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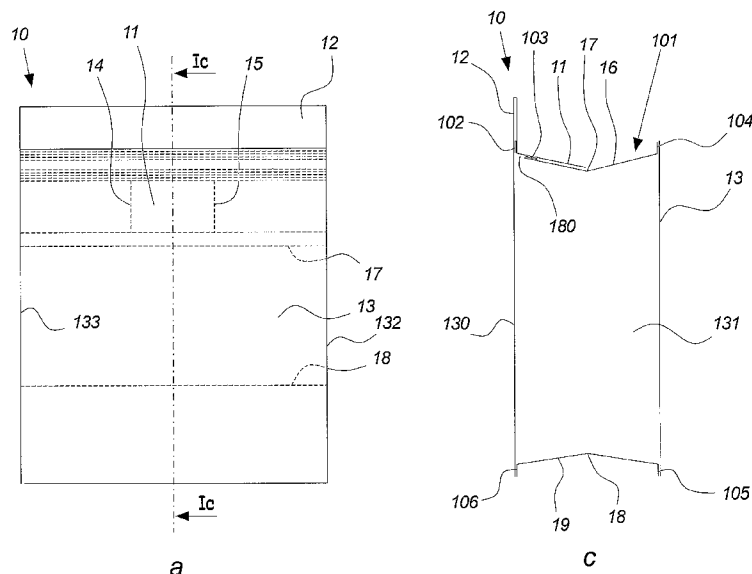
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(54) Title: DISPOSABLE BEVERAGE CAN



(57) Abstract: The invention relates to a disposable beverage can (10) formed at least partly by a flexible film material (13, 130, 16, 19) wherein said can (10) comprises a top surface (16) and wherein said can comprises a discharge arrangement (101) comprising a pull -tab opener (11) formed in said top surface. According to the invention a drinking can may advantageously be formed by film material. The can may advantageously be suitable for use in the same way as conventional cans made of a solid wall and at the same time be manufactured in a very cost-efficient way. Moreover, the can may be disposed in a very environmental -friendly way.

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DISPOSABLE BEVERAGE CAN

Field of the invention

The invention relates to a disposable beverage can according to claim 1.

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Background of the invention

Different attempts in the prior art have been made to apply film-based packages in connection with e.g. distribution of soft drinks.

- 10 US patent 5,833,368 discloses a beverage container which is made by film material. The container comprises a discharge system which involves a pull tab system covering a straw input area.

- 15 International patent application W0 01185560 discloses a further container which is a stand-up bag of heat-sealable plastic film. The container is applied for containing flowable products.

- 20 The above documents suffer from the disadvantage that the discharge systems are either not suitable for drinking per se, i.e. requires further discharge elements such as a straw, or that drinking directly from the beverage is inconvenient compared to conventional discharge arrangements such as bottles, cans or glasses in the sense that the container itself comprises integrated discharge arrangements such as a pipe-like output from which a user may drink directly.

- 25 It is one of several objects of the invention to provide a disposable beverage suitable for keeping and discharging of e.g. soft drinks.

Summary of the invention

- 30 The invention relates to a disposable beverage can formed at least partly by a flexible film material wherein

said can comprises a top surface and wherein said can comprises a discharge arrangement comprising a pull-tab opener formed in said top surface.

5 According to the invention a drinking can may advantageously be formed by film material. The can may advantageously be suitable for use in the same way as conventional cans made of solid walls and at the same time be manufactured in a very cost-efficient way. Moreover, the can may be disposed in a very environmentally friendly way.

10

Moreover, the can according to the invention may be easily collapsed and handled after use during disposal.

15 According to the invention, the can should facilitate transportation, storage of soft drinks and facilitate drinking by means of a discharge arrangement of the can. Preferable, the drinking should be facilitated directly without a requirement for additional accessories such as straws and mouthpieces.

20 Moreover, the invention addresses basic application of cans from a user perspective, as conventional advantages and comfort are obtained by the flexible can together with further advantages such as comfortable and easy collapsing of the can after use which may easily be obtained just by squeezing the can by means of the hands instead of relying on compression tools.

25 Moreover, the flexible can provides further significant advantages with respect to the possibility of incorporating e.g. filter or further internal barriers within the can in a cost-effective way as many such measures may be obtained by altering the sealing pattern or procedure and/or simply applying a relatively cheap further film.

Moreover, the flexible can according to the invention offers several various wall materials which may be adapted to the specific application, i.e. with or without UV barrier, with or without heat insulating properties, with or without transparency, etc.

- 5 In an embodiment of the invention, said can structure comprises a container volume defined by a top end, a bottom surface and a container wall and wherein said container wall is formed by flexible film material.

- 10 In an embodiment of the invention, said can structure comprises a container volume defined by a top end, a bottom surface and a container wall and wherein said top end is formed by flexible film material.

- 15 In an embodiment of the invention, said can structure comprises a container volume defined by a top end, a bottom surface and a container wall and wherein said bottom surface is formed by flexible film material.

- 20 In an embodiment of the invention, said can structure comprises a container volume defined by a top end, a bottom surface and a container wall and wherein said container wall, top end and bottom surface is formed by flexible film material.

In an embodiment of the invention, said container wall comprises a flexible film sheet joined together in the direction between the top end and the bottom surface.

- 25 In an embodiment of the invention, said container wall comprises at least two flexible film sheets joined together in the direction between the top end and the bottom surface.

In an embodiment of the invention, said can is joined as a substantially flat or collapsed structure.

In an embodiment of the invention, said collapsed joined structure is expanded subsequent to the joining of the can.

5 In an embodiment of the invention, said can is expanded prior to or simultaneously to filling by liquid.

In an embodiment of the invention, said joining is performed by gluing.

10 In an embodiment of the invention, said joining is performed by heat-welding.

In an embodiment of the invention, said joinings are at least 2 mm.

15 In an embodiment of the invention, said joinings are within the range of about 3 mm to 30 mm.

In an embodiment of the invention, said joinings are within the range of about 4 mm to 25 mm.

20 In an embodiment of the invention, the diameter of the can is about 40 to 120 mm and the height is about 90 mm to about 150 mm.

In an embodiment of the invention, said top surface has a smallest dimension which is less than about 10 cm.

25 In an embodiment of the invention, said top has a smallest dimension of less than about 7 cm.

In an embodiment of the invention, said top surface is substantially cylindrical.

In an embodiment of the invention, said top surface is formed of a separate film/sheet material.

5 In an embodiment of the invention, said top surface is formed of a bended part of a can defining film material.

In an embodiment of the invention, said top surface approximates a circular surface when the can is filled with liquid.

10 In an embodiment of the invention, said top surface approximates a rectangular surface when the can is filled with liquid.

In an embodiment of the invention, said top surface approximates a rounded surface when the can is filled with liquid.

15 According to an advantageous embodiment of the invention, the top surface, shape, size and joining to the side walls of the can, define at least a part of the tubular shape of the receptacle which compares to conventional circular top ends of a can.

20 In an embodiment of the invention, the interface between the can and the top surface is formed by at least one joining.

In an embodiment of the invention, the top sealing is at least partly covered by an at least partly removable further sealing to the discharge arrangement.

25 According to an advantageous embodiment of the invention, the top surface should be at least partly covered by a further sealing in order to protect the part of the can applied during drinking hygienically prior to the initial opening of the can. The further sealing may e.g. comprise a sheet covering the opening and e.g. a part of the
30 edge of the can. Alternatively, such further sealing may e.g. comprise part of the pull

tab arrangement and be flapped around the drinking edge in order to ensure that the drinking edge is clean.

In an embodiment of the invention, said can comprises a bottom surface.

5

In an embodiment of the invention, said can comprises at least one bottom fold.

In an embodiment of the invention, the can comprises a bottom end which comprises a self-supporting arrangement.

10

According to a preferred embodiment of the invention, the bottom arrangement comprises a bottom arrangement which allows the can to be self-standing in substantially the same way as conventional solid cans.

15 In an embodiment of the invention, said bottom surface approximates a circular surface when the can is filled with liquid.

In an embodiment of the invention, said bottom surface approximates a rounded surface when the can is filled with liquid.

20

According to an advantageous embodiment of the invention, bottom surface, shape, size and joining to the side walls of the can, defines at least a part of the tubular shape of the receptacle which compares to conventional circular top ends of a can.

25 In an embodiment of the invention, said pull-tab opener is formed of film material.

The peelable discharge arrangement may be made in numerous ways within the scope of the invention. One of obtaining a film-based peelable opening is described in WO 00/58166 hereby incorporated by reference.

30

In an embodiment of the invention, said pull-tab opener is formed of a multilayer film material.

5 In an embodiment of the invention, said pull-tab opener comprises of reinforced film material.

The reinforcement of the film material forming at least part of the pull-tab opener may be obtained e.g. by lamination of several film layers or e.g. by increased thickness of the film or sheet material. Alternative embodiments may e.g. comprise
10 film with an attached adhesive label which makes the pull tab easier to grip and makes the peeling by the tab more effective.

In an embodiment of the invention, at least a part of said pull-tab opener is comprised by a part of said top surface.

15 In an embodiment of the invention, at least a part of said pull-tab opener is comprised by a cut-off or a peel-off part of said top surface.

In an embodiment of the invention, said pull-tab opener comprises a handle.
20

In an embodiment of the invention, said pull-tab opener comprises a handle having a finger opening.

In an embodiment of the invention, said pull-tab opener is formed in an overlay sheet
25 which is fastened to the top surface of the can by a peelable sealing.

In an embodiment of the invention, said pull-tab opener is formed in an overlay sheet which is fastened to the top surface of the can by a peelable sealing over at least half the area of the top overlay sheet.

30

In an embodiment of the invention, said pull-tab opener covers and seals an opening by a peelable sealing.

5 In an embodiment of the invention, said pull-tab opener is fastened to the top surface by means of a resealable sealing.

When fastening the pull tab to the top surface by means of a resealable sealing, the can may be closed after use. The resealable sealing may thus facilitate that a user may initially open the can and the, subsequently, close the can again by the pull tab.

10

In an embodiment of the invention, the can comprises a resealable closing.

According to a further embodiment, the can may comprise a resealable closing, e.g. a separate sheet or tab which may be attached to the can and cover the opening of the discharge arrangement completely or partly if a user wants to reseal the can after the initial opening.

15

In an embodiment of the invention, the can has an internal volume.

20 In an embodiment of the invention, the internal volume comprises a barrier arrangement.

The barrier arrangement basically comprises an inside barrier to flow in the internal volume, in particular to flow from the inside of the can to the outside. The barrier arrangement may simply be comprised by different flow-restricting measures in the internal volume such as a wall comprising one or several openings, a filter material with smaller apertures, etc.

25

The barrier arrangement may moreover facilitate consumer control of the outlet flow of the flexible can.

30

It is furthermore noted that the barrier material may also serve the purpose of keeping the can form stable, i.e. adding strength to the construction vis-à-vis pressure.

5

In an embodiment of the invention, the barrier arrangement is arranged between the discharge arrangement and the internal volume.

10 In an embodiment of the invention, the barrier arrangement divides the internal volume into at least two compartments.

In an embodiment of the invention, the barrier arrangement (defines an outlet volume.

15 According to an advantageous embodiment of the invention, the internal volume of the can comprises an outlet volume through which liquid must flow in order to be discharged from the can. This volume may advantageously be applied to filter liquid prior to discharge, serve as a spillage constrainer in the sense that sudden flow towards the outlet, i.e. the opening of the top surface, may face flow restriction in
20 various different ways and therefore counteract unintended discharge.

In an embodiment of the invention, said can comprises a barrier arrangement comprising at least one perforated sheet material.

25 In an embodiment of the invention, said barrier arrangement comprises a filter.

According to an advantageous embodiment of the invention, a filter is provided to filter residues from liquid kept in the internal volume of the can.

In an embodiment of the invention, said barrier arrangement is joined to the can at the top end by the sealing joining the top surface and the side wall(s).

5 In an embodiment of the invention, said discharge arrangement comprises an opening in said top surface when the pull-tab has been peeled.

In an embodiment of the invention, said opening is at least partly a cut-out or a peel-out opening formed in a sheet material of said top surface.

10 In an embodiment of the invention, said discharge arrangement comprises an opening in said top surface formed by a flap preferably pointing towards the circumference of the top surface.

15 In an embodiment of the invention, said top surface and said at least one joining form an external reservoir.

20 According to a preferred embodiment of the invention, the top of the can should advantageously form a sort of reservoir or at least an external spillage-restricting barrier in the top of the container.

25 Experiments have revealed that such external reservoir may also render eventual extra discharge arrangements or fitting such as a straw superfluous and more importantly provide the user with a "drink feeling" which is comparable to the experience when drinking from conventional solid cans, such as beer cans.

In an embodiment of the invention, at least one of the can defining films extends above the top surface and extends to form a drinking edge.

30 The spout may advantageously help a user to drink from the can without spilling.

In an embodiment of the invention, the drinking edge comprises at least one reinforcement in the transverse direction of the drinking edge.

5 In an embodiment of the invention, the opening in said top surface has an area which is less than half the area of the top surface.

In an embodiment of the invention, the opening in said top surface has an area which is less than half the area of the top surface and higher than about 0.25 cm².

10 In an embodiment of the invention, the can comprises an outer support arrangement.

In an embodiment of the invention, the can comprises an outer support arrangement and wherein the outer support arrangement comprises a cylindrical outer wall.

15 According to an advantageous embodiment of the invention, the can is fitted with or supported by a cylindrical structure which may both serve as a support for the by nature relatively flexible can and thereby allow the structure to be experienced as a conventional e.g. aluminum-based can having a solid metal wall. It may moreover increase the ability of the can to be self-standing in a secure and reliable way and it
20 may also increase the ability of the can to comprise e.g. carbonated drinks.

The outer can may serve both to keep the can stable with respect to shape and handling. Moreover, the outer can may serve as a volume fixation which allows filling by carbonated fluid.

25

In an embodiment of the invention, the outer support arrangement is formed by a form-stable polymer.

In an embodiment of the invention, the outer support arrangement is formed by a
30 form-stable cardboard.

In an embodiment of the invention, the outer support arrangement has the form of a tube.

- 5 In an embodiment of the invention, the outer support arrangement further comprises a bottom support.

In an embodiment of the invention, the outer support arrangement further comprises a bottom support and a top support.

10

In an embodiment of the invention, said can is at least partly attached to said outer support.

- 15 In an embodiment of the invention, the diameter of the can including the outer support is about 40 mm to 100 mm and the height is about 75 mm to about 150 mm.

In an embodiment of the invention, the diameter of the can including the outer support is about 50 mm to 60 mm and the height is about 88 mm to about 125 mm.

- 20 In an embodiment of the invention, the outer support arrangement may be applied as a beverage or a cup.

In an embodiment of the invention, said film material comprises a multilayer film.

- 25 In an embodiment of the invention, said film material comprises a single-layer film.

In an embodiment of the invention, said film material comprises polyethylene.

In an embodiment of the invention, said film material comprises polypropylene.

30

In an embodiment of the invention, said film material comprises aluminum foil.

In an embodiment of the invention, said film material comprises metalized film material.

5

Metalized films may e.g. result in a complete or at least partial UV filtering of light into the can and thereby protect the interior of the bag.

According to an advantageous embodiment of the invention, the film material
10 comprises metalized film material thereby enabling disposal by burning with a minimum impact on the environment.

In an embodiment of the invention, said can is a drinking can.

