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(54) Opening device for package for pourable food products, and package including the same

(57) It is described a reclosable opening device (8) for a pourable food product package (1) made from a sheet packaging material. The opening device (8) comprises a frame (10) including in turn a peripheral base flange (17) designed to be fitted to the packaging material at a hole (12) thereof and a neck (21) extending from the base flange (17) and defining a pouring opening (11); and a lid (13) connected to the frame (10) by a hinge (14) and having a closing portion (27) for engaging the neck (21) and closing the pouring opening (11), and a pull tab (28) protruding outwards with respect to the neck (21), located at a pouring side, opposite the hinge (14), of the opening device (8) and defining an handle to be pulled to raise the lid (13) in an open position. The opening device (8) further comprises supporting means (38) for rigidly connecting the pull tab (28) to the base flange (17) in response to an external load pushing the pull tab (28) towards the base flange (17) itself.

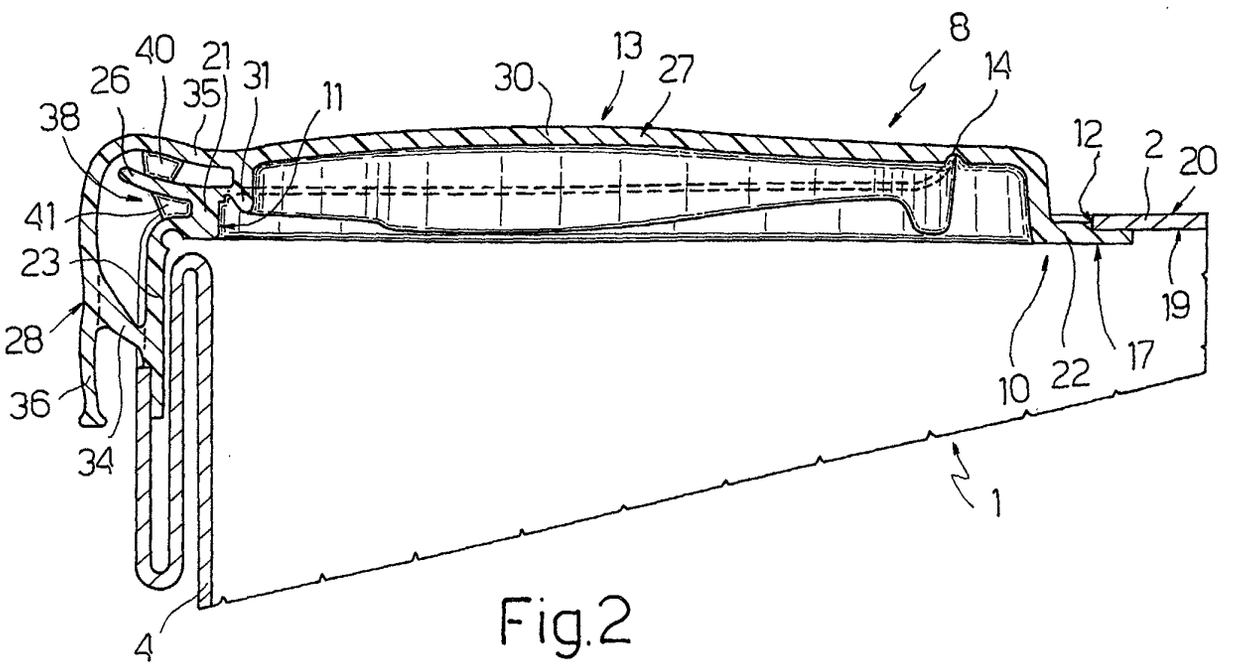

Fig.2

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Description

[0001] The present invention relates to an opening device for a package for pourable food products, as well as to a food product package including such an opening device.

[0002] Many pourable food products, such as fruit juice, UHT milk, wine, tomato sauce, etc., are sold in packages made of laminated packaging material.

