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(54) **OPENING DEVICE FOR A PACKAGE CONTAINING A POURABLE PRODUCT**

(57) There is described an opening device (3, 3') configured to be applied to a package (1) containing a pourable product; the opening device (3, 3') comprises a cap (12) configured to close a passage (11) for the pourable product obtainable at an opening area of the package (1); the opening device (3, 3') comprises a connection member (26, 26') binding the cap (12) to the package (1) .

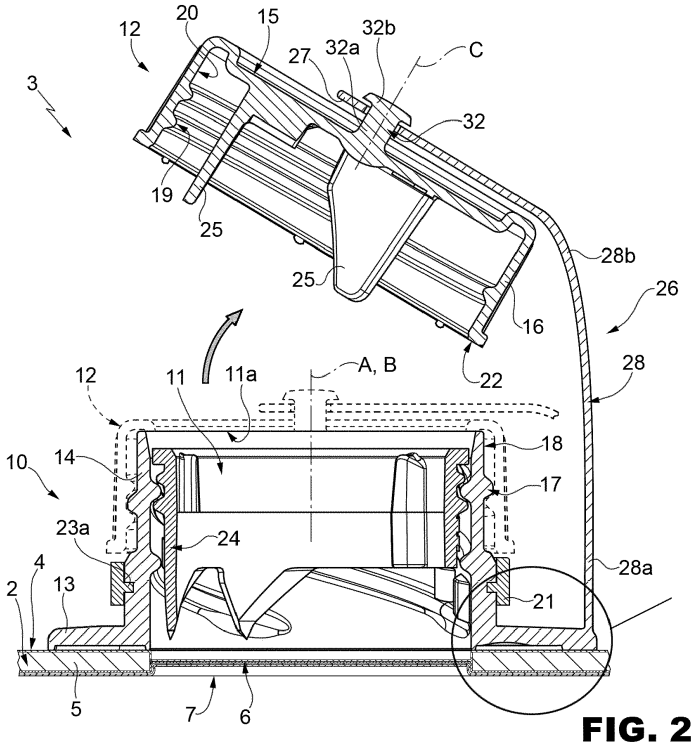

FIG. 2

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Description

TECHNICAL FIELD

[0001] The present invention relates to an opening device, in particular to a reclosable opening device, configured to be applied to a package containing a pourable product, preferably a pourable food product.

BACKGROUND ART

[0002] As it is generally known, many pourable food products, such as fruit juice, UHT (ultra-high temperature-treated) milk, wine, tomato sauce, etc., are sold in packages made of sterilized packaging material.

[0003] A typical example is the parallelepiped-shaped package for pourable food products known as Tetra Brik Aseptic (registered trademark), which is made by folding and sealing a laminated sheet of packaging material.

[0004] In particular, the packaging material has a multilayer structure substantially comprising a base layer for stiffness and strength, which may be made of fibrous material, e.g. paper or mineral-filled polypropylene material, and a number of lamination layers made of heat-seal plastic material, e.g. polyethylene films, covering both sides of the base layer.

[0005] In the case of aseptic packages for long-storage products, such as UHT milk or fruit juice, the packaging material also comprises a layer of gas-barrier material, e.g. aluminum foil or ethyl vinyl alcohol (EVOH) film, which is superimposed on a layer of heat-seal plastic material, and is in turn covered with another layer of heat-seal plastic material. This latter layer of plastic material forms the inner face of the package eventually contacting the pourable food product.

[0006] Packages of this sort are normally produced on fully automatic packaging machines, in which a continuous tube is formed from the sheet of packaging material.

[0007] Furthermore, the sheet of packaging material is sterilized in the packaging machine by applying a chemical sterilization agent, which is then removed after sterilization is completed.

[0008] Subsequently, the sheet of packaging material is maintained in a closed, sterile environment and is folded and sealed longitudinally to form the tube.

[0009] In order to complete the forming operations, the tube is filled from above, by means of a pipe, with the pourable food product and is formed, sealed and subsequently cut along equally spaced transversal cross sections.

[0010] Pillow packs are obtained thereby, which have a longitudinal sealing band, a top transversal sealing band and a bottom transversal sealing band, and which are then folded mechanically to form respective finished substantially parallelepiped-shaped packages.

[0011] Alternatively, the packaging material may be cut into blanks, which are formed into packages on forming spindles, and the resulting packages are filled with the food product and sealed. One example of such package is the so-called "gable top" package commonly known by the trade name Tetra Rex (registered trademark).

[0012] To open the packages described above, various solutions have been proposed, one of which involves the use of reclosable opening devices made of plastic material.

[0013] Opening devices of such type generally comprise:

- a frame defining an opening and fitted over a hole or a pierceable or tear-off portion in a wall of the package; and
- a cap configured to be coupled to the frame in order to close the opening.