15 According to a preferred embodiment of the invention, the can should facilitate drinking directly without a requirement for additional accessories such as straws and mouthpieces.

In an embodiment of the invention, the can comprises liquid.

20

In an embodiment of the invention, the can comprises carbonated liquid and an outer support.

In an embodiment of the invention, said can is burnable.

25

In an embodiment of the invention, the container volume is between about 0.15 to about 2 liters, preferably between about 0.2 and 1.5 liters.

Moreover the invention relates to a method of filling carbonated drinks into a can
30 according to any of the claims 1 to 81, wherein the can is reinforced by a form-stable

material such as a cylindrical structure within about 30 minutes from time where carbonated liquid was introduced into the can.

Moreover the invention relates to a disposable can comprising carbonated drinks
5 wherein said can is comprised by less than 50% by weight of metal.

According to a preferred embodiment of the invention, the can comprises a reduced amount of metals compared to conventional cans, e.g. made of stiff aluminum based metal, thereby providing an environmental friendly disposable can.

10

In an embodiment of the invention, said can is comprised by less than 10% by weight of metal.

In an embodiment of the invention, said can is comprised by less than 5% by weight
15 of metal.

In an embodiment of the invention, said can is substantially free of metal.

According to a further advantageous embodiment of the invention, the can is
20 substantially free of metal and may therefore be disposed by an environmental burn-process which may ultimately reduce the complete packaging to residues such as e.g. carbon dioxide and water. Evidently, such process should advantageously be controlled to result in the desired, preferably non-metal, residues.

25 In an embodiment of the invention, the can prior to filling with liquid has a volume which is less than 5% the can.

In an embodiment of the invention, the can has a volume subsequent to emptying of liquid which is less than 30% of the can filled with liquid.

30

In an embodiment of the invention, the can has a volume subsequent to emptying of liquid which is less than 20% of the can filled with liquid.

5 In an embodiment of the invention, the can has a volume subsequent to emptying of liquid which is less than 10% preferably less than 5 % of the can filled with liquid.

Moreover, the invention relates to a disposable can, preferably formed by at least one flexible film wall, comprising an inside barrier arrangement. It is noted that this barrier, according to an embodiment of the invention, basically needs to be
10 positioned between the main volume of the can and the outlet irrespective of the design of the top end of the can with respect to the discharge arrangement. The can basically comprises an inside barrier to flow in the internal volume, in particular to flow from the inside of the can to the outside. The barrier arrangement may simply be comprised by different flow-restricting measures in the internal volume such as a
15 wall comprising one or several openings, a filter material with smaller apertures, etc.

It is furthermore noted that the barrier material may also serve the purpose of keeping the can form stable.

20 A further, and very broad perspective of an embodiment of the invention is that the logistics are significantly improved when applying a flexible can according to the invention due to the fact that the can may initially be produced and brought to the filling station, e.g. at a brewery, in a collapsed state and then be expanded during filling. Then, when a consumer has emptied the can, the can may easily be collapsed
25 to a minimum volume. This also applies significantly, when applying a can comprising an outer support.

Finally, the invention also features very environmental-friendly provisions compared to conventional metal cans.

Detailed description

A can is generally referred to as a usually cylindrical receptacle for holding liquids or flowable material. Within the field of soft drinks, e.g. carbonated beverages, such terminology typically refers to a metal receptacle having a removable pull-tab and a world standard has generally evolved over some decades.

It is generally noted that joinings, e.g. heat or glue sealings are permanent and in principle not intended for peeling unless specifically stated.

Fig. 1A-fig. 1F illustrate an embodiment of a disposable can according to the invention.

Fig. 1B and fig. 1C illustrate a cross-section along the line IC of fig. 1A.

The illustrated disposable beverage can 10 is formed by joined films 130, 13, 16 and 19, where the films 130 and 13 form the wall(s) of the can and the sheet 16 forms a top surface 16 and the sheet 19 forms a bottom surface 19.

The two films 13 and 130 are joined by side sealing 132 and 133. Alternatively, the can may be produced on the basis of one single film which is folded at the one side and joined at the other, e.g. by sealing 132 or 133.

The top surface 16 of the can 10 is formed with a pull-tab opener 11 which is formed by an overlay film and defined by peel-off lines 14 and 15. The overlay material partly covering the top surface may be formed by a single sheet of a film or e.g., as the illustrated design, by a top end of the side wall 130, extended from the wall portion at the top to form a folded drinking edge 12, at least partly joined by joining 102 and an optionally further joining (not shown). The peel-off lines should preferably be about 5- 8 mm or longer in order to facilitate the intended peeling of the tab.

The top surface 16 may also be formed by a separate sheet as illustrated or e.g. be formed by a folded part of one of the side walls 53 or 530.

5 An opening 180 beneath the pull-tab 11 is defined and preformed in the top surface 16. The overlay portion of the pull tab 11 is completely sealed by a peelable sealing 103 which, alone or e.g. in combination with the joining 102, seals the internal volume 131 of the can completely.

10 The top surface 16 has at least one inward fold 17, which allows the can to be expanded from the manufacturing position which is completely or at least partly collapsed.

15 The bottom surface 19 has at least one upward fold 18, which allows the can to be expanded from the manufacturing position which is completely or at least partly collapsed.

20 The can comprises an upper discharge arrangement 101 formed by the top surface 16, the opening 180 and joining 102 and 104, which defines the circumference of a reservoir-like structure.

The circumference-defined reservoir structure around the opening 180 allows a user to drink from the can 10 without other operation than the operation related to a conventional can, namely removal of the tab and subsequently drinking directly from the top end of the can.

25 The provided discharge arrangement 101 furthermore allows the user to capture optional undesired spilling during drinking, as in conventional cans.

The drinking edge 12, which is optional in other embodiments of the invention, serves as a support or a sort of mouthpiece availing an attractive handling during drinking.

- 5 Fig. 1F illustrates when the pull tab 11 has been removed from the can and giving access to the internal volume of the can via the opening 180.

Fig. 1D and 1E show a three-dimensional view of the can 10.

- 10 The pull tab 11 is defined by two peel lines 14 and 15 and the pull tab 11 exposes an opening 180 to the internal volume when removed.

Fig. 2A to fig. 2F illustrate a can 20 which is a variant of the above-described drinking can of fig. 1A-1F, now with a modified pull tab 21.

15

The pull tab 21 is again formed and attached to the top surface of the can by means of joining 204 surrounding and sealing an opening 280 completely prior to removal. The pull tab 21 is again formed in an overlay sheet 2001 which covers the surface of the can 20 at least partly and at least enough to cover the opening 280.

20

The pull tab 21 is at least partly joined to a cut-off or a peel-off part 205 of the top surface.

- 25 When the pull tab 21 is removed, the cut-off or peel-off part 205 of the top surface will stick to the pull tab and be removed together with it as illustrated in fig. 2F.

- 30 An alternative embodiment of the above-illustrated pull tab may be to form the part 205 as a peel-off or push-down part 205 and omitting the above-explained joining between the pull tab 21 and the peel-off part 21. In this way, the opening of the can may be performed as a two-step opening comprising a separate removal of the peel-

tab and a separate peel-off or push-down of the part 205 of the top surface. When applying the part as a push-down part, the part should at least partly be fastened to or form part of the top surface when the part has been push down.

- 5 A further alternative embodiment may be obtained by a complete initial cut-off of the opening and thus covering the opening only by a pull tab.

Fig. 3A to 3C illustrate a further embodiment of the invention based on the can 10 of fig. 1A to 1F, but now provided with a barrier arrangement 310.

10

The barrier arrangement 310 comprising a sheet perforated by perforations 350 is fastened to the can and divides the internal volume 331 in two volumes, the main volume and an outlet volume 325.

- 15 The barrier 310 may serve several different purposes.

One purpose is to restrict or counteract sudden flow from the internal volume 331 to the exterior via an opening 380.

- 20 Another purpose may also be to act as a filter to residues which should not be outlet during emptying of the can. Such residues may e.g. comprise food-fibers, small fruit parts, etc.

Another important purpose may also be to add form stability to the flexible can.

25

Fig. 4A to 4F illustrate a further embodiment of the invention based on the can 20 of fig. 2A to 2F, but now provided with a barrier arrangement 410.

The barrier arrangement 410 comprising a sheet perforated by perforations 350 is

- 30 fastened to the can and divides the internal volume 331 in two volumes.

The barrier 410 may serve several different purposes.

One purpose is to restrict or counteract sudden flow from the internal volume to the
5 exterior via an opening.

Another purpose may also be to act as a filter to residues which should not be outlet
during emptying of the can. Such residues may e.g. comprise food-fibers, small fruit
parts, etc.

10 Another important purpose may also be to add form stability to the flexible can.

Fig. 5A to 5C illustrate a further embodiment of the invention also based on the can
20 of fig. 2A to 2F, but now provided with another barrier arrangement 510 than the
15 above-explained perforated filter structure.

The barrier arrangement 510 comprises a sheet comprising an opening 5800, which
is fastened to the internal volume of the can and divides the internal volume into two
volumes.

20 The barrier 510 may again serve several different purposes.

One purpose is to restrict or counteract sudden flow from the internal volume to the
exterior of the can via an opening 580.

25 Another purpose may also be to act as a filter to residues which should not be outlet
during emptying of the can. Such residues may e.g. comprise food-fibers, small fruit
parts, etc.

30 Another important purpose may also be to add form stability to the flexible can.

Evidently, several other barrier arrangements may be made within the scope and the spirit of the invention.

- 5 It is moreover noted that the can 50 has some further modifications when compared to the can 20 with respect to the pull tab design and the design of a drinking edge 52.

Starting with the drinking edge design, a reinforcement 590, e.g. in the form of a relatively rigid string 590, has been inserted into a folded side wall 530 forming the drinking edge 52 and part of a pull tab 51. The reinforcement 590 may be made of
10 any suitable material, preferably a polymer, and be both welded or glued within the compartment forming the inside of the drinking edge or even just be positioned by means of the compartment-defining sealing. The function of the applied reinforcement 590 is to keep the drinking edge 52 form stable and comfortable to
15 drink of during discharge. Finally, the reinforcement 590 may simply be fixated at the two ends within the fold by side weldings 532, 533.

Turning now to the modified pull tab 51, this tab is formed by peel-lines 54 and 55 in an overlay sheet 5001 which covers a top surface 56 of the can 50 at least partly and
20 at least enough to cover a cut 581 in the top surface 56 forming a horse shoe formed opening 580 in the top surface 56. The peel-lines 54, 55 may e.g. comprise perforated lines or cuts in the overlay sheet 5001. It is noted that the perforated line or cut form a flap-like arrangement pointing towards the circumference of the top surface, thereby providing a self-opening arrangement, which when inclined slightly,
25 will facility relatively unrestricted output of liquid. Moreover, it is noted that the opposite end of the flap pointing towards the circumference should be as close to the circumference as possible in order to facilitate complete emptying of the internal volume. Again, the overlay sheet 5001 may form a single sheet welded to a side wall 530 or simply be formed by a folded prolonged side wall 530 as illustrated.

The overlay sheet 5001 is welded to the top surface 56 by a peelable sealing over the entire area of the overlay sheet, although it is preferred that the end of the overlay sheet 5001 or at least the part of the overlay sheet forming the pull tab 51 defined by the peel-lines 54, 55 is un-joined to the top surface 56 thereby enabling a user to grip
5 the pull tab 51.

It is noted that the opening 580 is now defined by a flap which is still fastened to the top surface 51 although discharge is now made possible.

10 Fig. 6A illustrates a disposable can according to an embodiment of the invention. The can 60 may e.g. fully correspond to the can 20 of fig. 2A-2F.

The can 60 fits into a rigid tube structure 601 forming an outer support for the can 60 and may be provided with a bottom support 603 and a top lid 602.

15

Fig. 7A and 7B illustrate a further embodiment of a flexible can 70 supported by an outer support 701 according to the invention. The can 70 corresponds largely to the can 20 illustrated in fig. 2A but now without a prolonged drinking edge.

20 The can 70 may be positioned within the cylindrically shaped outer support 701, supported at the bottom by a bottom support 703 and protected at the top by a top support 702. The bottom support is moreover formed in a suitable form 753 to mechanically fixate the outer support 701.

All support components 701, 702, 703 may be mutually fixed or completely or
25 partially releasable.

The can may moreover be fastened, e.g. by gluing or welding to the outer support or simply just be mechanically fixated by the outer support arrangement 701,703.

When applying the flexible can for carbonated drinks, all surfaces of the can should be supported by the outer support, i.e. outer support 701, bottom support 703 as well as the top support 702 in order to compensate the significant pressure in the can.

- 5 Fig. 8A and 8B illustrate a further embodiment of the invention where a can 80 is positioned in an outer cardboard support 801. The can 80 corresponds largely to the can 10 illustrated in fig. 1A but now without a prolonged drinking edge.

10 The outer support 801 comprises a peel-off strip 808 integrated into the outer support and with a handle 807.

Fig. 8B illustrates when the peel-off strip has been removed and the outer support has been split into two separate parts 801, 802 and now facilitating access to the can 80.

- 15 In the illustrated embodiment, a further embodiment will now be described. This embodiment involves that the can 80 is brought to the consumer within the outer support 801, 802.

20 The user breaks the sealing 808 as explained above and removes the can 80 from the outer support 801. Then, the user opens the discharge arrangement and pours liquid contained within the can 80 into the below outer support 801 and finally drinks the liquid from the below outer support 801 as a cup.

- 25 Fig. 9A to fig. 9H illustrates a number of alternative embodiments of the application of outer support arrangements for use with a can, e.g. the can 10.

30 The outer support arrangements comprises an outer support 901A, 901B, 901C, 901D, 901E, 901F, 901G, 901H, a top support 902A, 902B, 902C, 902D, 902E, 902F, 902G, 902H and a bottom support 903A, 903B, 903C, 903D, 903E, 903F, 903G, 903H.

When applying the can and the outer support arrangement for carbonated liquid the outer support has a very important function of counteracting the pressure within the can, i.e. ensuring the film structure does not break due to the relatively high pressure
5 invoked by the carbonated liquid. Thus, the use of a combined flexible can and an outer support solves a problem in relation to keeping carbonated liquid in flexible container which has never been solved before.

The outer support may advantageously be formed in relatively rigid and form-stable
10 polymer of cardboard-based structure.

The can may fit loosely into the outer support or be fastened to the outer support.

The outer support may serve several different purposes such as
15

- keeping the can in the desired shape,
- facilitating packaging and transportation to the shelves and piling,
- adding strength to the flexible can and facilitating filling with carbonated soft drinks.

20

Generally, the films applied to form the above illustrated cans may comprise a single or a multilayer web-material.

The films may be transparent or at least partly transparent to light. The films may
25 also be provided with a UV filter to protect liquid held in the can.

The films may preferably comprise polymer films optionally supplemented by metal films. According to a preferred embodiment, however, the complete can is made substantially free of metals or at least such small an amount to render the can
30 burnable when disposed in a relatively environmentally attractive way.

At least the inner part of the flexible can should be made of liquid-impermeable material.

- 5 In an embodiment of the invention, said sheets of liquid-impermeable material comprise multilayered sheets.

In an embodiment of the invention, said sheets of liquid-impermeable material comprise a laminate of at least one polymer sheet and at least one metal sheet.

10

In an embodiment of the invention, said sheets of liquid-impermeable material comprise wall(s), top and bottom of can.