[0003] A typical example of such a package is the parallelepiped-shaped package for liquid or pourable food products known as Tetra Brik or Tetra Brik Aseptic (registered trademarks), which is formed by folding and sealing laminated web packaging material. The packaging material has a multilayer structure comprising a layer of fibrous material, e.g. paper, covered on both sides with layers of heat-seal plastic material, e.g. polyethylene. In the case of aseptic packages for long-storage products, such as UHT milk, the packaging material also comprises a layer of oxygen-barrier material defined, for example, by an aluminium 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 eventually defining the inner face of the package contacting the food product.

[0004] As is known, such packages are made on fully automatic packaging units, on which a continuous tube is formed from the web-fed packaging material; the web of packaging material is sterilized on the packaging unit itself, e.g. by applying a chemical sterilizing agent, such as a hydrogen peroxide solution, which, after sterilization, is removed, e.g. vaporized by heating, from the surfaces of the packaging material; and the web of packaging material so sterilized is maintained in a closed sterile environment, and is folded and sealed longitudinally to form a vertical tube.

[0005] The tube is filled continuously from the top with the sterilized or sterile-processed food product, and is sealed and cut at equally spaced cross sections to form pillow packs, which are then folded mechanically to form the finished, e.g. substantially parallelepiped-shaped, packages.

[0006] 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 a package is the so-called "gable-top" package commonly known by the trade name Tetra Rex (registered trademark).

[0007] The above packages are normally provided with reclosable opening devices to permit consumption of, and prevent external agents from coming into contact with, the food product in the package.

[0008] Reclosable opening devices for packages of the above types are known, which include a frame defining a pouring opening and designed to be fitted to a hole or a punch-through or pull-off portion in a wall of the package, and a lid connected to said frame by a hinge.

[0009] More specifically, the frame comprises a peripheral or annular base flange designed to be fitted to the package, and a raised neck extending from the base flange and delimiting the above mentioned pouring opening.

[0010] The lid comprises a closing portion for engaging the neck of the frame and closing the pouring opening, and a pull tab projecting outwards from the closing portion at a pouring side, opposite the hinge, of the opening device, and defining an handle to be pulled to raise the lid in an open position.

[0011] In particular, the closing portion of the lid includes a flat wall, which is hinged to the frame and is adapted to close the pouring opening, and a raised peripheral engagement lip projecting from the flat wall for engagement with the neck of the frame.

[0012] The lid is moulded integrally with the frame and is originally sealed to a top internal edge of the neck of the frame surrounding the pouring opening by a thin breakable rib, which extends along a peripheral line around the engagement lip of the lid, and which is broken when the lid itself is unsealed. The breakable rib has a lower strength than that of the other parts of the opening device so as it can be easy broken during the opening of the lid.

[0013] During transportation and storing, the above described packages are generally stacked on top of each other and, therefore, the opening devices, normally positioned on upper portions of the packages themselves, are subjected to compression loads by the above packages.

[0014] Such compression loads produce the effect of pushing downwards the lid of a relative package and bending the pull tab towards the base flange of the respective frame. Since the frame of the opening device is secured to a wall of the package, the above mentioned compression loads may determine a slight displacement of the lid with respect to the frame, with a possible consequent unwanted breaking of the breakable rib, particularly at the pouring side, where normally the pouring opening and the engagement lip of the lid have a tapered shape, e.g. a cusp or V shape.

[0015] It is an object of the present invention to provide an opening device for a package for pourable food products, designed to provide a straightforward solution to the aforementioned drawback typically associated with known opening devices.

[0016] According to the present invention, there is provided a reclosable opening device for a pourable food product package made from a sheet packaging material, said opening device comprising:

- a frame including a peripheral base flange designed to be fitted to said packaging material at a hole or removable portion thereof and a neck extending from said base flange and defining a pouring opening; and

- a lid connected to said frame by a hinge and having a closing portion for engaging said neck and closing said pouring opening, and a pull tab protruding outwards with respect to said neck, located at a pouring side, opposite said hinge, of said opening device and defining an handle to be pulled to raise said lid in an open position;

characterized by comprising supporting means for rigidly connecting said pull tab to said base flange in response to an external load pushing said pull tab towards the base flange itself.

[0017] A preferred 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 perspective view of an upper portion of a package for pourable food products including an opening device according to the present invention; and

figure 2 is a larger-scale cross section of the figure 1 package and opening device; and

figure 3 is an enlarged view of a detail of figure 2.

