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(54) **A package and a material for forming said package**

(57) A package (100, 200, 300) for enclosing a food product is provided. The package comprises a hollow body (110, 210, 310) of a packaging laminate extending from a closed bottom end (112, 212, 312) towards an upper end (114, 214, 314), and a top portion (120, 220, 320) of a polymeric material being connected along its periphery to said upper end (112, 212, 312) of said hollow body (110, 210, 310) for closing said package (100, 200, 300), wherein said periphery of said top portion (120, 220, 320) is defining a planar shape having an hourglass shape.

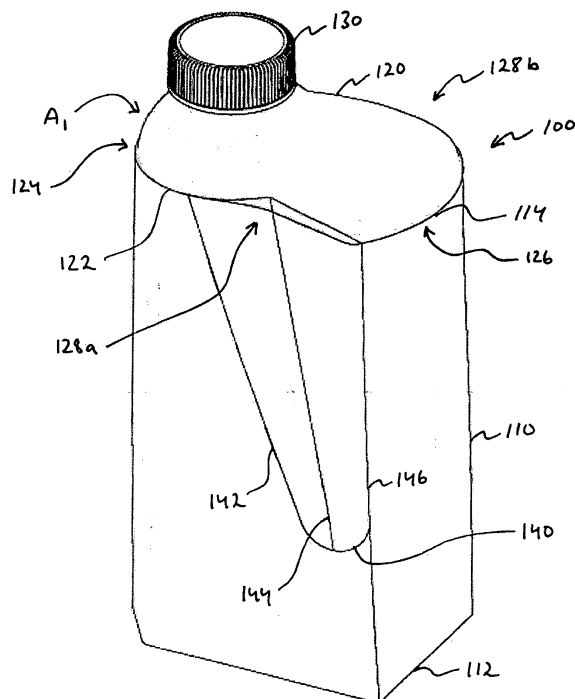


Fig. 1

Description

Technical Field

[0001] The invention relates to the field of packages for storing food products. More particularly, the invention relates to packages being formed at least to some extent by a packaging material.

Background of the invention

[0002] Within the food industry, it is common practice to pack liquid and partly liquid food products in packages manufactured from a packaging laminate comprising a core layer of paper or paperboard and one or more barrier layers of, for example, plastic or aluminum foil.

[0003] A common packaging type is manufactured in a packing and filling machine in which blanks of a packaging material are formed into tube forms which are then sealed at one end by means of a top of thermoplastic material that is injection molded direct on an open end portion. After the package is filled through the open bottom end, the bottom end is sealed and folded. The blanks of packaging material may for example be cut from a magazine reel of packaging laminate.

[0004] Methods for assembling such packages are well known and several methods are subject to granted patents or pending applications in the name of the applicant.

[0005] A package of the above described type typically comprises a body of packaging material being cylindrical or having another form showing a symmetrical cross-section, and a convex top of thermoplastic material, which top is equipped with an opening mechanism for providing discharge of the enclosed product.

[0006] Such package encounters a number of disadvantages. A particular problem occurs when the size of the package is increased, e.g. to 1 to 2 liters. For such volumes, the longitudinal body of packaging material will have a large cross-sectional area leaving it hard or even impossible for some users to hold the package with only one hand. Hence, prior art packages suffer from cumbersome handling capabilities.

Summary

[0007] It is, therefore, an object of the present invention to overcome or alleviate the above-described problems.

[0008] Another object of the present invention is to provide a user-friendly package, also for packages enclosing a volume of e.g. 2 liters.

[0009] A further object of the present invention is to provide a package that allows the user to easily understand how the package should be held during discharge.

[0010] An idea according to the present invention is to provide a package that exhibits a handle integrally formed with the package.

[0011] A yet further idea is to construct the handle such

that an increased robustness is achieved when the package encloses a large amount of product, and such that the robustness is decreased as the package is emptied.

[0012] A further idea is to provide a package which allows users having differently sized hands to manoeuvre the package comfortable.

[0013] A still further idea is to provide a package wherein a flexible body is conforming to the shape of a more rigid top portion. Hence, the flexible body may be made of a more environmental friendly material, while at the same time its shape is ensured.

[0014] According to a first aspect of the invention, a package for enclosing a food product is provided. The package comprises a hollow body of a packaging laminate extending from a closed bottom end towards an upper end, and a top portion of a polymeric material being connected along its periphery to said upper end of said hollow body for closing said package, wherein said periphery of said top portion is defining a planar shape having an hourglass shape. This is advantageous in that a handle is provided showing a sufficient stability when the package is filled as well as when the package is almost empty without the use of excess material.

[0015] The planar shape may be symmetrical.

[0016] The top portion may comprise a reclosable opening for allowing food product being enclosed inside said package to be discharged through said opening. The opening may be arranged off-center on said top portion. Hence, the user may be directed in how to hold the package for optimum performance during discharge of enclosed food product.

[0017] The cross-section of the closed bottom end of said hollow body may have a shape being different from the planar shape being defined by the periphery of said top portion. This allows flexible design, still providing advantageous functionality and robustness.