[0014] According to a known solution, the frame is fitted over a so-called prelaminated hole, i.e. a hole formed through the base layer only and covered, by means of a lamination process, by the other lamination layers of the packaging material, including the layer of gas-barrier material.

[0015] In other words, the frame is fitted, typically glued, onto the pierceable portion of the prelaminated hole, which is made of such lamination layers.

[0016] According to an alternative solution, the pierceable portion may be defined by a patch attached to the packaging material to close a hole formed, in this case, through the full thickness of the packaging material.

[0017] Threaded opening devices are known, in which the frame typically comprises an externally threaded, substantially cylindrical-shaped collar, whereas the cap comprises an internal thread and is initially screwed to the collar. Furthermore, the cap is normally injection-molded integrally with a relative tamper-evidence ring, which is coaxially connected to the cap itself by means of a plurality of breakable bridges and which is destined to remain fitted to the collar once the bridges are broken and the cap is unscrewed.

[0018] It is known in the field that, after unsealing the cap, i.e. after detaching the cap from the tamper-evidence ring and unscrewing the cap from the frame by applying torque, the user must also remove (i.e. cut or tear) the pierceable portion covering the prelaminated hole, in order to access the inside of the package.

[0019] For this purpose, according to a known configuration, the opening device comprises a pull-off tongue coupled to the pierceable portion and configured to be torn by the user, once the cap has been unscrewed from the frame.

[0020] According to an alternative solution, the known opening devices comprise a substantially tubular cutting member screwed inside the collar and having an edge with a number of substantially triangular end teeth, which cooperate with and partly detach the pierceable portion from the relative wall, preferably with the exception of a small-angle portion, so as to avoid the torn pierceable portion to fall into the inside of the package after cutting.

[0021] More precisely, the cutting member is activated by the cap by means of a one-way ratchet-type transmission means, operated during disengagement of the cap from the collar. In detail, the cutting member is movable along a spiral path with respect to the frame, from a raised rest position, in which the end teeth face the pierceable portion, into successive lowered cutting positions, in which the end teeth interact with the pierceable portion, thereby cutting the pierceable portion.

[0022] It is known in the field the constantly growing need for reducing the environmental impact that comes along with packaging and bottling of foodstuff and non-foodstuff products. In particular, due care must be taken with regard to the plastic components of the packages, which can pollute aquatic and terrestrial environments.

DISCLOSURE OF INVENTION

[0023] It is therefore an object of the present invention to provide an opening device for a package containing a pourable product, which is designed to meet the above-mentioned need in a straightforward and low-cost manner.

[0024] This object is achieved by an opening device as claimed in claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] Two non-limiting embodiments of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a top portion of a sealed package for containing pourable products, onto which an opening device according to a first embodiment of the present invention is fitted;

Figure 2 is a larger-scale, partially sectioned side view of the opening device and package of Figure 1, with parts removed for clarity;

Figure 3 is a larger-scale sectioned side view, with parts removed for clarity, of a detail of the opening device and package of Figure 2; and

Figure 4 is a perspective view of a top portion of a sealed package for containing pourable products, onto which an opening device according to a second embodiment of the present invention is fitted.

BEST MODE FOR CARRYING OUT THE INVENTION

[0026] With reference to Figure 1, number 1 indicates as a whole a package made of a multilayer sheet of packaging material 2, adapted to contain a pourable product, and having a wall, in particular a top wall 4, onto which an opening device 3, preferably made of plastic material, is fitted.

[0027] In particular, package 1 is adapted to contain a pourable food product, such as milk, water, fruit juice or the like.

[0028] In the example shown, opening device 3 is fitted to an opening area of package 1 by conventional fixing means, such as adhesive substances, e.g. glue, or by means of welding systems, e.g. laser welding or micro-flame welding.

[0029] With reference to Figures 2 and 3, packaging material 2 comprises a base layer 5 for providing stiffness and strength, which may be made of fibrous material, e.g. paper or mineral-filled polypropylene material, and a cover layer arrangement 6.

[0030] In detail, cover layer arrangement 6 comprises a first covering layer 6a and a second covering layer 6b, both made of heat-seal plastic material, e.g. polyethylene film, and covering both sides of base layer 5.

[0031] Packaging material 2 comprises, at top wall 4 of package 1, a pierceable portion 7 which is covered externally, in use, by opening device 3 and which is configured to be detached, at least partially, from top wall 4 in order to allow the pourable product to exit package 1.

[0032] In one embodiment, pierceable portion 7 defines the opening area to which opening device 3 is fitted.

[0033] In another embodiment not shown, opening area may be a through hole made in the packaging material 2, in particular in the portion of packaging material 2 forming top wall 4.

