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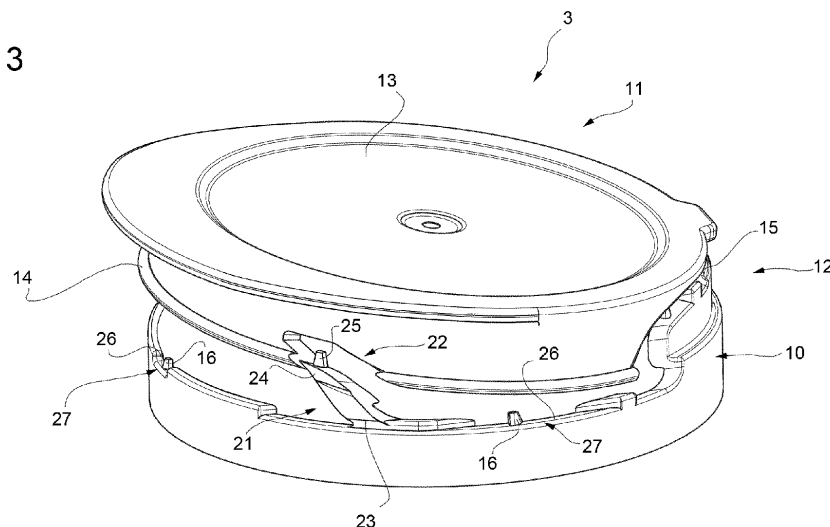
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(54) **LID ASSEMBLY FOR A SPOUT OF A PACKAGE, LID-SPOUT GROUP FOR A PACKAGE AND PACKAGE HAVING A LID ASSEMBLY**

(57) There is described a lid assembly (3) comprising at least a coupling ring (10), a lid (11) and a connecting unit (12) connecting the lid (11) to the coupling ring (10). The lid (11) is controllable in a closed configuration and in an open configuration. The lid (11) is in an initial state in which the lid (11) is in the closed configuration and prior to any control of the lid (11) from the closed configuration to the open configuration and a used state in which the lid (11) has been controlled at least once from the closed configuration to the open configuration. The lid assembly (3) also comprises a tamper-evidence unit

(20) associated to the coupling ring (10) and the lid (11). The tamper-evidence unit (20) comprises a tamper-evidence element (21) fixedly connected to one of the coupling ring (10) and the lid (11) and a housing seat (22) associated to the other one of the coupling ring (10) and the lid (11). At least a portion of the tamper-evidence element (21) is arranged in the housing seat (22) with the lid (11) being in the initial state and the tamper-evidence element (21) is detached from the housing seat (22) with the lid (11) being in the used state.

FIG. 3



Description

TECHNICAL FIELD

[0001] The present invention relates to a lid assembly for a spout of a package, in particular a package having a sealed main body, filled with a pourable product, even more particular filled with a pourable food product.

[0002] Advantageously, the present invention also relates to a lid-spout group for a package, in particular a package having a sealed main body, filled with a pourable product, even more particular filled with a pourable food product, and having a spout and a lid assembly.

[0003] Advantageously, the present invention also relates to a package, in particular a package having a sealed main body, filled with a pourable product, even more particular filled with a pourable food product, and comprising a lid assembly.

BACKGROUND ART

[0004] As is known, many liquid or pourable food products, such as fruit juice, UHT (ultra-high-temperature treated) milk, wine, tomato sauce, etc., are sold in packages, in particular sealed packages, made of sterilized packaging material.

[0005] A typical example is the parallelepiped-shaped package for pourable food products known as Tetra Brik Aseptic (registered trademark), which is made by sealing and folding a laminated strip packaging material. The packaging material has a multilayer structure comprising a carton and/or paper base layer, covered on both sides with layers of heat-seal plastic material, e.g. polyethylene. In the case of aseptic packages for long-storage products, the packaging material also comprises a layer of oxygen-barrier material, e.g. an aluminum foil, which is superimposed on a layer of heat-seal plastic material, and is in turn covered with another layer of heat-seal plastic material forming the inner face of the package eventually contacting the food product.

[0006] Some of the known packages, in particular a sealed main body of the packages formed from the packaging material, comprise a designated pour opening, which allows the outpouring of the pourable product from the package. Typically, the designated pour opening is covered by a separation membrane, which isolates the inner of the package from the outer environment and which is to be opened or to be removed or to be ruptured or to be cut or to be pierced prior to the first outpouring of the pourable product so as to allow for the outpouring of the pourable product through the designated pour opening. It is also known to arrange a lid-spout group on the main body about the designated pour opening.

[0007] There are known lid-spout groups, which comprise a spout having a pouring outlet so as to allow for a controlled outpouring of the pourable product from the package and a lid assembly for selectively opening and closing the pouring outlet.

[0008] Typical lid assemblies comprise a coupling ring arranged around a portion of the spout and a lid configured to allow to selectively close and open the pouring outlet.

[0009] The lid is designed to be controlled between a closed configuration and an open configuration in which the lid is configured to respectively cover and open the pouring outlet.

[0010] A typical lid assembly also comprises a plurality of rupturable coupling bridges, which are configured to irreversibly rupture the first time the lid is controlled from the closed configuration to the open configuration.

[0011] For some kinds of lid assemblies the rupturable coupling bridges are the only means of connection between the coupling ring and the lid so that after the first control of the lid from the closed configuration to the open configuration, there is no physical connection between the lid and the coupling ring. This also leads to a clearly visible separation of the coupling ring and the lid operating thereby as a tamper evidence.

[0012] Recently, lid assemblies have been developed, which comprise a non-rupturable connecting element, which permanently connects the lid and the coupling ring with one another. Such a connecting element shall avoid the separation of the lid and the coupling ring from one another. This steady coupling has, however, the undesired effect that the coupling ring and the lid become less separated and a user encounters more difficulties in determining whether the lid has already been controlled at least once from the closed configuration to the open configuration.