[0018] Numeral 1 in figures 1 and 2 indicates as a whole a sealed package for pourable food products, e. g. a parallelepiped-shaped package known as Tetra Brik Aseptic (registered trademark), of which an upper portion only is shown.

[0019] Package 1 comprises a top wall 2, a base wall (not shown) opposite top wall 2, a front wall 3, a back wall (not shown), and a pair of side walls 4 (only one of them is shown in figure 1).

[0020] Package 1 is made from a packaging material having a multilayer structure (not shown) and comprising a layer of fibrous material, normally paper, covered on both sides with respective layers of heat-seal plastic material, e.g. polyethylene. The side of the packaging material eventually contacting the food product in package 1 may also have a layer of oxygen-barrier material, e.g. aluminium, in turn covered with one or more layers of heat-seal plastic material.

[0021] Preferably, package 1 is made from a continuous tube (not shown) of packaging material, which is obtained by bending and longitudinally sealing a packaging material web along lateral edges thereof. More precisely, an edge portion of the packaging material web is superimposed and sealed onto the opposite edge portion so as to obtain a longitudinal seal (not shown) which has an intermediate portion extending along a vertical centreline of the back wall (non shown) of the finished package 1 and opposite end portions extending along the base wall and top wall 2 of the package itself.

[0022] The tube is then transversally sealed at regular intervals to form transversal seals 5 which are orthogonal to longitudinal seal and extend along the base wall and top wall 2 of the finished package 1. Afterwards, the tube is cut along transversal seals 5 to form so-called pillow packs, which are intermediate products adapted to be transformed into finished packages 1 by means of a plurality of final folding step.

[0023] Package 1 is provided with a reclosable opening device 8 made of plastic material.

[0024] Opening device 8 comprises a frame 10 defining a pouring opening 11, through which to pour out the food product contained in package 1, and preferably fitted to the upper portion of package 1 at a hole 12 thereof, and a lid 13 connected to frame 10 by a hinge 14 defining an axis A parallel to top wall 2.

[0025] Alternatively, frame 10 may be fitted also to a removable portion of package 1, such as a punch-through or pull-off portion (not shown).

[0026] Conveniently, hole 12 is punched through the packaging material web and opening device 8 is fitted to the packaging material before the web enters forming, filling and sealing sections of a filling machine (not shown), wherein the web itself is bent and longitudinally sealed to obtain the above mentioned vertical tube to be filled with the pourable food product.

[0027] In the embodiment shown, hole 12 and frame 10 of opening device 8 extend across an edge 16 of package 1 parallel to axis A, e.g. an horizontal edge of package 1 dividing top wall 2 from an adjacent side wall 4.

[0028] Lid 13 is moulded integrally with frame 10.

[0029] In particular, opening device 8 is preferably formed by injecting plastic material through hole 12 and between two mould elements (not shown) cooperating with each other on opposite sides of the packaging material web, so that frame 10 embeds a peripheral edge of hole 12 thereby preventing opening device 8 to be removed from hole 12. More specifically, frame 10 forms a substantially flat, peripheral or annular base flange 17, which rests on a first face 19 of the packaging material adapted to define an internal surface of package 1, and a plurality of coplanar fins 18 extending on a plan parallel to base flange 17 and resting on a second face 20 of the packaging material opposite first face 19.

[0030] Alternatively, frame 10 of opening device 8 may be attached to the packaging material by means of gluing or welding through heating elements or ultrasonic sealing elements.

[0031] Frame 10, pouring opening 11 and lid 13 have respective shapes elongated in the direction of transversal seal 5 of top wall 2.

[0032] Frame 10 further includes a raised neck 21 extending from base flange 17 and delimiting pouring opening 11.

[0033] Base flange 17 of frame 10 is bent over edge 16 so as a substantially rectangular-shaped main portion 22 of base flange 17 extends along top wall 2, and a tapered end portion 23, opposite hinge 14, of the base flange itself extends along side wall 4; tapered end portion 23 is substantially V-shaped and presents a rounded vertex.

