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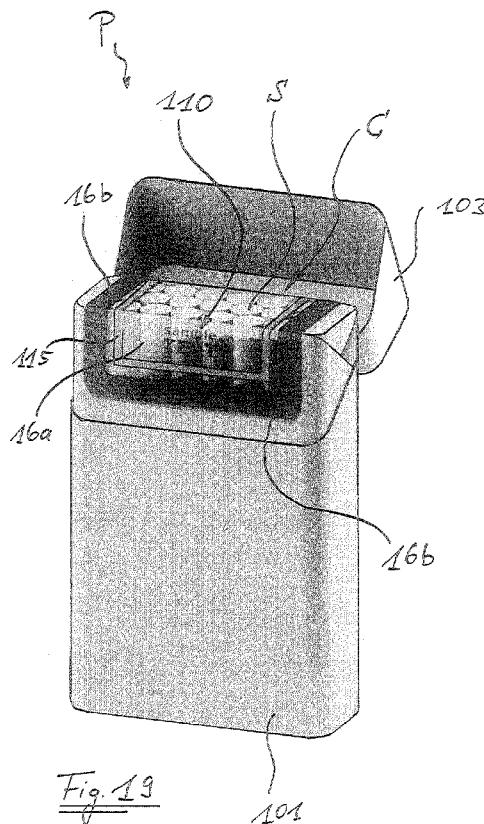
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(54) Title: RESEALABLE PACK OF SMOKING ARTICLES AND METHOD FOR PACKAGING SMOKING ARTICLES



(57) Abstract: The invention relates to a resealable pack of smoking articles, which comprises a sealed protective enclosure suitable for enclosing a charge of smoking articles. The enclosure is adapted to be opened in order to enable a user to take one or more of the smoking articles out of the pack. Further, the enclosure is adapted to be subsequently resealed in order to restore protection for the charge of smoking articles or for a remainder of the charge against aroma and freshness alteration. The enclosure comprises a component at least in part semi-transparent, preferably transparent which enables the user to see the charge or the remainder of the charge from the outside of the enclosure in the resealed state thereof. Furthermore, the invention relates to a method for packaging smoking articles.



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**Resealable pack of smoking articles  
and method for packaging smoking articles**

**FIELD OF THE INVENTION**

The present invention generally relates to the packaging of smoking articles, for example cigarettes, cigarillos and/or cigars. In particular, the invention concerns a resealable pack of smoking articles and a method for packaging smoking articles.

**TECHNICAL BACKGROUND**

In order to protect packaged smoking articles and preserve their taste and freshness, so-called resealable packs for smoking articles have been proposed.

Conventional resealable packs for smoking articles may be useful for preserving the taste and quality of the smoking articles contained in such a pack better than traditional packs which do not offer a possibility of being tightly resealed, to reduce escape of aroma from the packaged smoking articles towards the outside atmosphere and/or to hinder the ingress of undesired moisture from outside.

A smoker may desire to smoke one of the smoking articles contained in a pack of smoking articles from time to time. Such a user therefore repeatedly opens and closes a conventional resealable pack while gradually removing and consuming the smoking articles until the pack is empty. Between the instant of opening the conventional resealable pack for the first time and the instant at which the last smoking article is removed from the pack, some escape of aroma from those smoking articles remaining in the pack, and some loss of freshness thereof, still might occur.

Thus, in view of the above, it would be desirable to be able to offer smoking articles, such as cigarettes, cigarillos and/or cigars, packaged in a resealable pack which has a further increased protective effect and reduces the loss of aroma and freshness even further, and which can nevertheless be conveniently used.

It would also be desirable to provide users with packaging reducing the need for opening the pack to know how many cigarettes are left in the packaging, thereby further improving aroma and freshness conservation.

#### SUMMARY OF THE INVENTION

Therefore, it is an object of the present invention to provide a resealable pack of smoking articles of improved protective effect, which further can be conveniently used. It is a further object of the present invention to provide a correspondingly improved method for packaging smoking articles.

According to the invention, the technical problem just described is solved by a resealable pack of smoking articles having the features of claim 1. Furthermore, this problem is solved by a method having the features of claim 13.

Accordingly, the present invention proposes a resealable pack of smoking articles which comprises a sealed protective enclosure suitable for enclosing a charge of smoking articles. The protective enclosure is adapted to be opened in order to enable a user to take one or more of the smoking articles out of the pack. Moreover, the enclosure is adapted to be subsequently resealed in order to restore protection for the charge of smoking articles or for a remainder of the charge against aroma and freshness alteration, in particular through moisture loss or ingress in the pack. In accordance with the invention, the enclosure comprises a component at least in part semi-transparent, preferably transparent which enables the user to see the charge or the remainder of the charge

through the component from the outside of the enclosure in the resealed state thereof.

The method for packaging smoking articles which is proposed in accordance with the present invention comprises the steps of:

- providing a charge of smoking articles; and
- enclosing the charge by a sealed protective enclosure.

The enclosure is adapted to be opened in order to enable a user to take one or more of the smoking articles out of the pack. Further, the enclosure is adapted to be subsequently resealed in order to restore protection for the charge of smoking articles or for a remainder of the charge against aroma and freshness alteration. The enclosure, by which the charge is enclosed, comprises a component at least in part semi-transparent, preferably transparent which enables the user to see the charge or the remainder of the charge from the outside of the enclosure in the resealed state thereof.

The idea underlying the present invention is to provide the resealable pack with a component which gives the user (e.g. a smoker) the possibility of inspecting the contents of the resealable pack, and in particular of finding out, at least approximately, how many of the smoking articles remain inside the resealable pack, without having to open the protective enclosure. The user therefore can check whether smoking articles remain without a need for opening and subsequent resealing of the enclosure for this purpose. In this way, a resealable pack is provided which is more convenient than conventional resealable packs, as the remaining contents can be easily and quickly determined.

By means of the resealable pack of the invention, it can therefore also be avoided that the user frequently opens the sealed protective enclosure only for inspecting the contents of the pack, even if she or he actually does not desire to take a smoking article out of the pack at that time. Hence, the enclosure of the inventive resealable pack will be opened by the user significantly less frequently, compared to conventional resealable packs for smoking articles. Additionally,

the chances of improper or incomplete resealing of the enclosure by the user are reduced, as the number of resealing operations is minimized.

Accordingly, the advantageous protective environment afforded by the sealed protective enclosure can be better maintained. Therefore, the freshness, quality and taste of the smoking articles can be even better preserved than in the case of conventional resealable packs.

The advantages and benefits just described are also attained by performing the method for packaging smoking articles proposed by the present invention.

Further advantageous developments, enhancements and improvements of the present invention are contained in the dependent claims as well as in the detailed description, which refers to the figures of the drawings.

Within the framework of this application, a “transparent” material or element should be understood as a material or element through which light can pass, and which also enables a user, in particular a human, to more or less clearly discern and identify objects placed behind such a material or element. That is, light passes through such a material or element essentially without the light being scattered. A “semi-transparent” material or element, in the context of this application, should be understood as allowing a user to discern and identify objects behind such a material or element at least to some degree. However, it should be understood that the degree of transparency can vary from one semi-transparent material to another, and that the term “semi-transparent”, as it is used here, is not intended to restrict the degree of transparency to a particular numerical value. Therefore, a transparent material may be understood to be a particular case of a semi-transparent material, having a high degree of transparency. However, materials being semi-transparent and having a degree of transparency substantially less than the degree of transparency of a fully transparent material are contemplated in the present application as well.

Further, in the context of this application, a “non-transparent” material or element should be understood as being capable of letting light pass through, but without allowing a user to discern or identify objects placed behind such a “non-transparent” material or element. Finally, an “opaque” material or element, as this term is used here, should be understood as denoting a material or element that does not allow light to pass through at all.

According to a preferred development, the component is formed as an element for repeatedly opening and resealing the enclosure. In particular, the component may be formed as a label of a flexible sheet material. In this way, the element used for repeatedly opening and resealing the enclosure is at the same time advantageously used as the element which provides the visual access for the user from an outside of the enclosure to the inside thereof. Thus, advantageously, the function of visual access and of opening and resealing of the protective enclosure are combined in one component. A resealable pack having such a component formed as a label may be conveniently manufactured. If this is desired, even large portions of the charge enclosed by the protective enclosure may be covered by an opaque rigid outer case or an opaque outer wrapper without impairing the function of visual access afforded by the component. With this development, the user can conveniently inspect the contents of the pack and, if desired, open the enclosure in the same region of the pack.

According to a development, the component is formed as an element for repeatedly opening and resealing the enclosure, in particular as a label of a flexible sheet material, adhesively connected to the sealed protective enclosure. This may further contribute to convenient manufacturing of the pack and to a convenient use of the pack by the user.

In accordance with another advantageous improvement, the sealed protective enclosure comprises a barrier sheet, which may in particular be a flexible barrier sheet. The barrier sheet is disposed around the charge of smoking articles. The barrier sheet may, in particular, be formed of a suitable barrier sheet material

which is adapted to protect the smoking articles for preserving their taste and freshness, for example by hindering the escape of aroma from the packaged smoking articles towards the outside atmosphere and/or by hindering the ingress of undesired moisture from outside. For providing the desired protective properties, a sealed protective enclosure can be manufactured from a barrier sheet in a relatively simple and cost-effective manner by disposing the barrier sheet around the charge of smoking articles and then sealing the barrier sheet, where necessary. The sealing can be accomplished, for example, by forming suitable sealed seams using an appropriate sealing device. A flexible barrier sheet can be easily folded around the charge.

In accordance with a preferred development, the component is adhesively connected to the barrier sheet. By choosing a suitable adhesive, the component may be conveniently formed as a means, such as a label, which can be repeatedly peeled off the barrier sheet at least in part for opening the enclosure, and which can be repeatedly folded back or bent back into its original position for tightly resealing the enclosure.

According to a further preferred development, the component is a label that is manufactured separately from the barrier sheet and that is adhered to the barrier sheet in order to produce the resealable pack. In this manner, the barrier sheet and the label can be easily manufactured.

In accordance with a further development, the barrier sheet may be formed of a laminate.

In accordance with a still further improvement, the barrier sheet may be formed of a heat-sealable or a self-sealing material, in particular a heat-sealable laminate or a self-sealing laminate. If the barrier sheet material is heat-sealable, seams of the enclosure may be formed by heat-sealing.