[0013] Thus, a desire is felt in the sector to provide for a lid assembly, which does not come along with such inconveniences.

[0014] In particular, there is a desire felt in the sector to provide for a lid assembly comprising a non-rupturable connection, which still allows a user to clearly recognize that the lid has already been controlled at least once from the closed configuration to the open configuration.

DISCLOSURE OF INVENTION

[0015] It is therefore an object of the present invention to provide in a straightforward and low-cost manner an improved lid assembly for a spout of a package, in particular a package having a sealed main body, filled with a pourable product, even more particular filled with a pourable food product.

[0016] In particular, it is an object of the present invention to provide in a straightforward and low-cost manner an improved lid assembly for a spout of a package, in particular a package having a sealed main body, filled with a pourable product, even more particular filled with a pourable food product, which allows to clearly recognize whether the lid has already been controlled at least once from a closed configuration to an open configuration.

[0017] It is a further object of the present invention to

provide in a straightforward and low-cost manner an improved lid-spout group for a package, in particular a package having a sealed main body, filled with a pourable product, even more particular filled with a pourable food product.

[0018] It is a further object of the present invention to provide in a straightforward and low-cost manner an improved lid-spout group for a package, in particular a package having a sealed main body, filled with a pourable product, even more particular filled with a pourable food product, which allows to clearly recognize whether the lid has already been controlled at least once from a closed configuration to an open configuration.

[0019] It is a further object of the present invention to provide in a straightforward and low-cost manner a package, in particular a package having a sealed main body, filled with a pourable product, in particular filled with a pourable food product, having an improved lid assembly, in particular a lid assembly which allows to clearly recognize whether the lid has already been controlled at least once from a closed configuration to an open configuration.

[0020] According to the present invention, there is provided a lid assembly according to the independent claim.

[0021] Further advantageous embodiments of the lid assembly are specified in the respective dependent claims.

[0022] According to the present invention there is also provided a lid-spout group according to claim 12.

[0023] According to the present invention, there is also provided a package according to any one of claims 13 to 15.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a schematic perspective view of a portion of a package having a lid assembly according to the present invention, with parts removed for clarity;

Figure 2 is a lateral view of the lid assembly of Figure 1 being in a first configuration, with parts removed for clarity;

Figure 3 is a lateral perspective view of the lid assembly of Figure 1 being in a second configuration, with parts removed for clarity; and

Figure 4 is a lateral perspective view of the lid assembly of Figure 1 being in a third configuration, with parts removed for clarity.

BEST MODES FOR CARRYING OUT THE INVENTION

[0025] Number 1 indicates as a whole a package (only partially shown to the extent necessary for the comprehension of the present invention) comprising:

- a sealed main body 2, in particular a sealed carton package, being filled with a pourable product, in particular a pourable food product, and in particular having a designated pour opening (not shown and known as such) configured to allow for an outflow of the pourable product from main body 2; and
- a lid-spout group coupled to the sealed main body 2 having at least a spout (not shown as known as such) arranged and/or arrangeable about the designated pour opening and a lid assembly 3 coupled and/or configured to be coupled to the spout.

[0026] According to some preferred non-limiting embodiments, main body 2 is obtained from a packaging material, in particular a composite packaging material, having a multilayer structure (not shown and known as such).

[0027] Preferentially, the packaging material is provided in the form of a web.

[0028] Preferentially, main body 2 is obtained by forming a tube from the packaging material, longitudinally sealing the tube, filling the tube with the pourable product and by transversally sealing and cutting the tube.

[0029] Preferentially, the packaging material comprises at least one layer of fibrous material, such as e.g. a paper or cardboard, and at least two layers of heat-seal plastic material, e.g. polyethylene, interposing the layer of fibrous material in between one another. One of these two layers of heat-seal plastic material defines the inner face of main body 2 contacting the pourable product.

[0030] Preferably, the packaging material also comprises a layer of gas- and light-barrier material, e.g. aluminum foil or ethylene vinyl alcohol (EVOH) film, in particular being arranged between one of the layers of the heat-seal plastic material and the layer of fibrous material. Preferentially, the packaging material also comprises a further layer of heat-seal plastic material being interposed between the layer of gas- and light-barrier material and the layer of fibrous material.

[0031] According to a preferred non-limiting embodiment, the spout (s) is (are) applied to package (s) 2 prior, during or after the formation, filling and sealing of main body(ies) 2.

[0032] Alternatively, the spout (s) can be applied onto the packaging material prior to arranging the packaging material within or during advancement of the packaging material through a packaging machine for forming, filling and sealing main bodies 2 from the packaging material.

[0033] In particular, application of the spout(s) to the packaging material or to main body 2 occurs by means of a molding process and/or adhesive bonding and/or ultrasonic bonding.

[0034] Preferentially, each lid assembly 3 is coupled to one respective spout prior or after application of the respective spout onto main body 2 or onto the packaging material.

[0035] With particular reference to Figure 1, main body 2 extends along a longitudinal axis A, a first transversal

axis B and a second transversal axis C. In particular, the extension of package 2 along longitudinal axis A is larger than the extension of package 2 along first transversal axis B and second transversal axis C.

[0036] Preferentially, main body 2 is parallelepiped-shaped.

[0037] According to some preferred non-limiting embodiments, main body 2 comprises a first wall portion (not shown and known as such), in particular being transversal, even more particular perpendicular, to axis A, from which main body 2 extends along axis A. Preferably, the first wall portion defines a support portion of package 1, in particular main body 2, which is designed to be put in contact with a support surface, such as e.g. a shelf, when, in use, being e.g. exposed within a sales point or when being stored. In particular, when being arranged on a support surface the first wall portion defines a bottom wall portion.

[0038] Preferably, main body 2 also comprises a plurality of lateral walls 4 being (fixedly) connected to the first wall portion and extending, in particular substantially parallel to axis A, from the first wall portion.