[0034] In the present case, package 1 is an aseptic package for long-storage food products; accordingly, cover layer arrangement 6 also comprises a barrier layer 8 made of gas-barrier material, e.g. aluminum foil or ethyl vinyl alcohol (EVOH) film, which is superimposed on the second covering layer 6b and is in turn covered with a third covering layer 6c of cover layer arrangement 6, made of heat-seal plastic material.

[0035] In particular, third covering layer 6c forms the inner face of package 1 eventually containing the pourable food product.

[0036] In other words, first covering layer 6a, second covering layer 6b, barrier layer 8 and third covering layer 6c define lamination layers applied, by a lamination process, to base layer 5 when producing packaging material 2 in the form of a continuous sheet, before cutting and folding it to form package 1.

[0037] Pierceable portion 7 is defined by a through hole formed only through base layer 5 and covered by first covering layer 6a, second covering layer 6b, barrier layer 8 and third covering layer 6c.

[0038] In practice, pierceable portion 7 is made of the above-mentioned lamination layers and closes the through hole formed in base layer 5.

[0039] Preferably, pierceable portion 7 is an integral part of cover layer arrangement 6.

[0040] According to an alternative embodiment not shown, pierceable portion 7 may be made of only one or more of first covering layer 6a, second covering layer 6b, barrier layer 8 and third covering layer 6c. For example, pierceable portion 7 may be made solely of barrier layer 8.

[0041] In a further alternative embodiment not shown, pierceable portion 7 may be defined by a patch attached

to packaging material 2 to cover a hole formed, in this case, through the full thickness of packaging material 2.

[0042] Pierceable portion 7 has an axis A, preferably orthogonal relative to top wall 4, in particular vertical when package 1 stands on a bottom wall (not shown and substantially parallel to top wall 4).

[0043] According to the non-limiting example shown, pierceable portion 7 has a substantially circular shape concentric to axis A.

[0044] With reference to Figures 1 to 3, opening device 3 comprises:

- a frame 10 defining a passage 11 for the pourable product ending with an opening 11a through which the pourable product is poured, in use, and fitted about pierceable portion 7, onto top wall 4 of package 1; and
- a cap 12 configured to cooperate in contact with frame 10 to close passage 11 and opening 11a.

[0045] In detail, opening 11a is arranged coaxially to axis A and cap 12 is configured to engage frame 10 coaxially to axis A to close passage 11.

[0046] More specifically, frame 10 comprises a base plate 13, preferably flat, configured to be attached to package 1 substantially parallel to top wall 4 and surrounding pierceable portion 7, and a cylindrical collar 14 projecting transversally, in particular orthogonally, from base plate 13, and having a longitudinal axis B coaxial, in use, to axis A. In particular, collar 14 coaxially defines passage 11. Hence, opening 11a is arranged coaxially also to axis B.

[0047] Cap 12 comprises a substantially flat circular portion 15 and a cylindrical portion 16, which projects from flat portion 15 along a longitudinal axis C of cap 12 itself and which is configured to coaxially engage collar 14 in order to close passage 11.

[0048] For this purpose, collar 14 is provided with an outer thread 17 extending onto an external lateral surface 18 of collar 14 itself, and cap 12 is provided with an inner thread 19 extending onto an internal lateral surface 20 of cylindrical portion 16.

[0049] In detail, outer thread 17 and inner thread 19 are configured to mutually engage so as to determine, in use and under the action of the user, unscrewing and screwing of cap 12 relative to frame 10, and therefore collar 14, thereby causing opening and closing of passage 11.

[0050] Opening device 3 further comprises tamper-evidence means, in particular a tamper-evidence ring 21, preferably formed integrally with cap 12, for example injection-molded together with cap 12, and initially connected coaxially to an edge 22 of cap 12 by means of a number of breakable connecting bridges.

[0051] In detail, cap 12 is fitted initially to frame 10 in a closed position, in which cap 12 is screwed completely onto collar 14, with edge 22 and tamper-evidence ring 21 still connected to one another.

[0052] In greater detail, tamper-evidence ring 21 is angularly fixed relatively to axis A and axis B, and, once detached from cap 12, tamper-evidence ring 21 remains angularly fixed relatively to axis A and axis B.

[0053] To this end, collar 14 comprises a number of recesses 23 configured to be engaged by corresponding protrusions 23a of tamper-evidence ring 21.

[0054] In particular, recesses 23 are distributed circumferentially onto collar 14, relatively to axis B, and protrusions 23a are distributed circumferentially onto tamper-evidence ring 21.

[0055] During fitting of cap 12 onto frame 10, tamper-evidence ring 21 is fitted to collar 14 so that protrusions 23a face recesses 23, thereby engaging corresponding recesses 23.

[0056] More precisely, each recess 23 acts as rotational and axial stop for the respective protrusion 23a, thereby preventing the angular motion, i.e. the rotation, of tamper-evidence ring 21 with respect to axis A and axis B.

