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(54) **TAMPER-EVIDENCE FOR A PRODUCT CASING**

(57) A tamper-evidence for a product casing (103), comprising the product casing made from a packaging material; at least a first longitudinally shaped tearing zone (111, 204) comprising structures embossed in the packaging material, the at least one first longitudinally shaped tearing zone being located on a surface of the product casing and defining a delimitation of a lid area (109, 202) on the surface of the product casing; an opening strip (104, 200) made of a foil material, the opening strip being configured to adhere on the packaging material of substantially the entire lid area, to cover the at least one first longitudinally shaped tearing zone in order to seal it, and to produce a tearing of the packaging material corresponding to the at least one first longitudinally shaped tearing zone on the product casing and a removing from the product casing of packaging material of the lid area, as an effect of the opening strip being pulled away from the product casing.

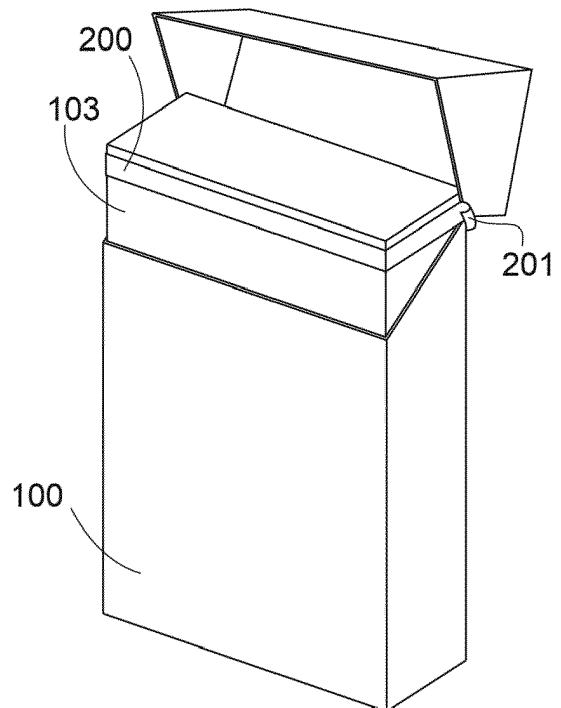


FIG. 2A

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Description

Technical field

[0001] The present invention is in the field of packaging, and more specifically relates to a product casing that comprises a tearing zone with embossed structures that enables tamper-evidence. In a preferred realisation, the tamper-evidence may also generate an audible signal at a time of first opening of the product casing.

Background

[0002] There is a need in the packaging industry to guarantee to a consumer that a packaged product has not been tampered with before the consumer unpacks the product for the first time. This need extends to packaging for all kinds of products including foods, e.g., chocolate, caviar, and nuts, hardware products, e.g., jewellery, electrical products, spare parts for the car industry, and smoking articles, e.g., cigarettes and cigars.

[0003] In an example taken from the tobacco industry, international publication WO 2021/122559 A1 discloses a packaging for smoking articles that comprises a packaging body and a lid attached to it via a first attachment section. The lid is further attached to the packaging body in a second attachment section wherein the second attachment section comprises an inner surface and an outer surface facing the inner surface. The second attachment section is breakable and comprises at least a first and a second breaking line, wherein one breaking line extends from the inner surface towards the outer surface without reaching the outer surface and another breaking line extends from the outer surface towards the inner surface without reaching the inner surface. The second attachment section has a predetermined width from the inner surface to the outer surface and both the first and second breaking lines and/or cut extends at least over 50% of that width. The second attachment enables a tamper-evidence means, which can make the need for outer overwrapping materials superfluous.

[0004] The present invention aims at solving the problem of providing an alternative to the tamper-evidence means known from prior art.

[0005] The present invention further aims at providing a tamper-evidence means that further enables a characteristic and determined sensorial experience being conveyed a consumer at the first opening of a packaged product that is protected by the tamper-evidence means.

Summary of invention

[0006] In one aspect the invention provides a tamper-evidence for a product casing, comprising the product casing made from a packaging material; at least a first longitudinally shaped tearing zone comprising structures embossed in the packaging material, the at least one first longitudinally shaped tearing zone being located on a

surface of the product casing and defining a delimitation of a lid area on the surface of the product casing; an opening strip made of a foil material, the opening strip being configured to adhere on the packaging material of substantially the entire lid area, to cover the at least one first longitudinally shaped tearing zone in order to seal it, and to produce a tearing of the packaging material corresponding to the at least one first longitudinally shaped tearing zone on the product casing and a removing from the product casing of packaging material of the lid area, as an effect of the opening strip being pulled away from the product casing.

[0007] In a preferred embodiment, the tamper-evidence further comprises a second longitudinally shaped tearing zone parallel to the first longitudinally shaped tearing zone, and wherein the lid area is delimited by the first and second longitudinally shaped tearing zones and a border of the packaging material.

[0008] In a further preferred embodiment, the opening strip is further configured to also adhere to the at least one longitudinally shaped tearing zone.

[0009] In a further preferred embodiment, the opening strip comprises a boundary zone that extends beyond the at least one longitudinally shaped tearing zone over a border zone of the packaging material separated from the lid area by the longitudinally shaped tearing zone, and is configured to removably adhere to the border zone by means of a re-sealable adhering system.

[0010] In a further preferred embodiment, the product casing is contained in a product box, the product box comprising a hinged lid covering the lid area when closed, and where the opening strip is attached at one of its borders to the hinged lid and configured to be pulled away from the product casing when the hinged lid is opened.

[0011] In a further preferred embodiment, the tamper-evidence further comprises glue configured to realise the adhering of the opening strip on the packaging material.

[0012] In a further preferred embodiment, the embossed structures are laid out in sequence in at least one groove extending in the longitudinal direction of the longitudinally shaped tearing zone, the groove having a depth of at least a half of a thickness of the packaging material.

[0013] In a further preferred embodiment, the embossed structures are shapes that protrude in the packaging material in a direction away from the opening strip.

[0014] In a further preferred embodiment, the embossed structures are openings pierced through the packaging material.

[0015] In a further preferred embodiment, the structures embossed are at least in part positioned in the tearing zone to be aligned with a periodicity in a range from 0,5 mm to 5 mm, hence being configured to produce an audible sound of determined frequency when the opening strip is being pulled away from the product casing.

[0016] In a further preferred embodiment, the opening strip further comprises a grip element configured to be seized to pull the opening strip away from the product

casing.

Brief description of the figures

[0017] The invention will be better understood through the detailed description of preferred embodiments of the invention, and in reference to the figures, wherein

figures **1A** to **1C** contain an example of realisation of a tamper-evidence according to the invention, in which an opening strip comprises a boundary zone that extends beyond a tearing zone;

figures **2A** to **2D** contain a further example of realisation of the tamper-evidence according to the invention, comprising two parallel longitudinally shaped tearing zones;

figure **3** contains a view of a cigarettes box in a closed state;

figure **4** contains a view of a cigarettes box in through-view with a tamper-evidence according to an example of the invention;

figure **5** contains a view of a cigarettes box with a specific example realisation of the tamper-evidence, in which the opening strip of an innerliner is attached to the lid of the cigarettes box, according to the invention;

figure **6** contains a view from the tamper-evidence illustrated in figures 2A to 2D, further configured to produce an audible effect when the opening strip is pulled, according to an example embodiment of the invention;

figures **7A** and **7B** show examples of embossing tools used to produce embossing structures in tearing zones according to examples of the invention;

figures **8A** to **8D** show examples of surface distributions of embossing structures for longitudinally shaped tearing zones according to example embodiments of the invention;

figures **9A** and **9B** schematically illustrate an example embodiment of longitudinally shaped tearing zones and an opening strip, comprising linearly aligned embossed structures according to the invention;

figures **10A** to **10C** schematically illustrate a further example embodiment of longitudinally shaped tearing zones and an opening strip, comprising each a plurality of linearly aligned embossed structures according to the invention;

figures **11A** and **11B** show an example embossing device comprising two rollers, the latter of the figures containing an exploded view of a cassette assembly, to be used to create longitudinally shaped tearing zones according to the invention; and

figure **12** illustrates schematically a further example of packaging material from a product casing, being embossed to obtain a longitudinally shaped tearing zone, by means of a pair of embossing rollers.

[0018] Same references will be used to reference identical or similar features illustrated throughout the figures.

Detailed description of preferred embodiments of the invention

[0019] Figure **1A** contains an example of realisation of a tamper-evidence according to the invention. In this example a cigarettes box **100** is used, but any other type of packaging, such as for example any one of those mentioned herein above in the *background* chapter, may be considered instead while adapted in its configuration as appropriate, to package the product being considered.

[0020] The cigarettes box **100** comprises a box lid **101** illustrated here in an open position. The box lid **101** is configured to rotate from a closed position (not shown in figure **1A**) to the open position, and vice-versa by rotating around a fold **102** indicated by an arrow in figure **1A**, operated in a back-side of the cigarettes box **100** not visible in figure **1A**. The cigarettes box **100** contains a product casing **103**, e.g., an innerliner, snugly fitted into an inside of the cigarettes box **100** and configured to protect the product, in this case a plurality of tobacco products, e.g., cigarettes, which are not shown in figure **1A**. The product casing **103** may comprise a packaging material. An opening strip **104** covers an access to the product protected by the product casing **103**, i.e., the opening strip **104** is in a closed position. The opening strip **104** comprises a foil material which renders it flexible in order to adapt around the shape of at least a part of the product casing **103**, in this particular case from a top side **107** to a front side **106** of the product casing **103**. The opening strip **104** may comprise an optional grip element **105** configured to be seized to pull the opening strip **104** away from the product casing **103** such to access to the product protected by the product casing **103**. Figure **1B** illustrates an example in which the opening strip **104** is in an opened position as an effect of the opening strip **104** having been pulled away from the product casing **103**. The product **108** protected by the product casing **103** may be accessed by a consumer (consumer not illustrated in the figure) in this configuration. A piece **109** of packaging material from the product casing **103** is removed from a lid area **110** of the product casing **103**. The piece **109** adheres to an inner side of the opening strip **104**. The piece **109** of packaging material was teared from the product casing **103** along a longitudinally

shaped tearing zone **111** located on a surface of the product casing **103** and defining a delimitation of the lid area **110** on the surface of the product casing **103**. The piece **109** of packaging material may comprise a part **112** of the longitudinally shaped tearing zone **111**. The longitudinally shaped tearing zone **111** comprises structures embossed in the packaging material, which are not represented in figure **1B** for a better readability but will be described and explained in the course of the following description and figures. At this point it can be said that the longitudinally shaped tearing zone **111** is subjected to an irreversible tearing at the time of opening of the opening strip **104**. If it is un-teared, i.e., before the opening of the opening strip **104**, it constitutes a proof a non-tampering with the product casing **103**.