[0039] Preferably, main body 2 also comprises a second wall portion 5 opposite to the first wall portion and being (fixedly) connected to at least some of lateral walls 4. In particular, lateral walls 4 are interposed between the first wall portion and second wall portion 5. In particular, with package 1, in particular main body 2, being arranged on the support surface, second wall portion 5 defines a top wall portion.

[0040] According to some non-limiting embodiments, the first wall portion and second wall portion 5 may be parallel to one another.

[0041] According to a non-limiting alternative embodiment not shown, the first wall portion and second wall portion 5 could be inclined with respect to one another.

[0042] According to some non-limiting embodiments, second wall portion 5 carries and/or comprises the designated pour opening.

[0043] According to some preferred non-limiting embodiments, package 1, in particular main body 2, comprises an inner space containing and/or configured to contain the pourable product. In particular, the first wall portion, lateral walls 4 and second wall portion 5 delimit the inner space.

[0044] According to a preferred non-limiting embodiment, main body 2 comprises a separation membrane (not shown and known as such) covering the designated pour opening. In particular, the separation membrane separates in the area of, in particular at, the designated pour opening the inner space from the outer environment. Preferentially, the separation membrane comprises a gas- and light-barrier material, e.g. aluminum foil or ethylene vinyl alcohol (EVOH) film.

[0045] In particular, during the first time use (see further below for more information), the separation membrane is at least partially removed and/or pierced and/or opened and/or ruptured and/or cut for allowing the pour-

able product to flow out of the inner space and main body 2.

[0046] According to some possible non-limiting embodiments, the separation membrane is defined by a portion of the packaging material, in particular a portion of the layers of the packaging material being different from the layer of fibrous material.

[0047] According to some alternative non-limiting embodiments, the separation membrane could be at least partially defined by a portion of an opening arrangement.

[0048] In more detail, the spout comprises at least:

- a pouring outlet configured to allow for the outflow of the pourable product from package 1; and
- a collar carrying (comprising) the pouring outlet.

[0049] Preferentially, the spout also comprises a base frame coupling and/or configured to couple the spout to main body 2, in particular to second wall portion 5, about the designated pour opening.

[0050] Preferentially, the collar extends along a longitudinal axis, in particular parallel to axis A, and carries (comprises) the pouring outlet at a first axial end of the collar itself and an inlet opening for the pourable product at a second axial end of the collar itself opposite to the first axial end. In particular, the collar delimits (and/or comprises) a flow channel for the pourable product extending between the inlet opening and the pouring outlet. In use, the collar is configured such to receive the pourable product from the inner space through the inlet opening and such that the pourable product flows out of the pouring outlet.

[0051] In particular, the collar has a tubular configuration.

[0052] Even more particular, the collar has an annular cross-sectional profile with respect to a cross-sectional plane perpendicular to the longitudinal axis of the collar.

[0053] With particular reference to Figures 1 to 4, lid assembly 3 comprises:

- a coupling ring 10 arrangeable and/or arranged around a portion of the spout, in particular the collar;
- a lid 11 configured to selectively close and open the pouring outlet; and
- a connecting unit 12 connecting lid 11 to coupling ring 10.

[0054] In particular, connecting unit 12 is designed such to permanently couple coupling ring 10 and lid 11 to one another. This means that connecting unit 12 guarantees the physical connection between lid 11 and coupling ring 10 under normal use circumstances.

[0055] Preferentially, connecting unit 12 hinges lid 11 to coupling ring 10. In particular, lid 11 is angularly moveable around a hinge axis defined by connecting unit 12. Even more particular, the hinge axis is transversal, in particular perpendicular, to the longitudinal axis of the collar.

[0056] Preferentially, coupling ring 10 is arranged around at least a portion of the collar. In particular, coupling ring 10 is rotatable around the longitudinal axis of the collar.

[0057] According to some preferred non-limiting embodiments, lid 11 is controllable between at least:

- a closed configuration, in which lid 11 is configured to cover and/or covers the pouring outlet, in particular for impeding an outflow of the pourable product out of the pouring outlet; and
- an open configuration in which lid 11 is configured to be and/or is detached from the pouring outlet, in particular for allowing an outflow of the pourable product through the pouring outlet.

[0058] Preferentially, lid 11 is in a first angular position and in a second angular position with respect to the hinge axis when being controlled in respectively the closed configuration and the open configuration. In particular, lid 11 is controllable between the closed configuration and the open configuration by means of a pure angular movement of lid 11 around the hinge axis and between the first angular position and the second angular position.

[0059] It should be noted that within the scope of the present description, a pure angular movement means that for angularly moving lid 11 about the hinge axis no rotation of lid 11 around a central axis being parallel, in particular coaxial, to the longitudinal axis of the collar with lid 11 being in the closed configuration, is required. In other words, it is possible to actuate the angular movement of lid 11 around the hinge axis while lid 11 is angularly fixed with respect to the central axis. According to such a definition, in the case the angular movement of lid 11 is actuated by means of a rotation around the central axis, the angular movement is not a pure angular movement.

[0060] It should be noted that package 1 after its formation is provided with lid 11 being in the closed configuration. Package 1 is distributed and/or sold to a consumer with lid 11 being in the closed configuration and lid 11 having not yet been controlled at least once to the open configuration.

[0061] In particular, lid 11 is in an initial state in which lid 11 is in the closed configuration and prior to any (first time) (full or partial) control of lid 11 from the closed configuration to the open configuration.

[0062] Furthermore, lid 11 is in a used state the first time lid 11 has been controlled at least once from the closed configuration to the open configuration.

[0063] According to some preferred non-limiting embodiments and with particular reference to Figures 1 to 4, lid 11 comprises a top wall 13 configured to cover the pouring outlet with lid 11 being controlled in the closed configuration and a side wall 14 protruding from top wall 13 and being configured to at least partially surround the collar with lid 11 being arranged in the closed configuration.