[0057] According to an alternative embodiment not shown, tamper-evidence ring 21 is rotatably fitted to collar 14 - i.e. it is freely rotatable with respect to collar 14.

[0058] Once unsealed, cap 12 is moveable between:

- an open position, in which cap 12 is unscrewed off collar 14 and detached from frame 10; and a
- the closed position, in which cap 12 is screwed again on collar 14 thereby re-closing passage 11 and opening 11a.

[0059] During first disengagement of cap 12 from collar 14, that is during first movement of cap 12 from its closed position to its open position, the connecting bridges initially connecting tamper-evidence ring 21 and cap 12 are broken.

[0060] More specifically, after the first disengagement of cap 12 from collar 14, each protrusion 23a of tamper-evidence ring 21 remains engaged into one respective recess 23, which, as stated above, acts as a rotational stop for such protrusion 23a.

[0061] Due to the resisting torque transmitted to the connecting bridges, these latter break, thereby freeing cap 12 from tamper-evidence ring 21 and permitting the unscrewing of the latter off collar 14.

[0062] According to this non-limiting embodiment shown, opening device 3 further comprises a known tubular cutting member 24 which engages collar 14 axially and in a movable manner and is activated by cap 12 to interact with pierceable portion 7 to open package 1.

[0063] In detail, cutting member 24 is provided with cutting means (known per se and not described in detail) and is connected to collar 14 by means of a guiding arrangement such as thread elements or cam elements (also known per se and not described in detail) and is configured to move between a raised resting position and a lowered opening position, during first disengagement of cap 12 from collar 14.

[0064] In greater detail, in the raised resting position,

cutting member 24 is entirely housed within collar 14, with the cutting means facing pierceable portion 7; in the lowered position, cutting member 24 projects axially from collar 14 to cut, penetrate and tear off pierceable portion 7 in a known manner, thereby allowing a fluid connection between the inside of package 1 and passage 11 (and also opening 11a).

[0065] Displacement of cutting member 24 is controlled via a one-way angular transmission device 25 carried by cap 12, in particular fitted to flat portion 15, in a manner known and not described in detail.

[0066] In an alternative embodiment not shown, opening device 3 comprises a pull-off tongue coupled to pierceable portion 7 and configured to be pulled by the user, once cap 12 has been unscrewed from collar 14, in order to manually tear off pierceable portion 7.

[0067] According to an important aspect of the present invention, opening device 3 comprises a connection member 26 binding cap 12 to frame 10.

[0068] Connection member 26 is so configured as to allow cap 12 to be unscrewed from collar 14 and to prevent cap 12 from being detached (and in particular disposed of separately) from frame 10, i.e. from package 1.

[0069] In detail, connection member 26 is angularly fixed relatively to axis A, in particular to axis A and to axis B.

[0070] In greater detail, connection member 26 comprises a loop portion 27 and a connecting portion 28 which, according to this preferred embodiment, is fitted to base plate 13 and, therefore, connects loop portion 27 to base plate 13.

[0071] More precisely, connecting portion 28 comprises a first stretch 28a protruding from base plate 13, preferably along a direction substantially parallel to axis B, and a second stretch 28b extending from first stretch 28a and connecting first stretch 28a to loop portion 27. In particular, first stretch 28a projects from a peripheral portion of base plate 13.

[0072] More precisely, connecting portion 28 is formed integrally with frame 10, preferably with base plate 13.

[0073] Hence, connecting portion 28 is angularly fixed relatively to axis A and axis B at first stretch 28a and carries loop portion 27 at second stretch 28b.

[0074] Preferably, the whole connection member 26 is formed integrally with frame 10, for example by injection-molding.

[0075] In view of the above, connection member 26 and, therefore, loop portion 27 are angularly fixed relatively to axis B and, therefore, to axis A.

[0076] According to the invention, cap 12 is movably fitted to connection member 26, in particular to loop portion 27.

[0077] In detail, cap 12 comprises a pin element 32 coupled to loop portion 27, in particular engaging loop portion 27.

[0078] In greater detail, as visible in Figures 1 and 2, pin element 32 projects from flat portion 15 coaxially to axis C and engages loop portion 27 rotatably about axis C.

[0079] More precisely, pin element 32 projects from an axial side of flat portion 15 which is axially opposite with respect to the other axial side of flat portion 15 from which cylindrical portion 16 projects from.

[0080] As visible in Figure 2, pin element 32 comprises:

- a main body 32a connected to flat portion 15, preferably integrally protruding from flat portion 15 coaxially to axis C; and
- a pin head 32b coaxially projecting from main body 32a and having a radial extension greater than the radial extension of main body 32a.