[0018] The top portion may be made of HDPE, which is preferred since the top portion may be injection molded by well-known processes.

[0019] Each one of two lateral sides of the hollow body may comprise a crease line arrangement for assisting the lateral sides to conform to the shape of the upper end of the hollow body being formed by means of the top portion.

[0020] The crease line arrangement may extend from a lower region of the hollow body to the upper end, wherein said lower region is arranged between the bottom end and said upper end. The crease line arrangements are advantageous since they provide better conformity between the hollow body and the top portion, which means that the integral or recessed handle is made more distinct.

[0021] The hollow body may be made of a packaging laminate.

[0022] According to a second aspect of the invention, a blank made of a packaging material comprising pre-formed crease lines is provided. The blank is configured such that it forms a package according to the first aspect of the invention when its lateral sides are sealed together

to form a hollow body and a bottom section of said hollow body is sealed to form a closed bottom end, when it is folded along the pre-formed crease-lines, and when it is connected to a top portion of a polymeric material.

[0023] An upper end of the hollow body may be adapted to coincide with said periphery of said top portion defining a planar shape having an hourglass shape.

[0024] According to a third aspect of the invention, a method for forming a package according to the first aspect of the invention is provided. The method comprises the steps of providing the hollow body by sealing two lateral ends of a blank, closing one end of said hollow body by injection molding the top portion onto the upper end of said hollow body, filling said hollow body with a food product, and closing the package by sealing the bottom end of said package.

[0025] According to a fourth aspect of the invention, a package for enclosing a food product is provided. The package comprises a hollow body of a packaging laminate extending from a closed bottom end towards an upper end, and a top portion of a polymeric material being connected along its periphery to said upper end of said hollow body for closing said package, wherein said closed bottom end is defining a planar surface having a D-shape.

[0026] This is advantageous in that the package may be held comfortably, as the fingers of a user's hand may follow the smooth curvature of the hollow body, defined at its lower end as a D-shape. A D-shape is hereby defined as a planar shape having two corners in a first end and three or more corners in the second end. Thus, a package having a bottom D-shape may thus have a main body having two folding/creasing lines coinciding with the two corners of the first end such that a package with the properties of a rectangular parallelepiped in one end and with properties of a cylinder formed package in the other end is provided.

[0027] The closed bottom end may have a back side, a front side, and two lateral sides connecting the front side to the back side, wherein the back side extends between two corners, and the front side extends between four corners. Hence, facilitated folding is provided.

[0028] The periphery of said top portion may define a planar shape having an hourglass shape. The planar shape may be symmetrical. This is advantageous in that a handle is provided showing a sufficient stability when the package is filled as well as when the package is almost empty without the use of excess material.

[0029] The top portion may comprise a reclosable opening for allowing food product being enclosed inside said package to be discharged through said opening. Said opening may be arranged off-center on said top portion. Hence, the user may be directed in how to hold the package for optimum performance during discharge of enclosed food product.

[0030] The cross-section of the closed bottom end of said hollow body may have a shape being different from the planar shape being defined by the periphery of said

top portion. This allows flexible design, still providing advantageous functionality and robustness.

[0031] The top portion may be made of HDPE, which is preferred since the top portion may be injection molded by well-known processes.

[0032] Each one of two lateral sides of the hollow body may comprise a crease line arrangement for assisting the lateral sides to conform to the shape of the upper end of the hollow body being formed by means of the top portion.

[0033] The crease line arrangement may extend from a lower region of the hollow body to the upper end, wherein said lower region is arranged between the bottom end and said upper end. The crease line arrangements are advantageous since they provide better conformity between the hollow body and the top portion, which means that the integral or recessed handle is made more distinct.

[0034] The hollow body may be made of a packaging laminate.

[0035] According to a fifth aspect of the invention, a blank made of a packaging material comprising pre-formed crease lines is provided. The blank is configured such that it forms a package according to the fourth aspect of the invention when its lateral sides are sealed together to form a hollow body and a bottom section of said hollow body is sealed to form a closed bottom end, when it is folded along the pre-formed crease-lines, and when it is connected to a top portion of a polymeric material.

[0036] According to a sixth aspect of the invention, a method for forming a package according to the fourth aspect of the invention is provided. The method comprises the steps of providing the hollow body by sealing two lateral ends of a blank, closing one end of said hollow body by injection molding the top portion onto the upper end of said hollow body, filling said hollow body with a food product, and closing the package by sealing the bottom end of said package.

[0037] An hourglass shape should in this context be interpreted broadly as a shape being defined by a closed loop having a waist. For example, an hourglass shape includes a continuous parametric curve, which when observed in 2D coordinates starts at a first point, and continues in the presented order to a local maximum, a local minimum, a local maximum, and to a turning point, at which the curve changes direction and returns to the starting point via a local maximum, a local minimum, and a local maximum in said order.

Brief description of the drawings

[0038] The above, as well as additional objects, features and advantages of the present invention, will be better understood through the following illustrative and non-limiting detailed description of preferred embodiments of the present invention, with reference to the appended drawings, wherein:

Fig 1 is a perspective view of a package according to a first embodiment.