[0064] Preferentially, top wall 13 and side wall 14 delimit an internal space having a (substantially) cylindrical shape. In particular, the internal space houses with lid 11 being arranged in the closed configuration at least a portion of the collar (and of the flow channel).

[0065] In particular, side wall 14 comprises an inner surface area facing the inner surface of the collar with lid 11 being arranged in the closed configuration.

[0066] With particular reference to Figures 2 to 4, connecting unit 12 comprises one or more coupling elements 15, preferentially at least two (only one shown in the Figures), fixed to and protruding from coupling ring 10 and being connected to lid 11. In particular, coupling elements 15 are designed such to define the hinge axis and to allow the angular movement of lid 11 around the hinge axis.

[0067] According to some preferred non-limiting embodiments, lid assembly 3 also comprises an opening arrangement (not shown and known as such) operatively coupled to lid 11 and configured to at least partially open and/or cut and/or rupture and/or remove the separation membrane during the first time lid 11 is controlled from the closed configuration to the open configuration. This means that with lid 11 being in the initial state, the separation membrane is still intact, and the inner space is separated from an outer environment.

[0068] According to the non-limiting embodiment shown, the opening arrangement comprises a (polymer) covering layer fused and/or connected to the separation membrane and/or at least partially defining the separation membrane and a coupling member connected to the covering layer and lid 11. In use, the angular movement of lid 11 around the hinge axis also leads to an angular movement of the covering layer and the separation membrane around the hinge axis.

[0069] Alternatively, the opening arrangement could be in the form of a cutter or a strapping element connected and/or fused to the separation membrane and which the consumer could remove together with the separation membrane from main body 2.

[0070] Preferentially, lid assembly 3 also comprises one or more rupturable coupling bridges 16 connecting coupling ring 10 and lid 11 with one another with lid 11 being in the initial state. Coupling bridges 16 are designed to irreversibly rupture during the first control of lid 11 from the closed configuration to the open configuration, i.e. coupling bridges 16 do not establish a physical contact between coupling ring 10 and lid 11 with lid 11 being in the used state.

[0071] Advantageously and with particular reference to Figures 1 to 4, lid assembly 3 comprises a tamper-evidence unit 20 associated to coupling ring 10 and lid 11. In particular, tamper-evidence unit 20 is configured to indicate that lid 11 has been controlled from the closed configuration to the open configuration at least once, i.e. tamper-evidence unit 20 is configured to indicate that lid assembly 3 is in the used state.

[0072] In particular, tamper-evidence unit 20 compris-

es a tamper-evidence element 21 fixedly connected to one of coupling ring 10 and lid 11, in the specific embodiment shown to coupling ring 10, and a housing seat 22 associated to, in particular comprised by, the other one of coupling ring 10 and lid 11, in the specific embodiment disclosed lid 11, within which a portion of tamper-evidence element 21 is arranged with lid 11 being in the initial state. Advantageously, tamper-evidence element 21 is (irreversibly) detached from housing seat 22 with lid 11 being in the used state.

[0073] As a result, the space of housing seat 22 occupied by the tamper-evidence element 21 with lid 11 being in the initial state is free and becomes clearly visible to a user, who learns, thus, that lid 11 is in the used state. This indicates to the user that the integrity of the package is presumably lost.

[0074] In particular, housing seat 22 is in the form of a through-slot provided within coupling ring 10 or lid 11, in the specific embodiment shown within lid 11.

[0075] Preferentially, housing seat 22 is provided within side wall 14. In particular, housing seat 22, in particular the through-slot, is inclined with respect to a central axis of lid 11, in particular the central axis being transversal, in particular perpendicular, to top wall 13. Even more particular, housing seat 22 (or more precisely its imaginary prolongation) and the central axis define an acute angle between 20° to 70°.

[0076] According to some preferred non-limiting embodiments, tamper-evidence element 21 is deflectable, in particular so as to deflect during control of lid 11 from the closed configuration to the open configuration. In particular, tamper-evidence element 21 is deflectable so as to at least partially follow the angular movement of lid 11 from the first angular position to the second angular position.

[0077] Preferentially, tamper-evidence element 21 is deflectable between at least a base position (see Figures 1 and 2) in which at least the above-mentioned portion of tamper-evidence element 21 sits within housing seat 22 and a detached position (see Figure 4) in which tamper-evidence element 21 is detached from housing seat 22.

[0078] In particular, tamper-evidence element 21 is configured such that tamper-evidence element 21 is biased from the base position in the detached position the first time lid 11 is controlled from the closed configuration to the open configuration.

[0079] Preferentially, during the first time lid 11 is controlled from the closed configuration to the open configuration, tamper-evidence element 21 is (continuously) controlled into (respective) intermediate positions (see Figure 3) until tamper-evidence element 21 loses contact with housing seat 22, in particular loss of contact of tamper-evidence element 21 and housing seat 22 leads to tamper-evidence element 21 being biased to the detached position.

[0080] According to the specific embodiment shown in Figures 1 to 4, tamper-evidence element 21 is fixedly

connected to coupling ring 10 and lid 11 comprises housing seat 22.

[0081] Preferentially, tamper-evidence element 21 comprises a first end 23 connected to coupling ring 10 and a second end 24 opposed to first end 23 and sitting within housing seat 22 with lid 11 being in the initial state. In particular, a first distance (with respect to a normal axis extending from coupling ring 10) between coupling ring 10 and second end 24 with tamper-evidence element 21 being arranged within housing seat 22 (i.e. with tamper-evidence element 21 being in the base position) is larger than a second distance between coupling ring 10 and second end 24 with tamper-evidence element 21 being detached from housing seat 22 (i.e. with tamper-evidence element 21 being in the detached position).