[0034] To facilitate the bending of frame 10 over edge

16, base flange 17 has a notch (not visible) extending along a bottom surface of the base flange itself.

[0035] Neck 21 forms a flat top flange or lip 25 having a substantially rectangular external profile and protruding outwards with respect to the neck itself. In particular, top flange 25 defines, at a pouring side, opposite to hinge 14, of opening device 8, a pouring spout 26 extending from neck 21 over edge 16 of package 1 and facing main portion 22 of base flange 17.

[0036] Lid 13 comprises a closing portion 27 for engagement with neck 21 of frame 10 and closing pouring opening 11, and a pull tab 28 projecting outwards from closing portion 27 at the pouring side of opening device 8, and defining an handle to be pulled by the consumer so as to raise lid 13 in an open position (figure 1).

[0037] In particular, closing portion 27 of lid 13 includes a flat wall 30, which is connected to frame 10 by hinge 14 and is adapted to close pouring opening 11, and a raised substantially U-shaped sealing lip 31 extending from the ends of hinge 14 and projecting from wall 30 for engagement with neck 21.

[0038] Lid 13 is originally sealed to an internal edge 32 of top flange 25 of frame 10 surrounding pouring opening 11 by a thin breakable rib 33 extending along a peripheral line around lip 31, and which is broken when lid 13 is unsealed.

[0039] Internal edge 32 of top flange 25 of frame 10 and lip 31 of lid 13 are conveniently so shaped as to define, at the pouring side of opening device 8, a cusp shaped pouring beak.

[0040] Once unsealed, lid 13 is movable between the raised open position (figure 1) and a closed position (figures 2 and 3), in which lip 31 of lid 13 is retained in fluidtight manner inside neck 21 of frame 10 by rib 33 snapping beyond edge 32.

[0041] Tab 28 is bent towards side wall 4 and is integrally connected to end portion 23 of base flange 17 by a breakable strip 34 defining a tamper evidence. When tab 28 of lid 13 is pulled upwards, the strip 34 is broken so as to permit the opening of package 1.

[0042] In particular, tab 28 is substantially inverted L-shaped and comprises a root portion 35 constituting a prolongation of wall 30 of lid 13 and facing pouring spout 26 of top flange 25, and a free end portion 36 which is bent at about 90° degrees with respect to root portion 35, faces end portion 23 of base flange 17 of frame 10 and is connected to end portion 23 by strip 34.

[0043] According to the present invention (figures 2 and 3), opening device 8 further comprises supporting means 38 for rigidly connecting pull tab 28 to base flange 17 in response to an external load pushing pull tab 28 towards the base flange itself.

[0044] In particular, supporting means 38 are located in proximity of a bending zone, between main portion 22 and end portion 23, of base flange 17 and rests on edge 16 of package 1 in response to an external load acting on pull tab 28.

[0045] Supporting means 38 includes a first rib or tooth 40, interposed between pull tab 28 and pouring spout 26, and a second rib or tooth 41 interposed between base flange 17 and pouring spout 26.

[0046] Rib 40 extends integrally from root portion 35 of pull tab 28 and is designed to contact pouring spout 26 in response to an external load pushing pull tab 28 towards base flange 17. Rib 40 is placed at a distance from closing portion 27.

[0047] Rib 41 is laterally adjacent to neck 21, extends from base flange 17 to pouring spout 26 and has a cross section increasing towards the pouring spout itself.

[0048] When an external load is applied on lid 13, producing the flexion of pull tab 28 towards base flange 17, rib 40 gets in contact with pouring spout 26, which, supported by rib 41, holds the load instead of breakable rib 33, so preventing an unwanted break of the rib itself.

[0049] This result is obtained without any modification of the configuration and thickness of breakable rib 33, and therefore without affecting the openability of opening device 8.

[0050] Furthermore, supporting means 38 are particularly effective since they act on an edge (16) of package 1, which obviously has a bigger stiffness than that of non-edge portions of the package itself.

[0051] Finally, the connection of pull tab 28 to end portion 23 of base flange 17 through strip 34 permits a correct positioning of rib 40; strip 34 also defines with pull tab 28 a sort of "shell" extending around and protecting ribs 40, 41.