Fig 2 is a top view of the package shown in Fig 1.

Fig 3 is a perspective view of a package according to a further embodiment.

Fig. 4 is a perspective view of a package according to a yet further embodiment.

Fig. 5 is a top view of a blank of packaging material according to an embodiment.

Fig. 6 is a view from below of the package shown in Fig. 1.

Detailed description of preferred embodiments

[0039] With reference to Figs. 1 and 2, a first embodiment of a package 100 is shown. The package 100 has a hollow body being made of a packaging laminate 110 and extending from a closed bottom end 112 towards an upper end 114. The upper end 114 is closed by means of a top portion 120 made of a thermoplastic material, such as HDPE (high density polyethylene). The top member 120 has a convex shape for allowing a smooth transition between the hollow body 110 and the top portion 120.

[0040] The top portion 120 is defined by its periphery 122, to which the upper end 114 of the hollow body 110 is attached. The periphery 122 is forming a closed loop having a front side 124, a back side 126, and two lateral sides 128a, b.

[0041] The front side 124 of the periphery 122 may have a shape of an arc A_1 of a first circle, while the back side 126 can have a shape of an arc A_2 of a second circle. In this particular embodiment, the radius of the first circle corresponding to the arc A_1 is smaller than the radius of the second circle corresponding to the arc A_2 . Each one of the two lateral sides 128a, b is extending from an endpoint of the arc A_1 to an endpoint of the arc A_2 in a curved direction, such that the periphery 122 of the top portion 120 is forming an hourglass shape. Hence, the width of the top portion 120 exhibits a minimum, or a waist, somewhere between the front side 124 and the back side 126.

[0042] The top portion 120 can include an opening mechanism 130 which may be arranged off-center towards the front side 124. The opening mechanism 130 may be a screw cap, a snap-locking cap or any other reclosable mechanism known per se.

[0043] The top portion 120 is made of a material being more rigid than the packaging laminate of the hollow body 110. Hence, the upper end 114 of the packaging laminate will adapt to the permanently shaped periphery of the top portion 120.

[0044] The hollow body 110 may have a closed bottom end 112, of which the bottom surface, i.e. the surface facing the support surface when the package is standing, has a shape that differs from the shape of the periphery of the top portion 120. This allows the bottom end 112 to be shaped by folding along predefined crease lines, while the top portion 120 may have rounded corners for in-

creasing the appeal to the user.

[0045] When folding the bottom end 112, the most simple shape to be achieved is a rectangle having perpendicular corners. However, due to e.g. tensile stress within the packaging material, it is advantageous if the shape of the bottom end to some extent conforms to the shape of the upper end 114, i.e. the shape of the periphery 122 of the top portion 120. This may be achieved by adding crease lines such that perpendicular corners are avoided. In the embodiment shown in Fig. 1 and 2, the front side of the bottom end 112 has three faces being angled relative each other, while the back side has only one. This configuration is advantageous in that the bottom end 112 is conforming to the upper end 114 such that the tensile stress within the hollow body 110 is reduced. Hence, as the arc A_1 of the front side has a small radius, this is compensated by the multi-edge front side of the bottom end 112. Contrary to this, as the arc A_2 of the back side has a larger radius, it does not need to be compensated leaving a single edge back side of the bottom end 112. A further advantage with the provision of multi edge sides is that sterilisation agents may more easily reach the interior corners, which allows for a more thoroughly sterilisation process.

[0046] Hence, the gripable portion of the package, i.e. the hollow body 110, has a polygonal bottom and an hourglass shaped upper end 114. The waist of the hourglass shape will thus contribute to the formation of a handle integrally formed within the hollow body 110, which structure being increasingly pronounced as the upper end 114 is approaching.

[0047] The lateral sides of the bottom end 112 are both single edge sides, and the hollow body 110 further comprises a crease line arrangement 140 for allowing the lateral sides of the hollow body 110 to conform to the periphery 122 of the top portion 120.

[0048] As is shown in Fig. 1, the crease line arrangement 140 has three lines 142, 144, 146 extending from a lower region adjacent to the back side of the hollow body 110 to the upper end 114. The crease lines are diverging, such that the distance between the crease lines 142, 144, 146 are increasing when the upper end 114 is approaching.

[0049] The backmost crease line 146 can coincide with the crease line forming the border between the back side and the lateral side of the hollow body 110. The backmost crease line 146 may be vertical or angled towards the front side 124. The centermost crease line 144 can extend substantially straight from the lower region to the position of the periphery 122 having the smallest width. The frontmost crease line 142 is extending vertically and diverging from the centermost crease line 144 from the lower region to the end position of the arc A_1 of the front side 124 of the top portion 120.

[0050] The crease line arrangement 140 is preferably identical on both sides of the package, and the top portion 120 is preferably symmetrical along an axis extending from the front side 124 to the back side 126.