[0082] According to some preferred non-limiting embodiments, tamper-evidence element 21 is configured such that during the first time lid 11 is controlled from the closed configuration to the open configuration and while at least still a portion of tamper-evidence element 21 remains within housing seat 22, tamper-evidence element 21 is deflected such that a third distance (with respect to the normal axis extending from coupling ring 10) between coupling ring 10 and second end 24 is larger than the second distance. In other words, while tamper-evidence element 21 is in the intermediate positions, the third distance is larger than the second distance.

[0083] According to some preferred non-limiting embodiments, tamper-evidence element 21 and coupling ring 10 define an acute angle between 20° and 70° with lid 11 being in the initial state and/or tamper-evidence element 21 being in the base position, and in particular an acute angle between 0° to 5° with lid 11 being in the used state and/or tamper-evidence element 21 being in the detached position. In particular, with tamper-evidence element 21 being in the detached position, tamper-evidence element 21 is (substantially) parallel to coupling ring 10.

[0084] In particular, the acute angle defined by tamper-evidence element 21 and coupling ring 10 with tamper-evidence element 21 being in one of the intermediate positions is larger than the acute angle defined by tamper-evidence element 21 and coupling ring 10 with tamper-evidence element 21 being in the base position.

[0085] According to some preferred non-limiting embodiments, connecting unit 12 is connected to a rear portion of lid 11. Preferentially, housing seat 22 is arranged on a lateral portion of side wall 26.

[0086] In particular, lid 11 comprises a central axis, in particular being parallel to longitudinal axis E. Preferentially, housing seat 22 is angularly displaced from rear portion along the central axis, in particular the angular displacement of housing seat 22 from the rear portion about the central axis ranges between 10° to 150°, in particular between 30° to 120°.

[0087] According to some preferred non-limiting embodiments, lid assembly 3 further comprises at least one rupturable linking bridge 25 connecting tamper-evidence

element 21 to housing seat and/or lid 11 with lid 11 being in the initial state.

[0088] Preferentially, linking bridge 25 is configured to irreversibly rupture the first time the lid 11 is controlled from the closed configuration to the open configuration. In other words, linking bridge 25 is ruptured with lid 11 being in the used state.

[0089] In particular, linking bridge 25 is connected to second end 24.

[0090] According to some preferred non-limiting embodiments, each coupling bridge 16 extends from a respective surface portion 26 (facing lid 11, with lid 11 being in the closed configuration) and towards and to lid 11 (with lid 11 being in the closed configuration). Preferentially, each coupling bridge 16 extends along a normal axis of the respective surface portion 26 (i.e. an axis normal to the respective surface portion 26). Even more preferentially, each coupling bridge 16 has a respective length along the normal axis and at least one coupling bridge 16 has a length, which is larger than the respective lengths along the normal axis of the other rupturable coupling bridges 16.

[0091] In this manner, after the irreversible rupture of coupling bridges 16 these differences in the lengths allow for an additional visual effect of lid 11 having been moved at least once from the closed configuration to the open configuration.

[0092] According to the specific embodiment shown, coupling ring 10 comprises a plurality of receiving seats 27, each one housing a respective coupling bridge 16, and in particular each one having one respective surface portion 26.

[0093] According to some preferred non-limiting embodiments, lid assembly 3, in particular coupling ring 10, lid 11, connecting unit 12 and tamper-evidence element 21, is/are formed and/or molded from a polymer.

[0094] In use, the outpouring of the pourable product from package 1 requires controlling lid 11 from the closed configuration to the open configuration. This means that the consumer needs to exert an opening force onto lid 11 for angularly moving lid 11 around hinge axis F and from the first angular position to the second angular position.

[0095] The first time lid 11 is controlled from the closed configuration to the open configuration tamper-evidence element 21 detaches from housing seat 22 providing for a visible tamper-evidence.

[0096] The first time lid 11 is controlled from the closed configuration to the open configuration also the opening arrangement is actuated so that the separation membrane loses its integrity and the pourable product can flow out of the inner space.

[0097] Additionally, also coupling bridges 16 rupture.

[0098] The advantages of lid assembly 3 and/or of the lid-spout group and/or of package 1 according to the present invention will be clear from the foregoing description.

[0099] In particular, a user clearly recognizes that lid

11 is in its initial state or in its used state by controlling the position of tamper-evidence element 21. This works despite the permanent connection between coupling ring 10 and lid 11 due to connection unit 12.

[0100] A further advantage resides in providing for the through-slot, which leads to a void when tamper-evidence element 21 is arranged in the detached position, which makes evident that lid 11 was at least once controlled in the open configuration and that package 1 has presumably lost its integrity.

[0101] Clearly, changes may be made to lid assembly 3 and/or the lid-spout group and/or package 1 as described herein without, however, departing from the scope of protection as defined in the accompanying claims.

Claims

1. Lid assembly (3) for a spout of a package (1) being filled with a pourable product;
the lid assembly (3) comprises at least:

- a coupling ring (10) arrangeable around a portion of the spout;
- a lid (11) configured to selectively close and open a pouring outlet of the spout; and
- a connecting unit (12) connecting the lid (11) to the coupling ring (10);

wherein the lid (11) is controllable in a closed configuration in which the lid (11) is configured to cover the pouring outlet and in an open configuration in which the lid (11) is configured to open the pouring outlet;

wherein the lid (11) is in an initial state in which the lid (11) is in the closed configuration and prior to any control of the lid (11) from the closed configuration to the open configuration and a used state in which the lid (11) has been controlled at least once from the closed configuration to the open configuration; wherein the lid assembly (3) comprises a tamper-evidence unit (20) associated to the coupling ring (10) and the lid (11);

wherein the tamper-evidence unit (20) comprises a tamper-evidence element (21) fixedly connected to one of the coupling ring (10) and the lid (11) and a housing seat (22) associated to the other one of the coupling ring (10) and the lid (11);

wherein at least a portion of the tamper-evidence element (21) is arranged in the housing seat (22) with the lid (11) being in the initial state; and wherein the tamper-evidence element (21) is detached from the housing seat (22) with the lid (11) being in the used state.