[0021] Figure **1C** illustrates a further view of a top part of the cigarettes box **100** with the product casing **103** and the opening strip **104**. The figure further shows the longitudinally shaped tearing zone **111** represented in a broken line to show that it is seen in transparency through the opening strip **104**. The longitudinally shaped tearing zone **111** is part of the product casing **103** and may generally not be noticed or seen when the opening strip **104** covers it. However, the opening strip **104** is configured to cover the longitudinally shaped tearing zone in order to seal it, i.e., to render it impermeable when the opening strip **104** is in the closed position on the product casing **103**.

[0022] Figure **2A** contains a further example of realisation of the tamper-evidence according to the invention. The cigarettes box **100** again contains the product casing **103**, e.g., an innerliner. A longitudinally shaped opening strip **200** made of foil material, with an optional grip element **201**, runs on a surface of the product casing **103** corresponding to the lid area of the product casing **103**. The lid area is not visible in figure **2A** since it is covered by the longitudinally shaped opening strip **200**. The latter is configured to adhere on the packaging material of substantially the entire lid area. A torn-away part, in a piece **203** of the lid area **202** of which is illustrated in figure **2B** where the longitudinally shaped opening strip **200** was already partly pulled away from the product casing **103**. Also, and similar as in figure **1B**, the piece **203** of packaging material from the product casing **103** is removed from the lid area **202** of the product casing **103**. The piece **203** adheres to an inner side of the opening strip **200**. The piece **203** of packaging material was torn from the product casing **103** along longitudinally shaped tearing zones **204** and **205** located on a surface of the product casing **103** and defining a delimitation of the lid area **202** on the surface of the product casing **103**. The piece **203** of packaging material may comprise parts **206** and **207** of the longitudinally shaped tearing zones **204** and **205**. The lid area **202** may extend to surround the whole perimeter of the product casing **103**, such that when the opening strip **200** is entirely pulled away from the product casing **103**, an upper part **208** of packaging material from the product casing **103** becomes separated from the

product casing **103**. The longitudinally shaped tearing zones **204** and **205** may be substantially parallel to each other, and the lid area **202** is delimited by both longitudinally shaped tearing zones **204** and **205** and a border of the packaging material (not shown in figures **2A** and **2B**).

[0023] Figure **2C** shows the cigarettes box **100** after the opening strip **200** has been entirely pulled away from the product casing **103**, and the upper part **208** separated from the product casing **103**. This reveals the product **108** inside of the product casing **103**.

[0024] Figure **2D** illustrates a further view of a top part of the cigarettes box **100** with the product casing **103** and the opening strip **200**. The figure further shows the longitudinally shaped tearing zones **204** and **205** represented in broken lines to indicate that they are seen in transparency through the opening strip **200**. The longitudinally shaped tearing zones **204** and **205** are part of the product casing **103** and may generally not be noticed or seen when the opening strip **200** covers them. However, the opening strip **200** is configured to cover the longitudinally shaped tearing zones **204** and **205** in order to seal them, i.e., to render them impermeable when the opening strip **200** is in the closed position on the product casing **103**.

In a preferred embodiment the opening strip **200** is further configured to also adhere to the longitudinally shaped tearing zones **204** and **205**.

[0025] Figure **3** illustrates the cigarettes box **100** with the box lid **101** is the closed position.

[0026] Figure **4** illustrates the same cigarettes box as in figure **3**, with a part of the box lid **101**, a part of the opening strip **104**, and a part of the lid area (known with reference **109** in figure **1B**), or more precisely a part of the piece **109** of packaging material intentionally erased in order to see what is under them, i.e., the product **108** protected by the product casing **103**. Figure **4** further shows the longitudinally shaped tearing zone **111**.

[0027] Figure **5** illustrates a further embodiment of the tamper-evidence for the product casing **103**, which is similar to that illustrated in figures **1A** to **1C**, except that a border side **500** of the opening strip **104** is fixed to the box lid **101** and configured such that when the box lid **101** is rotated from the closed position (such as seen in figure **3**) to its open position, the opening strip **104** is pulled away from the product casing **103**. The figure **5** also illustrates optional boundary zones **501** on the opening strip **104** which are configured to extend beyond the longitudinally shaped tearing zone **111** over a border zone of the packaging material separated from the lid area by the longitudinally shaped tearing zone **111**, when the opening strip **104** is in the closed position, to removably attach to the border zone on the product casing **103**, i.e., by means of a re-sealable adhering system, thereby preserving the freshness of the product **108** when the opening strip **104** is in the closed position. This optional feature may also be furnished on the opening strip illustrated in figures **1A** to **1C**.

[0028] In a preferred embodiment, the tamper-evi-

dence may comprise glue which is configured to realise the adhering of the opening strip on the packaging material.

[0029] In a preferred embodiment, illustrated schematically in figure 6, the pulling away of the opening strip **200** may cause a determined sound to be generated as the tearing zone becomes teared. This is realised by placing the embossed structures along the longitudinally shaped tearing zone with such spacing that, when the opening strip is being pulled away with common speeds (e.g., typically from 0,1 m/s to 1,0 m/s), sounds with low and medium frequencies (e.g., typically from 50 Hz to 500 Hz) are produced in the process of the mechanically breaking of the packaging material between the embossed structures constituting the longitudinally shaped tearing zone. This is illustrated by an ear and a sound wavefront symbol pointing to the point of tearing on the product casing **103**.

[0030] Figures **7A** and **7B** show examples of embossing tools used to produce embossed structures in longitudinally shaped tearing zones according to examples of the invention. In this example the embossing tools comprise a pair of embossing rollers.

[0031] Looking first at figure **7A** this schematically illustrates an embossing device **700** comprising a first embossing tool **701** and a second embossing tool **702** configured to emboss packaging material **703** from a product casing (the product casing as such is not illustrated in figure **7A** but is known with reference **103** from previously discussed figures). As can be seen in the magnified view, the first embossing tool **701** carries at least a matrix-type embossing structure **704** which extends from a first mean surface **706** of the first embossing tool **701**. The second embossing tool **702** comprises at a corresponding matrix-type embossing structure **705** which recesses from a second mean surface **707** of the second embossing tool **702**. The embossing structures **704** and **705** are illustrated at a time of embossing an embossed structure **708** into the packaging material, the embossed structure **708** being intended for a longitudinally shaped tearing zone of the product casing (not shown in figure **7A**). It becomes obvious by looking at figure **7A** that the packaging material is being compressed to obtain the embossed structure **708**. In the production process of the tearing zone, the embossing tools comprise a plurality of embossing structures laid out to obtain the tearing zones as appropriate (this is not illustrated in figure **7A**).

[0032] Looking now at figure **7B** this schematically illustrates an embossing device **715** comprising a third embossing tool **709** and a fourth embossing tool **710** configured to emboss packaging material **703** from the product casing. The third embossing tool **709** carries at least a matrix-type embossing structure **711** which extends from a third mean surface **712** of the third embossing tool **709**. The fourth embossing tool **710** presents a flat fourth mean surface **713** of the fourth embossing tool **710**. The embossing structure **711** and the fourth flat surface are illustrated at a time of embossing an embossed structure

714 into the packaging material, the embossed structure being intended for a longitudinally shaped tearing zone of the product casing (not shown in figure **7B**). It becomes obvious by looking at figure **7B** that the packaging material is being compressed to obtain the embossed structure **714**, which may result in a piercing of the packaging material **703**, i.e., a hole being operated through the packaging material **703**. In the production process of the longitudinally shaped tearing zone, the embossing tools comprise a plurality of embossing structures laid out to obtain the longitudinally shaped tearing zones as appropriate (this is not illustrated in figure **7B**).

[0033] Figures **8A** to **8D** show examples of surface distributions of embossed structures **800** and **801** in tearing zones. The tearing zones as such are not illustrated. It is understood that the embossed structures are comprised in packaging material of a product casing in each case.

[0034] In figure **8A** the embossed structures **800** are represented as dots but may well adopt any discrete geometrical shape. The embossed structures **800** are distributed in parallel grid lines **g1**, **g2**, **g3**, **g4** and **g5**, represented in dotted lines, in which they are periodically distanced from each other by a distance **p**. The parallel grid lines **g1**, **g2**, **g3**, **g4** and **g5** are distant amongst each other by a grid line distance **d**. Each embossed structure **800** has a length **l** along its grid line, and a width **w**.

[0035] In figure **8B** the embossed structures **801** are distributed in further parallel grid lines **j1**, **j2**, **j3**, ... represented in dotted lines, in which they are periodically distanced from each other by a distance **p1**. From one grid line to the next, for example from line **j1** to line **j2**, the

embossed structures are shifted by a distance $\frac{p1}{2}$. The parallel grid lines **j1**, **j2**, **j3** are distanced amongst each other by a first grid line distance **d1**. Each embossed structure **801** has a length **l1** corresponding to the dis-

tance $\frac{p1}{2}$ along its grid line, and a width **w1**.