According to a further improvement, the barrier sheet or at least a portion of the barrier sheet is transparent or semi-transparent. In this way, the smoking articles can at least partly be seen from an outside of the enclosure through the barrier sheet or the portion thereof.

According to a further preferred improvement, the barrier sheet or the transparent or semi-transparent portion thereof may be printed. By means of printing, the barrier sheet or the transparent or semi-transparent portion of the barrier sheet can be further improved with regard to its visual appearance and can also be provided with information that may be useful for the user. Such information could, for example, relate to the type of the smoking articles contained in the pack, to their brand and/or to their taste.

According to a further development, the component, which is at least partly semi-transparent or at least partly transparent, is at least partially arranged on the transparent or semi-transparent barrier sheet or on the transparent or semi-transparent portion of the barrier sheet. In this way, the transparency or semi-transparency of the barrier sheet or of the portion thereof, in cooperation with the transparency or semi-transparency of the component, can provide a visual access for the user from an outside of the enclosure through portions both of the component and of the barrier sheet. Thereby, advantageously, a resealable pack can be obtained which may be conveniently manufactured, as it may not be necessary to provide the barrier sheet with a cut-out in the region in which the component is arranged.

According to another development, the barrier sheet is non-transparent or is opaque. In this manner, the charge of smoking articles or the remainder thereof may at least partly be seen by the user, in the resealed state of the pack, due to the transparency or semi-transparency of the component or of portions thereof, while through adjacent portions of the opaque or non-transparent barrier sheet, the smoking articles cannot be seen. Thereby, a further variant of the resealable pack having an improved appearance is created. Moreover, in case the charge

of smoking articles enclosed by the protective enclosure is to be inserted, during the packaging process, into an opaque outer case or is to be wrapped with an opaque outer wrapper, such an outer case or outer wrapper may inhibit visual access through at least part of the barrier sheet. There may therefore be no need for the entire barrier sheet to be transparent or semi-transparent in this case.

The barrier sheet may comprise an access opening to allow a user to access the products wrapped within said barrier sheet. In this case, the component covers the access opening in an initial sealed state of the enclosure. The component is in this case adapted and connected to the barrier sheet in such a manner that the component can be at least partly lifted from the barrier sheet so as to uncover at least a portion of the access opening for opening the enclosure, whereby the user is enabled to access the smoking articles. Further, the component is in this case adapted to subsequently cover the access opening again for resealing the enclosure. This development may be particularly useful if the barrier sheet is non-transparent or opaque. Visual access for the user to the inside of the enclosure is provided through the at least partly transparent or at least partly semi-transparent component and the access opening covered by the component. After opening the enclosure by partly lifting the component, the user can take out a smoking article through the access opening.

According to a further, preferred development, the barrier sheet is provided with a rupture line along which the barrier sheet is adapted to rupture for forming an access opening. In an initial sealed state of the enclosure, the component covers the rupture line and the area of the access opening that is to be formed. Moreover, the component is adapted and connected to the barrier sheet in such a manner that the component can be at least partly lifted from the barrier sheet so as to cause rupture of the barrier sheet along the rupture line and formation of the access opening for opening the enclosure. Thereby, the user is enabled to access the smoking articles, in particular for removing one or more of the smoking articles from the pack. The component further is adapted to subse-

quently cover the formed access opening for resealing the enclosure. A resealable pack according to this development has, for example, the advantage of being rather simple in manufacture if the barrier sheet or at least a portion of the barrier sheet is transparent or semi-transparent, as the visual access for the user can be provided through the barrier sheet or its transparent or semi-transparent portion and through the component positioned on the barrier sheet. In this case, a rupture line is sufficient for defining the access opening. An at least partially detached portion of the barrier sheet in the area of the access opening, delimited by the former rupture line, may remain adhered to the component after the first opening operation without interfering with the visual access towards the interior of the enclosure. Also, in the case of this development, the smoking articles and in particular end faces of these can advantageously be protected from accidentally adhering to the component by the at least partially detached portion of the barrier sheet which remains adhered to the component.

In accordance with a further advantageous improvement, the rupture line may be formed as a perforation line. This is a rather simple way of providing a defined rupture line in the barrier sheet.

According to a further improvement, the component is entirely transparent or semi-transparent. According to an alternative development, a first portion of the component is transparent or semi-transparent, while a second portion of the component is non-transparent or opaque. A substantially entirely transparent or semi-transparent component may provide a large region of visual access for the user, making it easy to see the charge or the remainder thereof. In contrast, a second portion of the component which is non-transparent or opaque, while the first portion is transparent or semi-transparent, may further improve the outward appearance of the resealable pack, for example by highlighting or visually emphasizing the transparent or semi-transparent first portion.

In accordance with a further development, a first portion of the component is formed as a transparent or semi-transparent window which is bordered along at

least a portion of its circumference by a non-transparent or opaque margin. The margin, according to this development, is formed by a second portion of the component. According to this development, the window and the access opening overlap or substantially coincide in the sealed and/or resealed state of the enclosure. In particular, the window and the access opening may overlap entirely or partly. By this development, the exterior appearance of the resealable pack is further improved and the window in the component is accentuated. Although, in particular in the case of a transparent or semi-transparent barrier sheet, it is not imperative to arrange the window and the access opening so as to partly or entirely overlap or so as to coincide, the coinciding and/or overlapping arrangement of window and access opening is preferred.

In accordance with a further improvement, the component or the first portion of the component is printed. A printing on the transparent or semi-transparent portion of the component may contribute to a new and improved appearance of the pack and further may provide the user with important information, which might, for example, relate to the type of smoking articles, their brand, their taste etc. or contain instructions for proper use. As the component enables the user to see the remaining contents of the resealable pack, the user's attention is drawn also to the important information printed on the component.

According to a further improvement, the component may be produced from a cellophane-based or from a polypropylene-based sheet material.

In particular, the component may be produced from a cellophane-based sheet material having suitable protective properties for protecting the smoking articles while also being environmentally friendly, in particular exhibiting sufficient biodegradability and/or being manufacturable in sustainable manner.

For example, according to a variant, a type of film available from Innova Films Ltd of Wigton, Cumbria, United Kingdom, under the brand NatureFlex™ could be used for the component.

According to a further development, the resealable pack further is provided with a soft outer wrap of a flexible sheet material, wherein the charge that is enclosed by the sealed protective enclosure forms a resealable inner pack wrapped with the outer wrap. Alternatively, the pack may comprise a rigid or semi-rigid outer case. The charge enclosed by the sealed protective enclosure then forms a resealable inner pack contained in the outer case. The outer wrap or the outer case additionally protects the charge of smoking articles and the protective enclosure, for example, against mechanical damage during handling and/or transport.

According to a further improvement, the rigid or semi-rigid outer case may be formed of a suitable type of cardboard.

In particular, the rigid or semi-rigid outer case may be formed as an outer case comprising a hinged lid.

According to a further improvement, the resealable pack further comprises an inner supporting frame. The frame is disposed inside the enclosure between a portion of the charge of smoking articles and a portion of the enclosure. Such an inner supporting frame may, in particular, be formed of a semi-rigid material, for example of a suitable type of cardboard. The inner frame may help to inhibit damage to the smoking articles and/or to the barrier sheet due to pressure applied to the pack. Such a frame thus provides the pack with improved structural stability also in case some of the smoking articles have been removed already. The inner supporting frame may also facilitate the resealing operation by providing sufficient counter support.

According to a further development, the resealable pack further comprises an outer supporting frame, the frame being disposed outside the enclosure and covering a portion of the charge enclosed by the sealed protective enclosure. The outer supporting frame may in particular be made of a semi-rigid material,

such as a suitable cardboard material. By means of an outer supporting frame, further protection of the smoking articles and of the protective enclosure against mechanical loads applied to the pack may be provided.

According to various developments of the invention, the resealable pack may comprise the inner supporting frame or the outer supporting frame or both supporting frames.

The preceding improvements, enhancements and developments of the invention may be applied to the proposed inventive pack, but also to the method of the invention.

In accordance with a further improvement of the method for packaging smoking articles, enclosing the charge includes providing a barrier sheet, in particular a flexible barrier sheet, which comprises an access opening, wherein the component is adhesively connected to the barrier sheet so as to cover the access opening. The barrier sheet provided is disposed around the charge.

According to an alternative improvement, enclosing the charge includes providing a barrier sheet, in particular a flexible barrier sheet, which comprises a rupture line along which the barrier sheet is adapted to rupture for forming an access opening. The component is adhesively connected to the barrier sheet so as to cover the rupture line and the area of the access opening to be formed. The barrier sheet provided is disposed around the charge.

In accordance with an even further improvement of the method, after disposing the barrier sheet around the charge, the barrier sheet is sealed, in particular by means of sealed seams, in order to form the sealed protective enclosure.

Preferably, the method for packaging smoking articles is performed using a barrier sheet which is transparent or semi-transparent.

The method proposed by the invention may, in particular, be used to produce the inventive resealable pack.

The developments, improvements and enhancements described above may be arbitrarily combined with each other whenever this makes sense. Other possible developments, enhancements and implementations of the invention comprise combinations of features of the invention that have been described above or will be described in the following in relation to the detailed description of embodiments, even where such a combination has not been expressly mentioned.