- 15 In an embodiment of the invention, said sheets of liquid impermeable material comprises at least one film or foil selected from the group of metal foils, polymer films, metalized or coated films, polymer sealants, polyesters, polyamides and polyolefines comprising polyethylenes and polypropylenes or any combination thereof.

- 20 In an embodiment of the invention, said liquid-impermeable material of the can has a thickness in the range of 10 μm to 2 mm, preferably 40 μm to 500 μm , more preferably 60 μm to 200 μm and most preferably 80 μm to 150 μm .

- 25 In an embodiment of the invention, said multilayer structure of the can comprises an outside film, an optional intermediate barrier layer and an inside layer of polymer sealant.

- 30 The filter arrangement material and/or liquid-permeable inner compartment material may comprise punctured, etched, melted, stamped or cut material. The material may e.g. comprise plastic, polyolefines such as polyethylene or polypropylene, polyesters,

polyamides and other polymers, woven or non-woven expanded plastic, cloth, screen, wire-mesh, metal or injection-molded plastic.

The arrangement forming sheets may comprise liquid permeable sheet material
5 provided with a density of holes in the range of 1 - 30 holes per cm², preferably 2 – 20 holes per cm² and most preferably 4 - 12 holes per cm².

The holes may have dimensions in the range of 0.01 mm * 0.01 mm to 2.00 mm *
2.00 mm, preferably 0.1mm * 0.1 mm to 1.0 mm * 1.0 mm, more preferably 0.1mm
10 * 0.1 mm to 0.6 mm * 0.6 mm.

The wall film(s) of the flexible can may for example comprise a multilayer laminate material comprising three layers: An outside layer made of PETP, an intermediate layer as barrier layer made of aluminum foil, e.g. a 9 µm foil and an inside layer
15 forming a sealant comprising 80 to 120 µm polyethylene (PE). The multilayer laminate material may typically comprise two or further layers.

The bottom surface of the can may for example be made of a multilayer laminate material comprising three layers: An outside layer made of coextruded biaxially
20 oriented polypropylene, e.g. of a thickness of 20 µm, an intermediate layer as barrier layer made of polyethylene terephthalate (PET) metalized and coated with ethylene vinyl alcohol (EvOH), and an inside layer forming a sealant comprising, e.g. a 50 µm linear low-density polyethylene (LLDPE) or high-density polyethylene (HDPE).

25 Filter material and/or inner compartment may for example be made of 30 µm high-density polyethylene (HDPE) stamped with holes of 0.2 mm * 0.4 mm size and 8 holes per cm² density.

The structural material of the outer support may comprise at least one polymer film,
30 metalized or coated film, EvOH-coating, metal foil, sealant or combinations thereof.

The outer support may generally be formed by a large variety of material, whereas cardboard, fiber-based material and different polymers are obvious choices. The outer support should preferably be rigid enough to keep the can form-stable even
5 when used or piled.

If the liquid comprised in the can is carbonated the outer support should preferably be strong enough to counteract breaking of the can due to overpressure invoked by the carbonated liquid.
10

The outer support may be made of single-layer material or formed by multiple layers of materials.

The pull tab of the can may further include a backing which covers the adhesive on
15 the free end portion so that the adhesive present at the free end portion cannot adhere to the top surface. This backing could be either a plastic or paper material. Alternatively, instead of a separate backing, a top portion of the free end could be folded over and adhered to itself to provide the free end portion.

20 The can may also comprise an outer sealing medium layer of the first side wall section which may be a copolymer comprising polyethylene and polypropylene and an inner sealing medium layer of the can walls which is substantially made from polyethylene. Such structure may e.g. facilitate that the can is form-stable enough to form a stand-up can made from a single film web comprising an inner sealing
25 medium layer of substantially polyethylene and an outer sealing medium layer which is a copolymer comprising polyethylene and polypropylene.

Moreover, according to the invention the pull tab comprises a film strip arranged between the two side wall sections in the overlapping area and having a first and a
30 second outer sealing medium layer with which the film strip is firmly (non-peelably)

heat-sealed to the respective side wall sections. The film strip may further comprise an intermediate layer peelably connected to at least one of the outer sealing medium layers having a tear resistance weaker than the peel strength between the intermediate layer and the said sealing medium layer. The peelable connection is thus
5 opened by tearing the weak sealing medium layer on both sides of the sealing seam and by a delamination between the weak sealing medium layer and the intermediate layer.

The peel strength of the pull tab connections may e.g. be in the range from 100 to
10 800 g/20 mm, preferably from 200 to 600 g/20 mm, and most preferably from 300 to 500 g/20 mm.

For the manufacture of the bag and or the prefabricated bag according to the invention one or more flexible films may be used which have at least one inner heat-sealable surface, preferably comprising a polyolefin, i.e. PE or PP. Preferably, a
15 softer or more flexible, e.g. thicker, film is used for the top and bottom walls than for the side walls to obtain the intended expansion and standing properties. Furthermore, multilayer films are preferably used comprising an inner heat-sealable surface layer. For the manufacture of the bag the laminate COEX OPP/PETP (polyester) may for
20 instance be used, in which the PE layer is on the inner side seen in relation to the finished or prefabricated and COEX OPP denotes a CO-extruded oriented polypropylene film on either side provided with a thin sealing medium layer comprising a copolymer of PP and PE. In order to obtain enhanced barrier properties a barrier layer, e.g. a metallization layer or an aluminum film, may be provided
25 between the PETP layer and the PE layer or between the COEX OPP film and the PETP layer.

Furthermore, the PETP layer may be replaced by an oriented polyamide, OPA.

Claims

1. Disposable beverage can (10; 20; 30; 40; 50) formed at least partly by a flexible film material (13,130) wherein
- 5 said can (10; 20; 30; 40; 50) comprises a top surface (16; 26, 36, 46; 56) and wherein said can comprises a discharge arrangement (101) comprising a pull-tab opener (11; 21; 31; 41; 51) formed in said top surface.
2. Disposable beverage can according to claim 1, wherein said can structure
- 10 comprises a container volume (131) defined by a top end, (16) a bottom surface (19) and a container wall (13,130) and wherein said container wall is formed by flexible film material.
3. Disposable beverage can according to claim 1 or 2, wherein said can structure
- 15 comprises a container volume (131) defined by a top end, (16) a bottom surface (19) and a container wall (13,130) and wherein said top end (16) is formed by flexible film material.
4. Disposable beverage can according to any of the claims 1-3, wherein said can
- 20 structure comprises a container volume (131) defined by a top end, (16) a bottom surface (19) and a container wall (13,130) and wherein said bottom surface (19) is formed by flexible film material.
5. Disposable beverage can according to any of the claims 1-4, wherein said can
- 25 structure comprises a container volume (131) defined by a top end, (16) a bottom surface (19) and a container wall (13,130) and wherein said container wall (13,130), top end (16) and bottom surface (19) is formed by flexible film material.

6. Disposable beverage can according to any of the claims 1-5, wherein said container wall (13, 130) comprises a flexible film sheet joined together in the direction between the top end (16) and the bottom surface (19).

5 7. Disposable beverage can according to any of the claims 1-6, wherein said container wall (13, 130) comprises at least two flexible film sheets joined together in the direction between the top end (16) and the bottom surface (19).

8. Disposable beverage can according to any of the claims 1-7, wherein said can is
10 joined as a substantially flat or collapsed structure.

9. Disposable beverage can according to any of the claims 1-8, wherein said collapsed joined structure is expanded subsequent to the joining of the can (10; 20; 30; 40; 50).

15

10. Disposable beverage can according to any of the claims 1-9, wherein said can (10; 20; 30; 40; 50) is expanded prior to or simultaneously to filling by liquid.

11. Disposable beverage can according to any of the claims 1-10, wherein said
20 joining is performed by gluing.

12. Disposable beverage can according to any of the claims 1-11, wherein said joining is performed by heat-welding.

25 13. Disposable beverage can according to any of the claims 1-12, wherein said joinings are at least 2 mm.

14. Disposable beverage can according to any of the claims 1-13, wherein said joinings are within the range of about 3 mm to 30 mm.

15. Disposable beverage can according to any of the claims 1-14, wherein said joinings are within the range of about 4 mm to 25 mm.
16. Disposable beverage can according to any of the claims 1-15, wherein the
5 diameter of the can is about 40 to 120 mm and the height is about 90 mm to about 150 mm.
17. Disposable beverage can according to any of the claims 1-16, wherein said top surface (16; 26, 36, 46; 56) has a smallest dimension which is less than about 10 cm.
10
18. Disposable beverage can according to any of the claims 1-17, wherein said top has a smallest dimension of less than about 7 cm.
19. Disposable beverage can according to any of the claims 1-18, wherein said top
15 surface is substantially cylindrical.
20. Disposable beverage can according to any of the claims 1-19, wherein said top surface is formed of a separate film/sheet material.
- 20 21. Disposable beverage can according to any of the claims 1-20, wherein said top surface is formed of a bended part of a can defining film material.
22. Disposable beverage can according to any of the claims 1-21, wherein said top surface (16; 26, 36, 46; 56) approximates a circular surface when the can is filled
25 with liquid.
23. Disposable beverage can according to any of the claims 1-22, wherein said top surface (16; 26, 36, 46; 56) approximates a rectangular surface when the can is filled with liquid.

24. Disposable beverage can according to any of the claims 1-23, wherein said top surface (16; 26, 36, 46; 56) approximates a rounded surface when the can is filled with liquid.

5 25. Disposable beverage can according to any of the claims 1-24, wherein the interface between the can and the top surface is formed by at least one joining.

26. Disposable beverage can according to any of the claims 1-25, wherein the top sealing is at least partly covered by an at least partly removable further sealing to the
10 discharge arrangement.

27. Disposable beverage can according to any of the claims 1-26, wherein said can comprises a bottom surface (19; 29; 39; 49; 59).

15 28. Disposable beverage can according to any of the claims 1-27, wherein said can comprises at least one bottom fold (18).

29. Disposable beverage can according to any of the claims 1-28, wherein the can comprises a bottom end which comprises a self-supporting arrangement.

20

30. Disposable beverage can according to any of the claims 1-29, wherein said bottom surface (19) approximates a circular surface when the can is filled with liquid.

25 31. Disposable beverage can according to any of the claims 1-30, wherein said bottom surface (19) approximates a rounded surface when the can is filled with liquid.

32. Disposable beverage can according to any of the claims 1-31, wherein said pull-
30 tab opener (11; 21; 31; 41; 51) is formed of film material.

33. Disposable beverage can according to any of the claims 1-32, wherein said pull-tab opener (11; 21; 31; 41; 51) is formed of a multilayer film material.

5 34. Disposable beverage can according to any of the claims 1-33, wherein said pull-tab opener (11; 21; 31; 41; 51) comprises of reinforced film material.

35. Disposable beverage can according to any of the claims 1-34, wherein at least a part of said pull-tab opener (11; 21; 31; 41; 51) is comprised by a part of said top
10 surface (16; 26, 36, 46; 56).

36. Disposable beverage can according to any of the claims 1-35, wherein at least a part of said pull-tab opener (11; 21; 31; 41; 51) is comprised by a cut-off or a peel-off part of said top surface (16; 26, 36, 46; 56).

15 37. Disposable beverage can according to any of the claims 1-36, wherein said pull-tab opener (11; 21; 31; 41; 51) comprises a handle.

38. Disposable beverage can according to any of the claims 1-37, wherein said pull-tab opener (11; 21; 31; 41; 51) comprises a handle having a finger opening.
20

39. Disposable beverage can according to any of the claims 1-38, wherein said pull-tab opener is formed in an overlay sheet (2001; 5001) which is fastened to the top surface of the can by a peelable sealing.

25 40. Disposable beverage can according to any of the claims 1-39, wherein said pull-tab opener is formed in an overlay sheet (2001; 5001) which is fastened to the top surface of the can by a peelable sealing over at least half the area of the top overlay sheet.

30

41. Disposable beverage can according to any of the claims 1-40, wherein said pull-tab opener covers and seals an opening (180) by a peelable sealing.
42. Disposable beverage can according to any of the claims 1-41, wherein said pull-tab opener is fastened to the top surface by means of a resealable sealing.
43. Disposable beverage can according to any of the claims 1-42, wherein the can comprises a resealable closing.
44. Disposable beverage can according to any of the claims 1-43, wherein the can (10; 20; 30; 40; 50) has an internal volume (331; 431).
45. Disposable beverage can according to any of the claims 1-44, wherein the internal volume (331; 431) comprises a barrier arrangement (310; 410).
46. Disposable beverage can according to any of the claims 1-45, wherein the barrier arrangement (310; 410) is arranged between the discharge arrangement and the internal volume (331; 431).
47. Disposable beverage can according to any of the claims 1-46, wherein the barrier arrangement (310; 410) divides the internal volume into at least two compartments.
48. Disposable beverage can according to any of the claims 1-47, wherein the barrier arrangement (310; 410) defines an outlet volume (325).
49. Disposable beverage can according to any of the claims 1-48, wherein said can (10; 20; 30; 40; 50) comprises a barrier arrangement comprising at least one perforated sheet material (45).

50. Disposable beverage can according to any of the claims 1-49, wherein said barrier arrangement comprises a filter.

51. Disposable beverage can according to any of the claims 1-50, wherein said
5 barrier arrangement is joined to the can at the top end by the sealing joining the top surface and the side wall(s).

52. Disposable beverage can according to any of the claims 1-51, wherein said discharge arrangement comprises an opening (180; 280; 380; 480; 580) in said top
10 surface (16; 26, 36, 46; 56) when the pull-tab has been peeled.

53. Disposable beverage can according to any of the claims 1-52, wherein said opening (180; 280; 380; 480; 580) is at least partly a cut-out or a peel-out opening formed in a sheet material of said top surface (16; 26, 36, 46; 56).

15 54. Disposable beverage can according to any of the claims 1-53, wherein said discharge arrangement comprises an opening (180; 280; 380; 480; 580) in said top surface (16; 26, 36, 46; 56) formed by a flap (580) preferably pointing towards the circumference of the top surface.

20 55. Disposable beverage can according to any of the claims 1-54, wherein said top surface (16; 26, 36, 46; 56) and said at least one joining form an external reservoir (101).

25 56. Disposable beverage can according to any of the claims 1-55, wherein at least one of the can defining films (130) extends above the top surface (16; 26, 36, 46; 56) and extends to form a drinking edge (12; 52).

57. Disposable beverage can according to any of the claims 1-56, wherein the drinking edge (12; 52) comprises at least one reinforcement (590) in the transverse direction of the drinking edge.

5 58. Disposable beverage can according to any of the claims 1-57, wherein the opening (180) in said top surface has an area which is less than half the area of the top surface.

59. Disposable beverage can according to any of the claims 1-58, wherein the
10 opening (180) in said top surface has an area which is less than half the area of the top surface and higher than about 0.25 cm².

60. Disposable beverage can according to any of the claims 1-59, wherein the can
15 comprises an outer support arrangement (601).

61. Disposable beverage can according to any of the claims 1-60, wherein the can comprises an outer support arrangement and wherein the outer support arrangement comprises a cylindrical outer wall (601).

20 62. Disposable beverage can according to any of the claims 1-61, wherein the outer support arrangement (601) is formed by a form-stable polymer.

63. Disposable beverage can according to any of the claims 1-62, wherein the outer support arrangement (601) is formed by a form-stable cardboard.

25 64. Disposable beverage can according to any of the claims 1-63, wherein the outer support arrangement (601) has the form of a tube.