[0036] In figure **8C** the embossed structures **800** are also distributed in parallel grid lines, which are not represented for a better readability, in which they are periodically distanced from each other by a distance **p2**. From one grid line to the next the embossed structures are

shifted by a distance $\frac{p2}{2}$.

[0037] In figure **8D** the embossed structures **801** are also distributed in parallel gridlines, in which they are periodically distanced from each other to form straight continuous lines. This example illustrates the particular case, in which the period **p** and the length are equal, so that the embossed structures form continuous grooves of a width **w**. The lines (i.e., the embossed grooves) are distant from one another by the distance **d**.

[0038] Figures **9A** and **9B** schematically illustrate an

example embodiment of longitudinally shaped tearing zones and an opening strip, comprising linearly aligned embossing structures. In this sense, figure 9A shows the cigarettes box 100 with an opening strip 900 already partly pulled away from the product casing 103. The enlarged view on the right-hand side of the figure is a top view on the packaging material of the product casing 103 including a cross-section line A-A, and more precisely shows parts of longitudinally shaped tearing zones 901 and 902 in the product casing 103, delimitating a lid area 909. Each longitudinally shaped tearing zone 901 and 902 comprises embossed structures 903 aligned inside the respective longitudinally shaped tearing zone along straight lines 904 and 905 represented in dotted lines. The embossed structures 903 are each oval shaped with a length l and a width w , while being periodically spaced by a periodic distance p . From one longitudinally shaped tearing zone to the other the embossed structures are

shifted by a distance $\frac{p}{2}$.

[0039] Figure 9B shows a cross section through the opening strip 900 and the product casing 103 at the section A-A. It further shows a cross-section through an embossed structure 903, and a connection operated by glue 906 between the product casing 103 and the opening strip 900. A void space 907 may occur between the product casing 103 and the opening strip 900 at a part of the longitudinally shaped tearing zone where there is no embossing structure. Optional sealing material 908 may be used to seal the product casing 103 and the opening strip 900 outside of the lid area 909.

[0040] Figures 10A to 10C schematically illustrate example embodiments of longitudinally shaped tearing zones and an opening strip, comprising linearly aligned embossed structures. In this sense, figure 10A shows the cigarettes box 100 with an opening strip 1000 already partly pulled away from the product casing 103. The enlarged view on the right-hand side of the figure is a top view on the packaging material of the product casing 103 including the cross-section line B-B, and more precisely shows parts of longitudinally shaped tearing zones 1001 and 1002 in the product casing 103 delimitating a lid area 1009. Each longitudinally shaped tearing zone comprises embossed structures 1003 aligned inside the respective longitudinally shaped tearing zone along respectively a plurality of straight lines 1004 and 1005 represented in dotted lines. The embossed structures 1003 are each oval shaped with a length l and a width w , while being periodically spaced on their grid line by a periodic distance p . From one line to the other in each of the longitudinally shaped tearing zones the embossed structures

are shifted by a distance $\frac{p}{2}$, whereas the individual lines of the plurality of straight lines 1004 and 1005 are separated by a distance $p/4$.

[0041] Figure 10B shows a cross section through the opening strip 1000 and the product casing 103 along the

line B-B. It further shows a cross-section through embossed structures 1003, and a connection operated by glue 1006 between the product casing 103 and the opening strip 1000. Void spaces 1007 may occur between the product casing 103 and the opening strip 1000 at a part of the longitudinally shaped tearing zone where there is no embossing structure. Optional sealing material 1008 may be used to seal the product casing 103 and the opening strip 900 outside of the lid area 1009.

[0042] Figures 11A and 11B show an example embossing device 1100 comprising a first and a second roller respectively 1101 and 1102, wherein figure 11A shows an assembled view while the other figure, i.e., 11B shows an exploded view of a cassette assembly 1103, to be used to emboss the structures in longitudinally shaped tearing zones of a product casing 103's packaging material, according to the invention. The first roller 1101 is held in a bracket 1104 which enables to separately remove the first roller 1101 from the cassette assembly 1103, while the second roller 1102 is held in its own bracket 1105 which also enables to separately remove the second roller 1102 from the cassette assembly 1103.

[0043] Each first and second embossing roller 1101 and 1102 works as an embossing tool, such as for example the embossing tools illustrated partially in figures 7A and 7B. The product casing 103 is then embossed in a nip 1106 that is adjusted between the two rollers at the time of embossing.

[0044] Figure 12 illustrates schematically a further example of packaging material that may be a barrier paper from the product casing 103 being embossed to obtain a longitudinally shaped tearing zone 1200, by means of a pair of embossing rollers 1201 and 1202. The product casing 103 is being embossed in a nip 1203 between the rollers. The enlarged view at the upper left of the figure illustrates an example of embossing structures on the rollers, i.e., a matrix-type embossing structure 1204 on the second roller 1202 and a corresponding matrix-type embossing structure 1205 that result in an embossed structure in the product casing 103, located in the longitudinally shaped tearing zone 1200. Note that the latter is U-shaped on the product casing 103 and results from embossing structures located on respective rollers in a corresponding embossing U-shape 1206 represented in a dotted line. The enlarged view on the bottom left of the figure schematically shows that the longitudinally shaped tearing zone comprises two lines 1207 of embossed structures 1208, which incidentally are oval shaped. The enlarged view of the upper right of the figure illustrates that a determined structure, a preferred example for embossing packaging materials such as barrier papers without diminishing their barrier functions, may be embossed in the product casing 103 outside of the longitudinally shaped tearing zone 1200. This may result in for example a honeycomb type topography 1209 as that illustrated in the lower right part of the figure.

[0045] In the examples of embossed structures in the longitudinal shaped tearing zones given herein above,

the length of the embossing structures, their width, the periodic distance between them, the line distance when several parallel grid lines are filed with embossed structures and a gap $p - l$ between two consecutive embossed structures may for example be in the following ranges:

Parameter	Range of measures
length ($l, l1$)	0,5 to 5,0 mm
width ($w, w1$)	0,1 to 1,0 mm
period (p)	0,5 to 5,0 mm
line distance (d)	0,1 to 1,0 mm
Gap ($p - l$)	0,05 to 0,5 mm

[0046] In preferred embodiments, the packaging material is any one of the items in the list comprising

- a barrier-paper sheet with a grammage roughly between 40 g/m² and 100 g/m² and a thickness equal or greater than 50 μm and equal or less than 150 μm, comprising a paper-based packaging sheet material containing at least a protective layer of another material (e.g., lacquers, varnishes, or water-based, solvent-based, vacuum deposition or hot-melt coatings) preferably on its surface, in order to provide moisture, oxygen, heat, aroma, etc. barrier effect;
- a paper sheet with a grammage equal or greater than 30 g/m² and equal or less than 150 g/m² and a thickness equal or greater than 40 μm and equal or less than 180 μm;
- a metal foil with a thickness equal or greater than 10 μm and equal or less than 80 μm;
- a laminate that comprises paper and a plastic film, and has a grammage equal or greater than 20 and equal or less than 90 g/m²;
- a metallized paper or metallized plastic film, each with a grammage equal or greater than 30 and equal or less than 100 g/m²;
- a metallized plastic film with a thickness equal or greater than 6 μm and equal or less than 125 μm.

[0047] The person skilled in the art may use for the glues **906** (as in figure **9B**) and **1006** (as in figure **10B**) for instance the polyurethane-resin based adhesive disclosed in the publication WO1992018577 or a commercially available water-based acrylic emulsion.

[0048] Alternatively, for the optional sealing materials **908** (as in figure **9B**) and **1008** (as in figure **10B**) the person skilled in the art can use a generally low tack, removable adhesive, for example a synthetic semi-pressure sensitive hotmelt adhesive such as PRIMAGRIP 38-638, or a water-based polyethylene adhesive such as TOBACOLL ZD 4404-01, both available from Henkel & Cie AG.

Claims

1. A tamper-evidence for a product casing, comprising

5 the product casing made from a packaging material;
at least a first longitudinally shaped tearing zone comprising structures embossed in the packaging material, the at least one first longitudinally shaped tearing zone being located on a surface of the product casing and defining a delimitation of a lid area on the surface of the product casing; an opening strip made of a foil material, the opening strip being configured

10 to adhere on the packaging material of substantially the entire lid area,
to cover the at least one first longitudinally shaped tearing zone in order to seal it, and to produce a tearing of the packaging material corresponding to the at least one first longitudinally shaped tearing zone on the product casing and a removing from the product casing of packaging material of the lid area, as an effect of the opening strip being pulled away from the product casing.

2. The tamper-evidence of claim 1, further comprising a second longitudinally shaped tearing zone parallel to the first longitudinally shaped tearing zone, and wherein the lid area is delimited by the first and second longitudinally shaped tearing zones and a border of the packaging material.

3. The tamper-evidence of any one of claims 1 and 2, in which the opening strip is further configured to also adhere to the at least one longitudinally shaped tearing zone.

4. The tamper-evidence of claim 1, in which the opening strip comprises a boundary zone that extends beyond the at least one longitudinally shaped tearing zone over a border zone of the packaging material separated from the lid area by the longitudinally shaped tearing zone, and is configured to removably adhere to the border zone by means of a re-sealable adhering system.

5. The tamper-evidence of claim 4, in which the product casing is contained in a product box, the product box comprising a hinged lid covering the lid area when closed, and where the opening strip is attached at one of its borders to the hinged lid and configured to be pulled away from the product casing when the hinged lid is opened.

6. The tamper-evidence of any one of the preceding claims, further comprising glue configured to realise

the adhering of the opening strip on the packaging material.