[0081] More precisely, pin head 32b defines an axial stop for loop portion 27. Furthermore, flat portion 15 defines a further axial stop for loop portion 27, axially opposite to pin head 32b, relatively to axis C.

[0082] In this way, the movement of cap 12 relative to connection member 26, and in particular to loop portion 27, is substantially limited to its rotation about axis C.

[0083] However, it is specified that cap 12 could also perform a slight axial movement along axis C, depending on the length of main body 32a of pin element 32.

[0084] Preferably, main body 32a has a substantially cylindrical shape and loop portion 27 has a substantially circular configuration and engages main body 32a coaxially to axis C.

[0085] In view of the above, cap 12 is rotatably carried by connection member 26 by means of the rotatable coupling between pin element 32 and loop portion 27.

[0086] Therefore, pin element 32 is configured to rotate relatively to loop portion 27 during the screwing and unscrewing of cap 12 on/off collar 14, coaxially to axis A, axis B and axis C.

[0087] Conversely, connection member 26 is integrally coupled to frame 10 in a fixed and non-rotatable way about axis A and axis B.

[0088] Thanks to this configuration, during pouring of pourable product outside of package 1, a movement of cap 12 in front of the pouring trajectory of the pourable product exiting from package 1 is prevented, thereby avoiding undesired interferences between cap 12 and/or connection member 26 and the pourable product exiting from package 1.

[0089] In view of the above, connection member 26 defines a region of maximum distance of cap 12 from frame 10, within which cap 12 can be moved away from and towards frame 10, without interfering with the pourable product exiting, in use, from package 1.

[0090] The operation of opening device 3 is described hereinafter with reference to Figure 1 and 2 and starting from a condition in which cap 12 is still screwed on frame 10.

[0091] Starting from this condition, to open package 1, the user unscrews cap 12, thereby causing the connecting bridges of tamper-evidence ring 21 to break and causing the activation of cutting member 24, which determines

the tearing of pierceable portion 7.

[0092] The action of unscrewing displaces cap 12 from its closed position to its open position.

[0093] During the displacement of cap 12 from the closed position to the open position, cap 12 is tethered to frame 10 by means of connection member 26, as described above.

[0094] Once the desired amount of pourable product has been poured through passage 11, the user can close passage 11 by screwing again cap 12 on collar 14.

[0095] With reference to Figure 4, number 3' indicates as a whole an opening device fitted to package 1 and made according to a second preferred embodiment of the present invention.

[0096] Since opening device 3' is similar to opening device 3, the following description is limited to the differences between them, and using the same references, where possible, for identical or corresponding parts and components.

[0097] In particular, opening device 3' differs from opening device 3 by comprising a connection member 26' having a connecting portion 28' fitted to tamper-evidence ring 21.

[0098] More precisely, connecting portion 28' is formed integrally with tamper-evidence ring 21.

[0099] In detail, connecting portion 28' is integrally coupled, at its first stretch 28a', with tamper-evidence ring 21 and, at its second stretch 28b', with loop portion 27' (which is identical to loop portion 27 of connection member 26).

[0100] Preferably, connection member 26', tamper-evidence ring 21 and cap 12 are formed integrally with one another, for example by injection-molding.

[0101] The advantages of opening device 3, 3' according to the present invention will be clear from the foregoing description.

[0102] In particular, thanks to the presence of connection member 26, 26', cap 12 is firmly tethered to frame 10 and the risk of dispersing cap 12 in the environment after use of package 1 is consistently reduced, thereby preventing plastic pollution of the environment deriving from packages 1 of the above-mentioned type.

[0103] In addition, since connection member 26, 26' is coupled to cap 12 in a rotatable manner, i.e. in a loose way, by means of the rotatable coupling between pin element 32 and loop portion 27, 27', it does not affect the normal operation and use of opening device 3, 3', maintaining at least the same versatility of the opening devices known in the art and not provided with connection member 26, 26', and at the same time being more environment-friendly.

[0104] Moreover, as pin element 32 is arranged on flat portion 15, there is no need for design modifications and adaptations of cap 12.

[0105] In addition, in the case of opening device 3', as connection portion 28' of connection member 26' is formed integrally with tamper-evidence ring 21, there is no need for design modifications and adaptations of frame 10.

[0106] Clearly, changes may be made to opening device 3, 3' as described herein without, however, departing from the scope of protection as defined in the accompanying claims.

[0107] In particular, frame 10 of opening device 3 could be directly molded, for example by injection molding, at the opening area of package 1. In this case, a predetermined amount of molten plastic material is injected onto, and through, the pierceable portion 7 by means of a known molding device. During molding, the plastic material is forced to pierce the pierceable portion 7 from a first side thereof, due to the injection pressure and the geometry of the molding device used to form the opening device 3, so as to pass through the pierceable portion 7, and protrude from a second side of the pierceable portion 7, opposite to the first side. The lamination layers forming the pierceable portion 7 and closing the hole of the base layer 5 are first pierced through and then resealed by the plastic material forming frame 10.