[0051] The hourglass shape of the top portion 120 allows for an increased functionality and stability of the package 100, as an integral handle is formed within the package 100. The recessed portion along the hollow body 110 being formed by means of the hourglass shape of the top portion 120 is suitable to receive the fingers of a user, i.e. a thumb on one side and the resulting fingers on the opposite side. The recessed portion is further emphasized by the additional crease line arrangement 140.

[0052] When the package 100 is completely filled with a food product, the enclosed food product is creating a resistance against the recessed portion being further recessed when a user grasps the package. In the same way, when the package is almost empty, there is no longer a food product to resist the pressing force of the user. Hence, by determining the shape of the top portion as a function of the dimensions of the package, the robustness of the packaging laminate, as well as the physical properties of the food product to be enclosed, a package may be provided having an integral handle which is formed by a minimum of material costs, while still providing a sufficient rigidity relative the weight of the package.

[0053] In Figs. 3 and 4 alternative embodiments of a package are shown. With reference to Fig. 3, the package 200 comprises a hollow body 210 being similar to the hollow body 110 of the package 100 shown in Fig. 1. The hollow body 210 extends from a closed bottom end 212 to an upper end 214 being attached to a top portion 220. The top portion 220 is defined by its periphery 222 having a front side 224, a back side 226, and two lateral sides 228a, b connecting the front side 224 to the back side 226. The top portion 220 is symmetrical along two axes X and Y, thus leaving the arcs defining the front side 224 and the back side 226 of the periphery 222 as mirrored copies.

[0054] The hollow body 210 comprises a crease line pattern 240 on each one of the lateral sides. Each crease line arrangement 240 consists of a first line 242 arranged perpendicular to the longitudinal direction of the hollow body 200 and extending across the complete lateral side. Further, two crease lines 244a, b are arranged such that they coincide with the vertical lines forming the interface between the lateral side and the front side as well as the back side of the hollow body. Two additional crease lines 246a, b are provided, extending from the intersection between the transversal crease line 242 and the vertical crease lines 244a, b towards the center of the upper end 214.

[0055] The front side and the back side of the hollow body 210 also has a transversal crease line, arranged at the same height as the transversal crease line 242.

[0056] The bottom end 212 of the hollow body 210 is formed to adapt to the shape of the periphery 222 of the top portion 220. Hence, each one of the front side and the back side of the bottom end 212 is folded to a V-shape, thus reducing the tensile stress within the packaging laminate.

[0057] With reference to Fig. 4, the package 300 com-

prises a hollow body 310 being similar to the hollow body 110 of the package 100 shown in Fig. 1. The hollow body 310 extends from a closed bottom end 312 to an upper end 314 being attached to a top portion 320. The top portion 320 is defined by its periphery 322 having a front side 324, a back side 326, and two lateral sides 328a, b connecting the front side 324 to the back side 326. The top portion 320 is symmetrical along two axes X and Y, thus leaving the arcs defining the front side 324 and the back side 326 of the periphery 322 as mirrored copies. The top portion 320 further comprises an opening mechanism being arranged at the center of the top portion 320.

[0058] The hollow body 310 comprises a crease line pattern 340 on each one of the lateral sides. Each crease line arrangement 340 consists of a U-shaped line 342 arranged such that the legs of the U coincide with the vertical crease lines forming the interface between the lateral sides and the front side and the back side of the hollow body.

[0059] The bottom end 312 of the hollow body 310 is formed to adapt to the shape of the periphery 322 of the top portion 320. Hence, each one of the front side and the back side of the bottom end 312 is folded to a three edge side, thus reducing the tensile stress within the packaging laminate.

[0060] A blank 400 of packaging material is shown in Fig. 5. The blank 400 is provided to form a package according to what has previously been described with reference to Figs. 1 and 2. The blank 400 of packaging material has a first end 402, a second end 404 and two lateral ends 406, 408 extending between the first end 402 and the second end 404. The blank comprises a first set of crease lines 410 arranged at said first end 402, and a second set of crease lines 420 arranged at said second end 404, wherein said blank is sealable along the two lateral ends 406, 408 for forming a hollow body. The first set of crease lines 410 is disposed such that said first end 402 is forming a closed bottom end when said blank is sealed and folded along said first set of crease lines 410.

[0061] The second set of crease lines 420 may be disposed such that said second end 404 is assisted in conforming to an hourglass shape of a top portion.

[0062] Further, the first set of crease lines 410 may comprise a first configuration of crease lines 412 disposed such that a front side having four corners of the bottom end is formed when the blank is folded along the first disposition of crease lines 412.

[0063] The first set of crease lines 410 may comprise a second configuration of crease lines 414 disposed such that a back side having two corners of the bottom end is formed when the blank is folded along the second disposition of crease lines 414.

[0064] The first set of crease lines 410 and the second set of crease lines 420 may be arranged such that a longitudinal sealing formed when the two lateral ends 406, 408 are sealed to each other does not pass through the

first or second set of crease lines 410, 420.

[0065] Fig 6 illustrates an example of a bottom end 500, seen from below, of the package according to the first embodiment illustrated in fig 1 and 2 based on the blank illustrated in fig 5. For illustrative purposes the creasing lines are indicated by dotted lines.