7. The tamper-evidence of any one of claims 1 to 5, wherein the embossed structures are laid out in sequence in at least one groove extending in the longitudinal direction of the longitudinally shaped tearing zone, the groove having a depth of at least a half of a thickness of the packaging material. 5
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8. The tamper-evidence of any one of claims 1 to 5, in which the embossed structures are shapes that protrude in the packaging material in a direction away from the opening strip. 15
9. The tamper-evidence of any one of claims 1 to 5, in which the embossed structures are openings pierced through the packaging material.
10. The tamper-evidence of any one of claims 1 to 5, in which the structures embossed are at least in part positioned in the tearing zone to be aligned with a periodicity in a range from 0,5 mm to 5 mm, hence being configured to produce an audible sound of determined frequency when the opening strip is being pulled away from the product casing. 20
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11. The tamper-evidence of any one of the claims 1 to 4, in which the opening strip further comprises a grip element configured to be seized to pull the opening strip away from the product casing. 30

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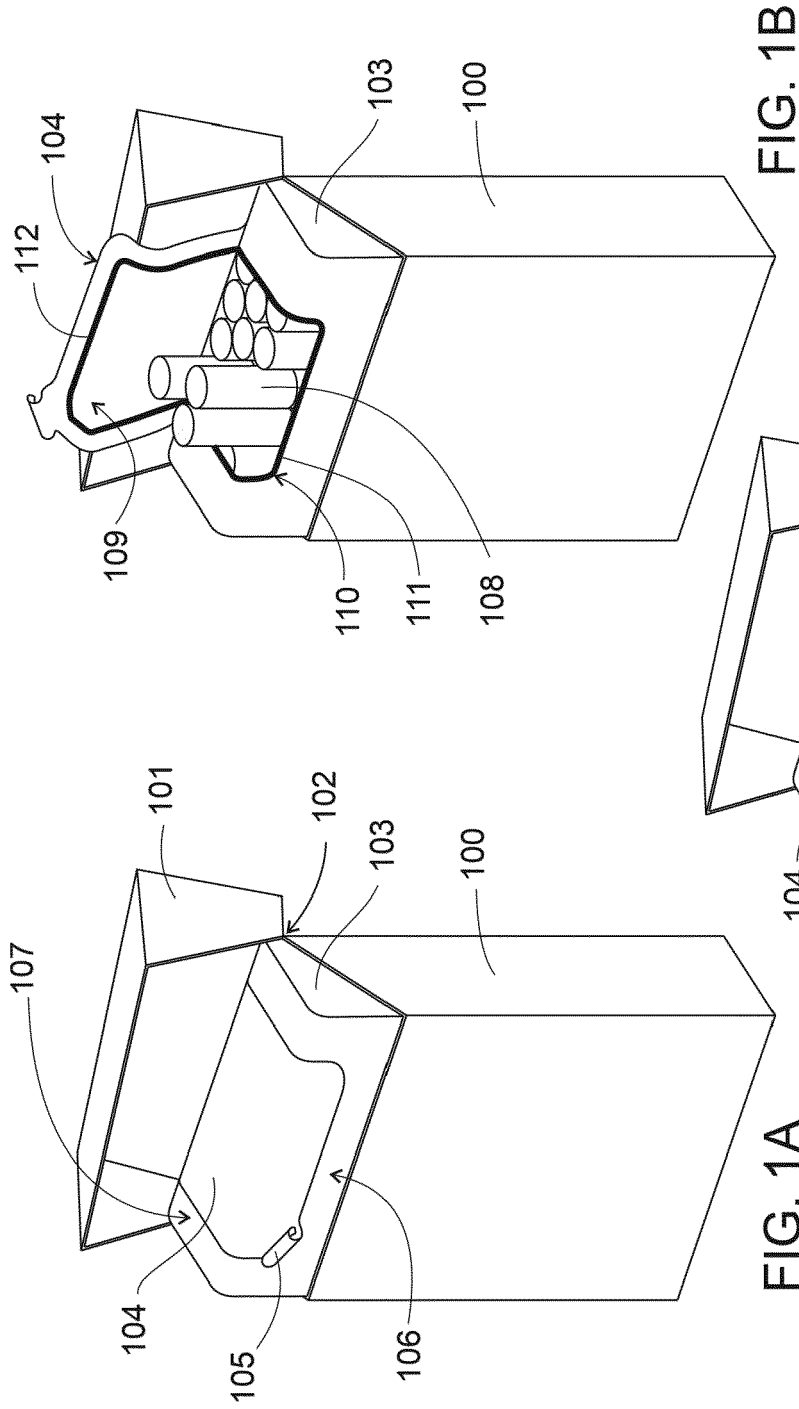


FIG. 1B

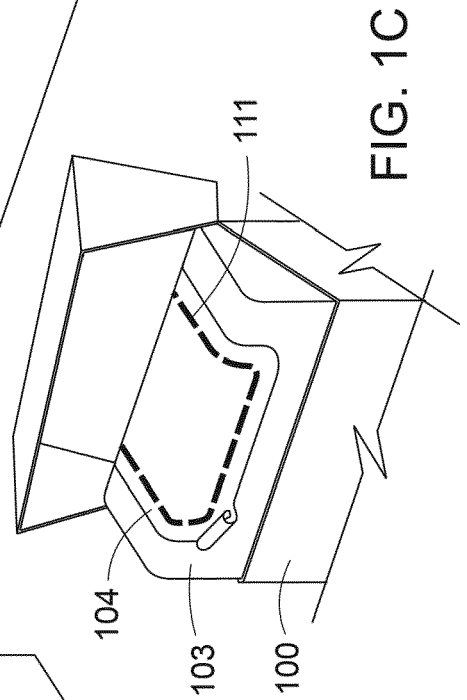
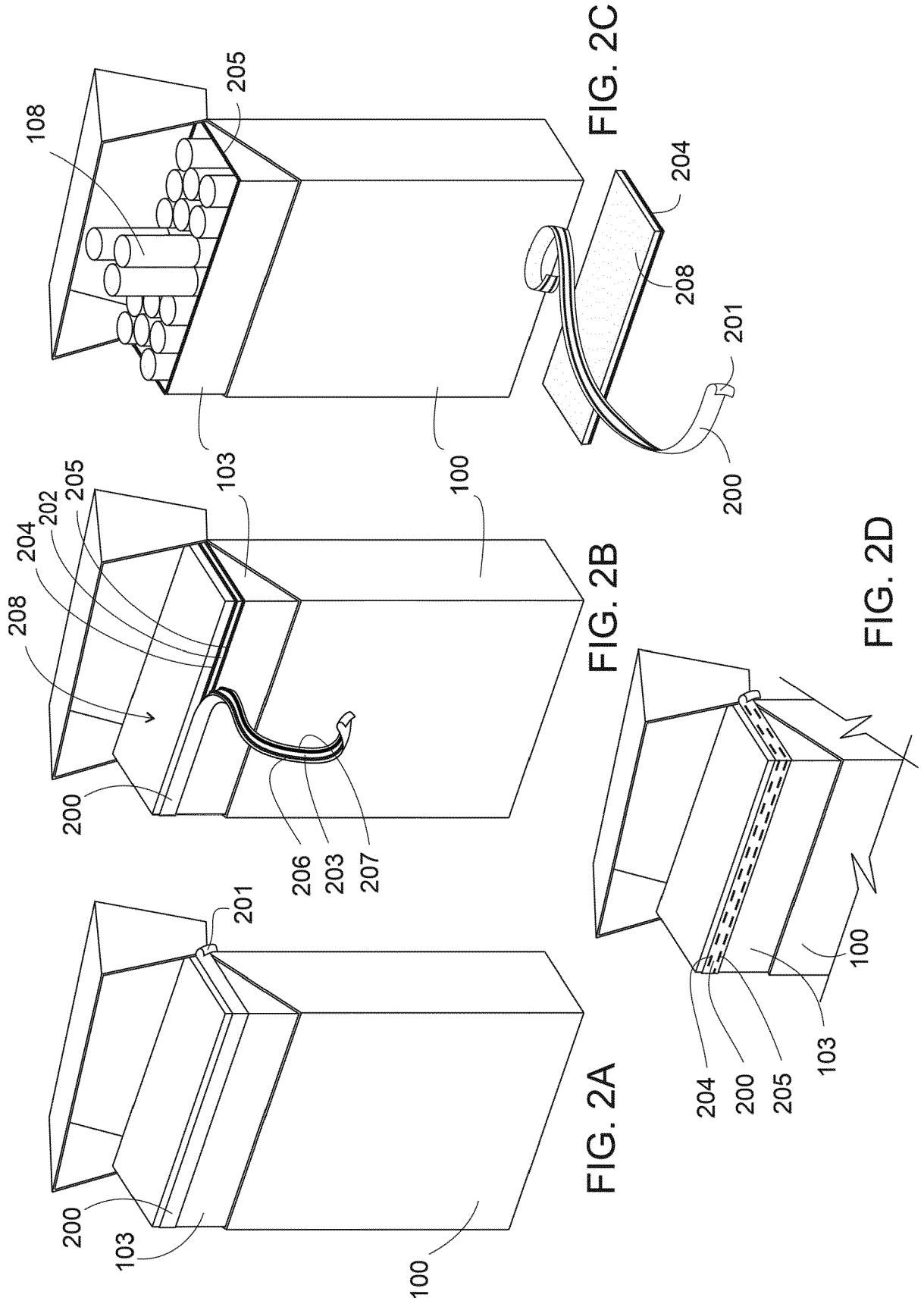