[0052] Clearly, changes may be made to package 1 and opening device 8 as described and illustrated herein without, however, departing from the scope of the accompanying claims.

Claims

1. A reclosable opening device (8) for a pourable food product package (1) made from a sheet packaging material, said opening device (8) comprising:

   - a frame (10) including a peripheral base flange (17) designed to be fitted to said packaging material at a hole (12) or removable portion thereof and a neck (21) extending from said base flange (17) and defining a pouring opening (11); and
   - a lid (13) connected to said frame (10) by a hinge (14) and having a closing portion (27) for engaging said neck (21) and closing said pouring opening (11), and a pull tab (28) protruding outwards with respect to said neck (21), located at a pouring side, opposite said hinge (14), of said opening device (8) and defining an handle to be pulled to raise said lid (13) in an open position;

   characterized by comprising supporting

means (38) for rigidly connecting said pull tab (28) to said base flange (17) in response to an external load pushing said pull tab (28) towards the base flange (17) itself.

2. A device as claimed in claim 1, **characterized in that** said neck (21) defines a pouring spout (26) protruding outwards from the neck (21) itself at the pouring side and facing said base flange (17) and at least a root portion (35) of said pull tab (28) adjacent to said closing portion (27), and **in that** said supporting means (38) includes a first rib (40), interposed between said pull tab (28) and said pouring spout (26), and a second rib (41) interposed between said base flange (17) and said pouring spout (26).

3. A device as claimed in claim 2, **characterized in that** said first rib (40) extends integrally from said pull tab (28) for contacting said pouring spout (26) in response to an external load pushing said pull tab (26) towards said base flange (17).

4. A device as claimed in claim 2 or 3, **characterized in that** said first rib (40) is placed at a distance from said closing portion (27).

5. A device as claimed in any one of claims 2 to 4, **characterized in that** said second rib (41) is laterally adjacent to said neck (21) and extends from said base flange (17) to said pouring spout (26).

6. A device as claimed in claim 5, **characterized in that** said second rib (41) has a cross section increasing towards said pouring spout (26).

7. A device as claimed in any one of the foregoing claims, **characterized in that** a free end portion (36) of said pull tab (28) is originally connected to said base flange (17) of said frame (10) by a breakable strip (34) defining a tamper evidence.

8. A device as claimed in any one of the foregoing claims, **characterized in that** said base flange (17) has a first portion (22) carrying said neck (21), and a second portion (23) which is bent with respect to said first portion (22) so as to fit said base flange (17) to an edge (16) of said package (1), said supporting means (38) being located in proximity of a bending zone between said first and second portion (22, 23) of said base flange (17).

9. A device as claimed in claim 8, **characterized in that** said free end portion (36) of said pull tab (28) is bent towards said second portion (23) of said base flange (17) and is connected thereto.

10. A package (1) for pourable food products made from a sheet packaging material and provided with a reclosable opening device (8) as claimed in any one of the foregoing claims.

11. A package as claimed in claim 10, **characterized in that** said frame (10) extends across an edge (16) of the package (1) and is bent over the edge (16) itself, and **in that** said supporting means (38) rests on said edge (16) in response to an external load acting on said pull tab (28).