#### BRIEF DESCRIPTION OF THE DRAWINGS

In the following, the present invention will be explained with reference to the schematic figures of the drawings, illustrating embodiments of the invention. In the figures,

Fig. 1 is a plan view of a portion of a barrier sheet, before disposing the barrier sheet around a charge of smoking articles, and of a transparent label arranged on the barrier sheet, in accordance with a first embodiment of the invention;

Fig. 1A is a schematic plan view of a barrier sheet and label according to a variant of the embodiment of Figure 1;

Fig. 2 is a sectional view A-A, as indicated in Figure 1, through the portion of the barrier sheet and the label of Figure 1;

Fig. 3 is a plan view of a portion of a barrier sheet before being disposed around a charge of smoking articles and of a transparent label arranged on the barrier sheet in accordance with a second embodiment of the present invention;

Fig. 3A is a schematic plan view of a barrier sheet and label according to a variant of the embodiment of Figure 3;

Fig. 4 is a sectional view B-B, as indicated in Figure 3, through the portion of the barrier sheet and the label of Figure 3;

Fig. 5 is a perspective front view of a resealable pack of smoking articles in accordance with the first embodiment of the invention;

Fig. 6 is a perspective rear view of the resealable pack of Figure 5;

Fig. 7 is a perspective front view of a resealable pack of smoking articles in accordance with the second embodiment of the invention;

Fig. 8 is a perspective rear view of the resealable pack of Figure 7;

Fig. 9 is a perspective front view of a charge of smoking articles enclosed by a sealed protective enclosure, a portion of the enclosed charge being covered by an outer supporting frame, for a resealable pack in accordance with a third embodiment of the invention;

Fig. 10 is a perspective rear view of the enclosed charge and outer supporting frame of Figure 9;

Fig. 11 is a perspective front view of a resealable pack comprising a soft outer wrap in accordance with variants of the first, second and third embodiments of the invention;

Fig. 12 is a perspective front view of a resealable pack comprising an inner supporting frame, in accordance with a fourth embodiment of the invention;

Fig. 13 is a perspective rear view of the resealable pack of Figure 12;

Fig. 14 is a plan view of an exemplary blank for the inner supporting frame of the resealable pack of Figure 12;

Fig. 15 is a perspective view of the blank of Figure 14 folded and placed around a charge of smoking articles;

Fig. 16 is a perspective front view of a resealable pack of smoking articles in accordance with a fifth embodiment of the invention, comprising a rigid outer case having a hinged lid;

Fig. 17 is a perspective front view of a resealable pack of smoking articles according to a first variant of the fifth embodiment, the hinged lid being shown in an open state;

Fig. 18 is a perspective front view of a resealable pack of smoking articles in accordance with a second variant of the fifth embodiment, the hinged lid being shown in an open state;

Fig. 19 is a perspective front view of a resealable pack of smoking articles in accordance with a third variant of the fifth embodiment, the hinged lid being shown in an open state; and

Fig. 20 displays various views of the resealable pack according to the second variant of the fifth embodiment of Figure 18.

The enclosed drawings are intended to illustrate embodiments of the invention so that the invention may be further understood. The drawings, in conjunction with the description, serve to explain principles and concepts of the invention. Other embodiments and many of the advantages described may be inferred from the drawings. Elements of the drawings are not necessarily drawn to scale.

Elements, features and components which are identical or which have the same function or effect have been labelled in the drawings using the same reference signs, except where explicitly stated otherwise.

#### DETAILED DESCRIPTION OF EMBODIMENTS

In Figure 1, a portion of a flexible barrier sheet 1 is illustrated in a top view. The barrier sheet 1 is preferably made from a flexible sheet material which has properties that are suitable for protecting smoking articles (not shown in Figure 1), such as cigarettes, cigarillos or cigars, against escape and loss of aroma and taste as well as against the ingress of external moisture. The sheet material for the barrier sheet may also be adapted to provide protection against other external influences that might be detrimental to the taste and quality of the smoking articles. As an example, the sheet material for forming the barrier sheet 1 may be a laminate, such as a heat-sealable or self-sealing laminate.

As shown in Figure 1, the barrier sheet 1 is provided with a rupture line 3 which, in the example displayed, has the form of a substantially U-shaped perforation line. The rupture line 3 delimits a region or area 6 which is shown in Figure 1 by hatching and in which an access opening 10, the function of which will be described in more detail further below, is formed when the barrier sheet 1 is ruptured along the rupture line 3 and the remainder of the barrier sheet 1 in the area 6 is folded away, for example to the left in Figure 1.

In Figure 1, the barrier sheet 1 has not yet been broken along the rupture line 3. A component 15 is arranged on one side, here the upper side, of the barrier

sheet 1 and is adhesively connected to the barrier sheet 1 across substantially the entire face of the component 15 which faces the barrier sheet 1. The component 15 completely covers the rupture line 3 and the area 6.

The component 15 has the form of an adhesive label, which is formed of a flexible sheet material as well. The sheet materials used for the label 15 and for the barrier sheet 1, respectively, may be of different type. The adhesive for connecting the component 15 to the barrier sheet 1 is chosen such that the component 15 can be conveniently peeled off and thereby lifted from the barrier sheet 1 at least partly in the direction of the arrow 19 in Figure 2. For this purpose, a user may lift the component 15 at its edge 15a.

When the component 15 is lifted at least partly in this manner and folded or bent away towards the left in Fig. 2, as indicated in Fig. 2 by a dashed line, rupture of the barrier sheet 1 along the rupture line 3 is caused. Thereby, the access opening 10 is formed. Further, the adhesive by which the component 15 is adhered to the barrier sheet 1 is chosen in such a manner that the component 15, for covering and thereby closing the access opening 10 again, can be folded back into place and can be again tightly adhered to the barrier sheet 1, whereby the access opening 10 is tightly resealed. Preferably, the component 15 is adapted to be lifted from the barrier sheet 1 for uncovering the access opening 10 and to be folded back into place for resealing the access opening 10 multiple times, after the initial formation of the access opening 10.

In Figures 1 and 2, the barrier sheet 1 is entirely made of a substantially fully transparent material. Furthermore, the component 15 of Figures 1, 2 is entirely made of a substantially fully transparent material as well. It is noted that either the barrier sheet 1 or the component 15 of Figs. 1, 2 or both of them may be semi-transparent or translucent instead of being fully transparent.

This means that an object O placed behind the barrier sheet 1 in the region of the component 15 can be at least partly seen by a user when looking through

the component 15. In Fig. 2, this is schematically illustrated by a user's eye E. In particular, the user can see what is behind the barrier sheet 1 in the area 6.

It is noted that in a variant, if this is desired, the barrier sheet 1 could also comprise a transparent or a semi-transparent translucent portion 2a as well as a non-transparent or opaque portion 2b, the component 15 being arranged on the transparent or semi-transparent portion 2a. This is schematically displayed in Figure 1A.

The component 15 may, for example, be produced from a cellophane-based or from a polypropylene-based sheet material. If a cellophane-based sheet material is used, it may be envisaged to employ a material which is sufficiently environmentally compatible. For example, a type of film available from Innova Films Ltd. of Wigton, Cumbria, UK under the brand NatureFlex<sup>TM</sup> could be used for the component 15.

Figure 1 illustrates a region 21 in which either the transparent or semi-transparent component 15 or the transparent or semi-transparent barrier sheet 1 or both may be printed. For example, ornaments, symbols, logos, or important hints and instructions for the user could be printed in the region 21. In this way, such hints and information, for example, will be easily perceived by the user while objects located behind the barrier sheet 1 nevertheless remain visible through the component 15 and the barrier sheet 1.

In Figure 3, a barrier sheet 1 and a component 15 for a resealable pack of a second embodiment are illustrated. In Figure 3, the barrier sheet is non-transparent or opaque, but it may instead, in a variant, be also either transparent or semi-transparent. In order to allow visibility through the component 15 towards what is behind barrier sheet 1, the barrier sheet 1 of Figure 3 comprises an access opening 10, which, in Figure 3, has an approximately rectangular shape with rounded corners. The edge of the access opening 10 is illustrated by a dashed line. On the barrier sheet 1 of Figure 3, a component 15 formed as a

label of a flexible sheet material is arranged, which essentially has the same properties as the component 15 of Figure 1 with regard to its adhesive connection to the barrier sheet 1. However, the component 15 of Figure 3 comprises a first portion 16a which is transparent and a second portion 16b which is non-transparent. It should be noted that the first portion 16a of the component 15 of Figure 3 could also be semi-transparent. Further, instead of being just non-transparent, the second portion 16b could be opaque. The first portion 16a of this example is formed as a transparent window. In Figure 3, a boundary of the window 16a is denoted by reference sign 17. The second portion 16b is formed as a non-transparent or opaque margin which borders the first portion 16a along its circumference.

As shown in Figure 3, the first portion 16a and the access opening 10 substantially coincide, the access opening 10 being slightly larger than the transparent window in this example. In a variant, the window formed by the first portion 16a and the access opening 10 could be arranged in an overlapping relationship, as schematically shown in Fig. 3A, where the entire window 16a overlaps with a portion of the access opening 10.

Figures 3 and 4 show that the component 15 according to the second embodiment completely covers the access opening 10. As in the case of Figures 1 and 2, the component 15 may be lifted, for example from its edge 15a, in the direction of the arrow 19. A region 20 of the component 15 may be free from adhesive in order to facilitate lifting the component 15.

In the example of Figures 3 and 4, the component 15 is not provided with adhesive across all its surface that faces the barrier sheet 1. Instead, adhesive is provided in a peripheral region 18 of the component 15, extending around but outside the access opening 10. The region 18 forms, in the example of Figure 3, part of the second portion 16b of the component 15. In this way, it can be avoided that the component 15 adheres to articles placed behind the barrier sheet 1 in the area of the access opening 10.

In the example of Figure 3 as well, the component 15, in particular the transparent or semi-transparent first portion 16a, may be printed, for example in a region 21, indicated in Figure 3 by a dash-dotted line. As in Figure 1, the printing may include ornaments, logos, the brand of the smoking articles, or hints and information for the user. By placing such hints and information on the transparent or semi-transparent window 16a, these can be perceived quickly and easily by the user.

In Figure 5, a resealable pack P of smoking articles S is displayed. The smoking articles S are cigarettes in the case of Figure 5. In accordance with the first embodiment of the invention, the smoking articles S are wrapped in a barrier sheet 1 as described above with reference to Figures 1 and 2. The barrier sheet 1, which, in the case of Figure 5, is transparent, is disposed around a charge C of the smoking articles S, in such a manner as to enclose the charge C. The barrier sheet 1 of Figures 1 and 2, after having been arranged around the charge C, is sealed along seams 28 and 29. In this way, after the seams 28, 29 have been formed, the barrier sheet 1 forms, in cooperation with the flexible label that forms the component 15, a sealed protective enclosure 36 that encloses the charge C. The enclosure 36 creates a protective environment for the smoking articles S, protecting the smoking articles against ingress of moisture from the outside and/or against loss of aroma, for example. Thereby, the taste and quality of the smoking articles S can be preserved.