[0066] A first end, which may be placed under a handle portion of the package, can be provided with two corners 502a, 502b, and a second end, which may be placed under a part of the top portion provided with an opening, can be provided with four corners 504a, 504b, 504c, 504d.

[0067] A first bottom sealing end 506 and a second bottom sealing end 508 can be folded inwardly towards a middle portion 510 of the bottom sealing.

[0068] A longitudinal sealing 512 of the package can be placed in an end of one of the lateral sides 128a,b of the package placed next to the backside of the bottom, which may be provided with four corners. An advantage of placing the longitudinal sealing in this end is that no longitudinal sealing is needed in the handle portion of the package. This is an advantage, since it is easier to form a handle portion of the hollow body of the package without the longitudinal sealing being present.

[0069] The invention has mainly been described above with reference to a few embodiments. However, as is readily appreciated by a person skilled in the art, other embodiments than the ones disclosed above are equally possible within the scope of the invention, as defined by the appended patent claims. It should further be noted that any reference to "front", "back", "upper", or "lower", etc., is only made for illustrative purpose and is by no means limiting the scope of the claims.

Claims

1. A package (100, 200, 300) for enclosing a food product, comprising a hollow body (110, 210, 310) of a packaging material extending from a closed bottom end (112, 212, 312) towards an upper end (114, 214, 314), and a top portion (120, 220, 320) of a polymeric material being connected along its periphery to said upper end (112, 212, 312) of said hollow body (110, 210, 310) for closing said package (100, 200, 300), wherein said periphery of said top portion (120, 220, 320) is defining a planar shape having an hourglass shape.
2. The package according to claim 1, wherein said planar shape is symmetrical.
3. The package according to claim 1 or 2, wherein said top portion (120, 220, 320) comprises a reclosable opening (130, 230, 330) for allowing food product being enclosed inside said package (100, 200, 300) to be discharged through said opening (130, 230,

330).

4. The package according to claim 3, wherein said opening (130, 230) is arranged off-center on said top portion (120, 220).
5. The package according to claim 4, wherein the top portion (110, 220, 320) has a front portion and a back portion being separated by means of a waist of the hourglass shape, wherein said opening (130, 230) is arranged at the front portion.
6. The package according to any one of the preceding claims, wherein the cross-section of the closed bottom end (112, 212, 312) of said hollow body (110, 210, 310) has a shape being different from the planar shape being defined by the periphery of said top portion (120, 220, 320).
7. The package according to any one of the preceding claims, wherein the top portion (110, 210, 310) is made of HDPE.
8. The package according to any one of the preceding claims, wherein each one of two lateral sides of the hollow body (110, 210, 310) comprises a crease line arrangement (140, 240, 340) for assisting the lateral sides to conform to the shape of the upper end (114, 214, 314) of the hollow body (110, 210, 310) being formed by means of the top portion (120, 220, 320).
9. The package according to claim 8, wherein the crease line arrangement (140, 240, 340) extends from a lower region of the hollow body (110, 210, 310) to the upper end (114, 214, 314), wherein said lower region is arranged between the bottom end (112, 212, 312) and said upper end (114, 214, 314).
10. The package according to any one of the preceding claims, wherein the hollow body (110, 210, 310) is made of a packaging laminate.
11. A blank (400) made of a packaging material comprising pre-formed crease lines, wherein the blank is configured such that it forms a package according to any one of claims 1 to 10 when its lateral sides are sealed together to form a hollow body and a bottom section of said hollow body is sealed to form a closed bottom end, when it is folded along the pre-formed crease-lines, and when it is connected to a top portion of a polymeric material.
12. The blank (400) according to claim 11, having a first end (402), a second end (404) and two lateral ends (406, 408) extending between the first end (402) and the second end (404), said blank comprising a first set of crease lines (410) arranged at said first end (402), wherein said blank is sealable along the

two lateral ends (406, 408) for forming a hollow body, said first set of crease lines (410) is disposed such that said first end (402) is forming a closed bottom end when said blank is folded along said first set of crease lines (410), and wherein the first set of crease lines (410) comprises 5
 a first configuration of crease lines (412) disposed such that a front side of the bottom end is formed when the blank is folded along the first disposition of crease lines (412), wherein said front side has at least three corners, and 10
 a second configuration of crease lines (414) disposed such that a back side of the bottom end is formed when the blank is folded along the second disposition of crease lines (414), wherein said back side has two corners. 15

