material having a first layer and a second layer adhesively joined to each other;

30 and wherein each of the first layer and the second layer has a thickness less than or equal to 35 micrometres.

13. The wrapped bundle of claim 9, wherein one or each of the first and second layers comprises a polymer material.

14. The wrapped bundle of claim 13, wherein one or each of the first and
5 second layers comprises any of: biaxially orientated polypropylene, orientated polypropylene or polyethylene.

15. The wrapped bundle of any of claims 12 to 14, wherein one or each of the first layer and the second layer has a thickness less than or equal to 33
10 micrometres.

16. The wrapped bundle of any of claims 12 to 14, wherein one or each of the first layer and the second layer has a thickness less than or equal to 30
15 micrometres.

17. The wrapped bundle of any one of claims 12 to 16, wherein the adhesive adhering the label to the barrier material is configured to provide a bond strength between one of the adhesive and the barrier material or the adhesive and the label greater than or equal to 2N/25mm.

18. The wrapped bundle of any of claims 12 to 17, wherein the adhesive adhering the label to the barrier material is configured to provide a bond strength between one of the adhesive and the barrier material or the adhesive and the label less than or equal to 12N/25mm.

19. The wrapped bundle of any of claims 12 to 17, wherein the adhesive adhering the label to the barrier material is configured to provide a bond strength between one of the adhesive and the barrier material or the adhesive and the label less than or equal to 10N/25mm.

20. A tobacco industry pack comprising the wrapped bundle of any of claims
30 1 to 19.

21. A wrapper comprising a blank of barrier material for wrapping about a group of tobacco industry products to form a wrapped bundle, the wrapper further comprising a label adhered to the barrier material by an adhesive to cover an openable section in the barrier material, the label having a total label
5 thickness less than or equal to 95 micrometres.

22. A wrapper comprising a blank of barrier material for wrapping about a group of tobacco industry products to form a wrapped bundle, the wrapper further comprising a label adhered to the barrier material by an adhesive to
10 cover an openable section in the barrier material, wherein the label comprises a flexible laminate material having a first layer and a second layer adhesively joined to each other;

and wherein each of the first layer and the second layer has a thickness less than or equal to 35 micrometres.