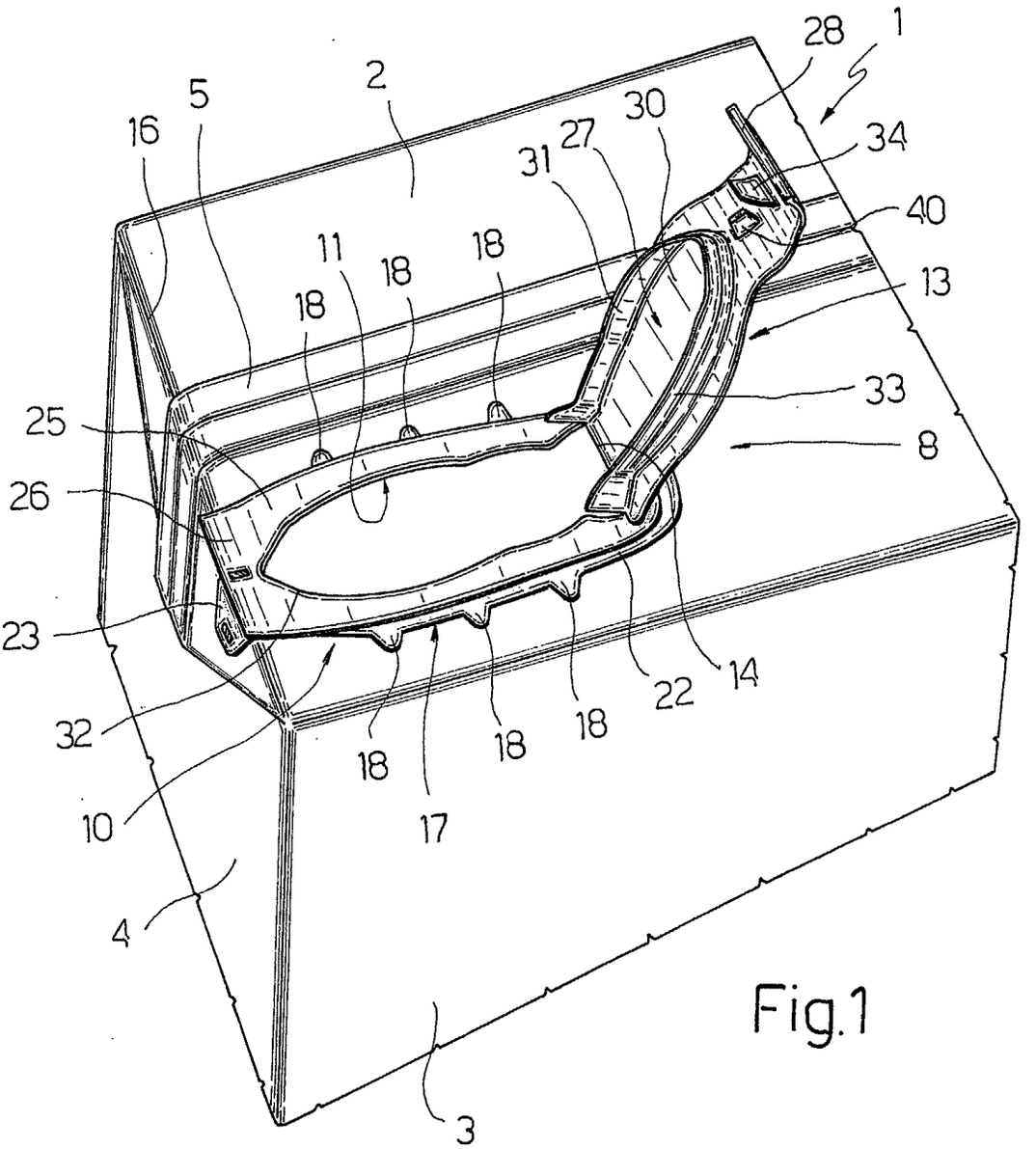
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Fig.1