As described above with respect to Figures 1 and 2, the component 15 of the pack P in Figure 5 is transparent. Therefore, as shown in Figure 5, the smoking articles S can be seen by the user from an outside of the pack P through both the barrier sheet 1 and the component 15. In order to enable the user to take one or more of the smoking articles S out of the resealable pack P, the enclosure 36 may be opened by peeling off the label 15 starting from its edge 15a. When the component 15 is lifted from the barrier sheet 1 in the direction of the arrow 19, the barrier sheet 1 ruptures along the rupture line 3, whereby the ac-

cess opening 10 is formed and the enclosure 36 is opened. Via the access opening 10, not shown in Figure 5, the user may take one or several of the smoking articles S out of the pack P.

By means of the component 15, the enclosure 36 can be resealed after the user has taken out a smoking article S from the pack P. As described above, the component 15 can be put back into place and adheres again to the barrier sheet 1 in a region that borders the access opening 10. In the case of Figure 5, the remainder of material of the barrier sheet 1 bounded by the rupture line 3, in the area 6 of the access opening 10, remains adhesively connected to the component 15, whereby upper tips of the smoking articles S are prevented from adhering to the component 15.

By resealing the enclosure 36 using the component 15, the protective environment for the charge C of smoking articles S, or, if a smoking article S has been taken out of the pack P, for a remainder of the charge C, is restored. Thus, the remainder of the charge C can be protected for a long time against detrimental external influences, and its taste and quality are preserved. In other words, protection of the charge C or the remainder thereof against aroma and freshness alteration is restored. It is noted that the component 15 may be used for repeatedly opening and resealing the enclosure 36.

The transparency of the component 15, and in the case of Figure 5, also of the barrier sheet 1, enables the user to see the remainder of the charge C from the outside after having resealed the enclosure 36 of the pack P. In this way, after smoking one of the smoking articles S, and possibly being desirous of smoking a further of the smoking articles S, the user can judge how many of the smoking articles S remain in the pack without having to open the enclosure 36. This contributes advantageously to a convenient handling of the resealable pack P and avoids unnecessary opening of the enclosure 36, whereby the protective environment for the smoking articles S is maintained in an improved manner. Figure 6 shows the pack P of Figure 5 in a perspective view from its rear side.

In Figures 7 and 8, a resealable pack P according to the second embodiment of the invention is displayed. The pack P of Figures 7 and 8 comprises a charge C of smoking articles S which is enclosed by a protective enclosure 36 formed by a barrier sheet 1 of Figures 3 and 4 and a corresponding, label-type component 15.

In the second embodiment of Figures 7, 8, the barrier sheet 1 is non-transparent or opaque, is disposed around the charge C and sealed along seams 28 and 29, whereby the barrier sheet 1 and the component 15 in cooperation form a sealed protective enclosure 36 for the charge C of smoking articles S. As described with regard to Figures 3 and 4, in the barrier sheet 1 of the pack of Figures 7 and 8, there is formed an access opening 10 which is covered, in a sealed or resealed state of the pack P, by the component 15. The component 15 is adapted to be lifted from the barrier sheet 1, for example starting from its edge 15a, in order to open the enclosure 36 for taking out one or more of the smoking articles S through the access opening 10. Afterwards, the enclosure 36 can be tightly resealed using the component 15.

In the embodiment of Figures 7 and 8, the first portion 16a of the component 15 forms a transparent window. The label-type component 15 extends around a front upper edge 44 and a rear upper edge 45 of the pack P. The window formed by the first portions 16a is dimensioned to extend around the front upper edge 44, but to end at the rear upper edge 45. Of course, this is only an example, and the size of the window formed by the first portion 16a may be chosen differently, as desired. The window 16a, bordered by a non-transparent or opaque margin formed by the second portion 16b, enables the user to see the charge C or the remainder thereof in an initial sealed state of the enclosure 36 as well as in a resealed state thereof.

Thus, while the barrier sheet 1 in Figures 7 and 8 is non-transparent, and may be completely opaque, the user still can judge or at least estimate, in a resealed

state of the enclosure 36, how many of the smoking articles S remain in the pack, without having to open the enclosure 36 by lifting the component 15. In this way, the taste and quality of the smoking articles S is better preserved.

While the resealable packs P of Figures 5, 6 as well as 7, 8 may be sold to the user as they are illustrated in these Figures, further variants and improvements are possible.

Figures 9 and 10 show a resealable pack according to a third embodiment of the invention, which comprises a charge C of smoking articles S enclosed by a sealed protective enclosure 36, as described with reference to Figures 7 and 8, having a non-transparent or opaque barrier sheet 1. Furthermore, the pack P of Figures 9 and 10 comprises an outer supporting frame 55 which, in the case of the third embodiment, is disposed outside the enclosure 36 and covers a relatively large portion of the charge C enclosed by the enclosure 36. As displayed in Figure 9, an upper edge 56 of the outer supporting frame 55 does not extend completely up to an upper end 46 of the enclosed charge C. Therefore, an inner pack formed by the charge C enclosed by the enclosure 36 sticks out from the outer supporting frame 55 at its upper end. As the frame 55 does not cover the component 15, and especially does not cover the access opening 10, the frame 55 may improve the mechanical stability of the pack P without compromising the access by the user to the smoking articles S. For the purpose of being able to conveniently open the enclosure 36, the frame 55 may be provided with a recess 57 which may be adapted to the shape of the component 15 and and/or to the shape of the access opening 10. If desired, the frame 55 may be adhesively attached to the enclosure 36.

Any of the packs P in accordance with the first, second or third embodiments may, for further improved protection, additionally comprise a soft outer wrap 66 of a flexible sheet material. This is schematically illustrated in Figure 11. The outer wrap 66 may be provided with suitable means for opening the outer wrap 66, for example a pull thread or a tear flap, which are not shown in the figure.

The outer wrap 66 may be printed as desired. In the case of Figure 11, any of the packs P of Figures 5 to 10 may form a resealable inner pack wrapped with the outer wrap 66.

A fourth advantageous embodiment of the invention is displayed in Figures 12 to 15. A charge C of smoking articles S is enclosed by a sealed protective enclosure 36, as discussed above with respect to Figures 5 and 6. However, the pack P of Figures 12 and 13 differs from the pack P of Figures 5 and 6 in that the pack P further comprises an inner supporting frame 78 which further improves the mechanical stability of the pack. The inner supporting frame 78 is arranged inside the enclosure 36 between a portion of the charge C and a portion of the enclosure 36. In the case of the embodiment displayed in Figures 12 and 13, the frame 78 partially covers a front face or major side of the charge C, while side flaps 77 partially cover side faces of the charge C. A cut-out region 76 may exist between the side flaps 77. A bottom face of the charge C is covered by an end flap 79 of the inner supporting frame 78. As can be understood from Figures 12-15 as well, a top face T of the charge C, located opposite the bottom face of the charge C covered by the end flap 79, is in this example not covered by any portion of the frame 78.

In the example of Figures 12-15, the inner supporting frame 78 is further provided with a recess 80. An exemplary blank 91 for forming the inner supporting frame 78 is displayed in Figure 14. The side flaps 77 and the end flap 79 are connected by folding lines to a major panel 75. The major panel 75 comprises the recess 80.

As shown in Figure 15, the blank 91 can be folded around the charge C of smoking articles S in order to form the inner supporting frame 78. Finally, in order to produce the pack P of Figures 12 and 13, the arrangement of the frame 78 and the charge C of Figure 15 is wrapped into the barrier sheet 1 as discussed above with respect to Figures 1 and 2, which is then sealed along

seams 28 and 29. In this way, the barrier sheet 1 and the label-type component 15 form a sealed protective enclosure 36 for the smoking articles S.

Preferably, the recess 80 is formed in such a manner that the rupture line 3 of the barrier sheet 1, see Figure 12, which is provided for forming the access opening 10, and the area 6 of the access opening 10 to be formed, are not covered by the inner supporting frame 78 from the inside of the enclosure 36. This facilitates the removal of one or more smoking articles S from the pack P after the enclosure 36 has been opened.

A preferred fifth embodiment will now be described with reference to Figures 16-20. A resealable pack P according to the fifth embodiment is illustrated in Figure 16 in a closed state. The resealable pack P according to this embodiment comprises a rigid outer case 100. The rigid outer case 100 is formed as a hinged lid case, having a main body 101 and a lid 103 connected to the main body 101 by means of a hinge 106. As can be seen from Figure 16, the rigid outer case 100 of this example is substantially cuboid-shaped and has rounded vertical corners.

Figure 17 displays the pack P according to a first variant of the fifth embodiment, with the lid 103 being open. Inside the outer case 100 is contained a resealable inner pack formed by a charge C of smoking articles S enclosed by a sealed protective enclosure 36, formed in cooperation by a barrier sheet 1 and a component 15 similar to those illustrated and described with reference to Figures 3 and 4. The charge C of smoking articles S may be disposed inside the enclosure 36 without an inner frame, e.g. in the manner shown in Figs. 7 and 8, and there may also be no outer supporting frame for the charge C enclosed by the enclosure 36. However, an inner supporting frame 78, as described before, or an outer supporting frame 55 as explained above, might also be used in the case of the fifth embodiment.

In the variant of Figure 17, the component 15, shaped as a label, has a first portion 16a that is embodied as a semi-transparent window which enables the user to discern at least some of the smoking articles S inside the enclosure 36. The degree of transparency of the first portion 16a in the variant of Fig. 17 is reduced compared to the degree of transparency that would correspond to a fully transparent window. A second portion 16b of the component 15 forms a non-transparent or opaque margin around the window 16a.

In the variant of Figure 18, which otherwise corresponds to the variant of Figure 17, the first portion 16a, forming the window which provides visual access to the inside of the enclosure 36, is fully transparent instead of being semi-transparent at a reduced degree of transparency.

Furthermore, according to the third variant of this embodiment, shown in Figure 19, which otherwise corresponds to the variant of Figure 17, the first portion 16a of the component 15 is fully transparent, but in the case of Figure 19, the transparent portion 16a is printed. As an example, hints and information for the user may be printed on the transparent portion 16a, as illustrated by the sample text 110. Ornamentation may also be printed onto the component 15 in the portion 16a. Moreover, means for accentuating the effect of the window may be arranged on the transparent portion 16a by printing. This is illustrated in Figure 19 by an exemplary accentuating frame 115, which emphasizes the printed text 110 and the transparent window 16a.

In a variant, the outer case 100 could be semi-rigid instead of completely rigid. The outer case 100 may be formed from a suitable blank of cardboard or heavy paper.