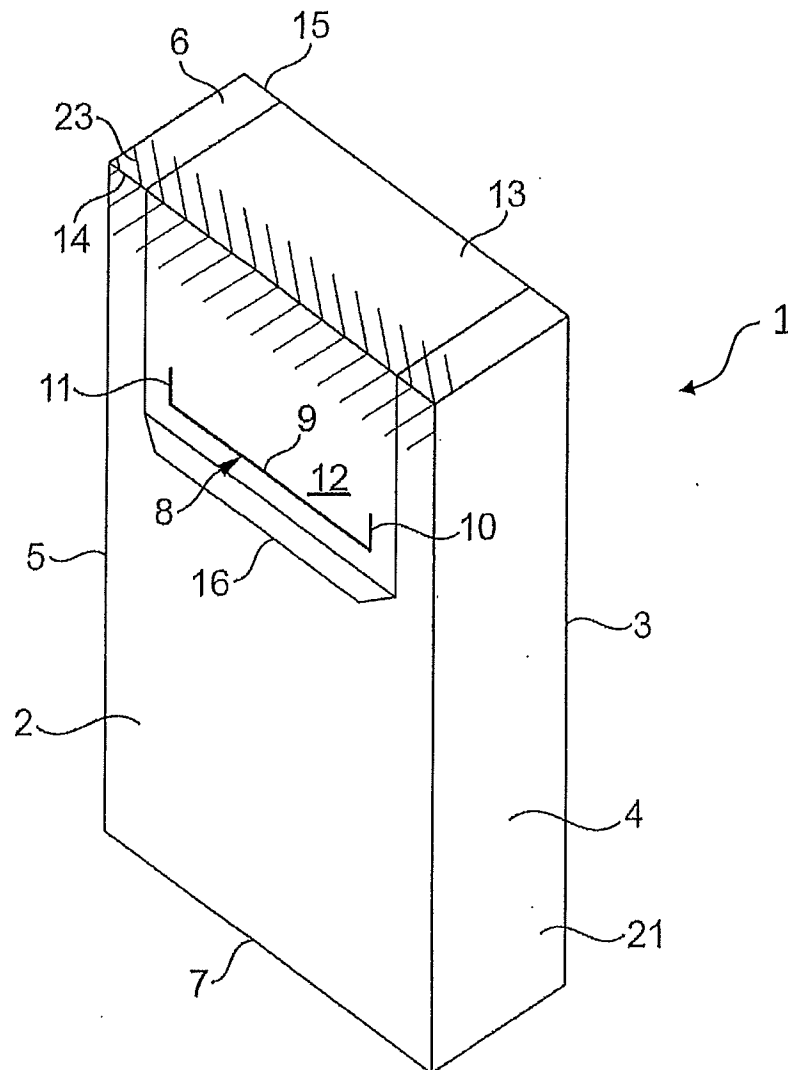


FIG. 1

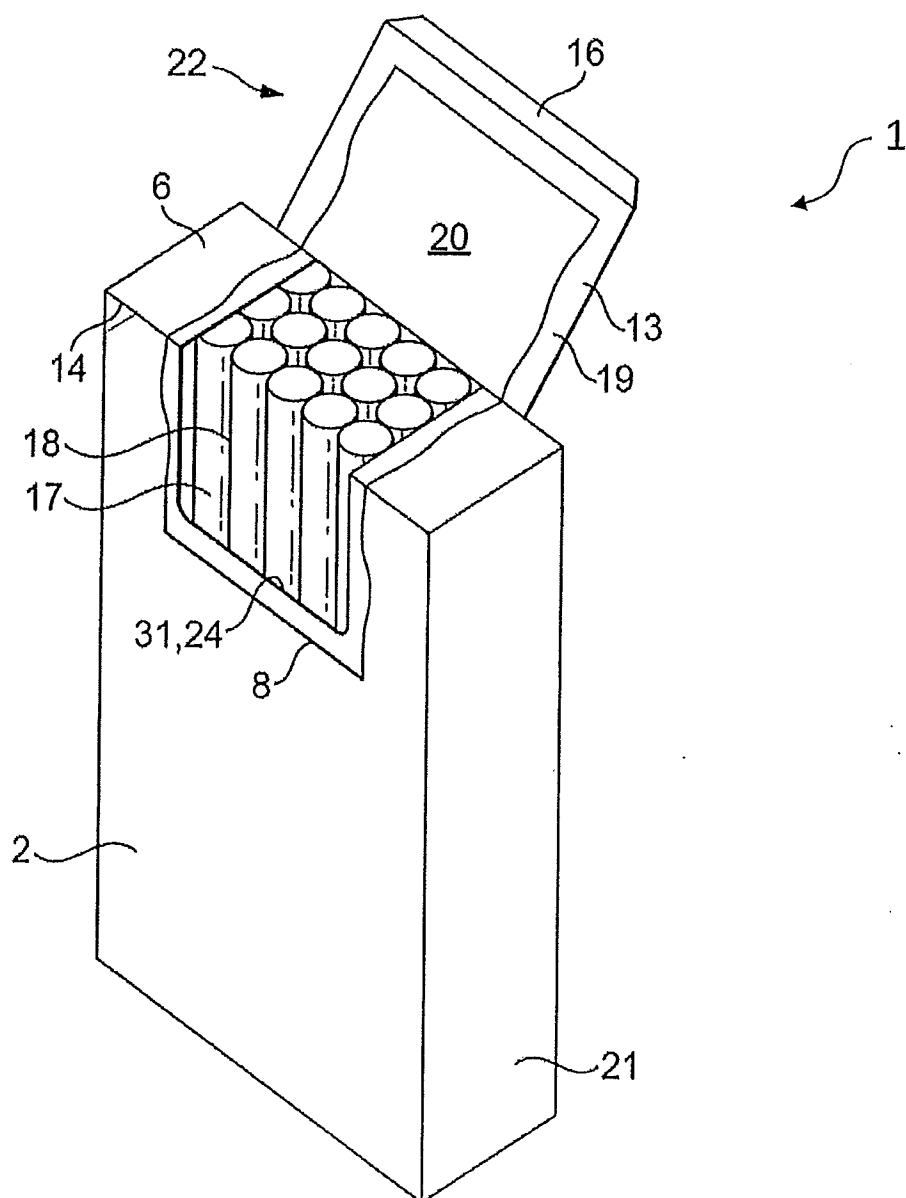


FIG. 2

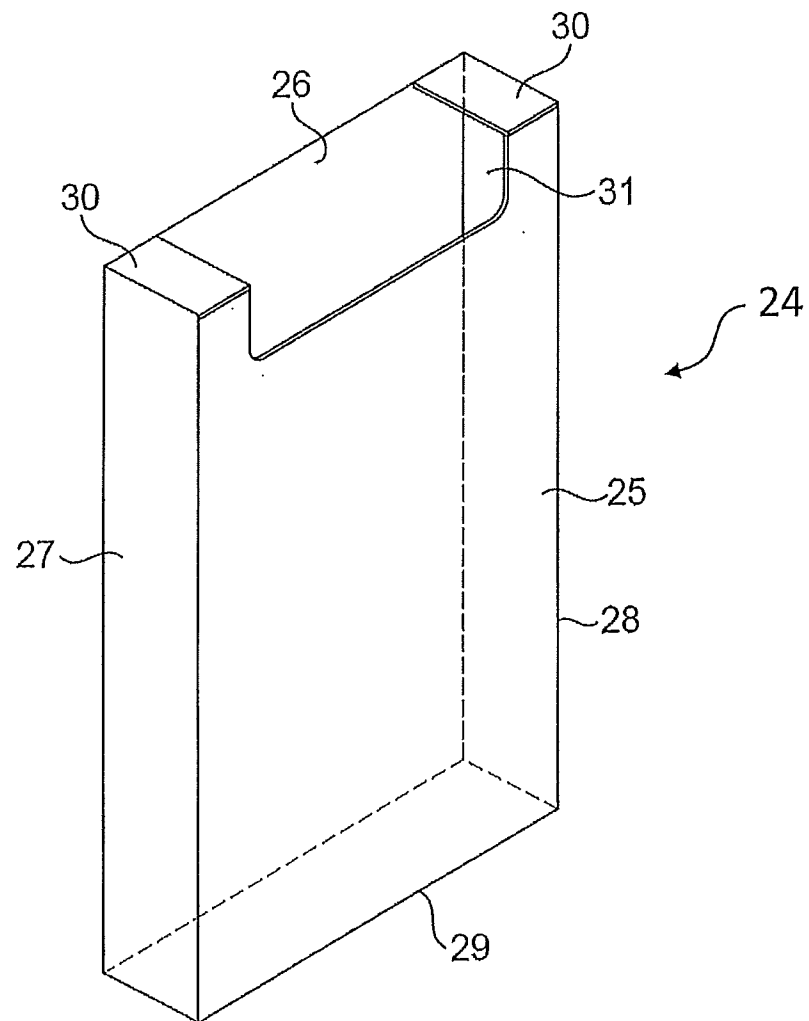


FIG. 3

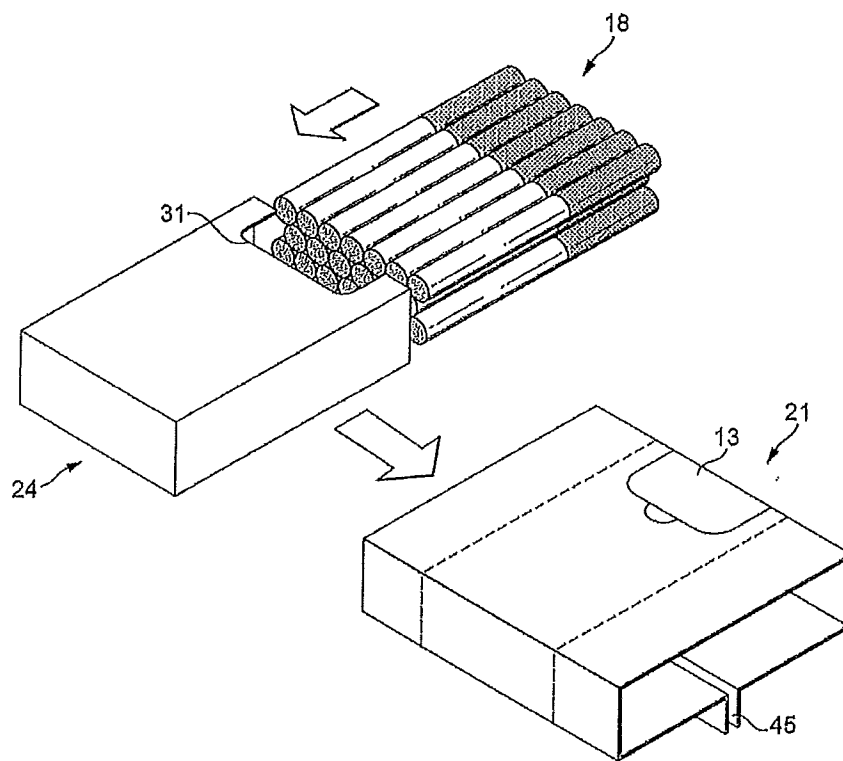


FIG. 4

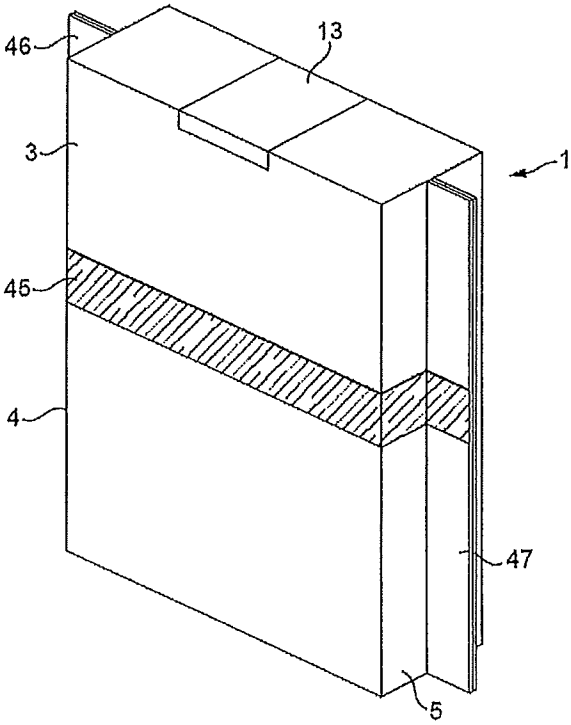


FIG. 5

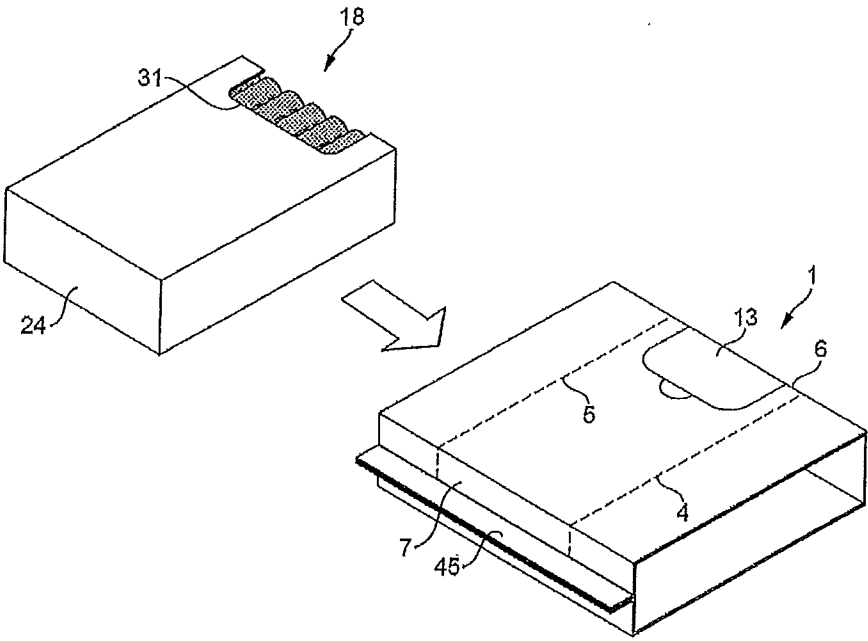