[0108] In such a case, the finished package 1 is defined by the assembly comprising the filled, folded and sealed package 1 and the frame 10 which has been injection molded on the top wall 4 of package 1, in particular at the opening area thereof. In other words, frame 10 can be regarded as part of both package 1 and opening device 3. Therefore, in this case, connection member 26, 26' is fitted to cap 12 and to package 1, that is, it secures cap 12 to package 1, as frame 10 is part of package 1.

Claims

1. An opening device (3, 3') configured to be applied to a package (1) containing a pourable product; said opening device (3, 3') comprising a cap (12) configured to close a passage (11) for said pourable product obtainable at an opening area of said package (1) ;
   characterized by comprising a connection member (26, 26') configured to bind said cap (12) to said package (1).

2. The opening device as claimed in claim 1-, wherein said cap (12) is movably fitted to said connection member (26, 26').

3. The opening device as claimed in claim 1 or 2, wherein said passage (11) has a first longitudinal axis (A) and said connection member (26, 26') comprises a loop portion (27, 27') and a connecting portion (28, 28');
   said cap (12) comprising a pin element (32) engaging said loop portion (27, 27').

4. The opening device as claimed in claim 3, wherein said cap (12) comprises a top wall (15) and a lateral wall (16), said lateral wall (16) projecting from said

top wall (15);
said pin element (32) being arranged onto said top wall (15).

5. The opening device as claimed in claim 4, wherein said cap (12) has a second longitudinal axis (C) ;
said lateral wall (16) defining a substantially cylindrical portion (16) projecting from said top wall (15) along said second longitudinal axis (C);
said pin element (32) projecting from said top wall (15) coaxially to said second longitudinal axis (C) and engaging said loop portion (27, 27') rotatably about said second longitudinal axis (C).

6. The opening device as claimed in claim 5, wherein said pin element (32) and said cylindrical portion (16) project from opposite axial sides of said top wall (15) .

7. The opening device as claimed in any one of claims 4 to 6, wherein said pin element (32) comprises a main body (32a) connected to said top wall (15) and a pin head (32b) axially projecting from said main body (32a) and having a radial extension greater than the radial extension of said main body (32a), relatively to said second longitudinal axis (C);
said pin head (32b) and said top wall (15) defining opposite axial stops for said loop portion (27, 27').

8. The opening device as claimed in any one of the foregoing claims, wherein said connection member (26, 26') is configured to be angularly fixed relatively to said first longitudinal axis (A).

9. The opening device as claimed in any one of the foregoing claims, and further comprising a frame (10) defining said passage (11) and being fittable about said opening area of said package (1); said cap (12) being configured to cooperate in contact with said frame (10) to close said passage (11);
said connection member (26, 26') binding said cap (12) to said frame (10).

10. The opening device (3) as claimed in claim 9, wherein said connecting portion (28) is fitted to said frame (10).

11. The opening device (3) as claimed in claim 10, wherein said connection member (26) is formed integrally with said frame (10).

12. The opening device (3') as claimed in any one of the foregoing claims, and further comprising tamper-evidence means (21) initially connected to said cap (12) by means of a number of breakable connecting bridges;
said connecting portion (28') being fitted to said tamper-evidence means (21).

13. The opening device as claimed in claim 12, wherein said tamper-evidence means (21) are angularly fixed relatively to said first longitudinal axis (A).

14. The opening device (3') as claimed in claim 12 or 13, wherein said connection member (26') is formed integrally with said tamper-evidence means (21).

15. The opening device as claimed in any one of the foregoing claims, wherein said opening area defines an opening portion (7) of said package (1);
said opening device (3) comprising a cutting member (24) configured to engage said passage (11) in a movable manner, and configured to cooperate in contact with said opening portion (7) to open said package (1).

16. A package (1) containing a pourable product and obtained from a sheet of packaging material (2) having an opening portion (7);
said package (1) comprising an opening device (3, 3') as claimed in any one of the foregoing claims and fitted about said opening portion (7).