As can be appreciated, the pack P according to Figures 16-20 is advantageous in that it provides additional protection for the smoking articles S, in particular against mechanical loads, by means of an outer case 100. Particularly, the hinged lid 103 provides protection for the label-type component 15. At the same

time, however, the smoking articles S inside the pack P are enclosed within a protective environment, whereby the taste and quality of the smoking articles S can be maintained. As the component 15 has the transparent or semi-transparent window-like portion 16a, which enables the user to see at least partly the charge C of smoking articles S inside the pack P, and which makes it possible to see, in the resealed state of the enclosure 36, how many of the smoking articles S remain, unnecessary opening of the enclosure 36 is avoided. If the lid 103 is closed, only the lid 103 has to be opened in order to visually check whether enough smoking articles S are left in the pack. It should be noted that, as shown especially in Figures 17-19, the pack P also has an enhanced outer appearance. The printed text 110 may draw the user's attention to useful information.

The pack P according to the variant of Figure 18 is shown again in various views in Figure 20. In detail, Figure 20 b) shows a front view, Figure 20 a) and c) show a left- and right-side view, respectively, Figure 20 d) shows a rear view, Figure 20 e) shows a bottom view and Figure 20 f) shows a top view. In all views a) to f), the hinged lid 103 is in an open state.

Although the invention has been completely described above with reference to preferred embodiments, the invention is not limited thereto, but may be modified in various ways.

For example, the invention is not limited to the packaging of cigarettes, such as filter cigarettes, but may also be used for the packaging of cigars or cigarillos.

The number of smoking articles that form the charge can vary. The pack of the invention may contain, for example, 19 or 20 smoking articles. However, in other embodiments, the number of smoking articles contained in the pack may be greater or smaller.

Further, the invention may not only be used in conjunction with a hinged lid outer case, as, for example, the outer case 100, but other types of outer cases may be envisaged instead.

## List of reference signs

1 barrier sheet  
2a, 2b portion (barrier sheet)  
3 rupture line (barrier sheet)  
6 area  
10 access opening  
15 component  
15a edge (component)  
16a first portion (component)  
16b second portion (component)  
17 boundary (first portion)  
18 region  
19 arrow  
20 region (component)  
21 region  
28 seam  
29 seam  
36 enclosure  
44 front upper edge  
45 rear upper edge  
46 upper end (charge)  
55 outer supporting frame  
56 upper edge (outer supporting frame)  
57 recess (outer supporting frame)  
66 outer wrap  
75 major panel (inner supporting frame)  
76 cut-out region (inner supporting frame)  
77 side flap (inner supporting frame)  
78 inner supporting frame  
79 end flap (inner supporting frame)  
80 recess (inner supporting frame)

91 blank  
100 outer case  
101 main body (outer case)  
103 lid (outer case)  
106 hinge  
110 sample text  
115 accentuating frame

C charge  
E user's eye  
O object  
P pack  
S smoking article  
T top face

CLAIMS

1. Resealable pack (P) of smoking articles (S), comprising a sealed protective enclosure (36) suitable for enclosing a charge (C) of smoking articles (S);
  - wherein the enclosure (36) is adapted to be opened in order to enable a user to take one or more of the smoking articles (S) out of the pack (P);
  - wherein the enclosure (36) is adapted to be subsequently resealed in order to restore protection for the charge (C) of smoking articles (S) or for a remainder of the charge (C) against aroma and freshness alteration; and
  - wherein the enclosure (36) comprises a component (15) at least in part semi-transparent, preferably transparent, which enables the user to see the charge (C) or the remainder of the charge (C) from an outside of the enclosure (36) in the resealed state thereof.
2. Resealable pack according to claim 1, characterized in that the component (15) is formed as an element for repeatedly opening and resealing the enclosure (36), in particular as a label of a flexible sheet material, adhesively connected to the sealed protective enclosure (36).
3. Resealable pack according to claim 1 or 2, characterized in that the sealed protective enclosure (36) comprises a barrier sheet (1), in particular a flexible barrier sheet, which is disposed around the charge (C) of smoking articles (S).
4. Resealable pack according to claim 3, characterized in that the barrier sheet (1) or at least a portion (2a) of the barrier sheet (1) is transparent or semi-transparent.

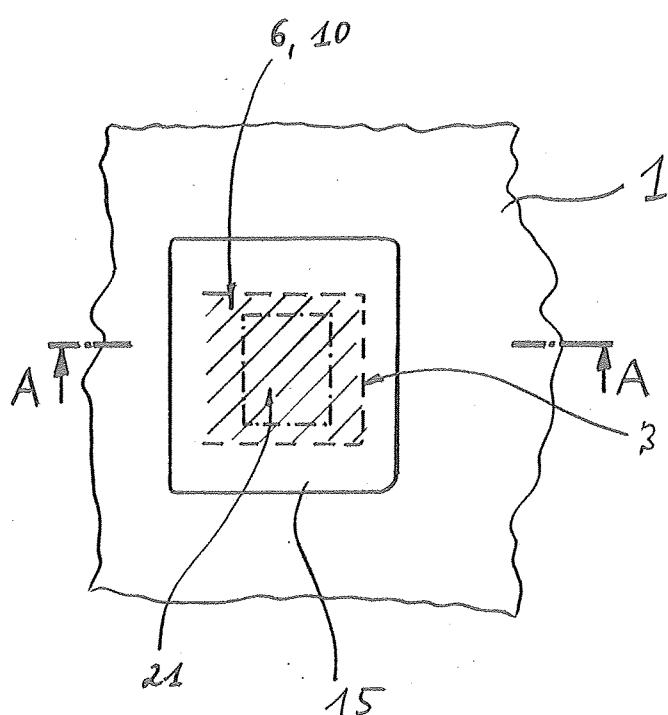
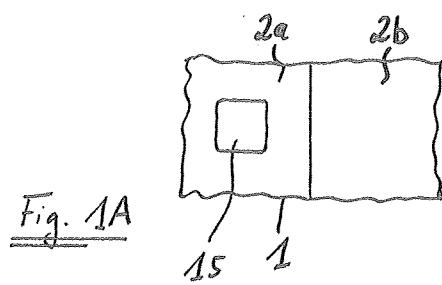
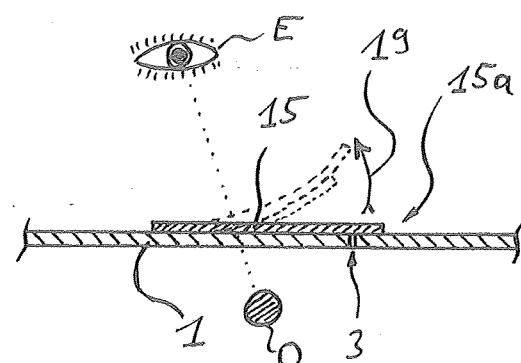
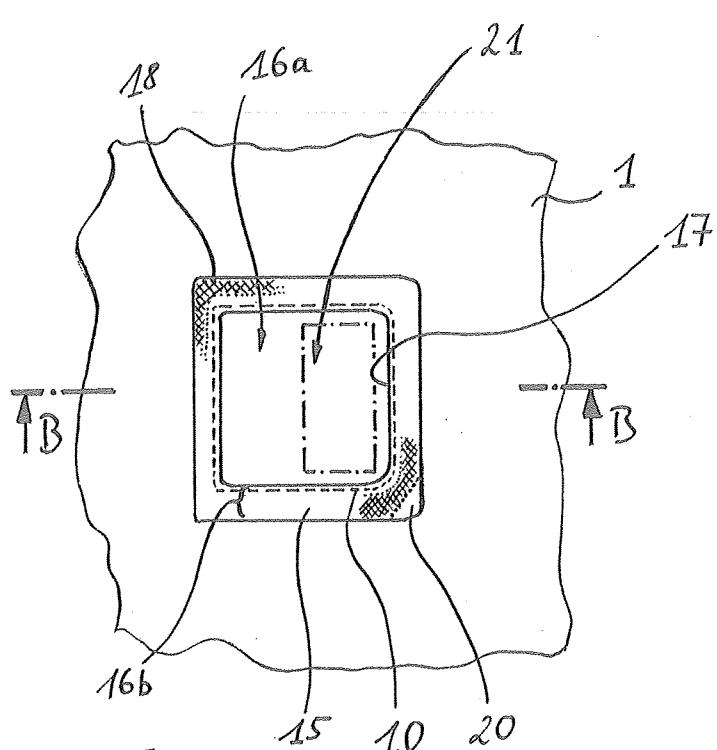
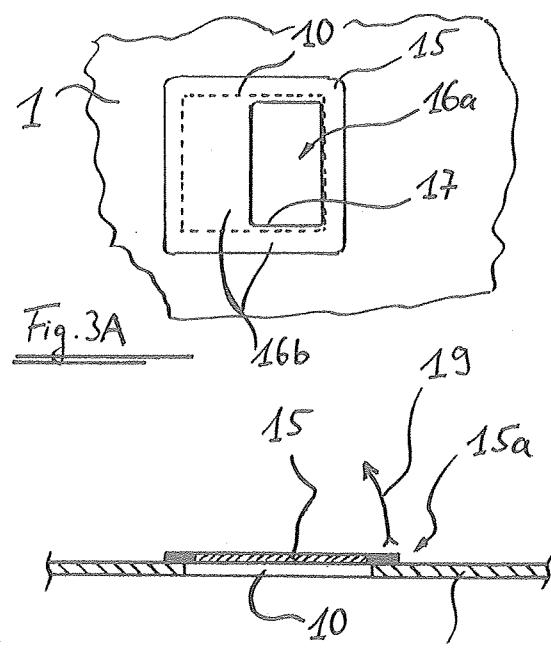
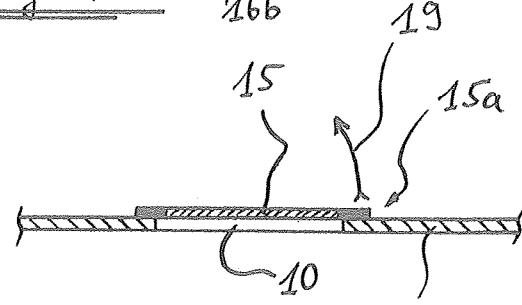
5. Resealable pack according to claim 4, characterized in that the component (15) is at least partially arranged on the transparent or semi-transparent barrier sheet (1) or on the transparent or semi-transparent portion (2a) of the barrier sheet (1).
6. Resealable pack according to claim 3, characterized in that the barrier sheet (1) is non-transparent or opaque.
7. Resealable pack according to at least one of claims 3 to 6, characterized in that the barrier sheet (1) comprises an access opening (10),  
wherein the component (15) covers the access opening (10) in an initial sealed state of the enclosure (36),  
wherein the component (15) is adapted and connected to the barrier sheet (1) in such a manner that the component (15) can be at least partly lifted from the barrier sheet (1) so as to uncover at least a portion of the access opening (10) for opening the enclosure (36), thereby enabling the user to access the smoking articles (S), and  
wherein the component (15) is adapted to subsequently cover the access opening (10) again for resealing the enclosure (36).
8. Resealable pack according to at least one of the preceding claims, characterized in that the component (15) is entirely transparent or semi-transparent or in that a first portion (16a) of the component (15) is transparent or semi-transparent while a second portion (16b) of the component (15) is non-transparent or opaque.
9. Resealable pack according to claim 7, characterized in that a first portion (16a) of the component (15) is formed as a transparent or semi-transparent window which is bordered along at least a portion of its circumference by a non-transparent or opaque margin which is formed by a second portion (16b) of the component (15), wherein the window and the