FIG. 1C



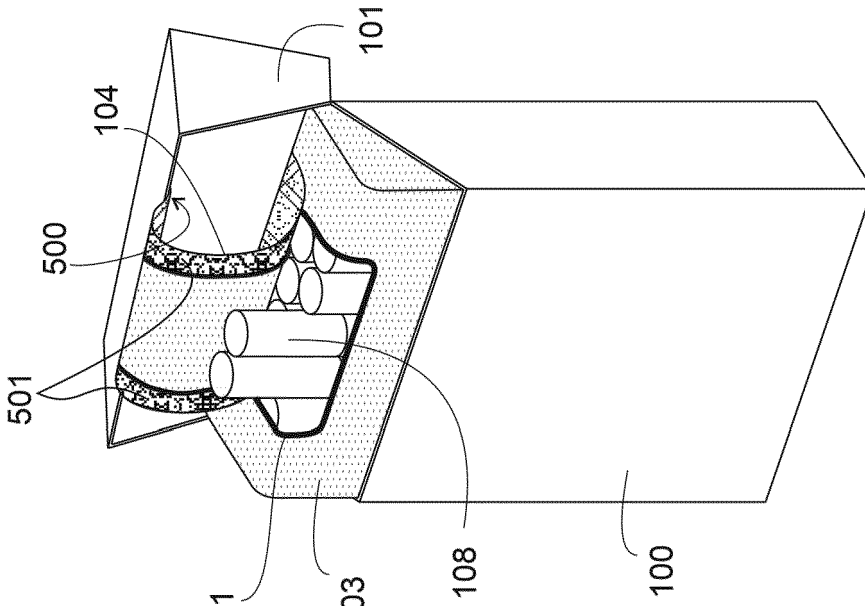


FIG. 3

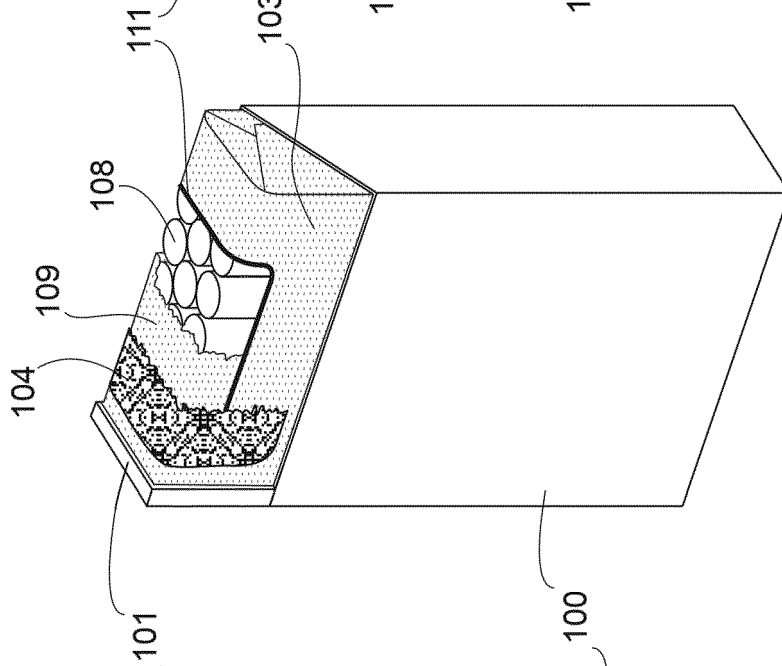


FIG. 4

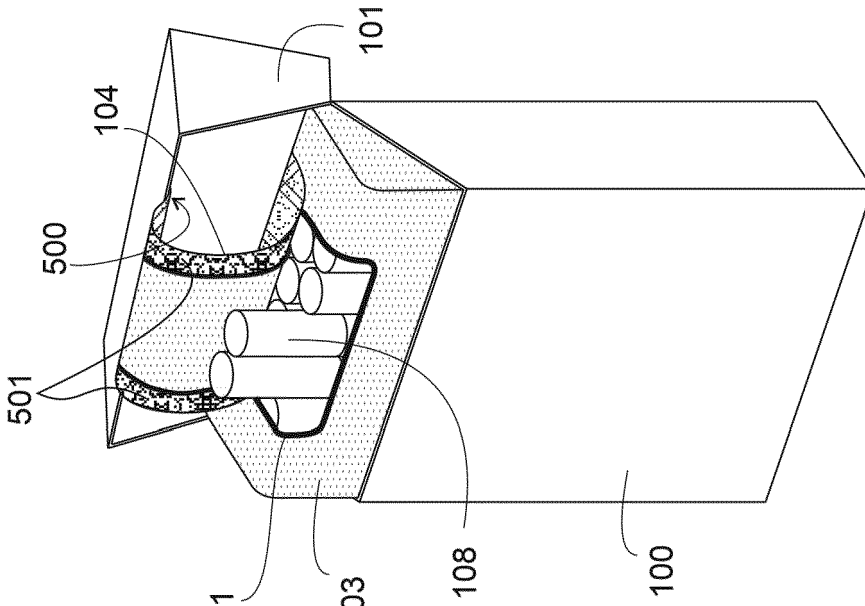


FIG. 5