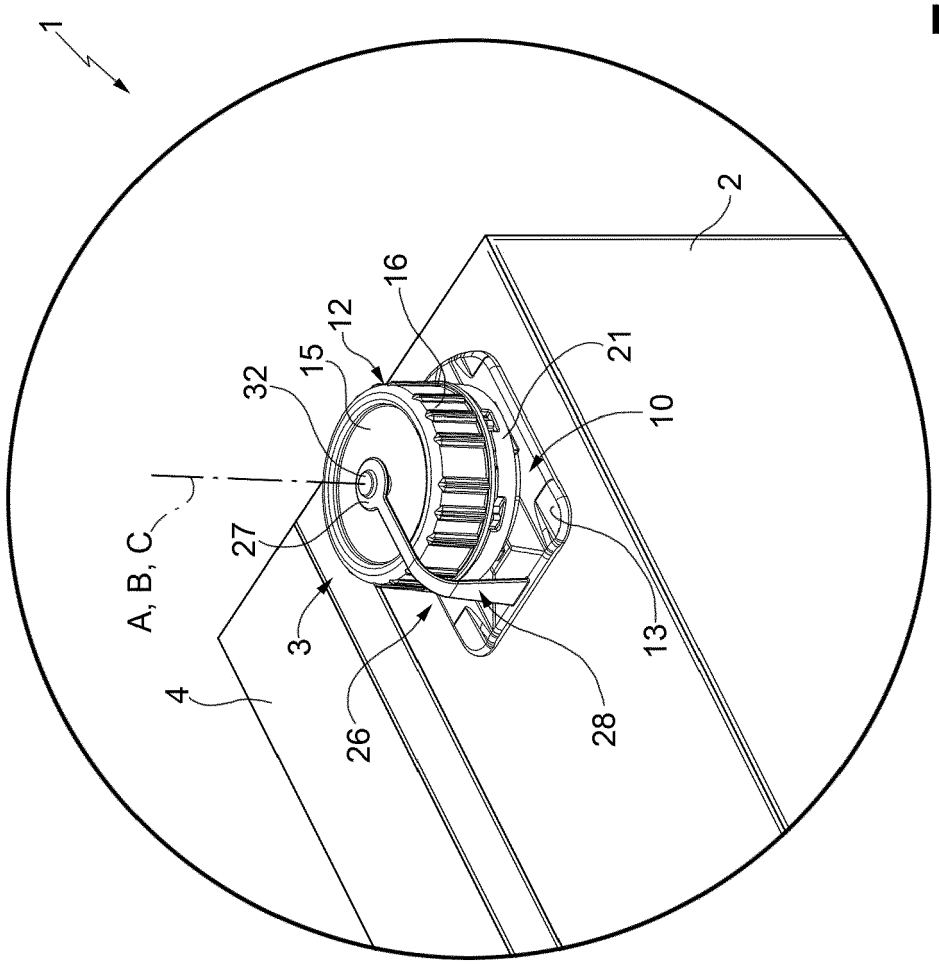

FIG. 1

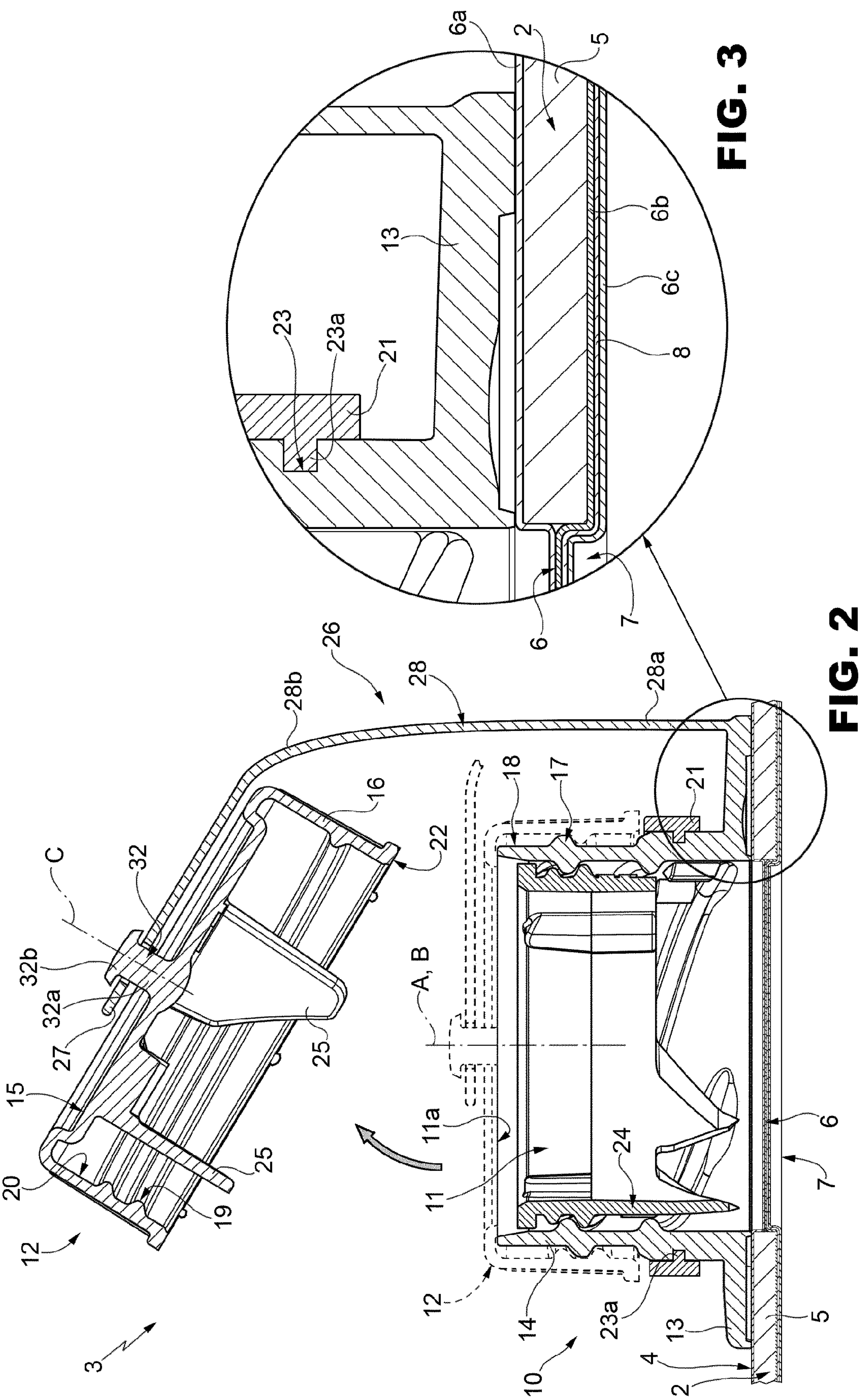
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FIG. 3