13. The blank according to claim 12, wherein the first configuration of crease lines (412) is disposed such that a front side of the bottom end is formed when the blank is folded along the first disposition of crease lines (412), wherein said front side has at least three corners. 20
14. The blank according to claim 12 or 13, further comprising a second set of crease lines (420) arranged at said second end (404), wherein said second set of crease lines (420) is disposed such that said second end (404) is assisted in conforming to an hourglass shape of a top portion. 25 30
15. The blank according to claim 14, wherein the second set of crease lines (420) comprises a vertical crease line (146) and at least one crease line (142, 144) extending at an angle towards the bottom end (112) of the hollow body (110). 35
16. The blank according to any one of claims 12 to 15, wherein the first set of crease lines (410) and the second set of crease lines (420) are arranged such that a longitudinal sealing formed when the two lateral ends (406, 408) are connected to each other does not pass through the first or second set of crease lines (410, 420). 40 45
17. The blank according to claim 16, wherein the longitudinal sealing extends from the second end (404) to a corner of the front side of the bottom end.
18. A reel of packaging material comprising a continuous web having pre-formed crease lines, wherein the reel is configured such that a plurality of blanks according to any one claim 11 to 17 are formed when the continuous web is cut. 50 55
19. A method for forming a package according to any one of the preceding claims, comprising the steps of:

providing the hollow body (110, 210, 310) by sealing two lateral ends of a blank (400), closing one end of said hollow body by injection molding the top portion (120, 220, 320) onto the upper end (114, 214, 314) of said hollow body (110, 210, 310), filling said hollow body (110, 210, 310) with a food product, and closing the package by sealing the bottom end (112, 212, 312) of said package.