2. Lid assembly according to claim 1, wherein the housing seat (22) is in the form of a through-slot provided

within the coupling ring (10) or the lid (11).

3. Lid assembly according to claim 2, wherein the lid (11) comprises a top wall (13) configured to cover a pouring outlet of the spout with the lid (11) being in the closed configuration and a side wall (14) protruding from the top wall (13); wherein the through-slot is provided with the side wall (14) .
4. Lid assembly according to any one of the preceding claims, wherein the tamper-evidence element (21) is deflectable.
5. Lid assembly according to any one of the preceding claims, wherein the tamper-evidence element (21) is deflectable between at least a base position in which at least a portion of the tamper-evidence element (21) sits within the housing seat (22) and a detached position in which the tamper-evidence element (21) is detached from the housing seat (22).
6. Lid assembly according to claim 5, wherein the tamper-evidence element (21) is biased from the base position to the detached position the first time the lid (11) is controlled from the closed configuration to the open configuration.
7. Lid assembly according to any one of claims 4 to 6, wherein the tamper-evidence element (21) is deflectable so as to at least partially follow the angular movement of the lid (11) from the closed configuration to the open configuration.
8. Lid assembly according to any one of the preceding claims, wherein the tamper-evidence element (21) is fixedly connected to the coupling ring (10) and the lid (11) comprises the housing seat; wherein the tamper-evidence element comprises a first end (23) connected to the coupling ring (10) and a second end (24) opposed to the first end (23) and sitting within the housing seat (22) with the lid (11) being in the initial state; wherein a first distance between the coupling ring (10) and the second end (24) with the tamper-evidence element (21) being arranged within the housing seat (22) is larger than a second distance between the coupling ring (10) and the second end (24) with the tamper-evidence element (21) being detached from the housing seat (22).
9. Lid assembly according to claim 8, wherein the tamper-evidence element (21) is configured such that during the first time the lid (11) is controlled from the closed configuration to the open configuration, the tamper-evidence element (21) is deflected such that a third distance between the coupling ring (10) and the second end (24) is larger than the second

distance.

10. Lid assembly according to claim 8 or 9, wherein the tamper-evidence element (21) and the coupling ring (10) define an acute angle between 20° and 70° with the lid (11) being in the initial state.
11. Lid assembly according to any one of the preceding claims, and further comprising at least one rupturable linking bridge (25) connecting the tamper-evidence element (21) to the housing seat (22) with the lid (11) being in the initial state.
12. Lid assembly according to claim 10, wherein the linking bridge (25) is configured to irreversibly rupture the first time the lid (11) is controlled from the closed configuration to the open configuration.
13. Lid assembly according to any one of the preceding claims, and further comprising a plurality of rupturable coupling bridges (16) connecting the coupling ring (10) to the lid (11) and configured to irreversibly rupture the first time the lid (11) is controlled from the closed configuration to the open configuration; wherein each coupling bridge (16) extends along a normal axis and from the coupling ring (10); wherein at least one of the coupling bridges (16) has a length along the normal axis which is larger than the length of the other coupling bridges (16).
14. Lid-spout group comprising at least a spout and one lid assembly (3) according to any one of the preceding claims coupled to the spout.
15. Package (1) filled with a pourable product comprising at least a spout and one lid assembly (3) according to any one of the preceding claims 1 to 13 and being coupled to the spout.