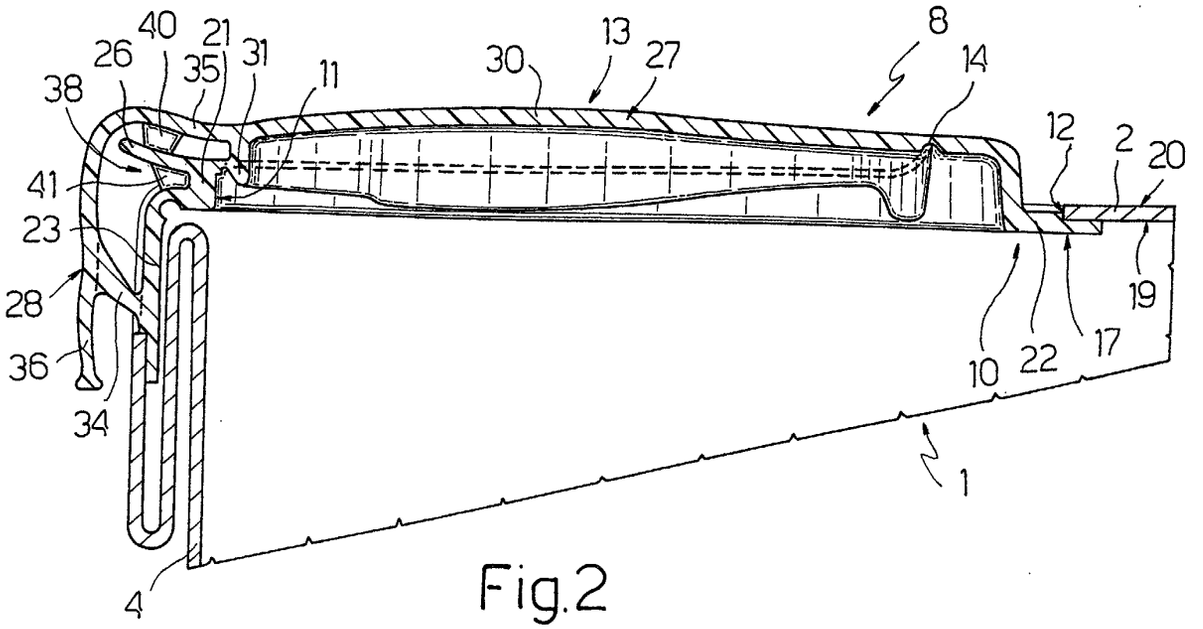
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Fig.2

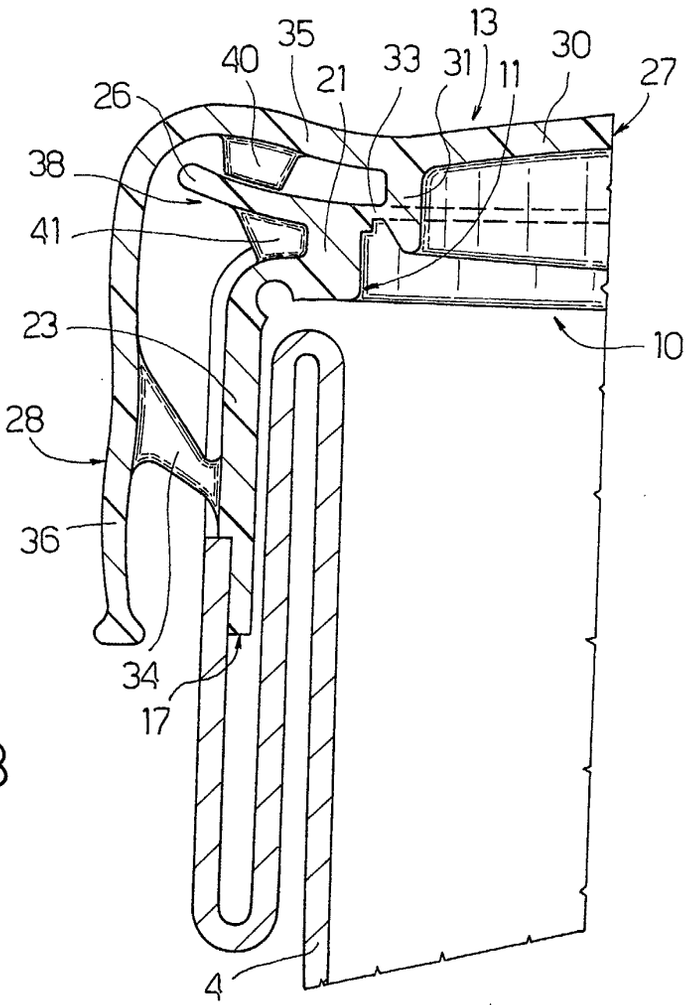
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Fig.3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 11 8302

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A	* figure 4 *	2	
E	DE 100 17 467 A (AHRENS HANS JOACHIM ;AHRENS ELVIRA (DE)) 13 September 2001 (2001-09-13) * column 3, line 32 - line 36; figure 13 *	1,10	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 November 2001	Martínez Navarro, A.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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