65. Disposable beverage can according to any of the claims 1-64, wherein the outer
30 support arrangement (601) further comprises a bottom support 703.

66. Disposable beverage can according to any of the claims 1-65, wherein the outer support arrangement (601) further comprises a bottom support 703 and a top support 702.

5

67. Disposable beverage can according to any of the claims 1-66, wherein said can is at least partly attached to said outer support.

68. Disposable beverage can according to any of the claims 1-67, wherein the diameter of the can including the outer support is about 40 mm to 100 mm and the height is about 75 mm to about 150 mm.

10

69. Disposable beverage can according to any of the claims 1-68, wherein the diameter of the can including the outer support is about 50 mm to 60 mm and the height is about 88 mm to about 125 mm.

15

70. Disposable beverage can according to any of the claims 1-69, wherein the outer support arrangement may be applied as a beverage or a cup.

71. Disposable beverage can according to any of the claims 1-70, wherein said film material comprises a multilayer film.

20

72. Disposable beverage can according to any of the claims 1-71, wherein said film material comprises a single-layer film.

25

73. Disposable beverage can according to any of the claims 1-72, wherein said film material comprises polyethylene.

74. Disposable beverage can according to any of the claims 1-73, wherein said film material comprises polypropylene.

30

75. Disposable beverage can according to any of the claims 1-74, wherein said film material comprises aluminum foil.
- 5 76. Disposable beverage can according to any of the claims 1-75, wherein said film material comprises metalized film material.
77. Disposable beverage can according to any of the claims 1-76, wherein said can is a drinking can.
- 10 78. Disposable beverage can according to any of the claims 1-77, wherein the can comprises liquid.
79. Disposable beverage can according to any of the claims 1-78, wherein the can
15 comprises carbonated liquid and an outer support.
80. Disposable beverage can according to any of the claims 1-79, wherein said can is burnable.
- 20 81. Disposable beverage can according to any of the claims 1-80, wherein the container volume (131) is between about 0.15 to about 2 liters, preferably between about 0.2 and 1.5 liters.
82. Method of filling carbonated drinks into a can according to any of the claims 1 to
25 81, wherein the can is reinforced by a form-stable material such as a cylindrical structure within about 30 minutes from time where carbonated liquid was introduced into the can.
83. Disposable can comprising carbonated drinks wherein said can is comprised by
30 less than 50% by weight of metal.

84. Disposable can according to claim 83, wherein said can is comprised by less than 10% by weight of metal.

5 85. Disposable can according to claim 83, wherein said can is comprised by less than 5% by weight of metal.

86. Disposable can according to claim 83, wherein said can is substantially free of metal.

10

87. Disposable can according to any of the claims 1-86, wherein the can prior to filling with liquid has a volume which is less than 5% of the can.

15 88. Disposable can according to any of the claims 1-87, wherein the can has a volume subsequent to emptying of liquid which is less than 30% of the can filled with liquid.

20 89. Disposable can according to any of the claims 1-87, wherein the can has a volume subsequent to emptying of liquid which is less than 20% of the can filled with liquid.

90. Disposable can according to any of the claims 1-87, wherein the can has a volume subsequent to emptying of liquid which is less than 10% preferably less than 5 % of the can filled with liquid.