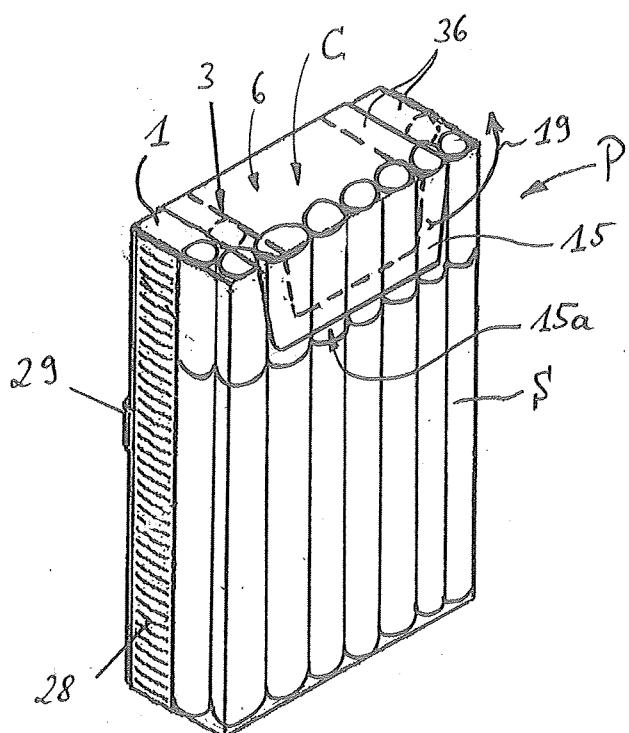
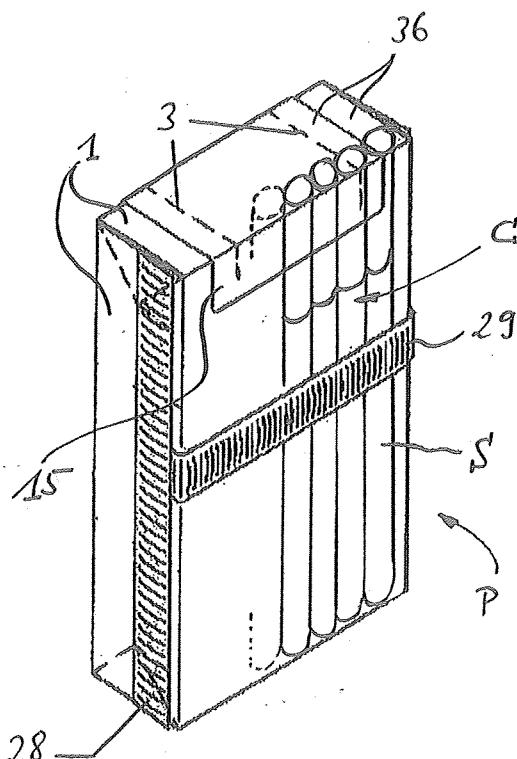
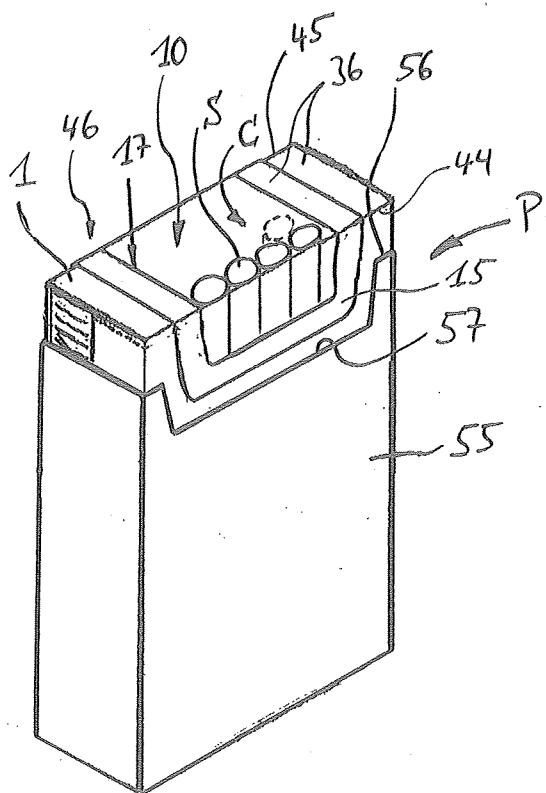
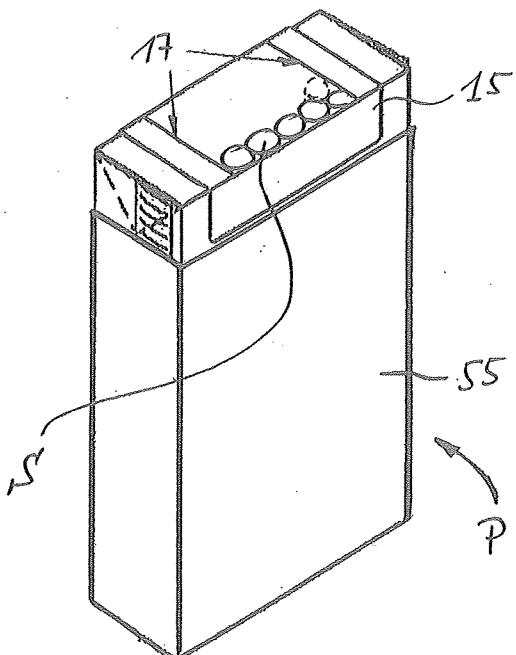
access opening (10) overlap or substantially coincide in the sealed and/or resealed state of the enclosure (36).

10. Resealable pack according to at least one of the preceding claims, characterized in that the component (15) is produced from a cellophane-based or a polypropylene-based sheet material.
11. Resealable pack according to at least one of the preceding claims, characterized in that the pack (P) further comprises a soft outer wrap (66) of a flexible sheet material or a rigid or semi-rigid outer case (100) and in that the charge (C) enclosed by the sealed protective enclosure (36) forms a resealable inner pack wrapped with the outer wrap (66) or contained in the outer case (100).
12. Resealable pack according to at least one of the preceding claims, characterized in that the pack (P) further comprises a supporting frame (78; 55), in particular a frame (78; 55) made of a semi-rigid material, wherein the frame (78; 55) is disposed inside the enclosure (36) between a portion of the charge (C) of smoking articles (S) and a portion of the enclosure (36) or is disposed outside the enclosure (36) and covers a portion of the charge (C) enclosed by the sealed protective enclosure (36).
13. Method for packaging smoking articles (S), comprising the steps of:
  - providing a charge (C) of smoking articles (S); and
  - enclosing the charge (C) by a sealed protective enclosure (36);
    - wherein the enclosure (36) is adapted to be opened in order to enable a user to take one or more of the smoking articles (S) out of the pack (P);
    - wherein the enclosure (36) is adapted to be subsequently resealed in order to restore protection for the charge (C) of smoking articles (S) or for a remainder of the charge (C) against aroma and freshness alteration; and

wherein the enclosure (36) comprises a component (15) at least in part semi-transparent, preferably transparent, which enables the user to see the charge (C) or the remainder of the charge (C) from an outside of the enclosure (36) in the resealed state thereof.

14. Method according to claim 13, characterized in that enclosing the charge (C) includes
  - providing a barrier sheet (1), in particular a flexible barrier sheet, which comprises an access opening (10), wherein the component (15) is adhesively connected to the barrier sheet (1) so as to cover the access opening (10); and
  - disposing the barrier sheet (1) around the charge (C).
15. Method according to claim 13, characterized in that enclosing the charge (C) includes
  - providing a barrier sheet (1), in particular a flexible barrier sheet, which comprises a rupture line (3) along which the barrier sheet (1) is adapted to rupture for forming an access opening (10), wherein the component (15) is adhesively connected to the barrier sheet (1) so as to cover the rupture line (3) and the area (6) of the access opening (10) to be formed; and
  - disposing the barrier sheet (1) around the charge (C).