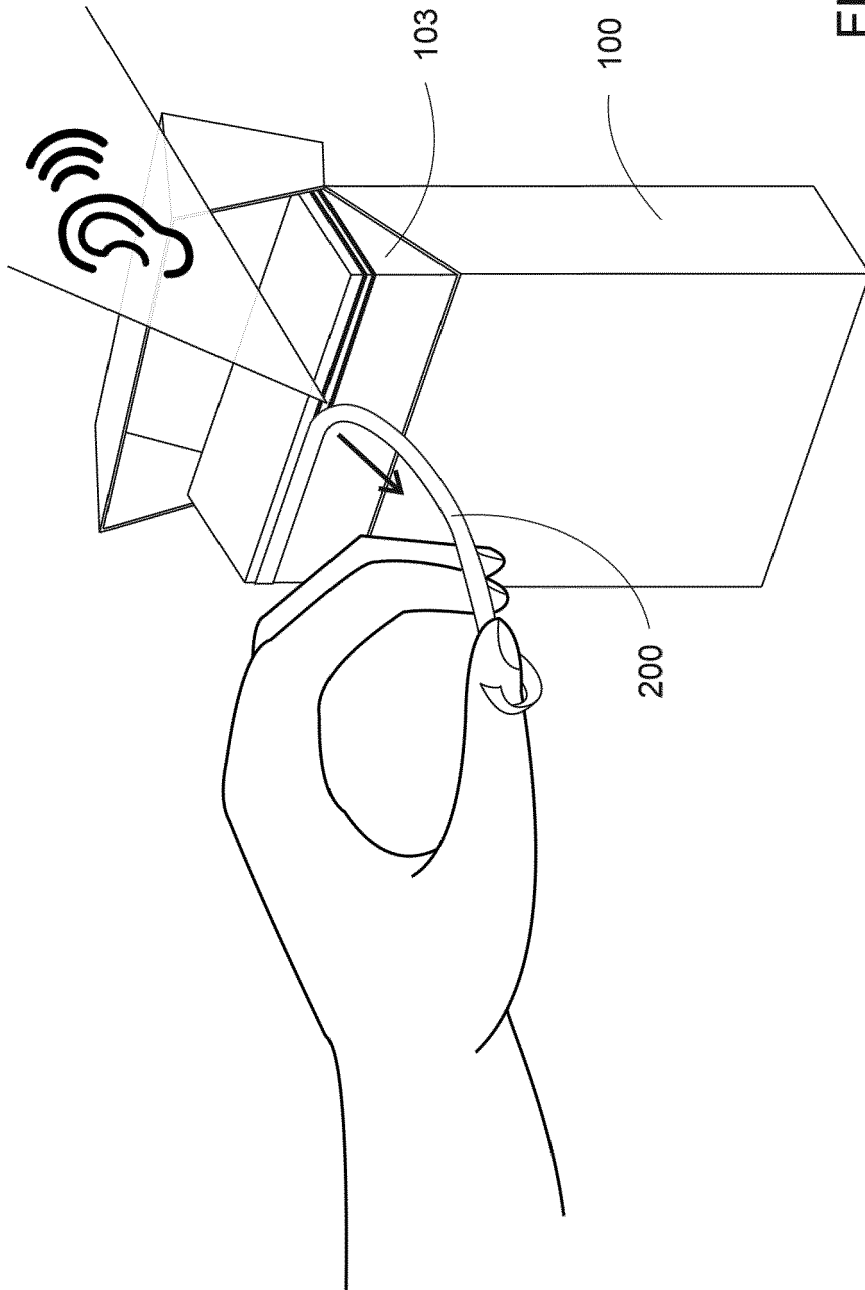
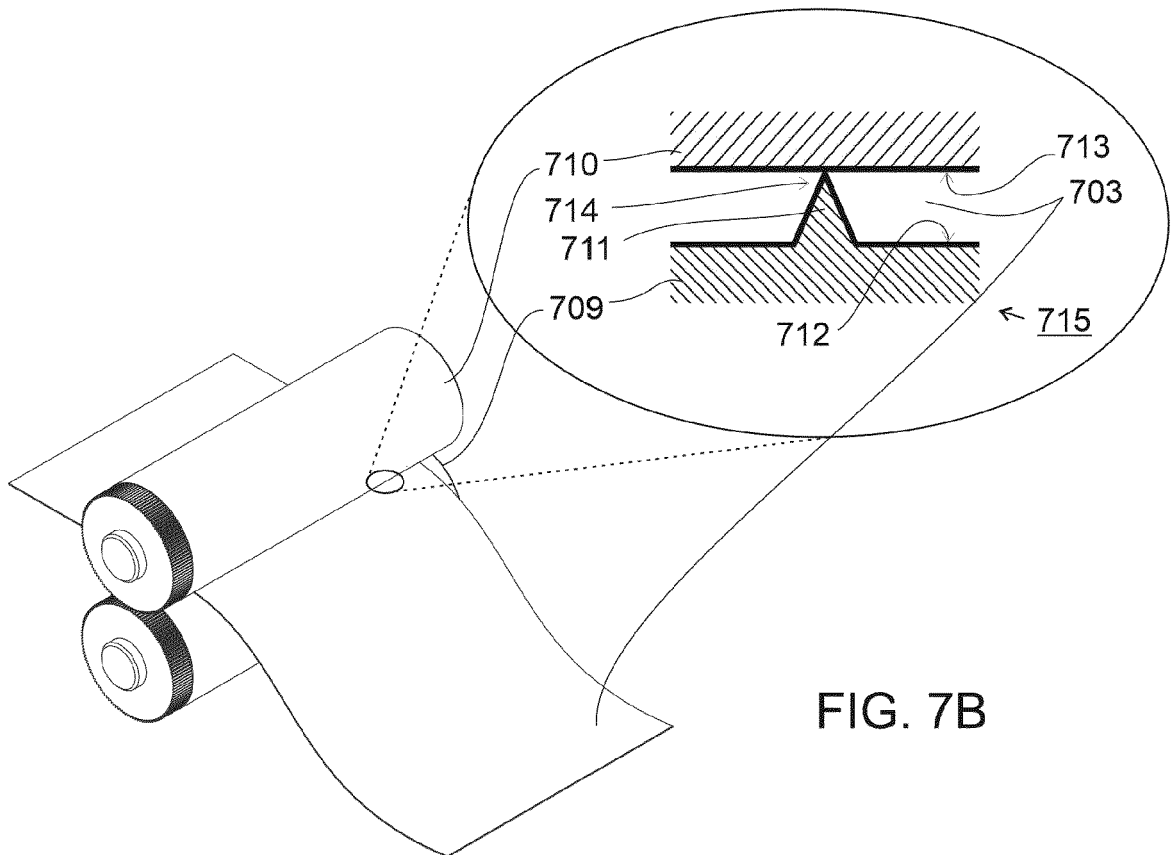
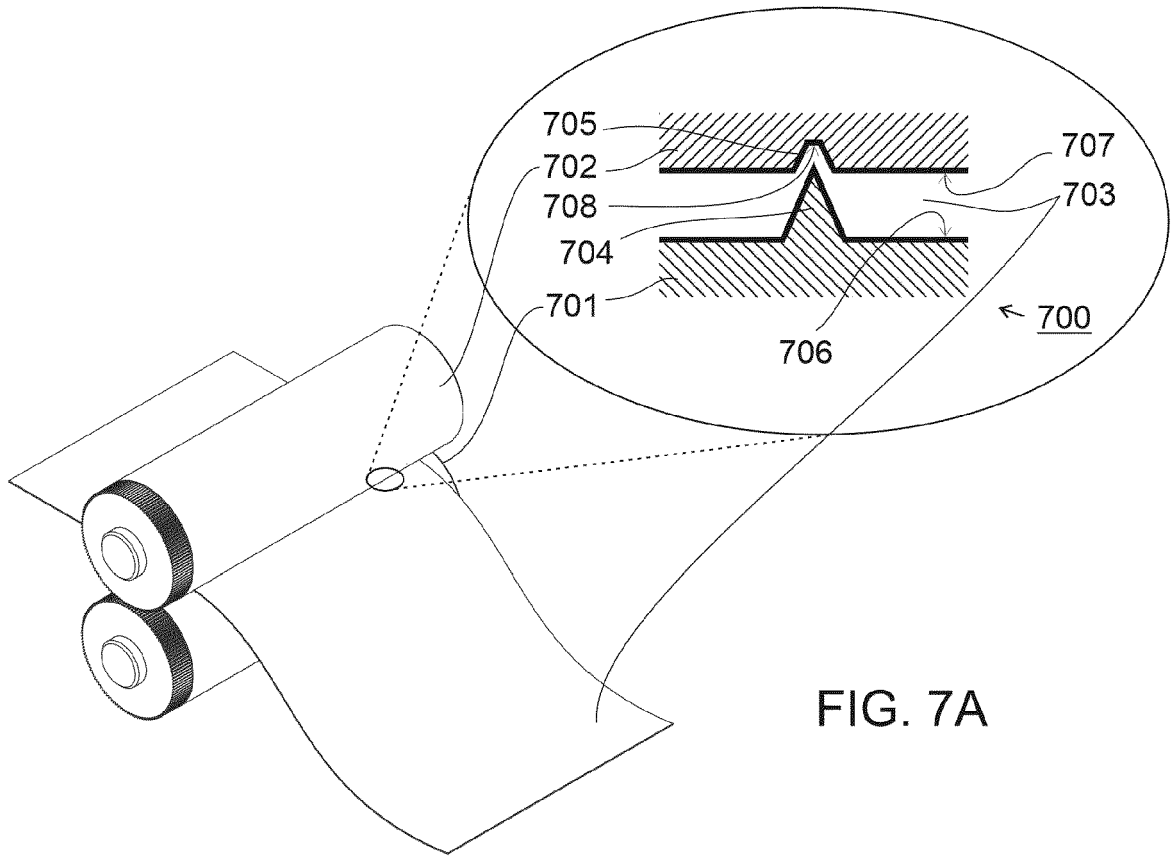
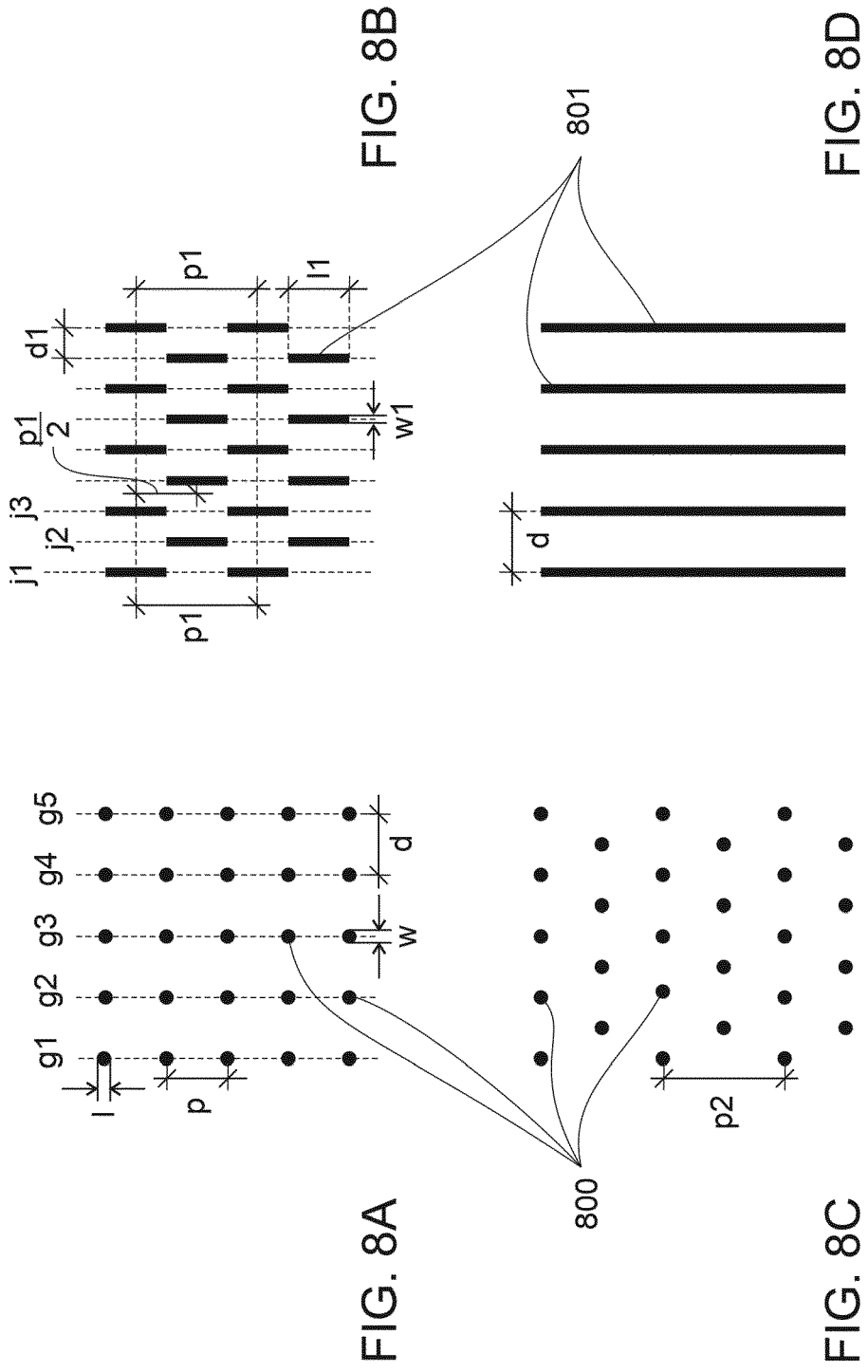