25

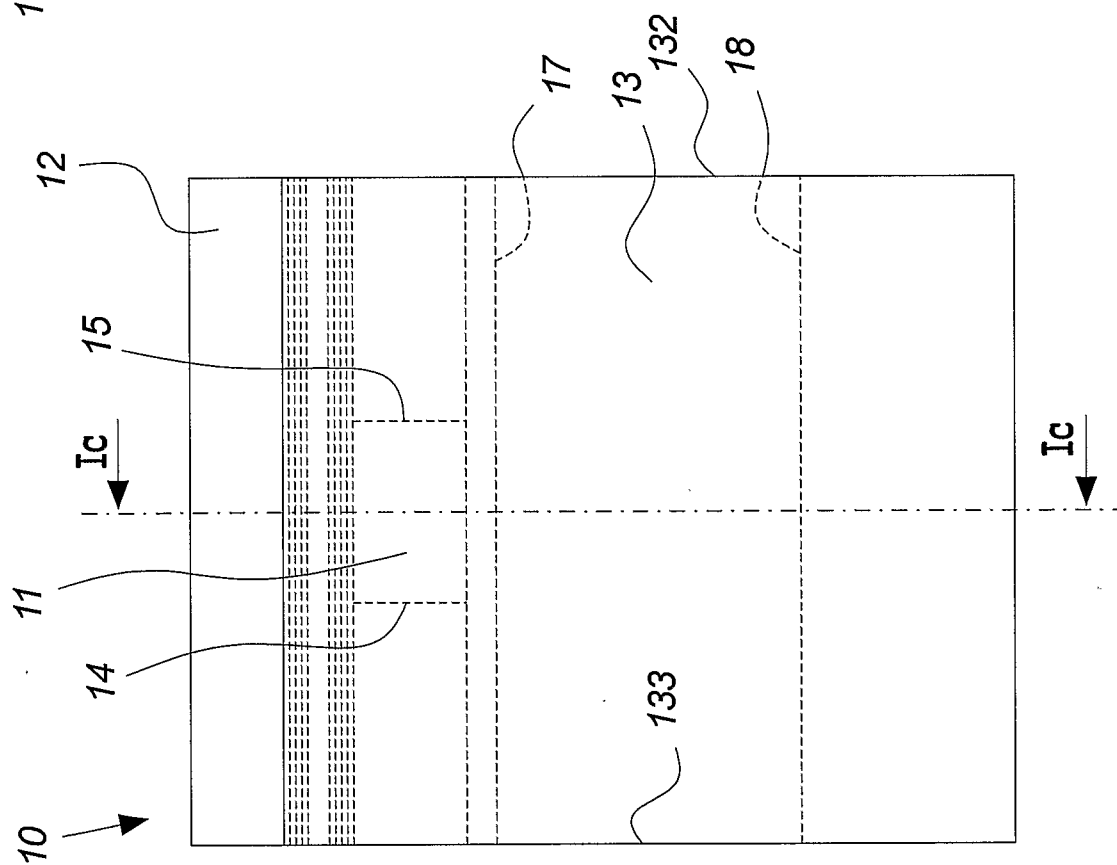


Fig. 1a

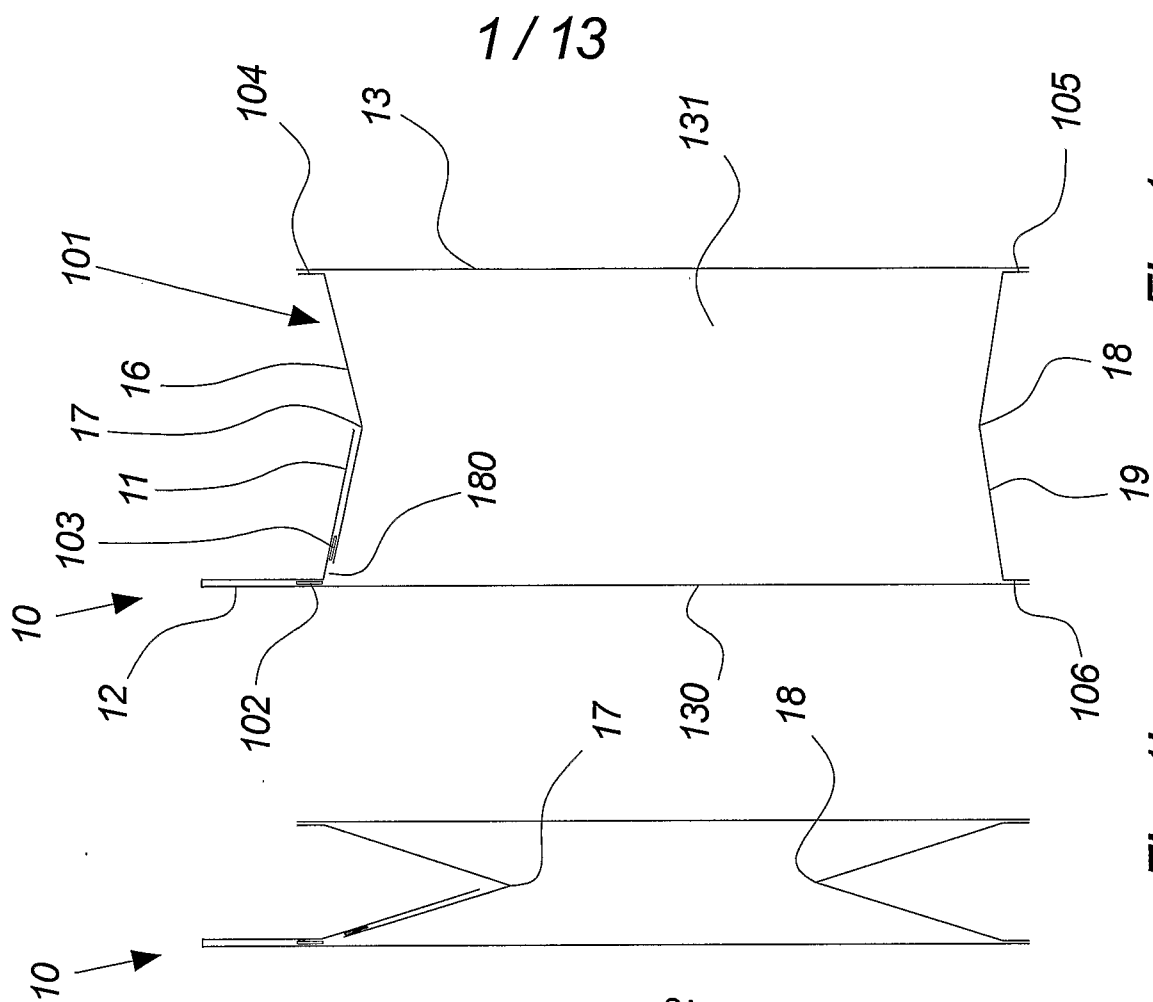


Fig. 1b

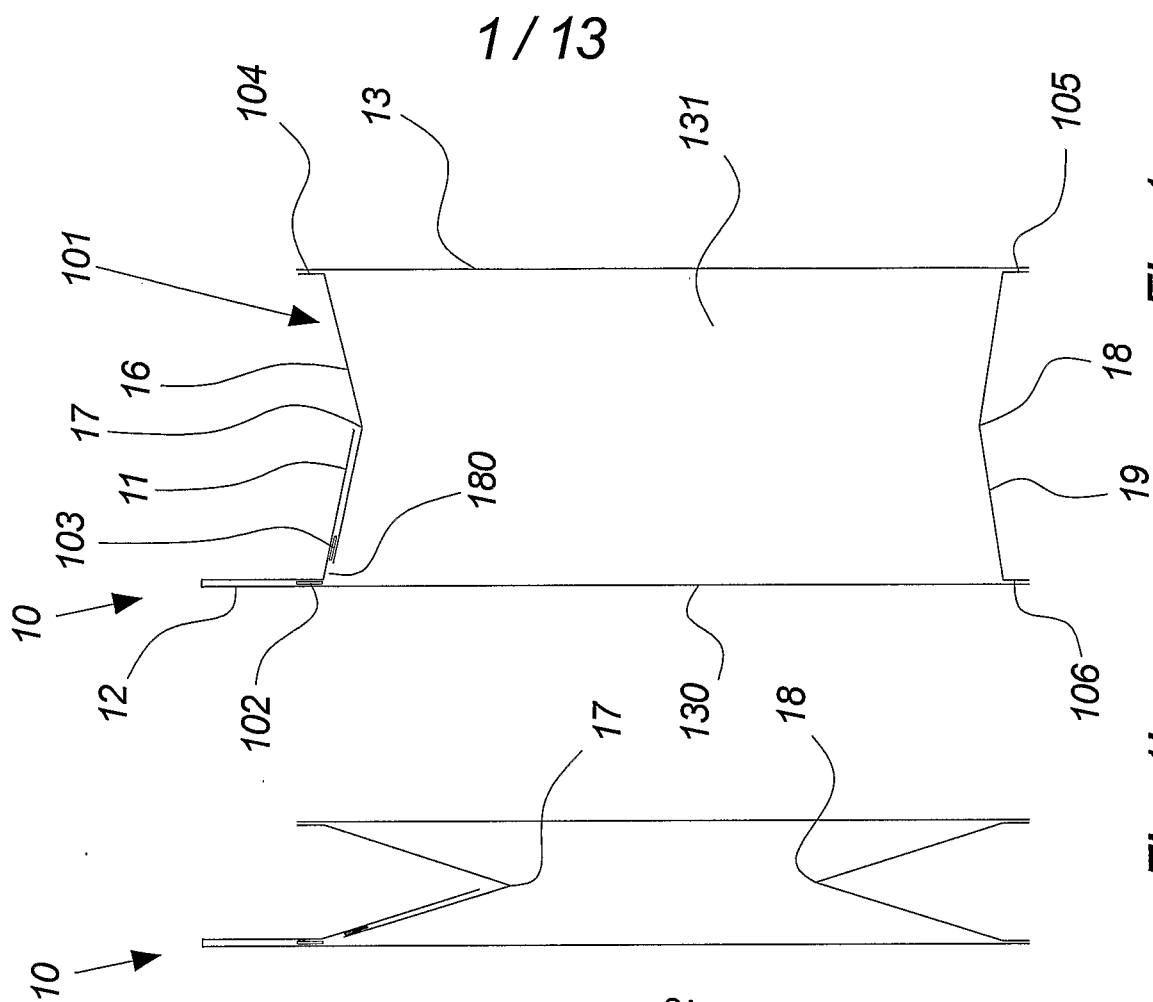


Fig. 1c

2 / 13

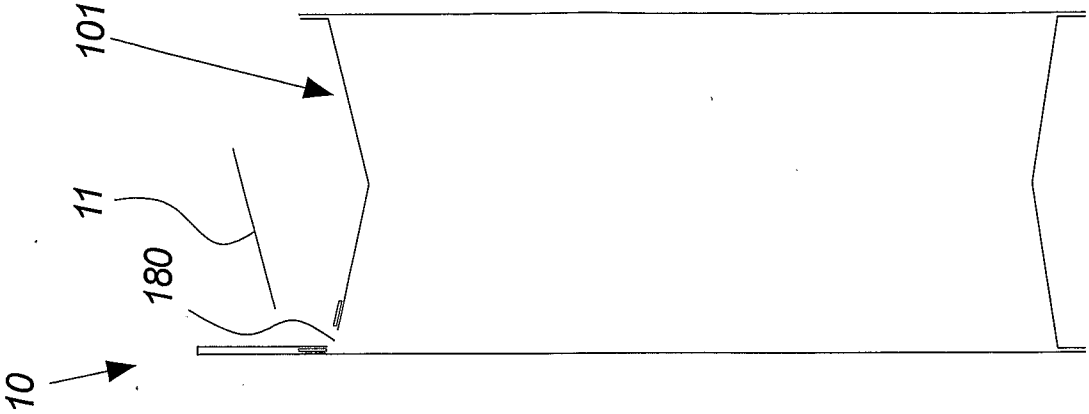


Fig. 1f

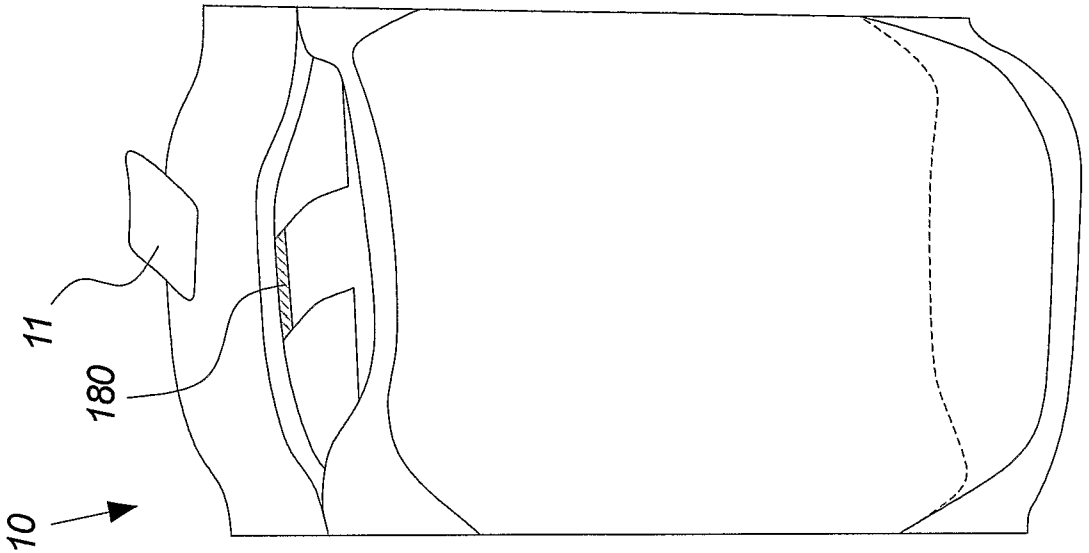


Fig. 1e

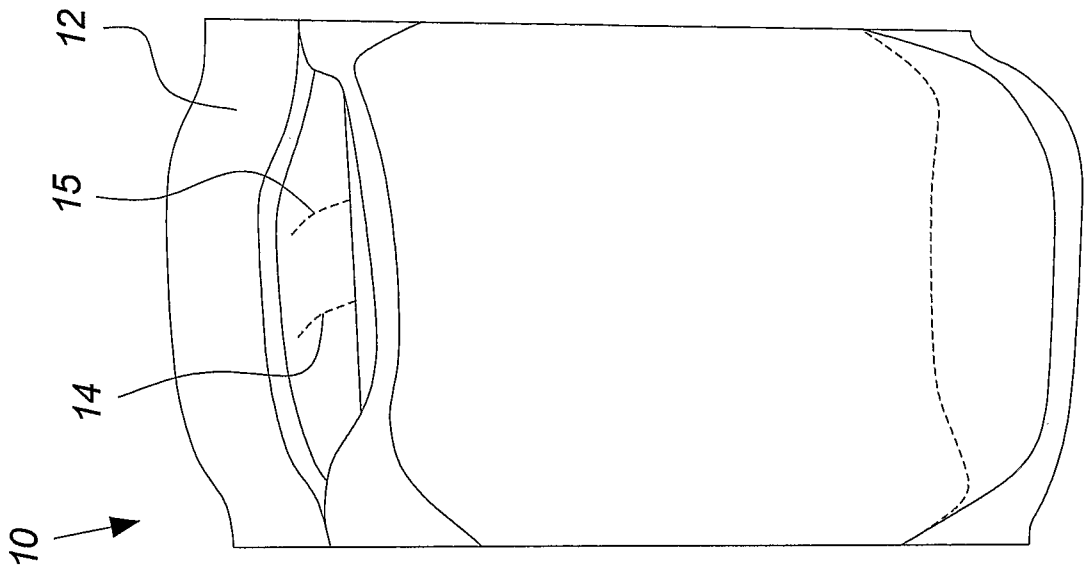
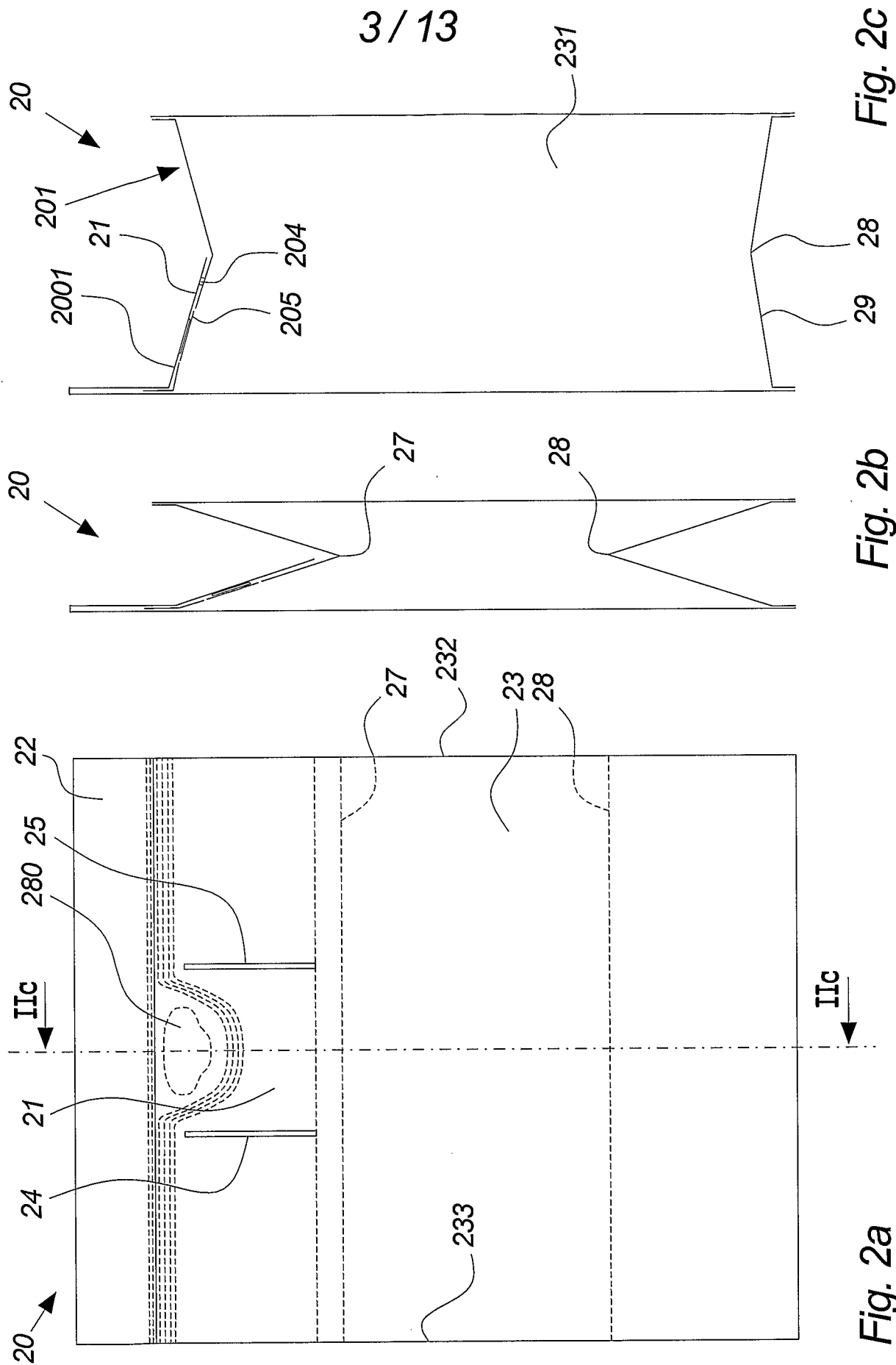