Fig. 1Fig. 1AFig. 2 (A-A')Fig. 3Fig. 3AFig. 4 (B-B')

Fig. 5Fig. 6Fig. 9Fig. 10

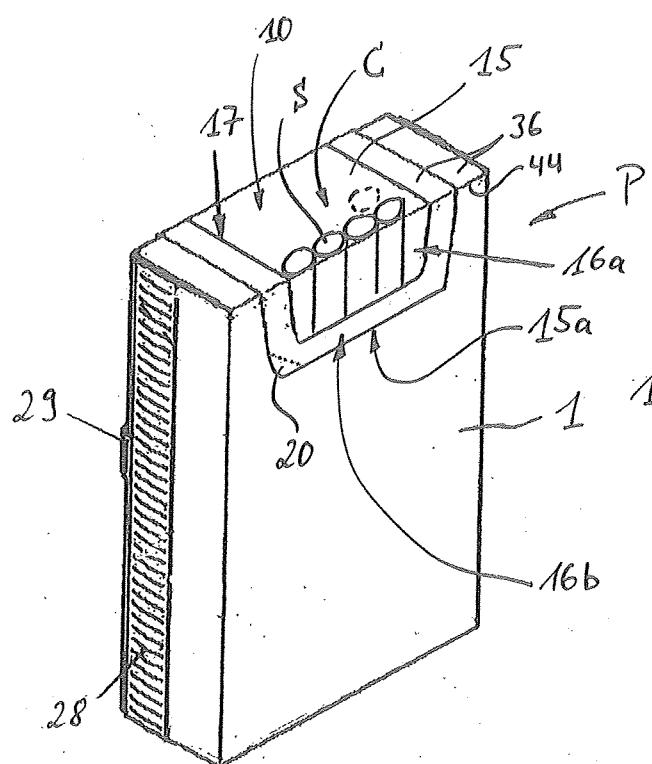


Fig. 7

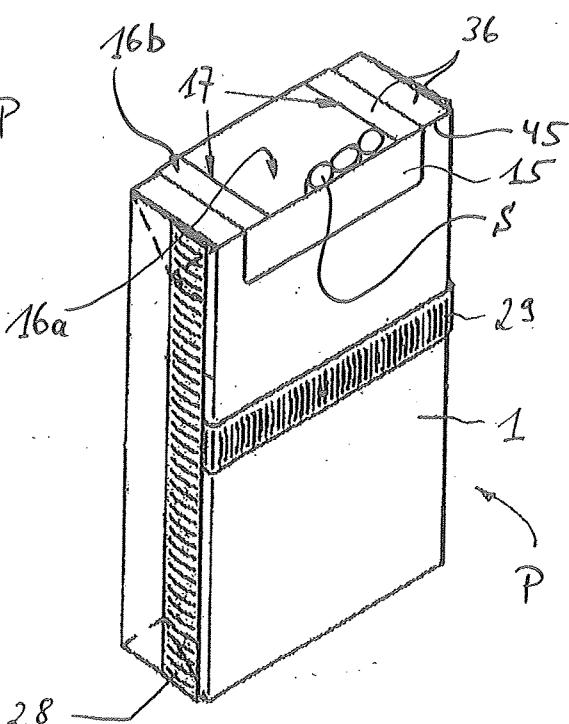


Fig. 8

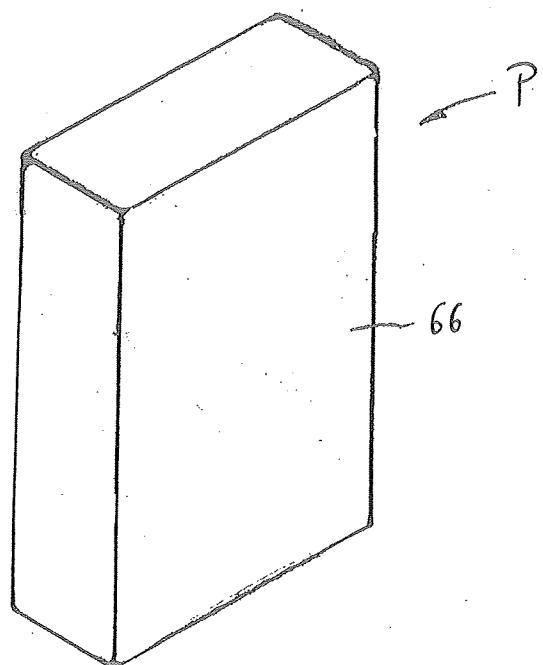
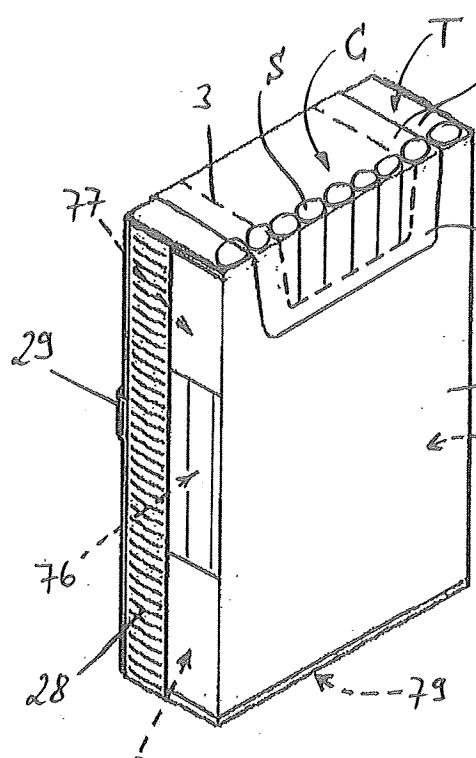
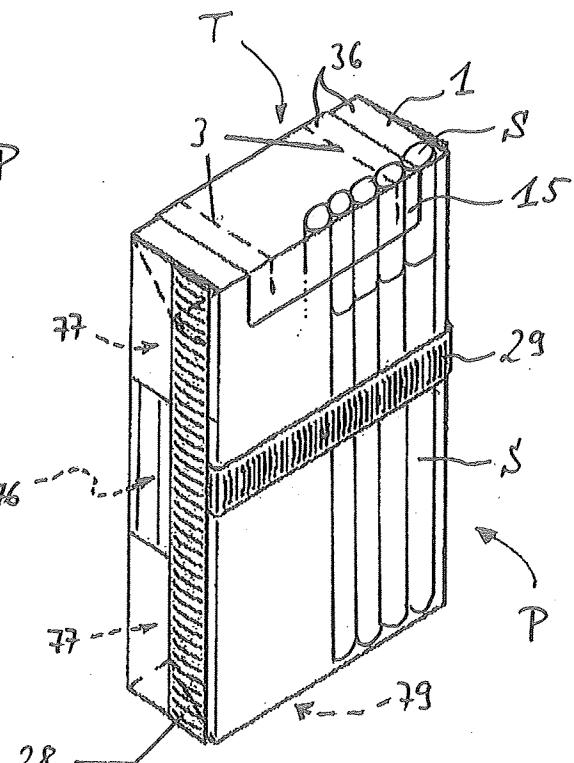
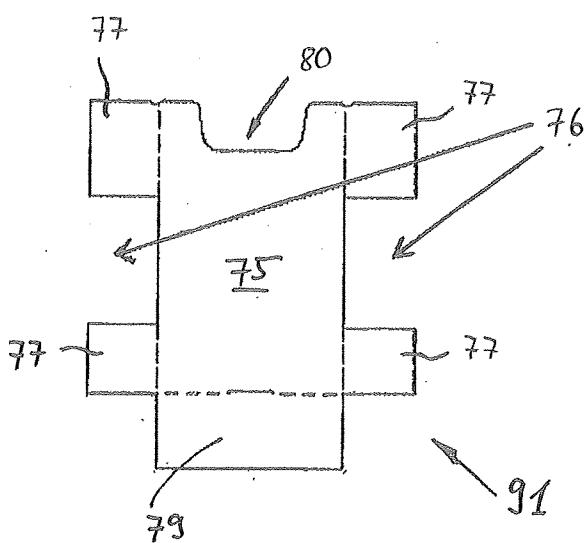
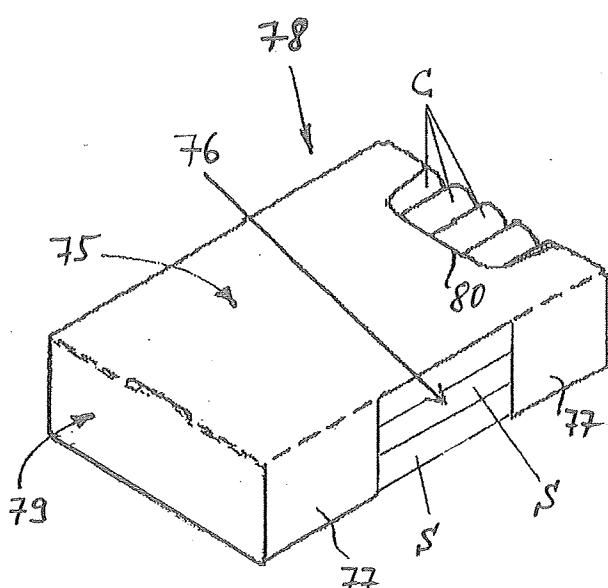