FIG. 6

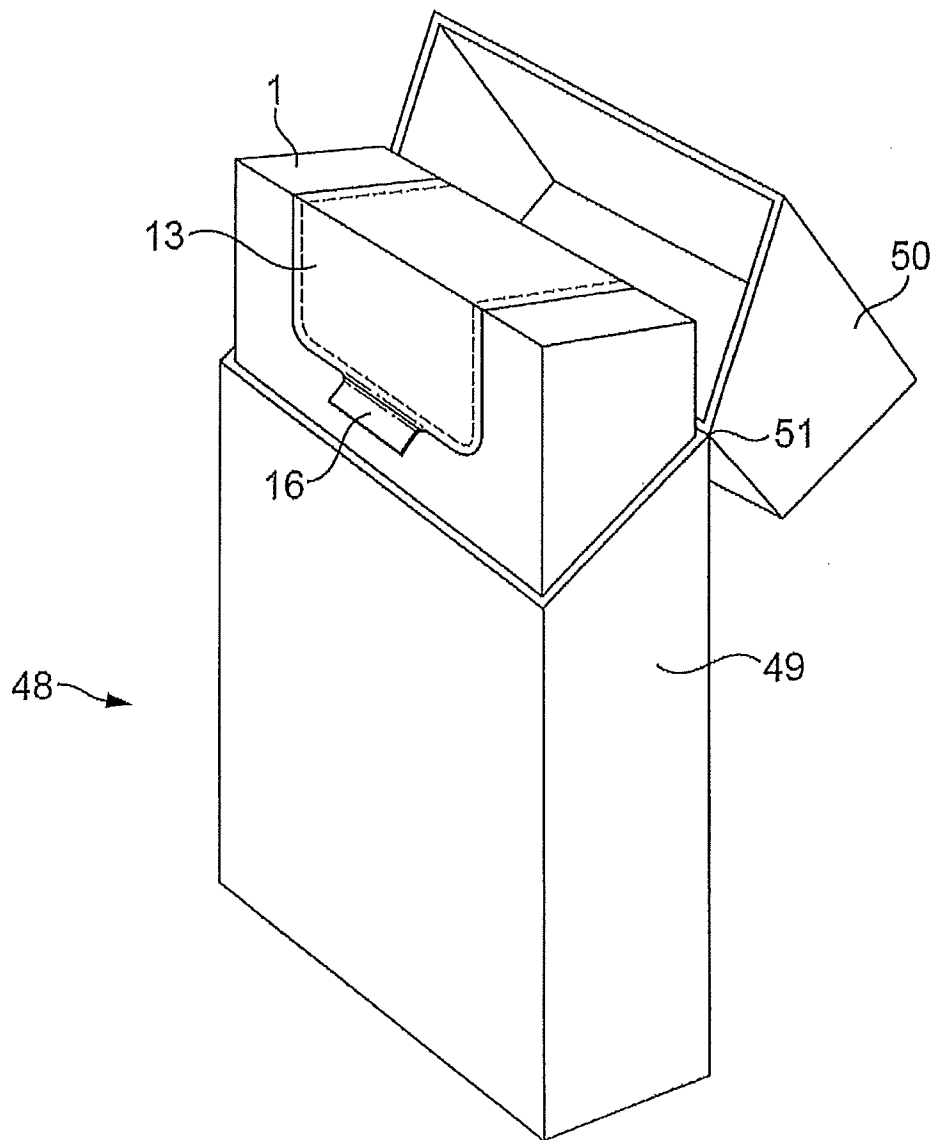


FIG. 7

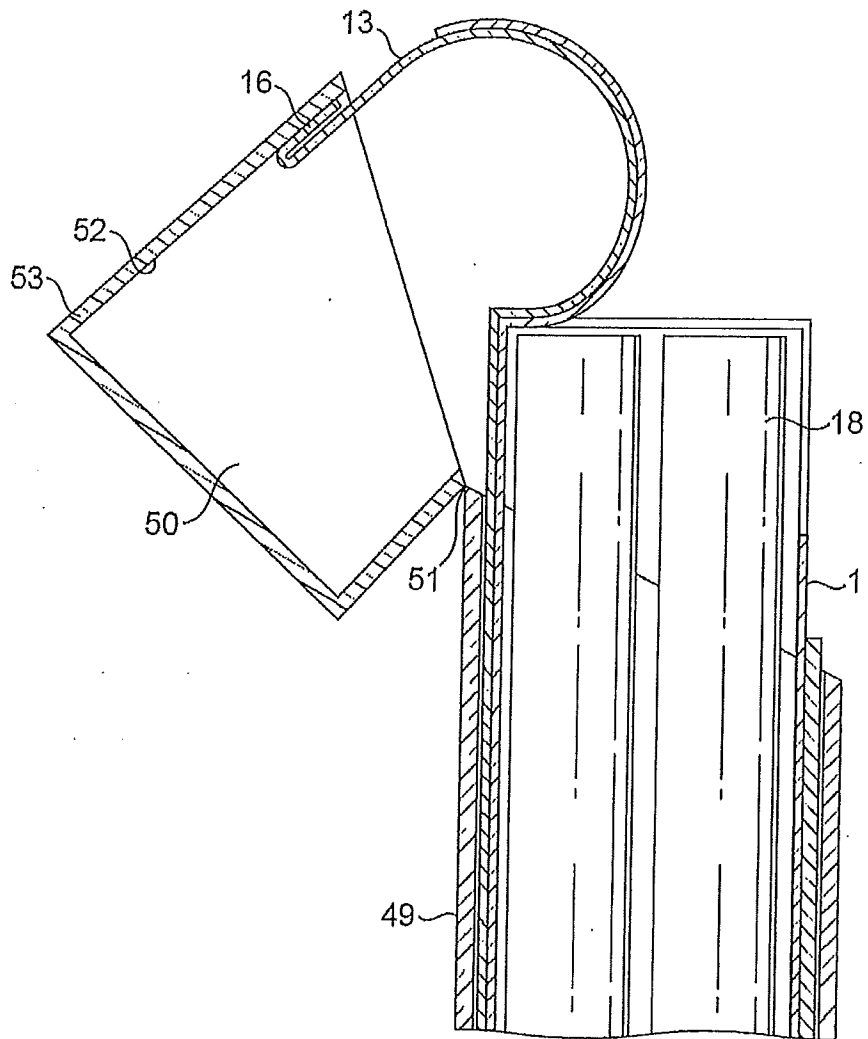


FIG. 8

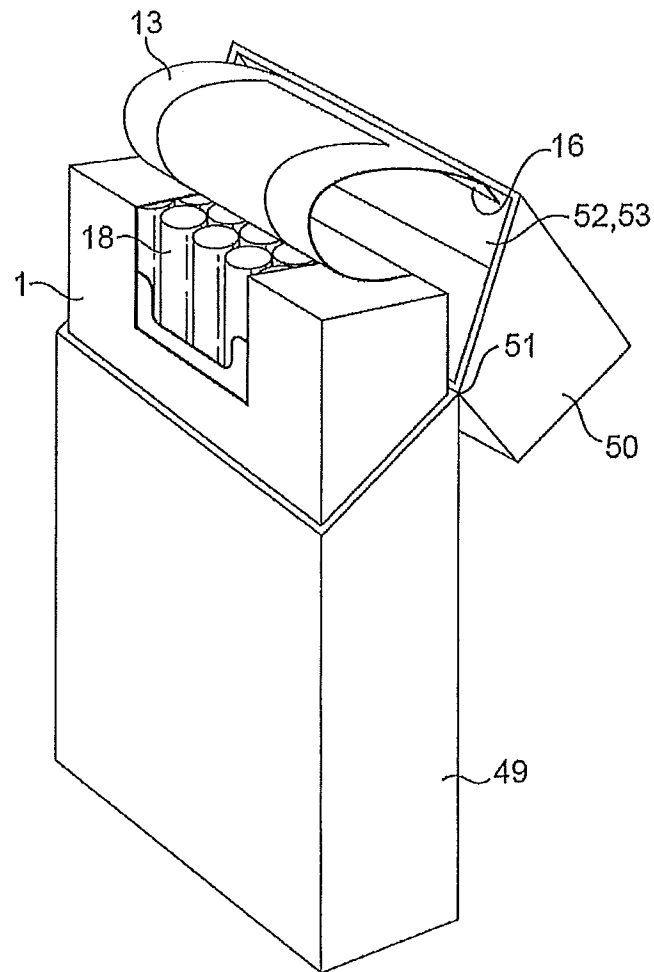


FIG. 9

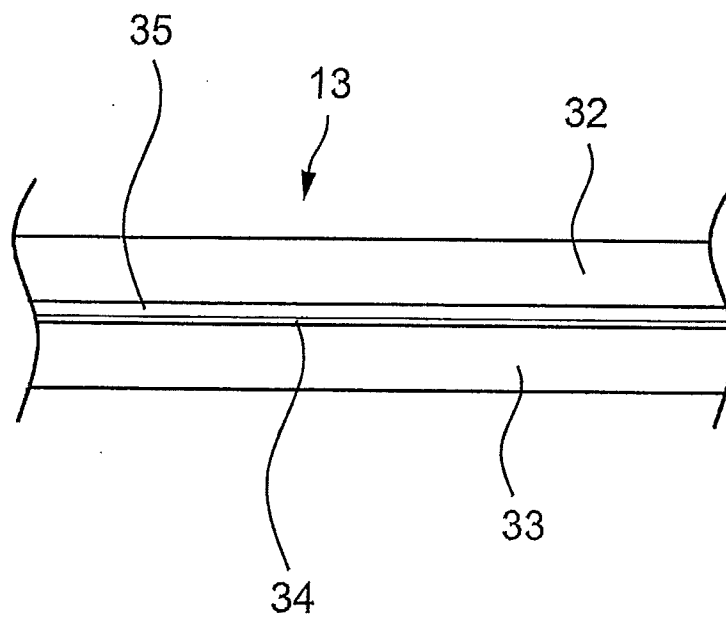


FIG. 10

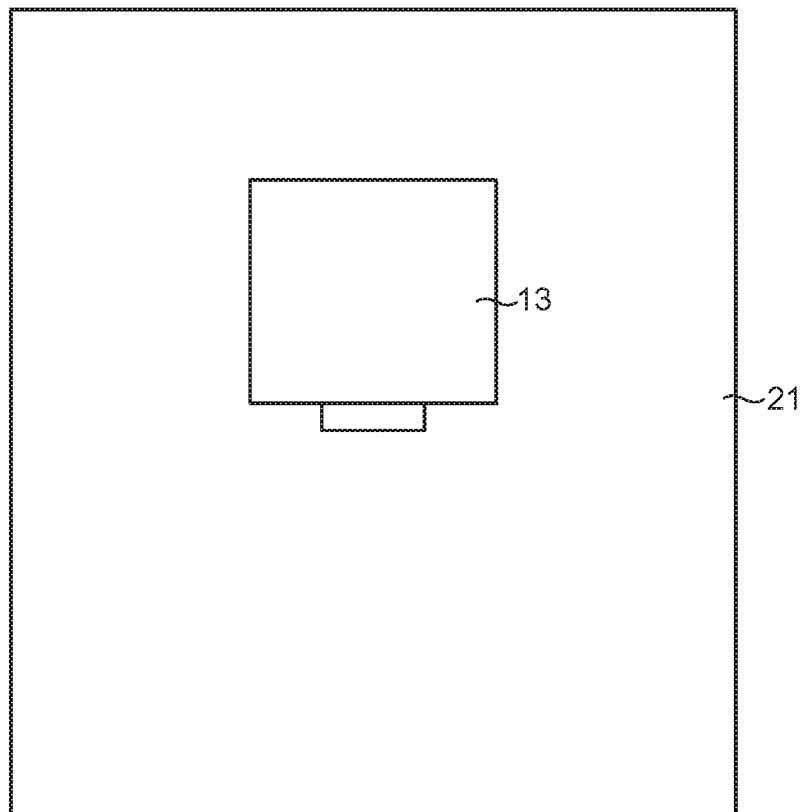


FIG. 11

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2018/050141

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D75/58 B65D85/10
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010/163563 A1 (LUTZIG BODO-WERNER [CH]) 1 July 2010 (2010-07-01)	21,22
Y	abstract; figures 1-5 paragraph [0041] - paragraph [0049]	1-20
X	WO 2015/144757 A1 (ESSENTIA PACKAGING & SECURITY LTD [GB]) 1 October 2015 (2015-10-01)	21,22
Y	abstract; figures 1-5 page 6, line 22 - page 7, line 18	1-20
Y	WO 2016/087826 A1 (BRITISH AMERICAN TOBACCO CO [GB]) 9 June 2016 (2016-06-09) abstract; figures 1,2 page 4, line 20 - page 9, line 21; claims 1,4,18,21	1-20



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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

"&" document member of the same patent family

Date of the actual completion of the international search

2 March 2018

Date of mailing of the international search report

12/03/2018

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Seegerer, Heiko

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2018/050141

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