Fig. 1d



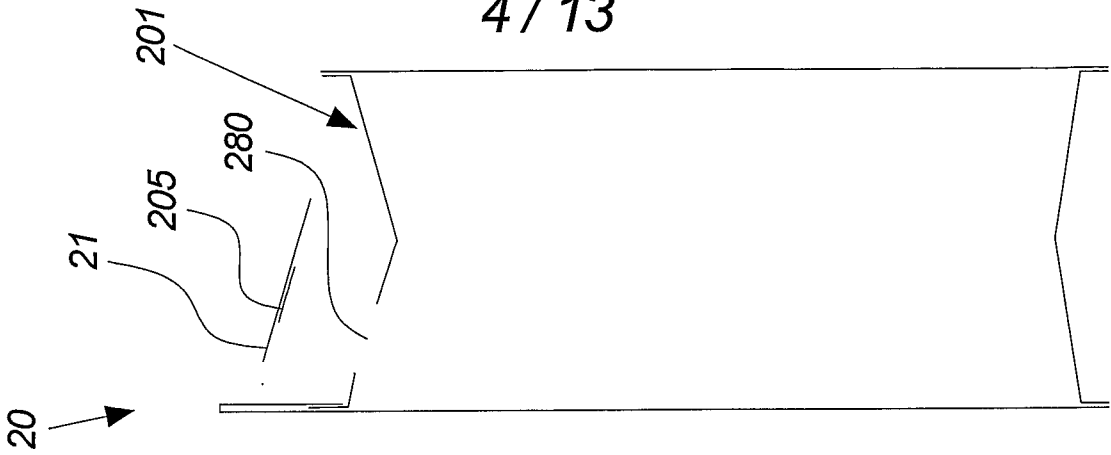


Fig. 2f

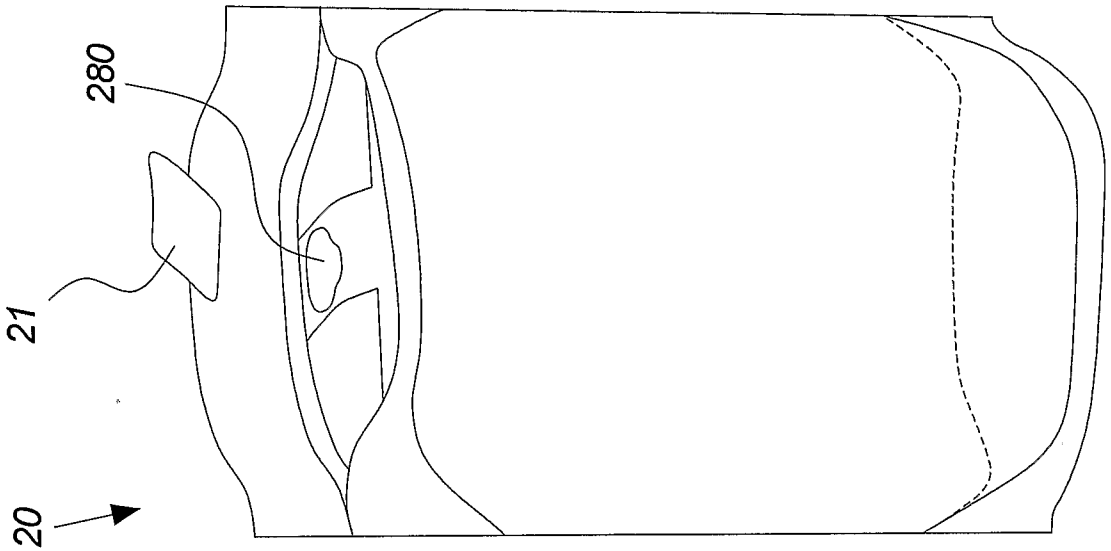


Fig. 2e

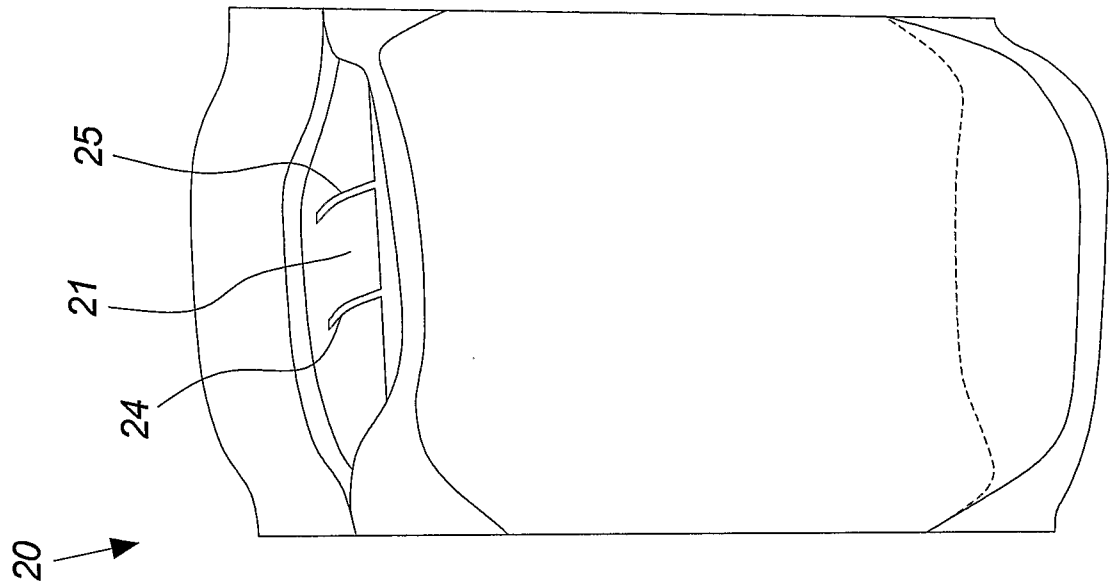


Fig. 2d

5 / 13

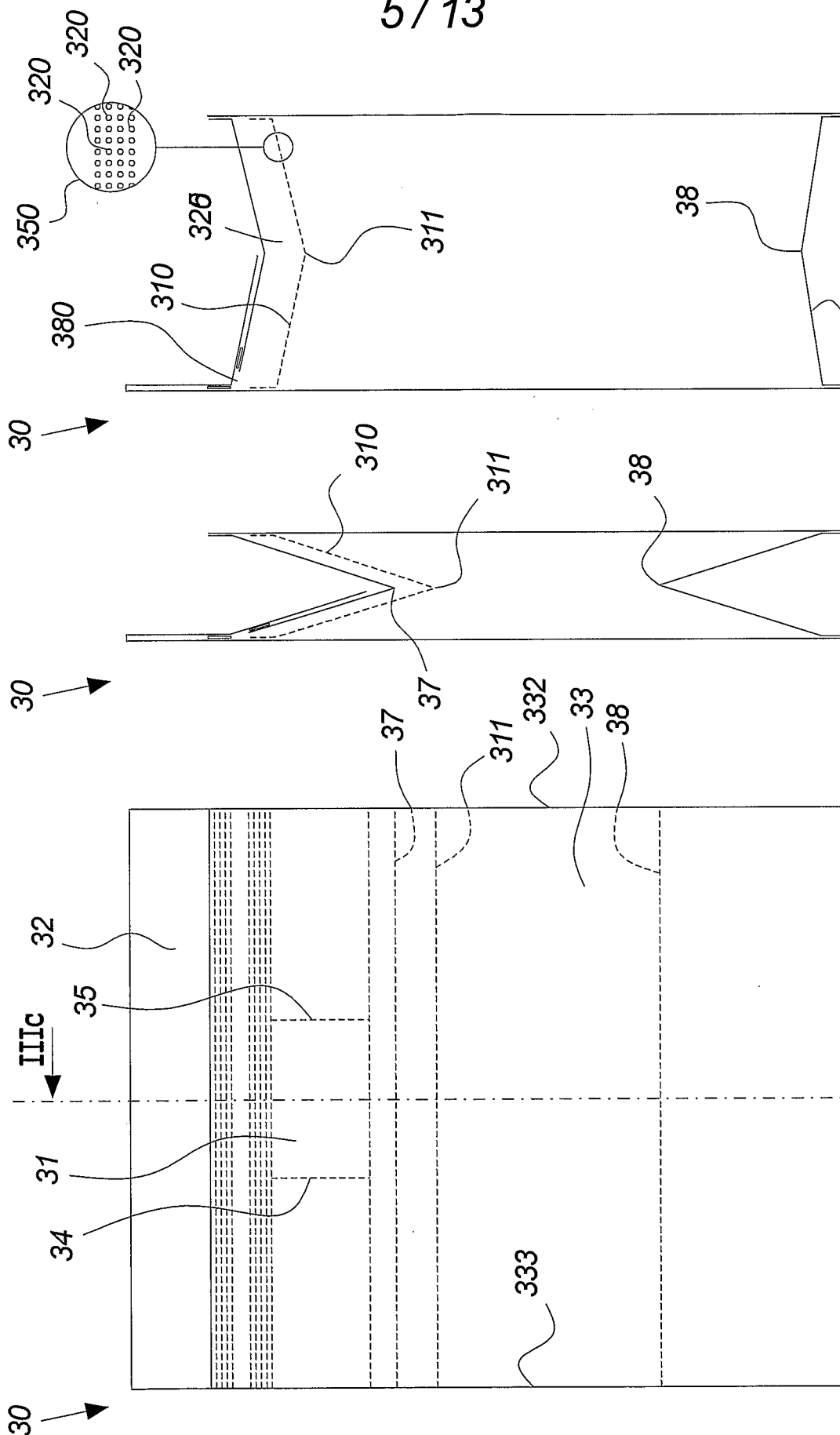


Fig. 3c

Fig. 3b

Fig. 3a

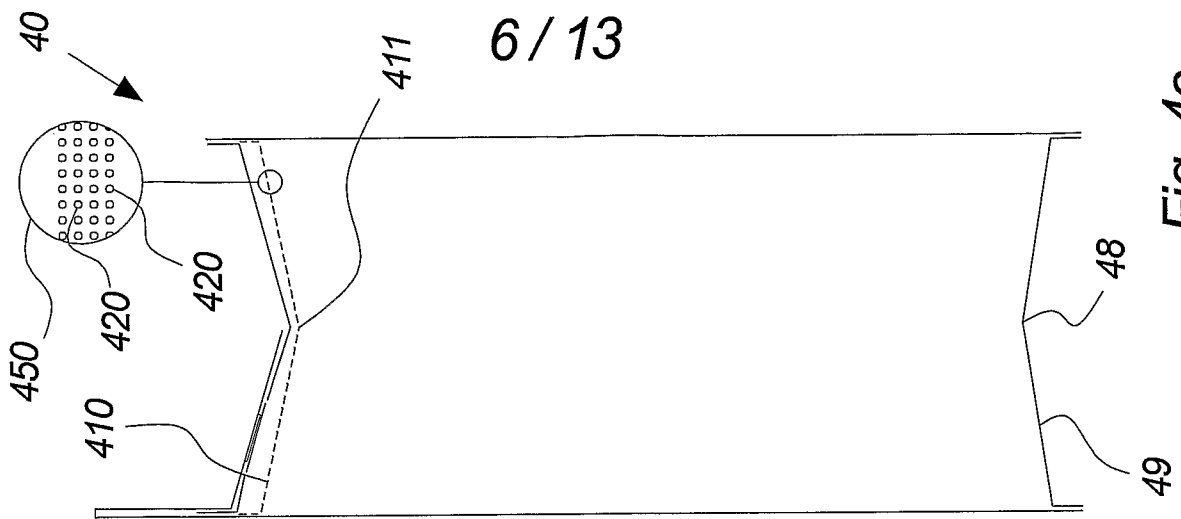


Fig. 4c

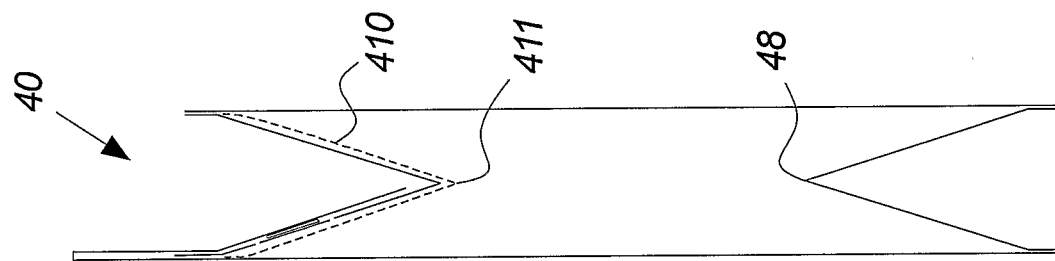


Fig. 4b

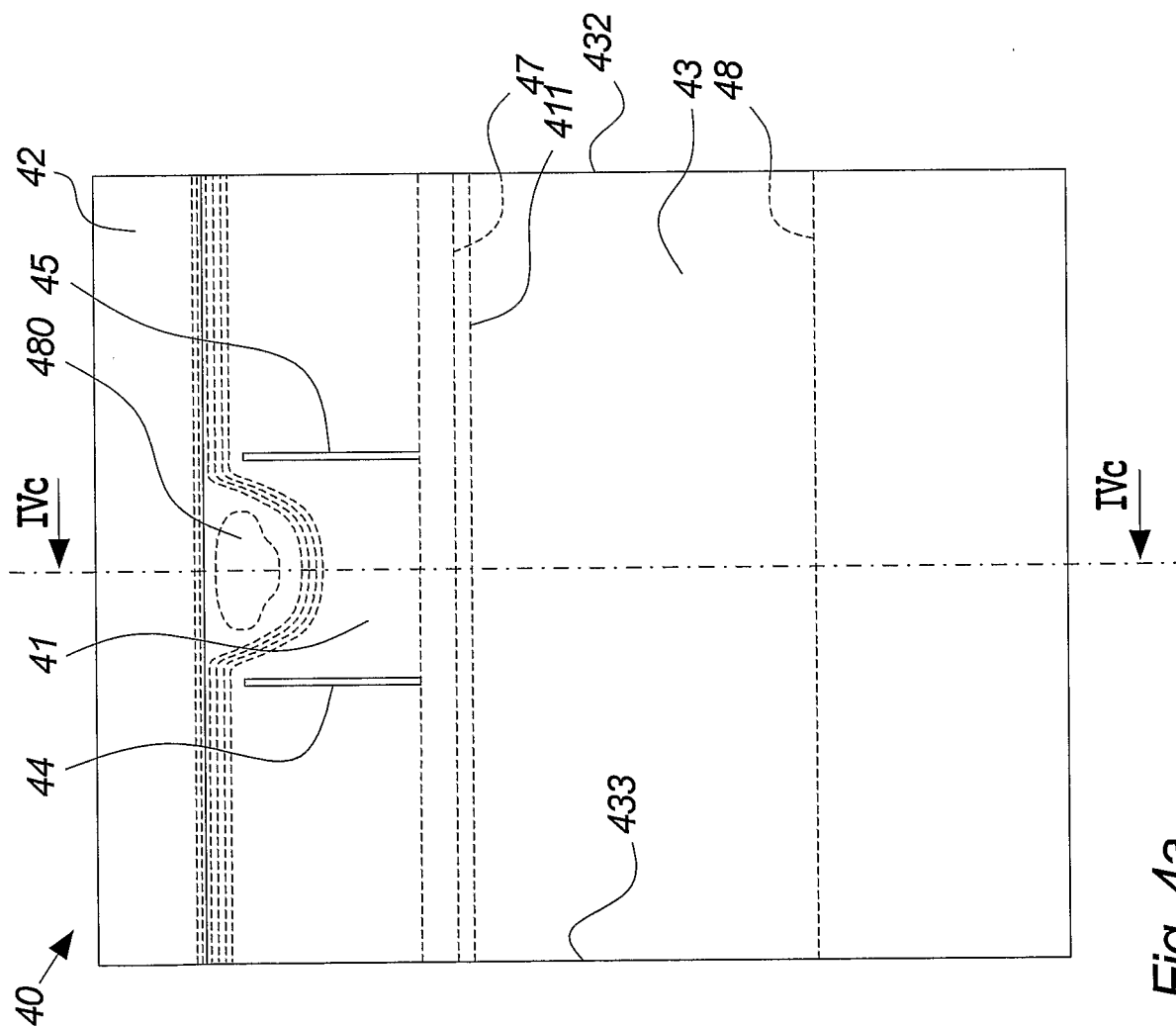


Fig. 4a

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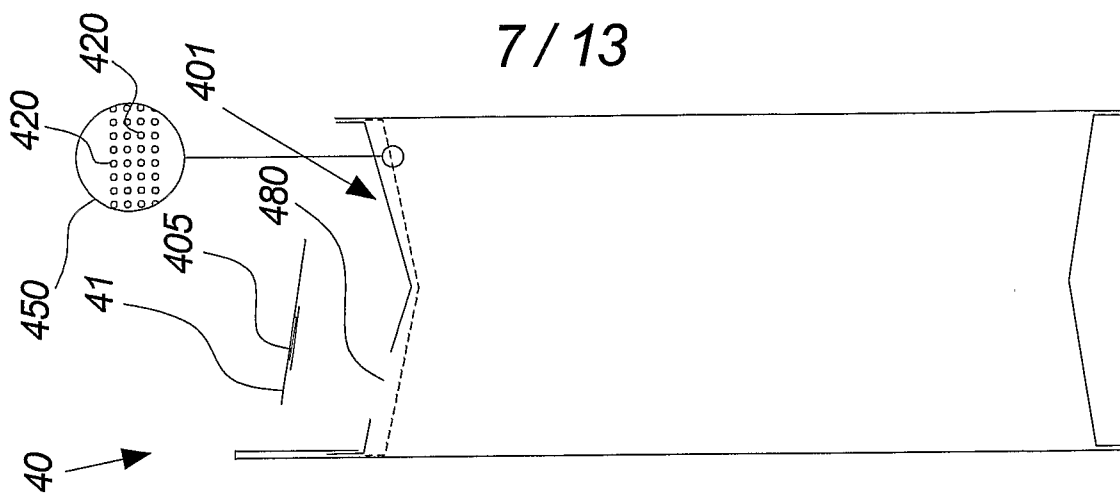