Fig. 11

Fig. 12Fig. 13Fig. 14Fig. 15

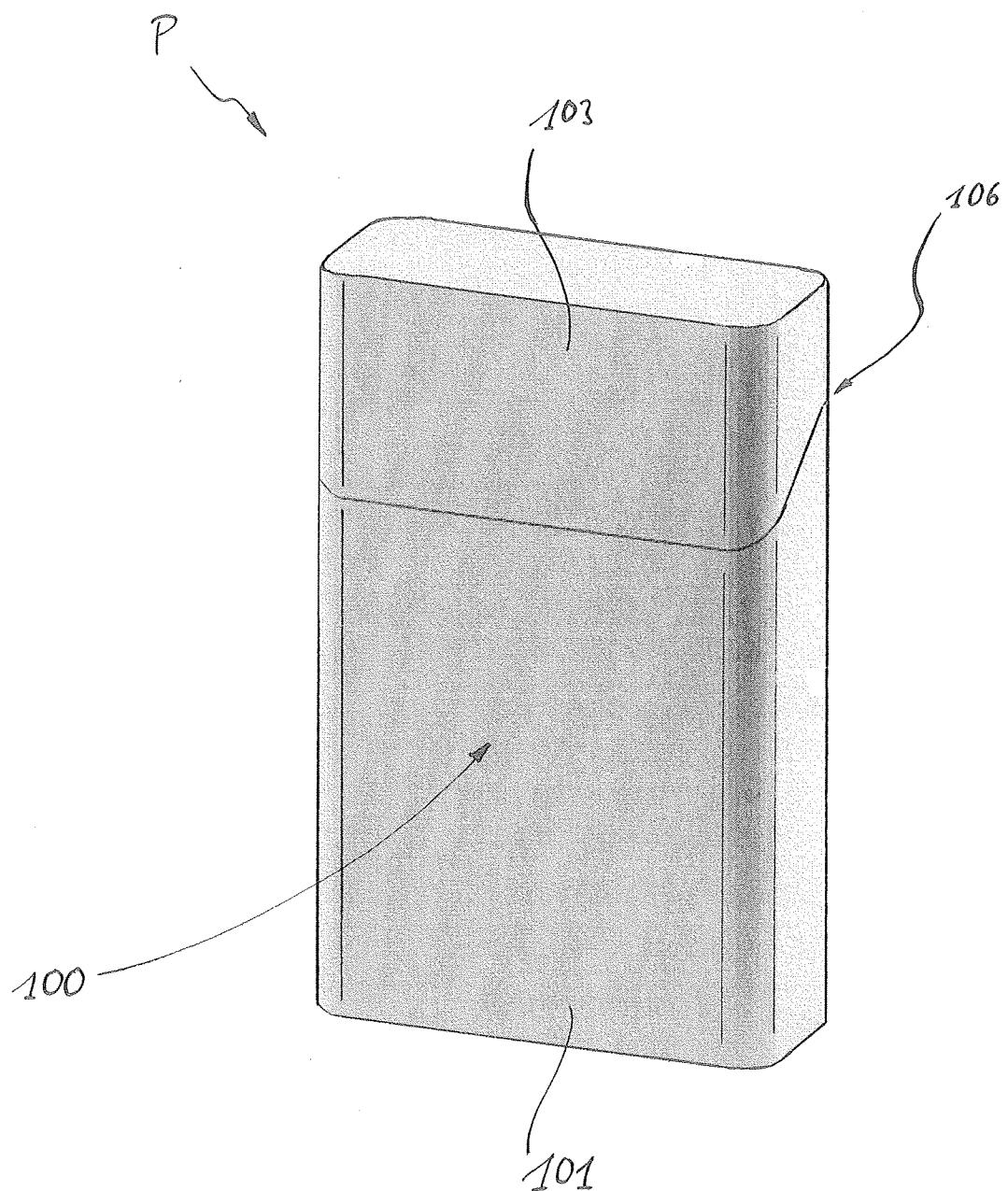
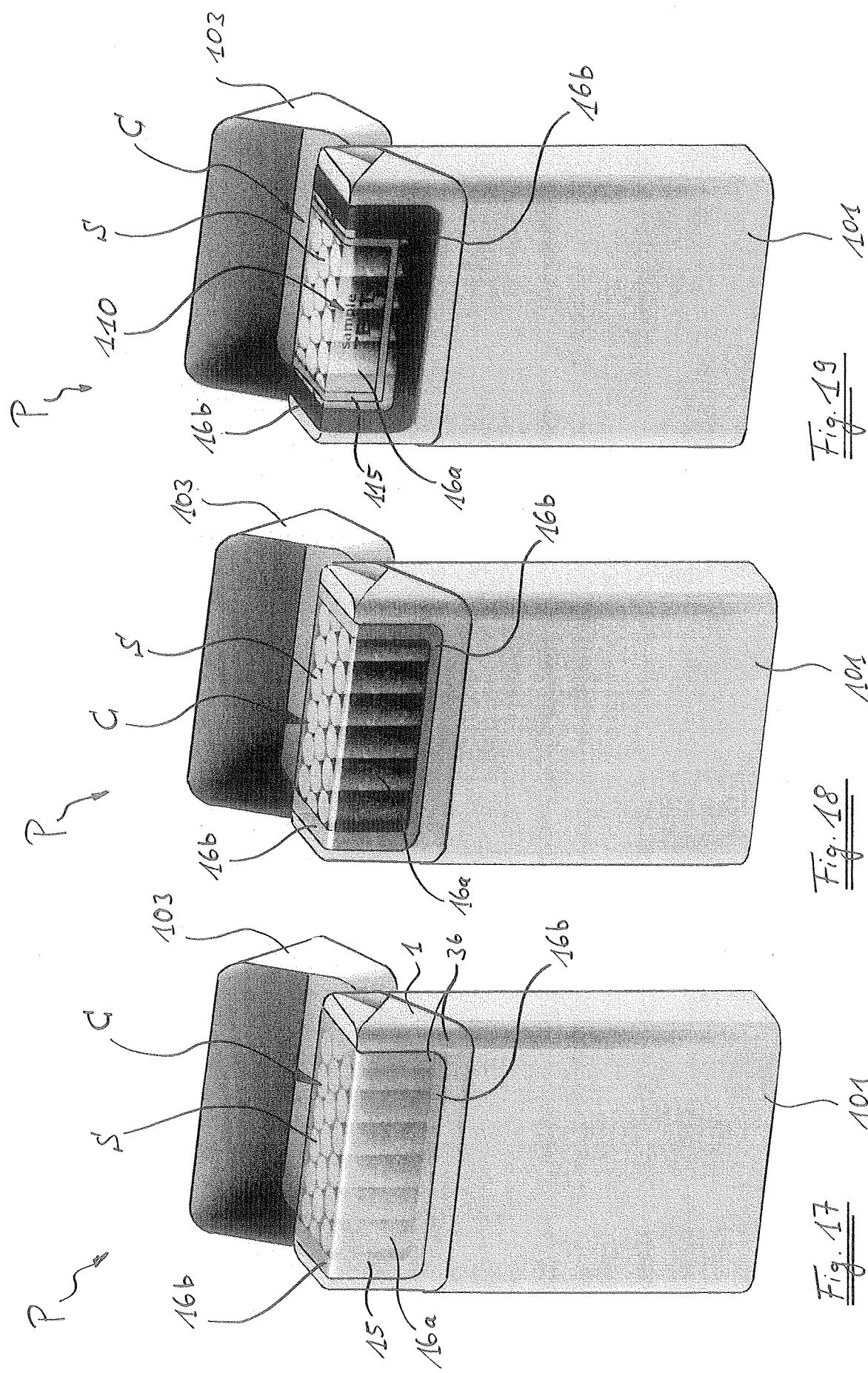


Fig. 16



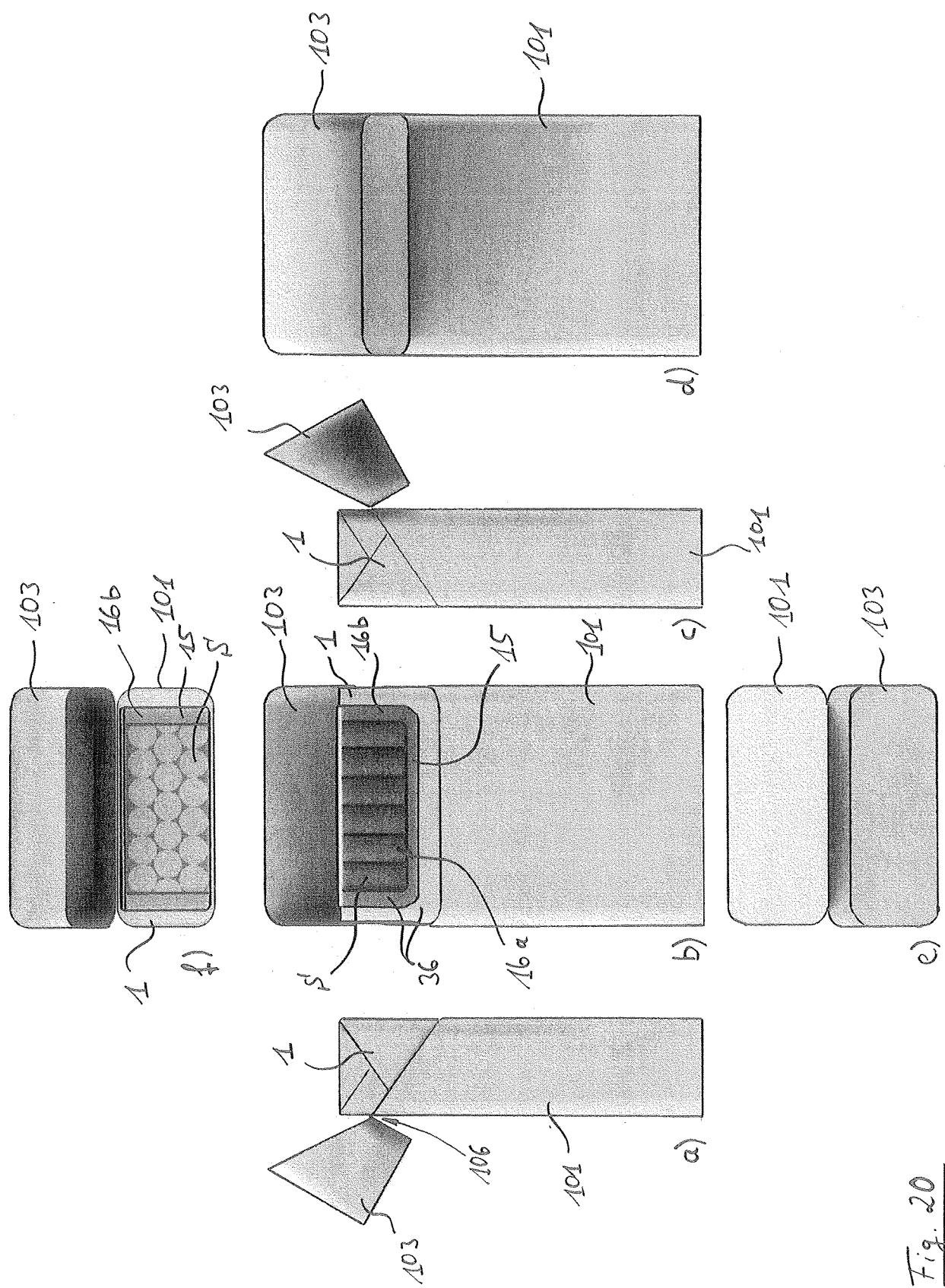


Fig. 20

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2015/051730

**A. CLASSIFICATION OF SUBJECT MATTER**  
INV. 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 2011/147443 A1 (IGO ZSOLT [CH]) 23 June 2011 (2011-06-23) paragraph [0003] - paragraph [0008]; figures 1, 2 paragraph [0035] paragraph [0077] ----- Y WO 2010/066543 A1 (BRITISH AMERICAN TOBACCO CO [GB]; BRAY ANDREW JONATHAN [GB]) 17 June 2010 (2010-06-17) page 2, line 20 - line 26; figures 1,2 page 5, line 29 ----- Y DE 20 2011 101774 U1 (HASTREITER PETRA MARGOT M A [DE]) 28 July 2011 (2011-07-28) paragraph [0004] - paragraph [0006]; figure 2 ----- - / --	1-3,6-8, 11,13-15  1-15  1-15  - / --

Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance  
"E" earlier application or patent but published on or after the international filing date  
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)  
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Date of the actual completion of the international search  21 April 2015	Date of mailing of the international search report  30/04/2015
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  Czerny, M

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