FIG. 2

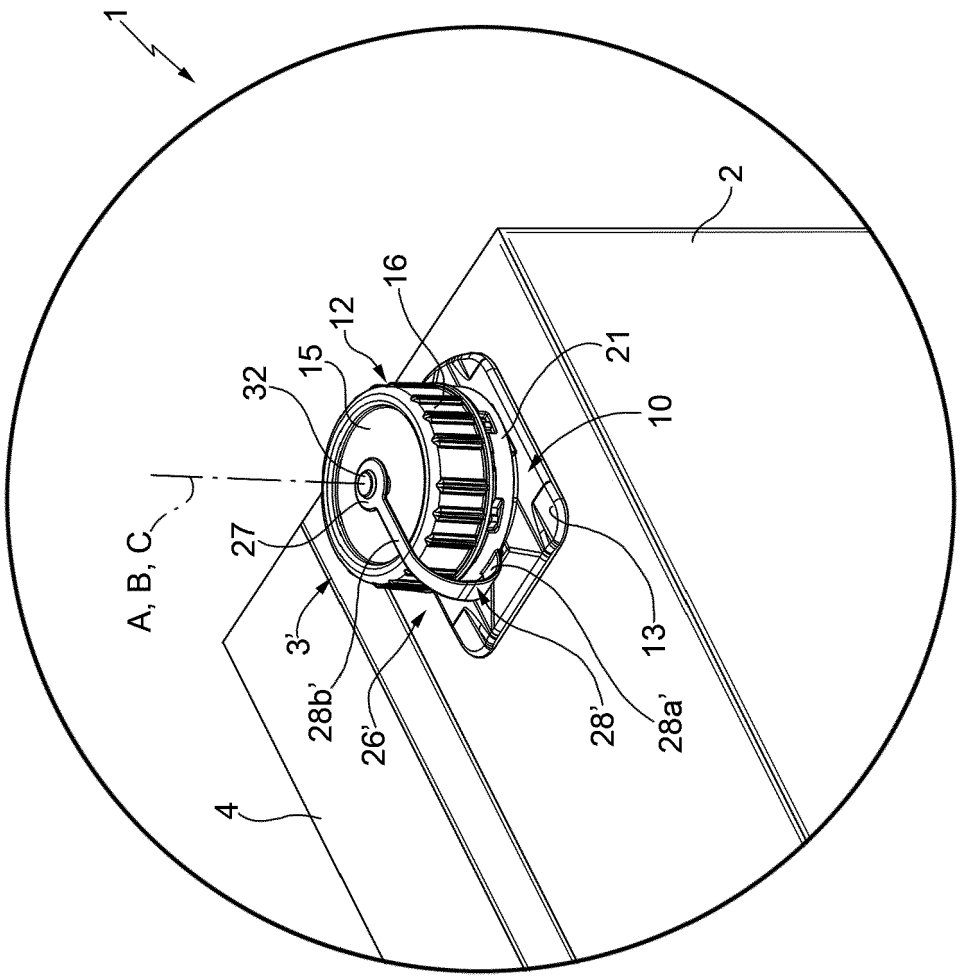

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 19 16 5230

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Place of search	Date of completion of the search	Examiner
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