Fig. 4f

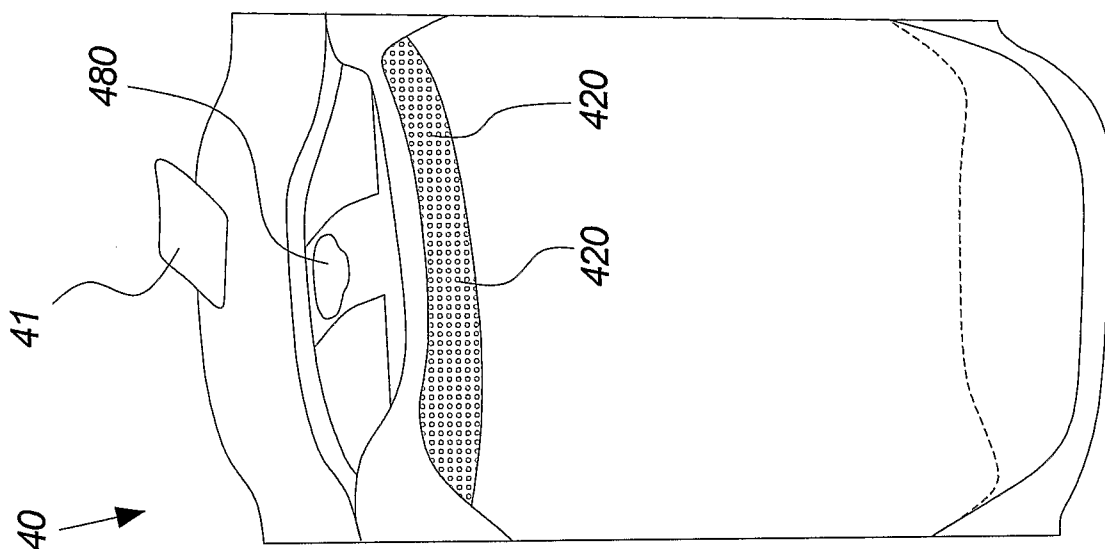


Fig. 4e

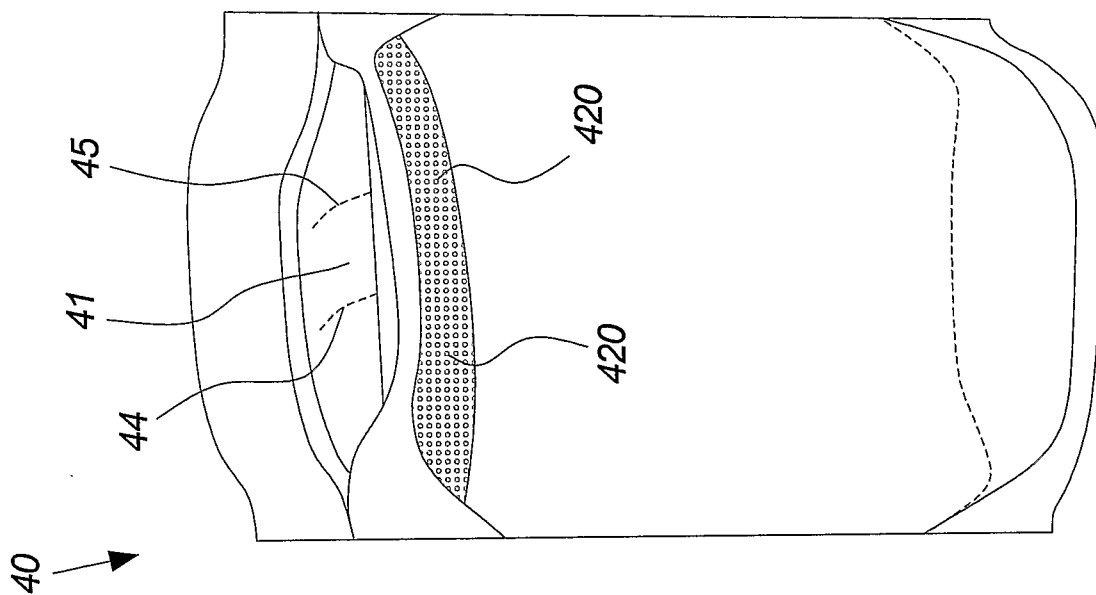


Fig. 4d

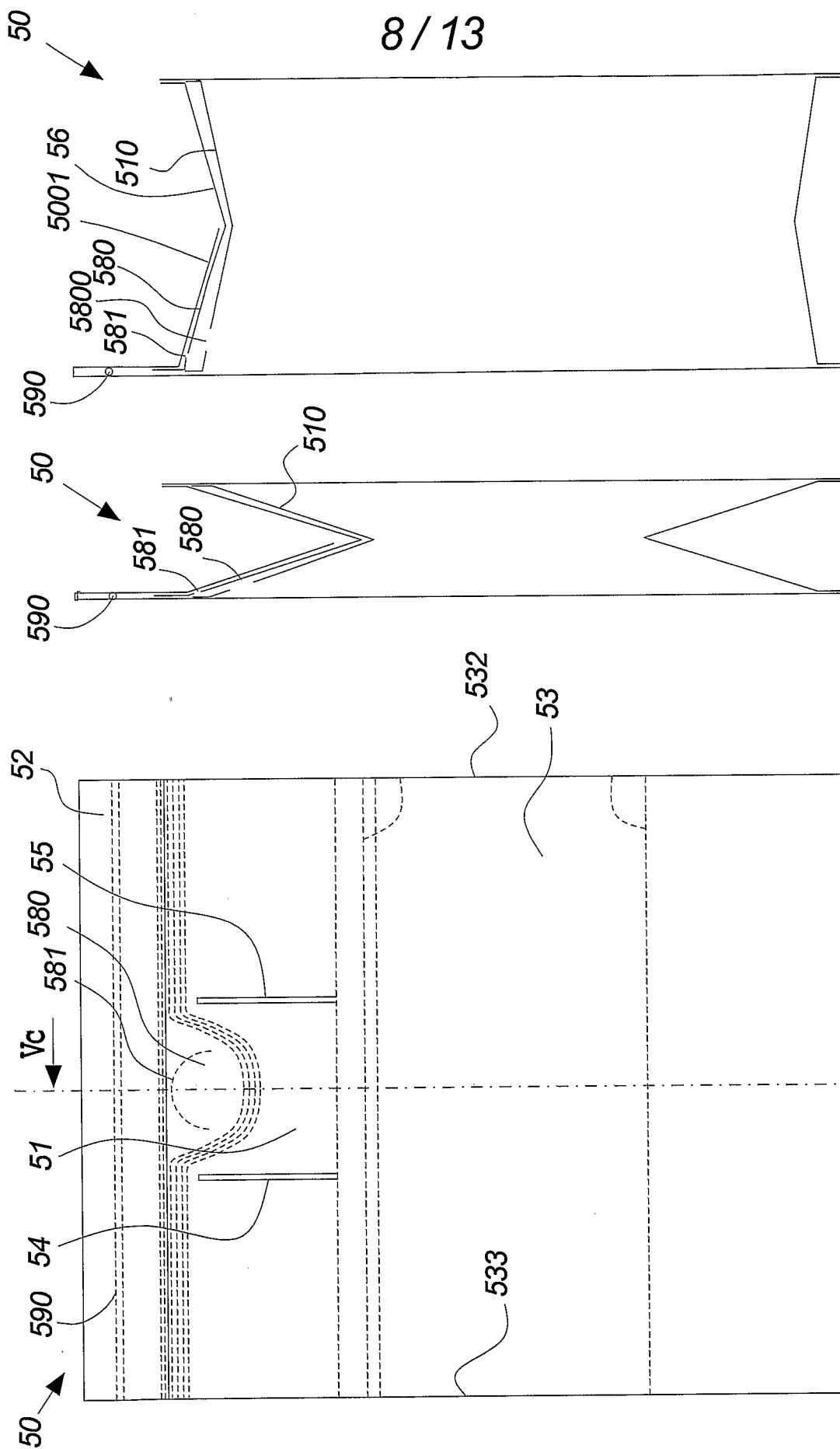


Fig. 5c

Fig. 5b

Fig. 5a

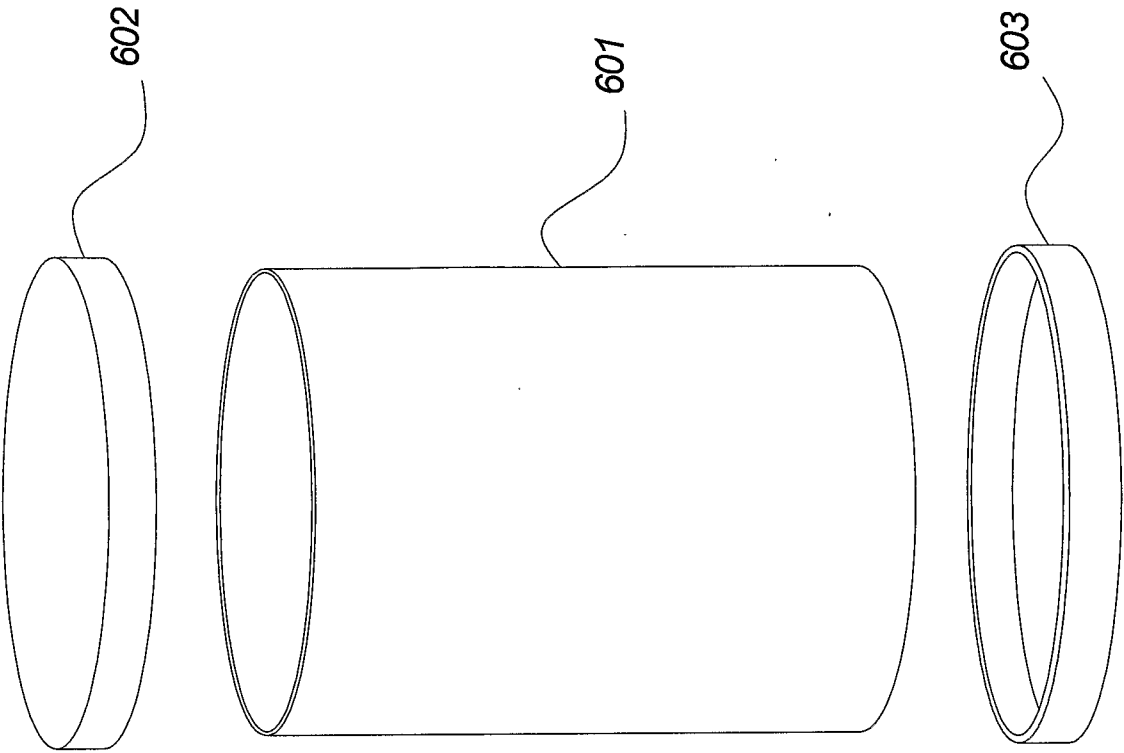


Fig. 6b

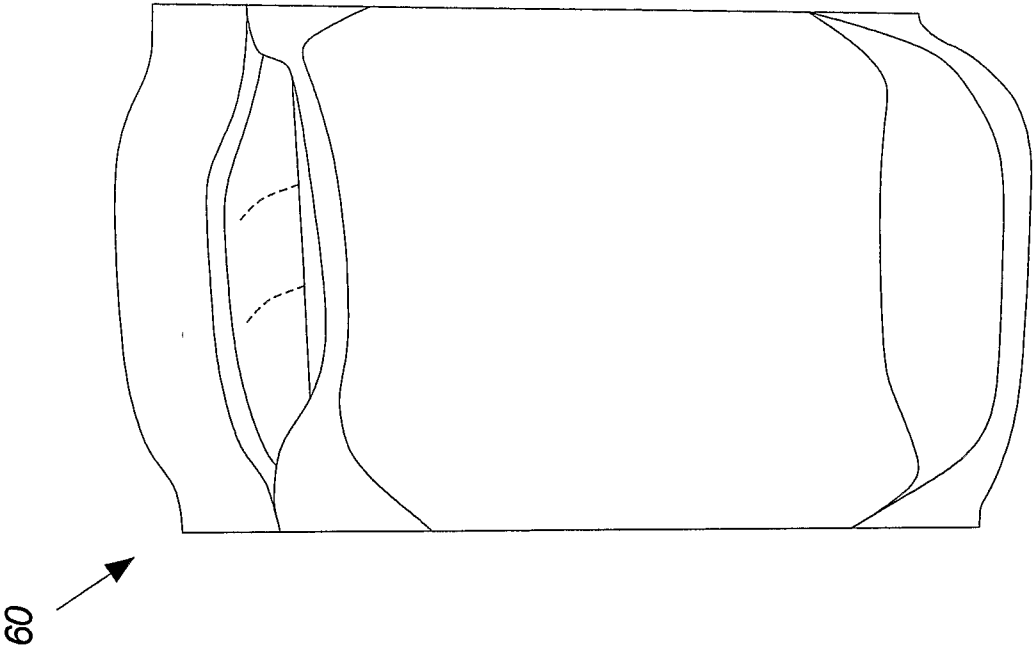
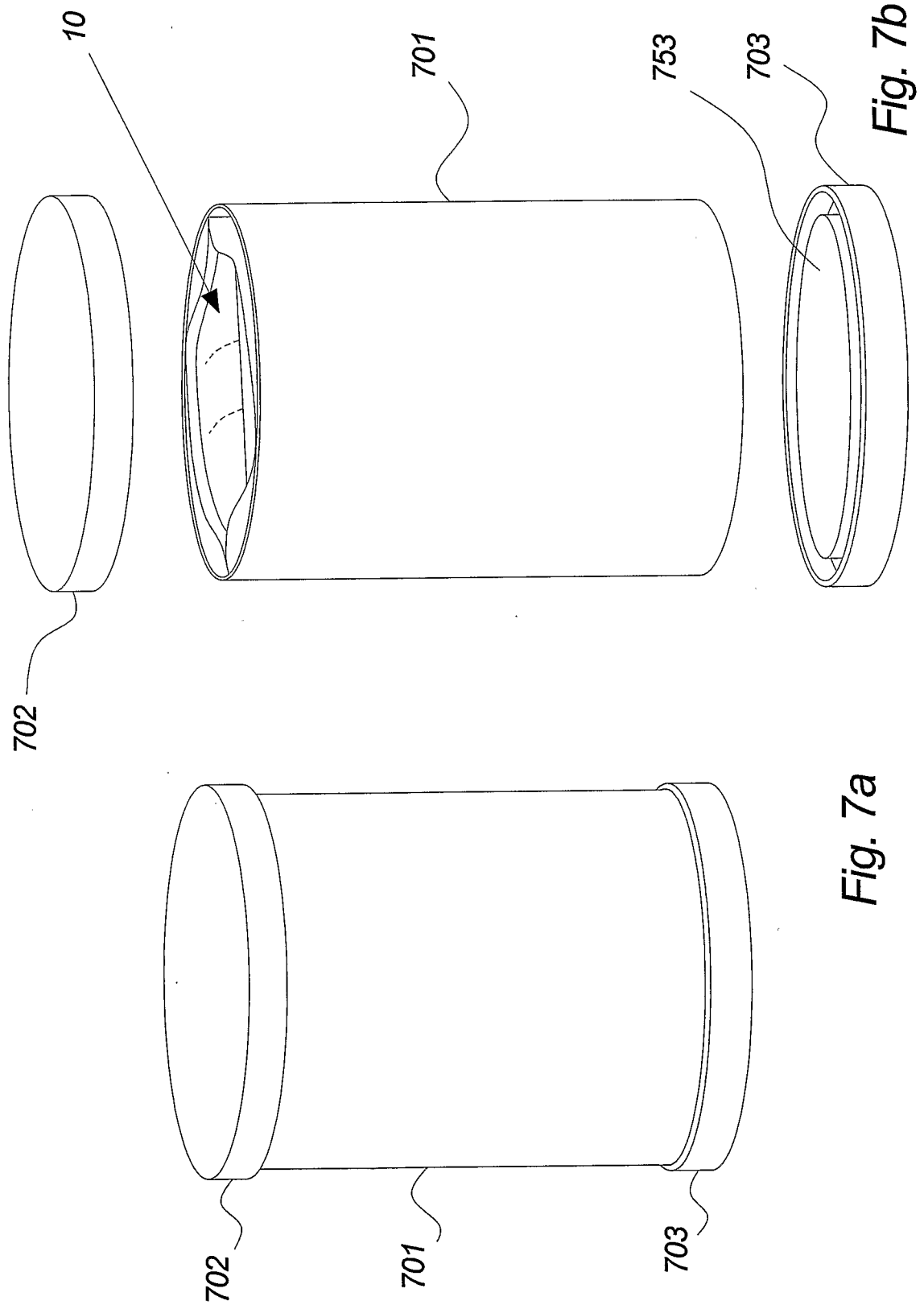


Fig. 6a

10 / 13



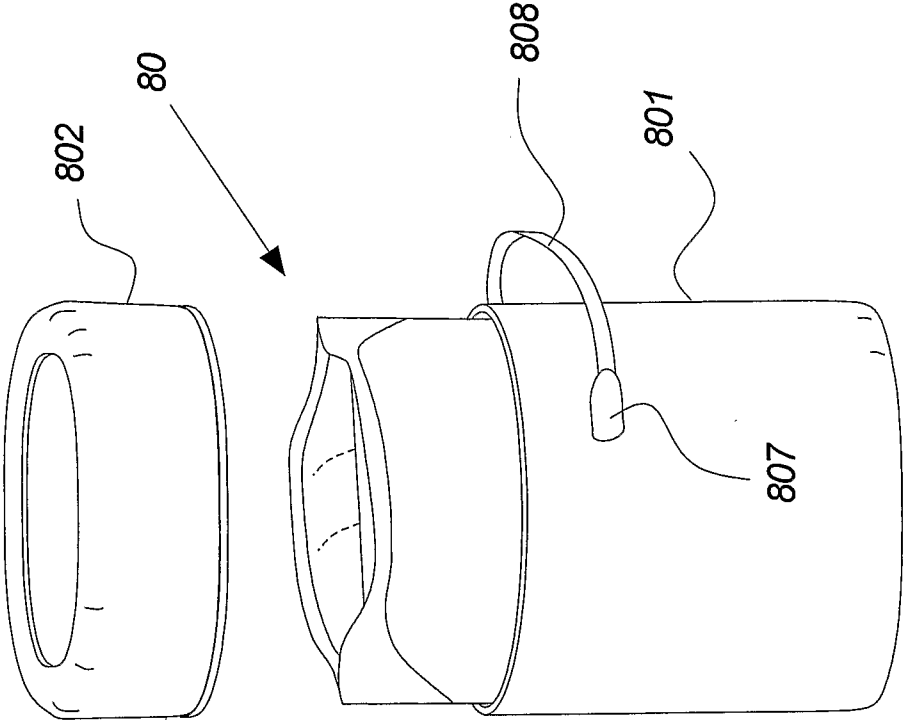


Fig. 8b

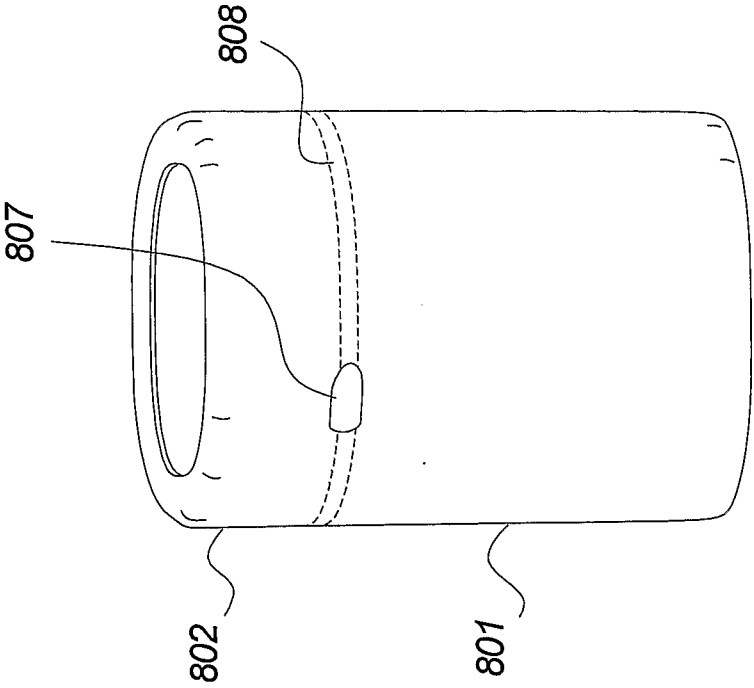


Fig. 8a

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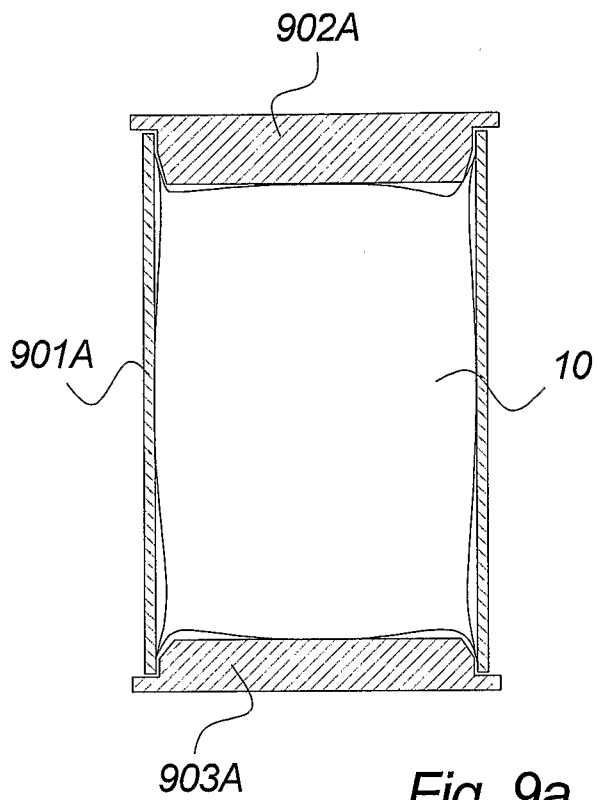