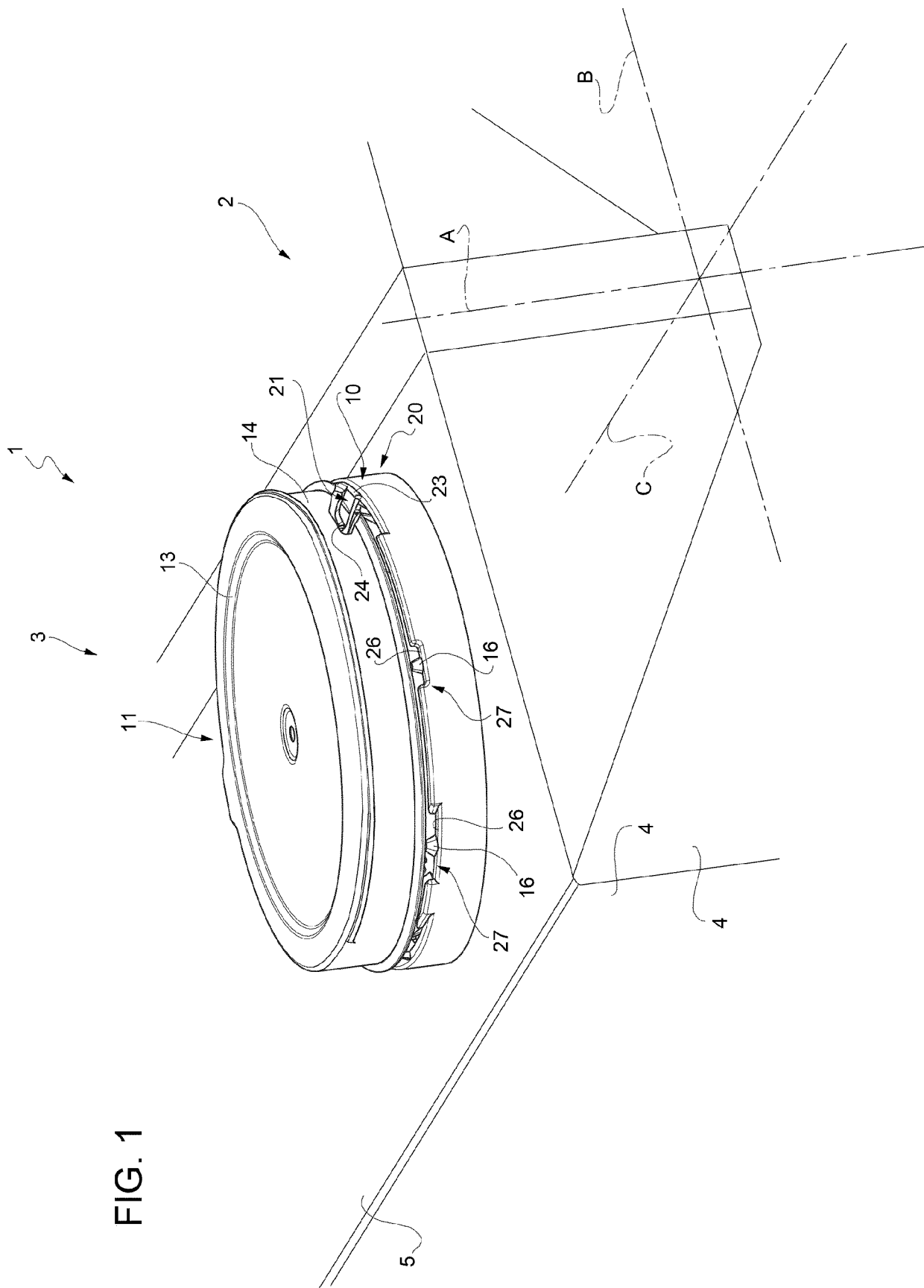
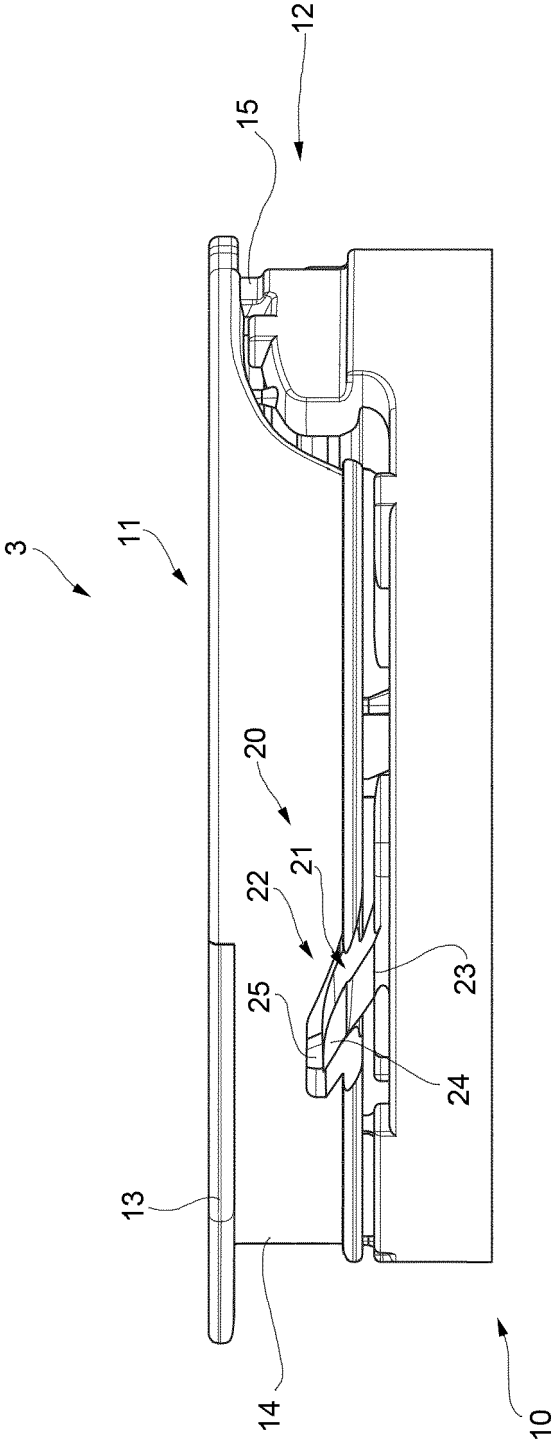
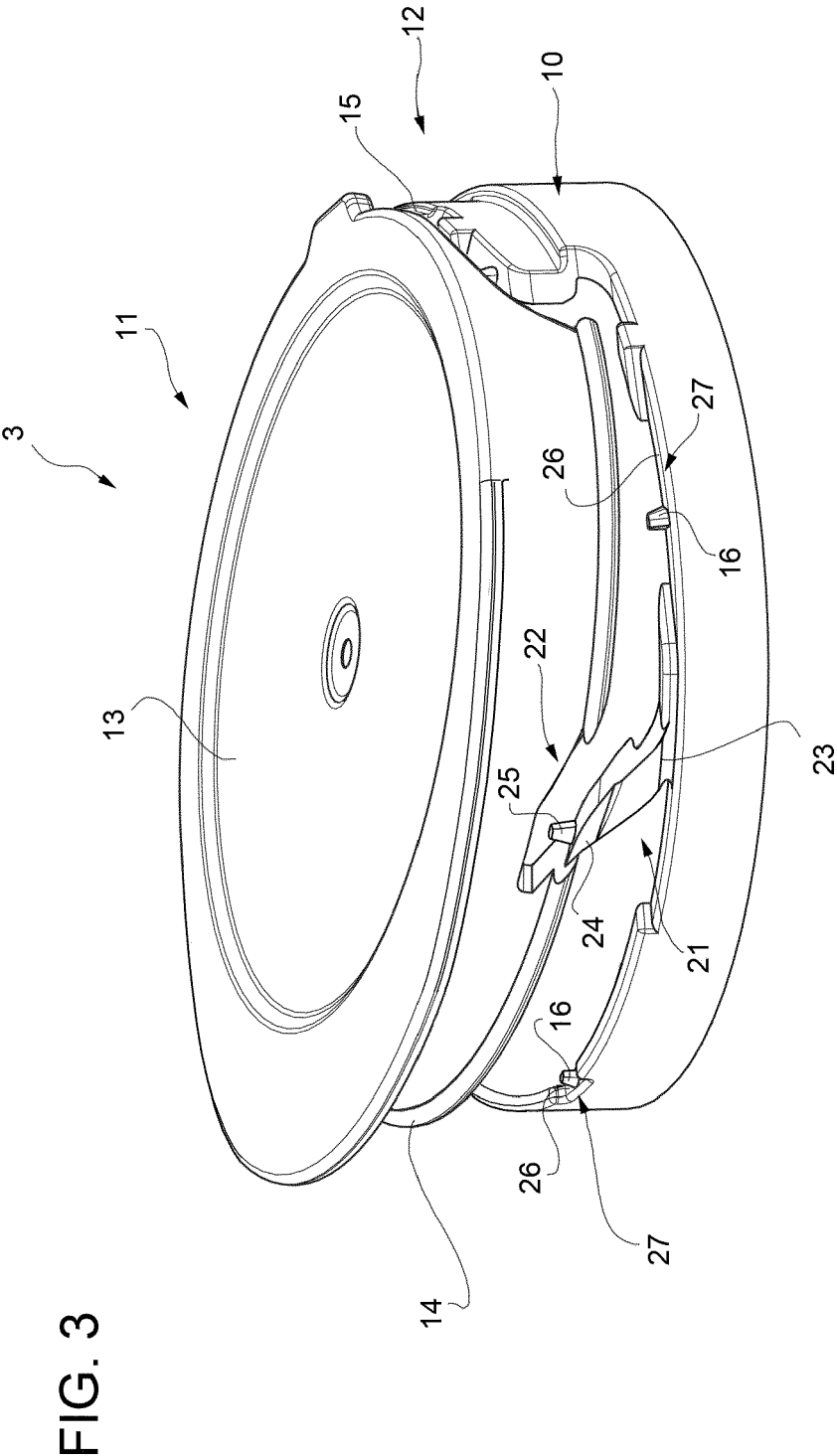