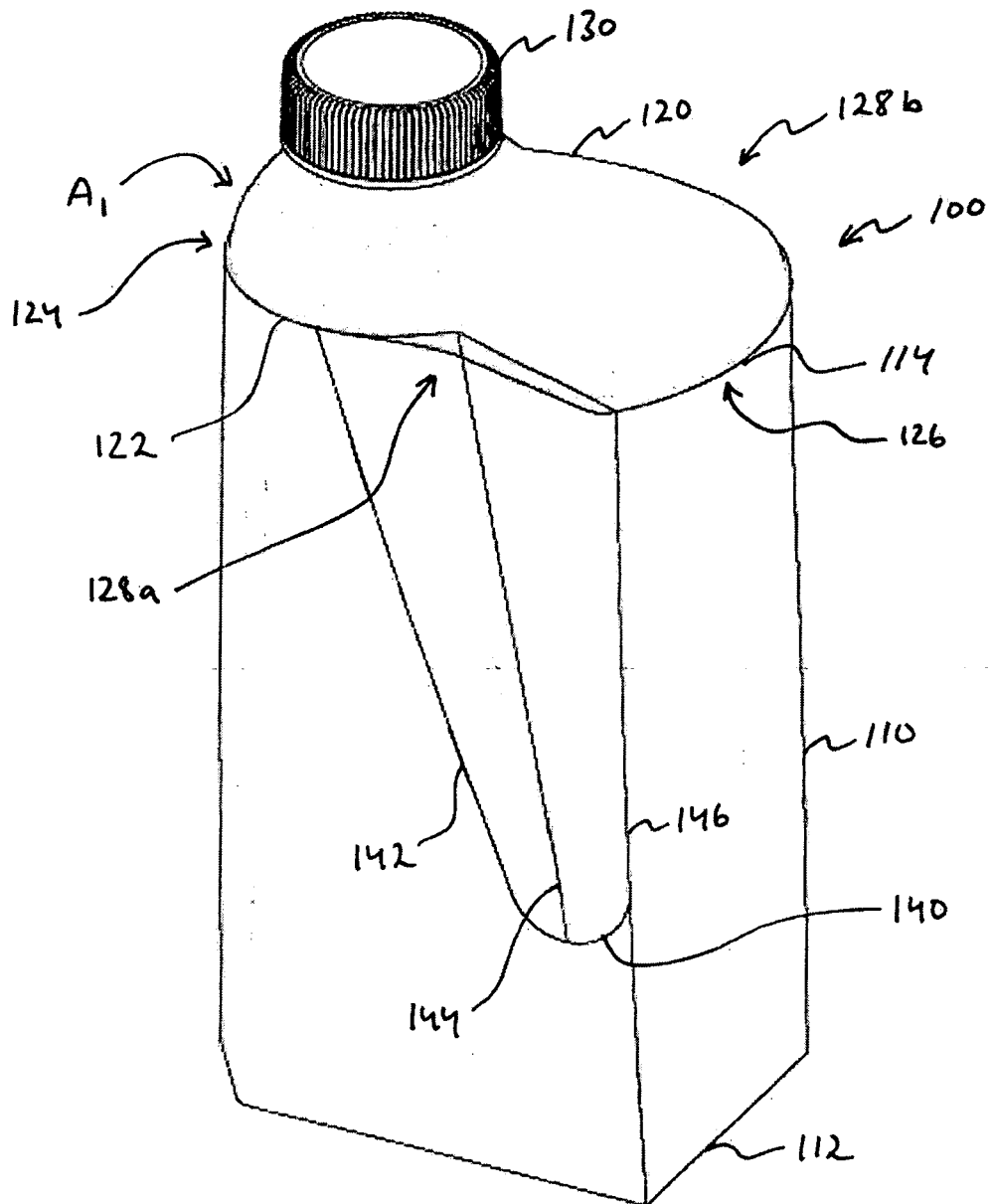


Fig. 1

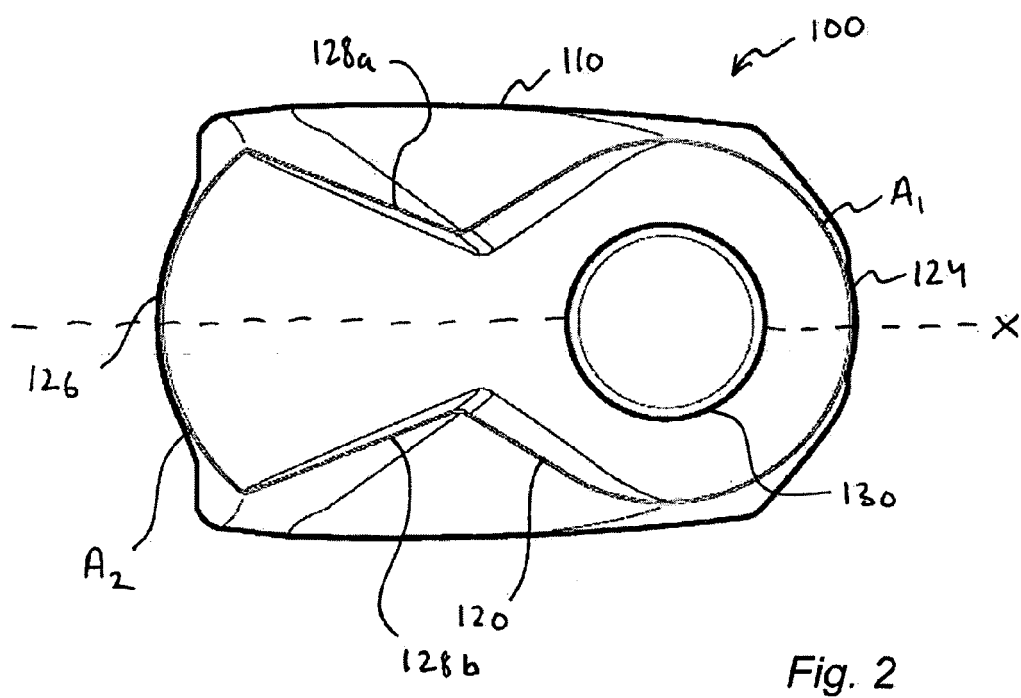


Fig. 2