Fig. 9a

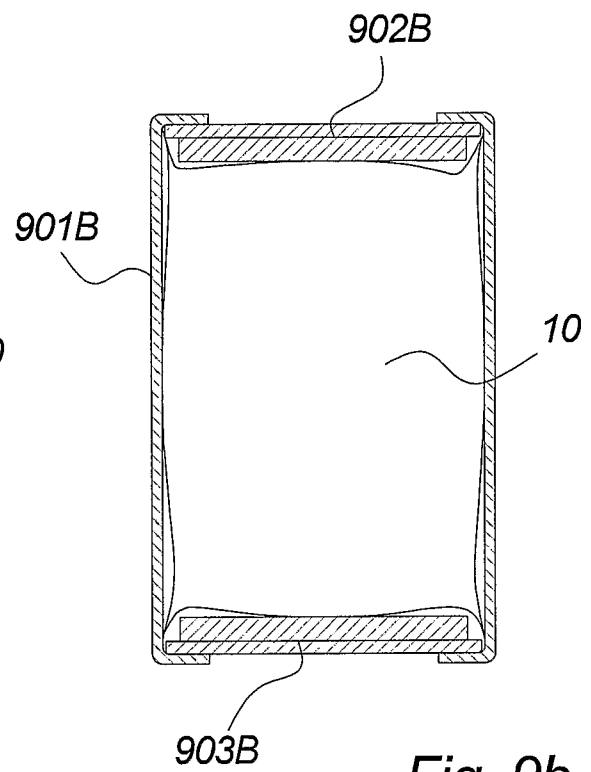


Fig. 9b

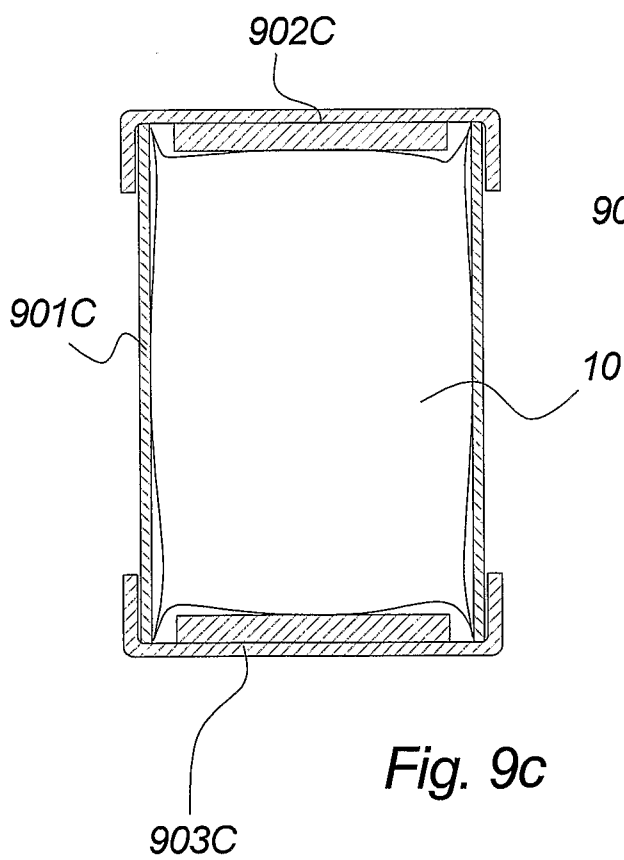


Fig. 9c

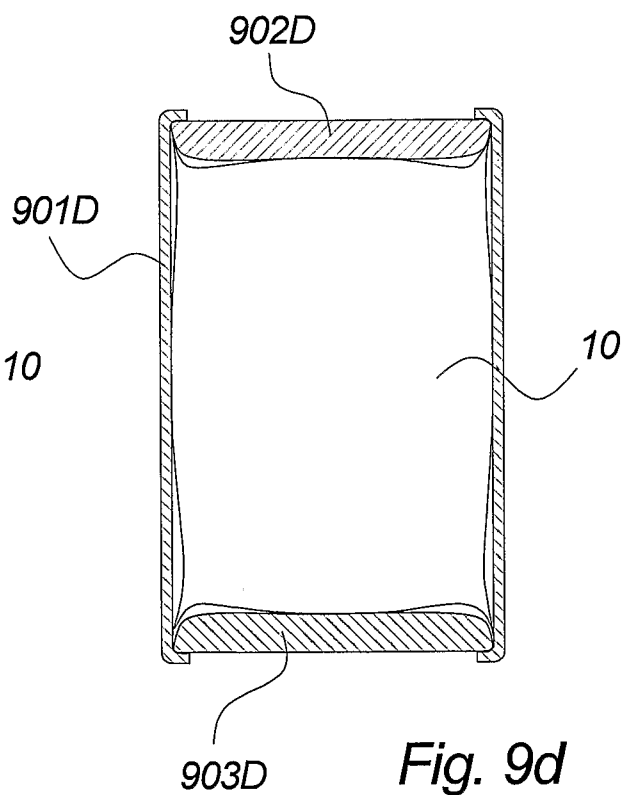
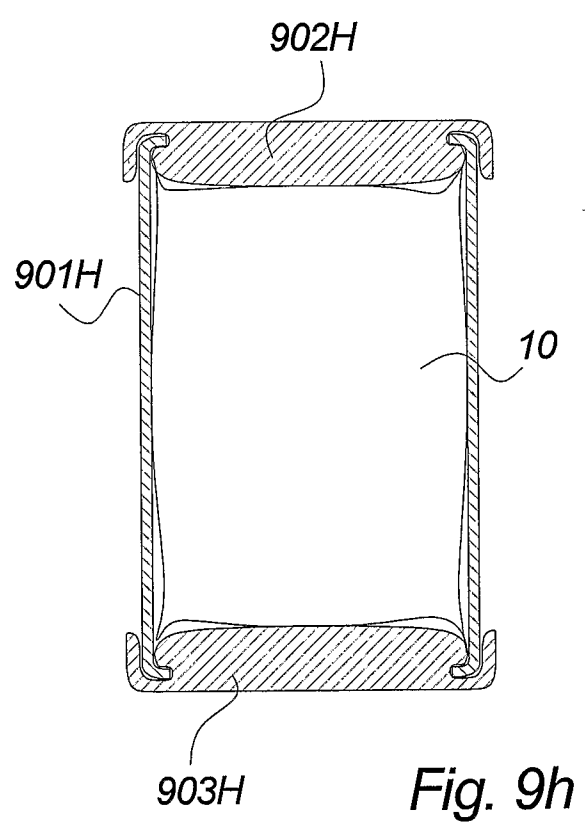
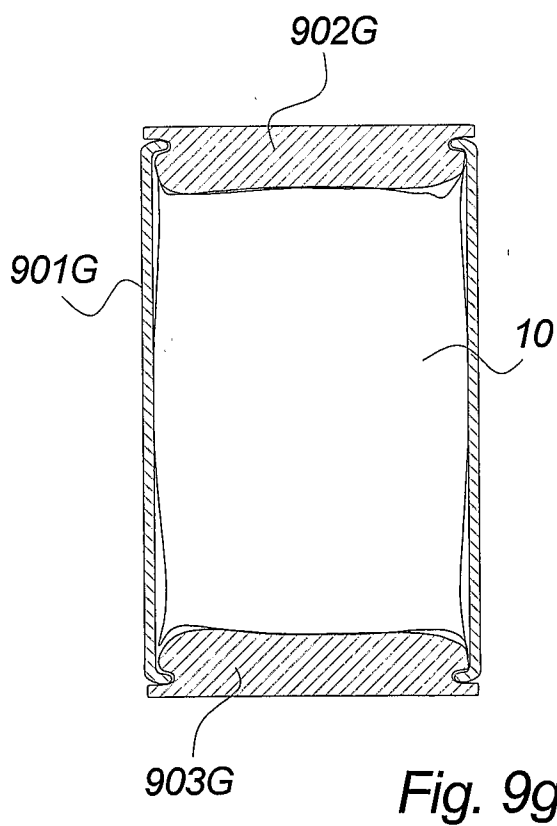
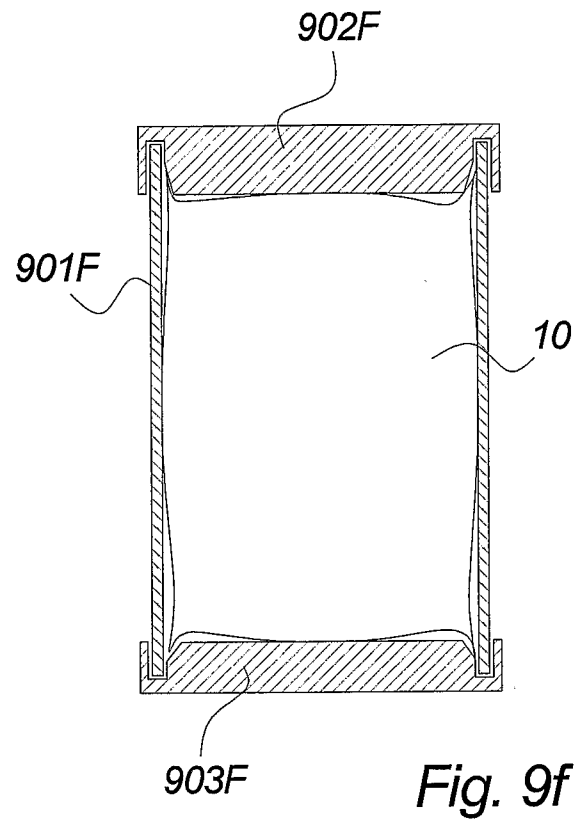
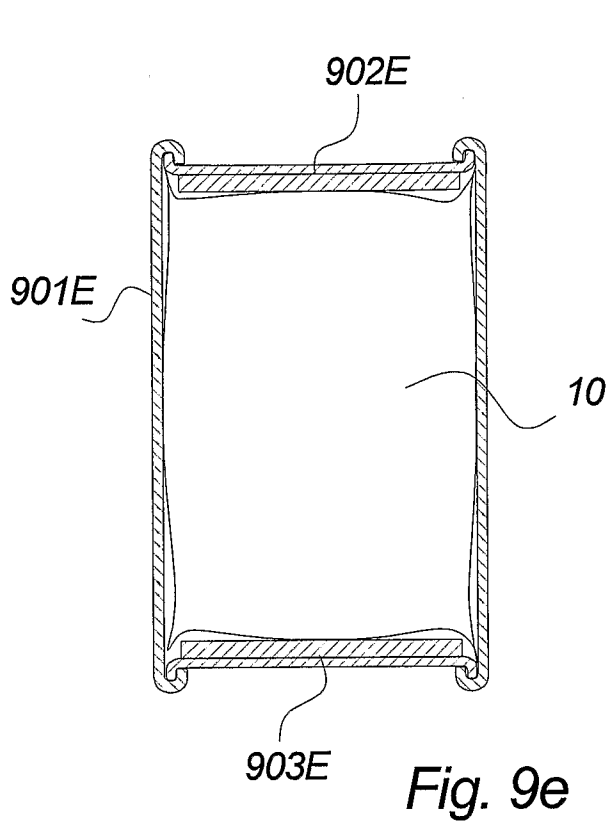


Fig. 9d

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INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2005/000814

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D75/58

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 310 262 A (ROBISON ET AL) 10 May 1994 (1994-05-10) the whole document	1-44, 52-59, 71-81
X	W0 2004/110885 A (AROMA SYSTEM SRL; VECCHIETTI, SERGIO) 23 December 2004 (2004-12-23) figure 7	1-18,23, 27,32, 52-59, 71-81
X	GB 2 024 772 A (DEUTSCHE SI SI WERKE GMBH) 16 January 1980 (1980-01-16) the whole document	1-44, 52-59, 71-81
	- / - -	

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

22 September 2006

Date of mailing of the international search report

09. 02. 2007

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Authorized officer

Pollet, Didier

INTERNATIONAL SEARCH REPORT

International application No

PCT/DK2005/000814

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2004/131286 A1 (ROSEN AKE) 8 July 2004 (2004-07-08) paragraphs [0025], [0026], [0031]; figures 1-3 -----	1-44, 52-59, 71-81
X	US 4 998 668 A (RAUSING ET AL) 12 March 1991 (1991-03-12) column 5, line 46 - line 65; figures 1,3,4 -----	1-44, 52-59, 71-81
X	CA 2 349 067 A1 (LAFOND, LUC MARCEL) 29 November 2002 (2002-11-29) page 7, line 15 - page 9, line 28; figure 1 -----	1-44, 52-59, 71-81
X	US 2004/238550 A1 (STEFANDL ROLAND E) 2 December 2004 (2004-12-02) paragraphs [0025], [0031]; figures 2,6 -----	1-44, 52-59, 71-81
X	EP 0 945 361 A (GOGLIO, LUIGI) 29 September 1999 (1999-09-29) paragraphs [0016] - [0018]; figures 1,2 -----	1-44, 52-59, 71-81
X	DE 196 12 633 A1 (AMANN, OTMAR, 83365 NUSDORF, DE) 2 October 1997 (1997-10-02) abstract; figures 1,2 -----	1-44, 52-59, 71-81

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK2005/000814

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-44, 52-59, 71-81

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-44,52-59,71-81

Disposable beverage can formed at least partly by a flexible film material having a pull-tab opener formed in the top surface.

2. claims: 1, 45-51

Disposable beverage can formed at least partly by a flexible film material having a pull-tab opener formed in the top surface and a barrier arrangement (see figs. 3-5).

3. claims: 1,60-70,82

Disposable beverage can formed at least partly by a flexible film material having a pull-tab opener formed in the top surface and an outer support arrangement (see figs. 6-9).

4. claims: 83-86

Disposable can comprising carbonated drinks wherein said can is comprised by less than 50% by weight of material.

5. claims: 1,83,87-90

Disposable can having a certain volume prior to filling with liquid or subsequent to emptying of liquid.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/DK2005/000814

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