FIG. 1

FIG. 2





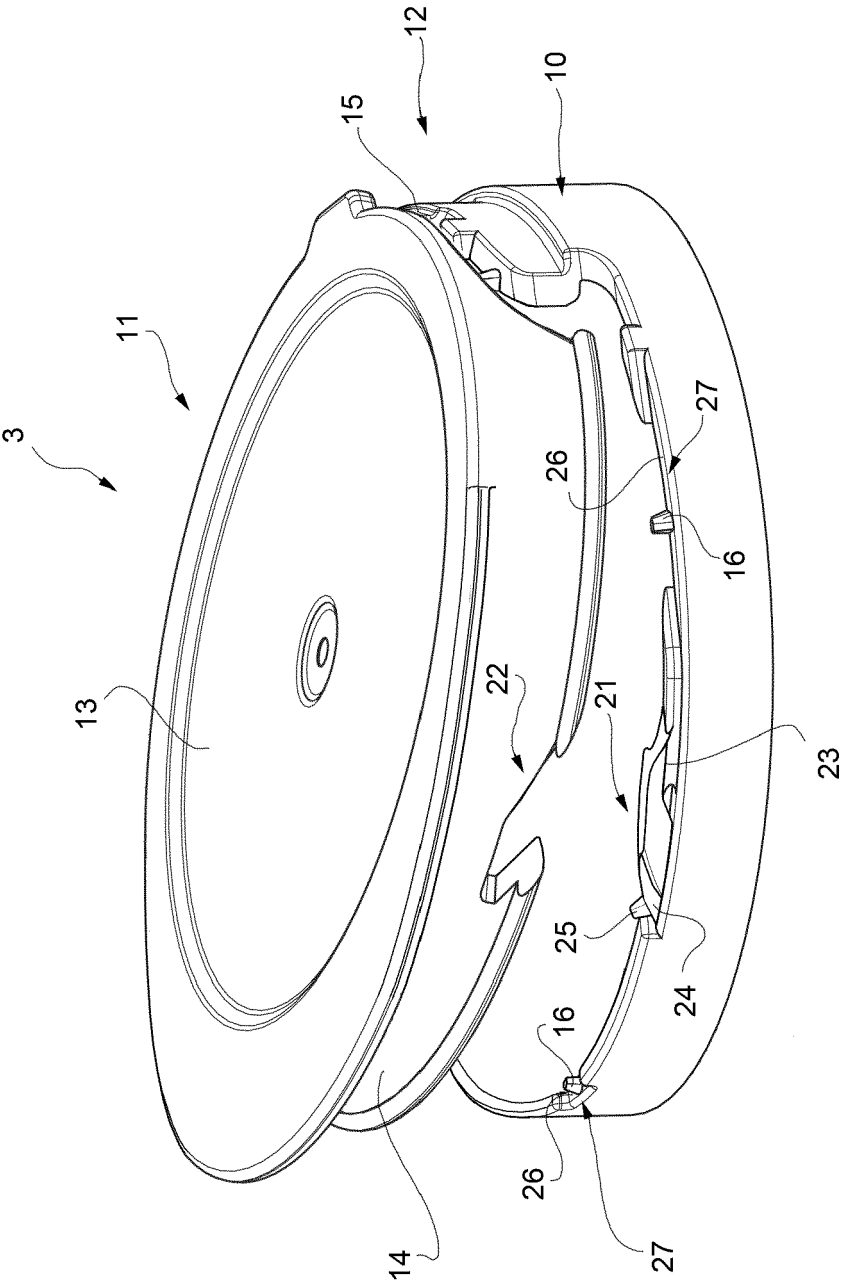


FIG. 4



EUROPEAN SEARCH REPORT

Application Number
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			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 30 June 2021	Examiner Serrano Galarraga, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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