FIG. 6





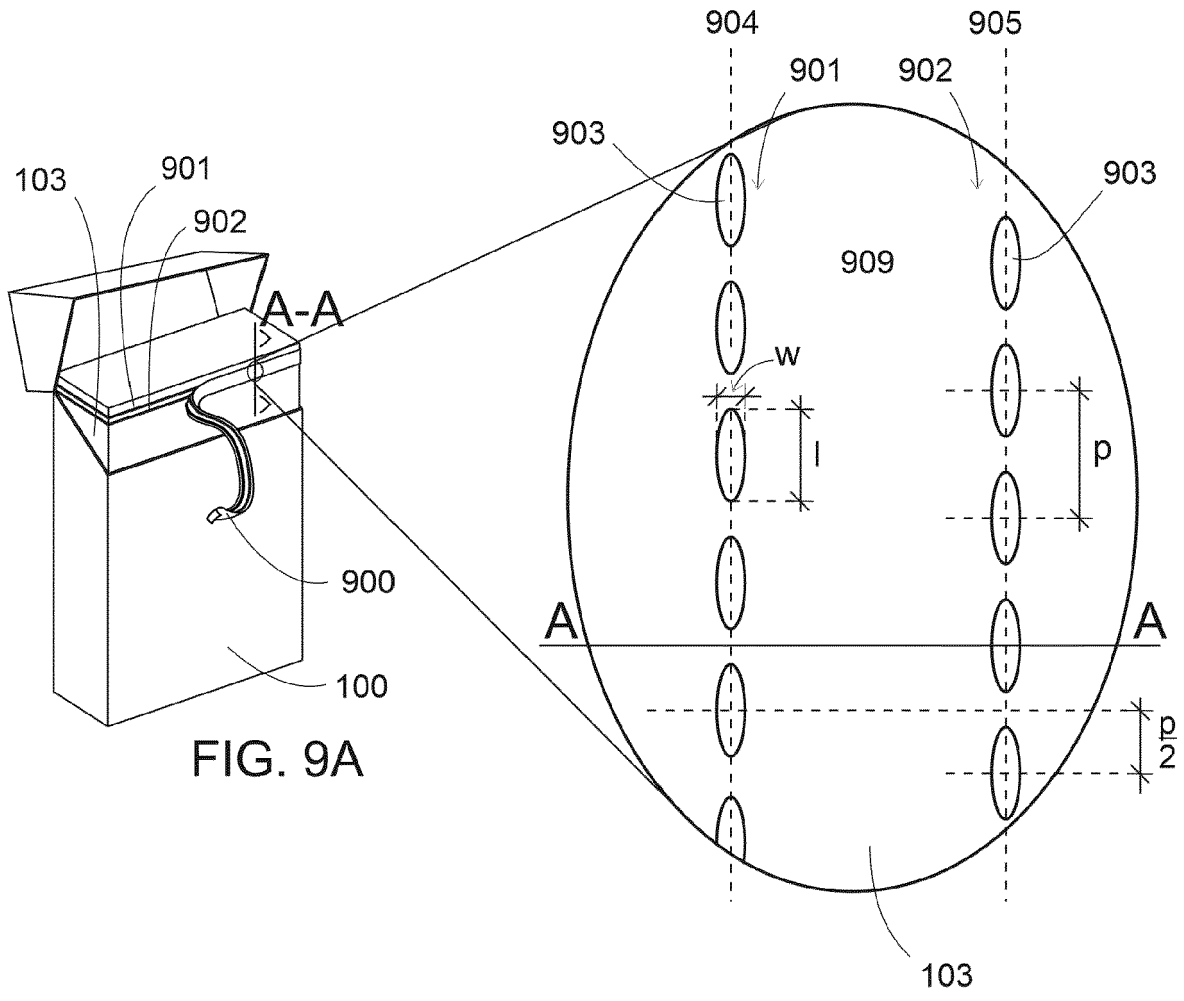


FIG. 9A

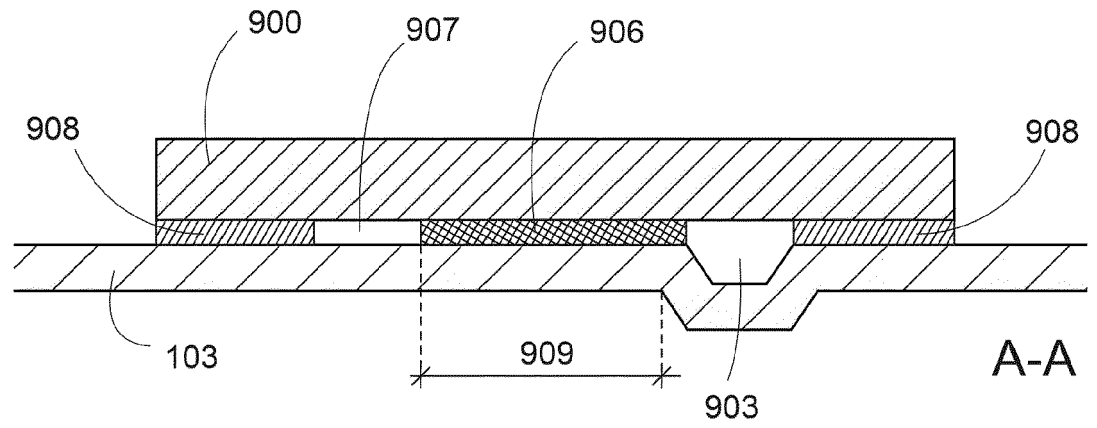


FIG. 9B

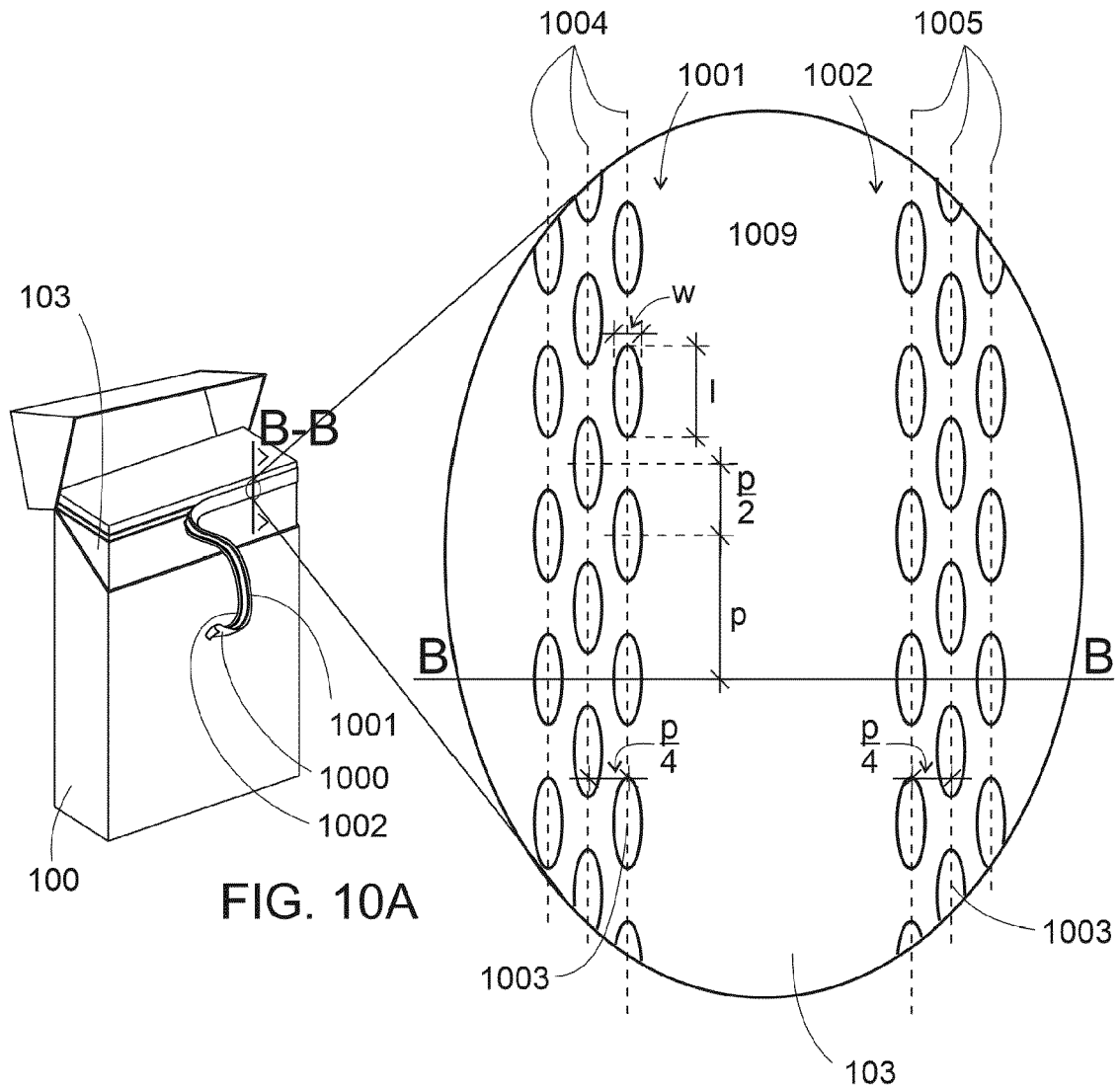


FIG. 10A

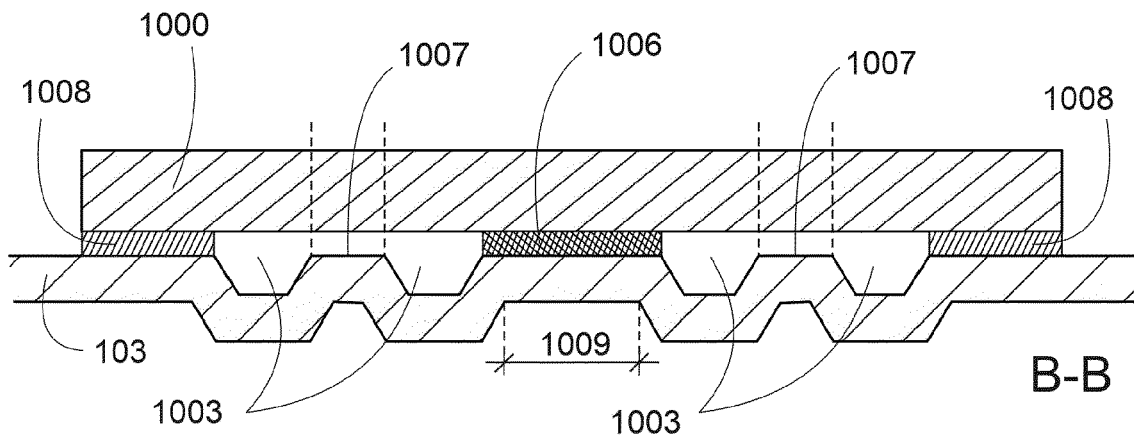


FIG. 10B

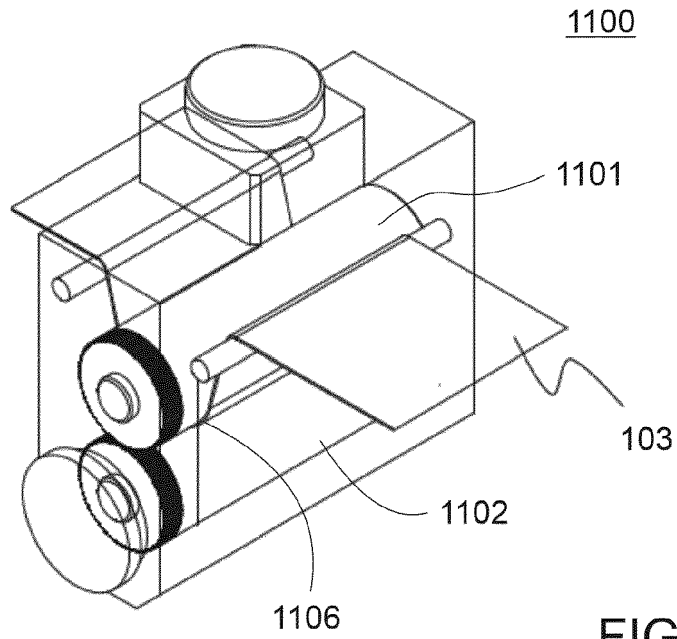


FIG. 11A

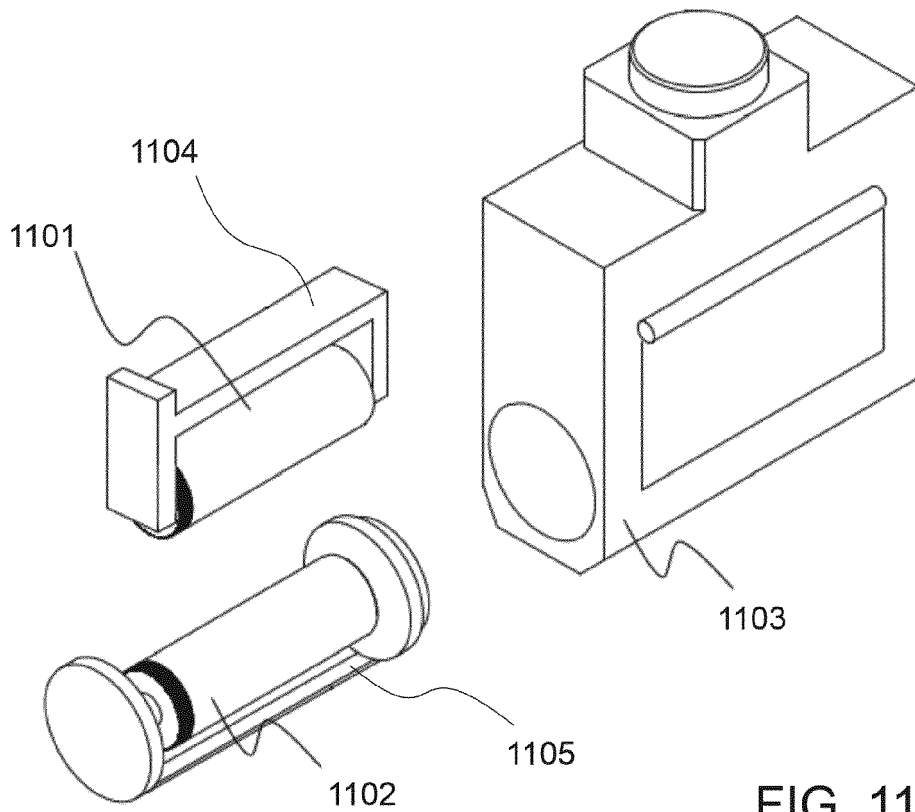


FIG. 11B

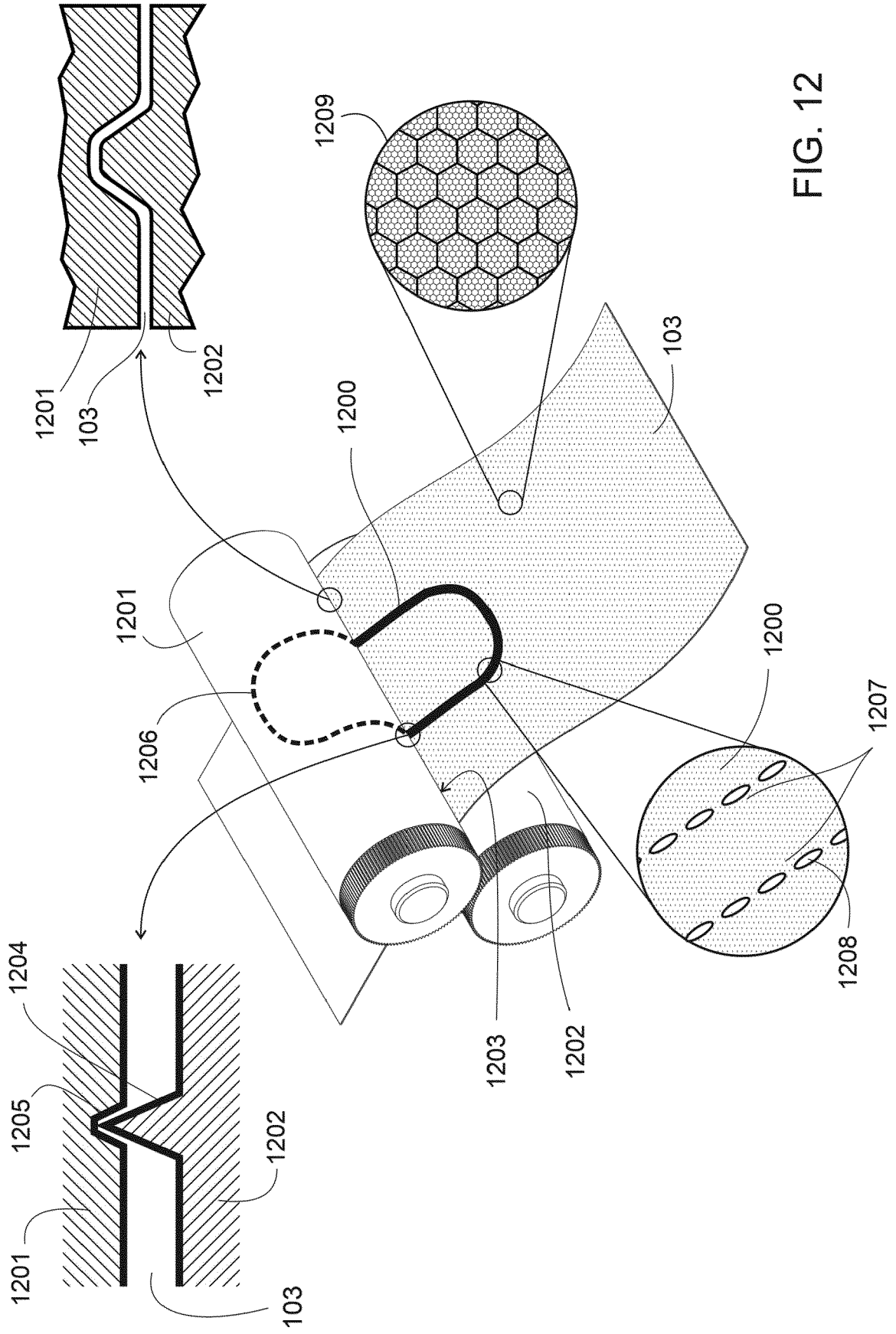


FIG. 12



EUROPEAN SEARCH REPORT

Application Number
EP 22 15 9783

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	<p>WO 2015/087079 A1 (BRITISH AMERICAN TOBACCO CO [GB]) 18 June 2015 (2015-06-18)</p> <p>* page 1, line 4 - page 3, line 21 *</p> <p>* page 4, line 29 - page 10, line 25 *</p> <p>* page 12, line 16 - page 13, line 24 *</p> <p>* page 15, lines 5-16 *</p> <p>* figures 1,2,4 *</p> <p>-----</p>	1-11	<p>INV.</p> <p>B65D75/58</p> <p>B65D85/10</p>
X	<p>WO 2009/034377 A1 (INNOVIA FILMS LTD [GB]; MILLS PETER [GB]; MAUDE STEVEN [GB]) 19 March 2009 (2009-03-19)</p> <p>* page 1, line 23 - page 2, line 10 *</p> <p>* page 4, lines 10-12 *</p> <p>* page 5, line 6 - page 7, line 10 *</p> <p>* page 23, line 19 - page 27, line 5 *</p> <p>* figures 1-5 *</p> <p>-----</p>	1-3,7-11	<p>TECHNICAL FIELDS SEARCHED (IPC)</p> <p>B65D</p>
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		19 September 2022	Leijten, René
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone</p> <p>Y : particularly relevant if combined with another document of the same category</p> <p>A : technological background</p> <p>O : non-written disclosure</p> <p>P : intermediate document</p> <p>T : theory or principle underlying the invention</p> <p>E : earlier patent document, but published on, or after the filing date</p> <p>D : document cited in the application</p> <p>L : document cited for other reasons</p> <p>.....</p> <p>& : member of the same patent family, corresponding document</p>			

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ON EUROPEAN PATENT APPLICATION NO.**

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The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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