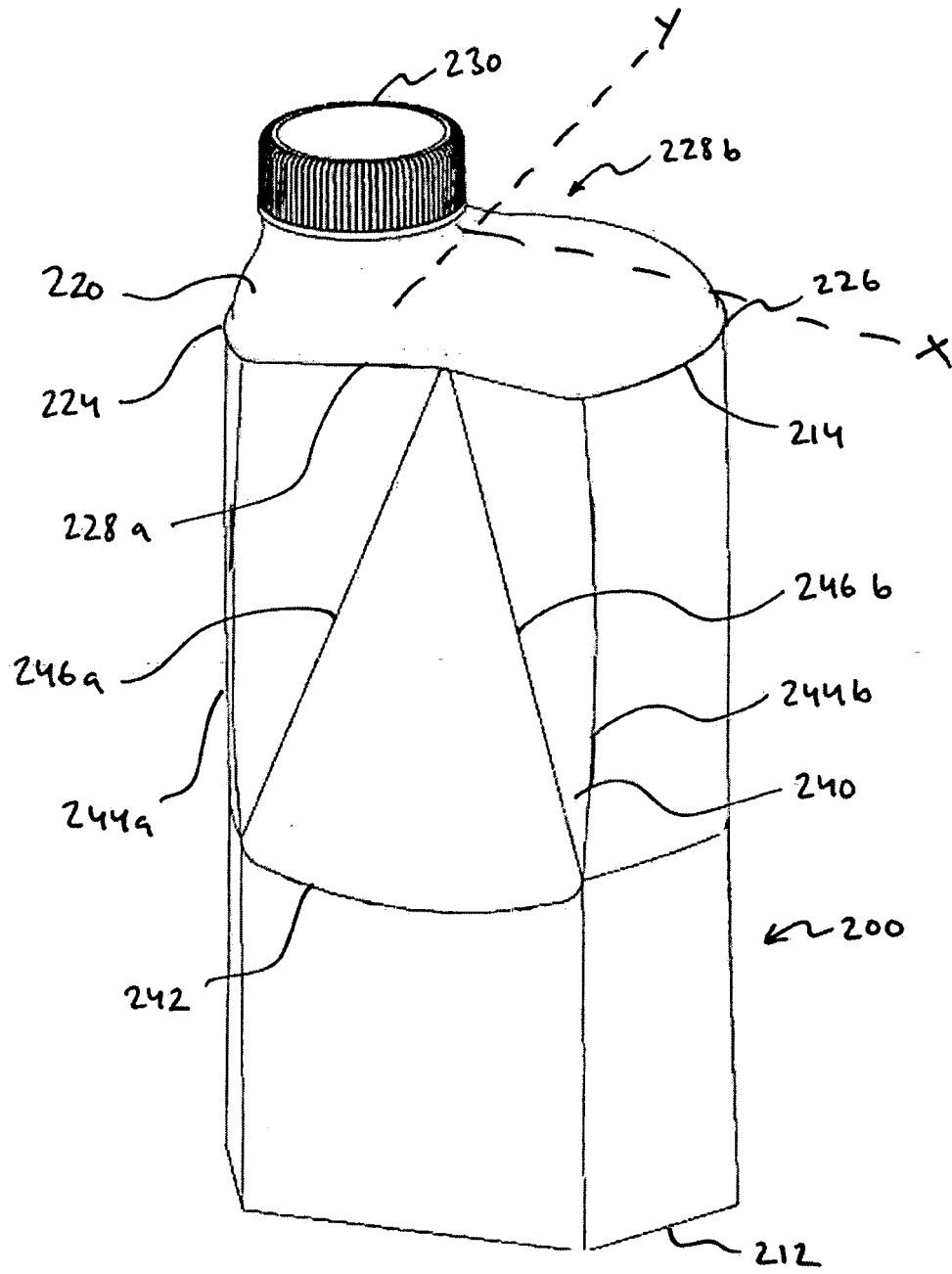


Fig. 3

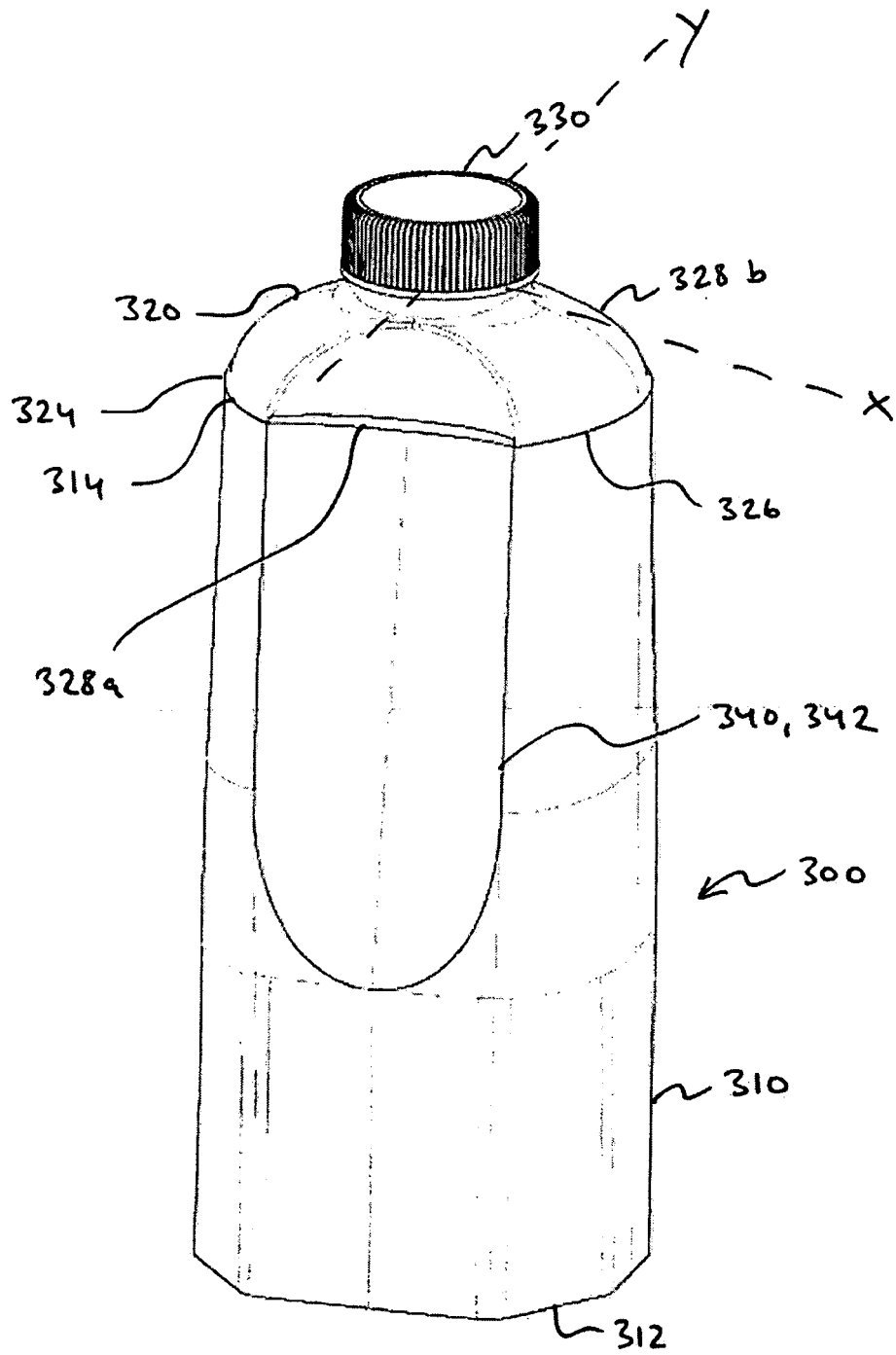


Fig. 4

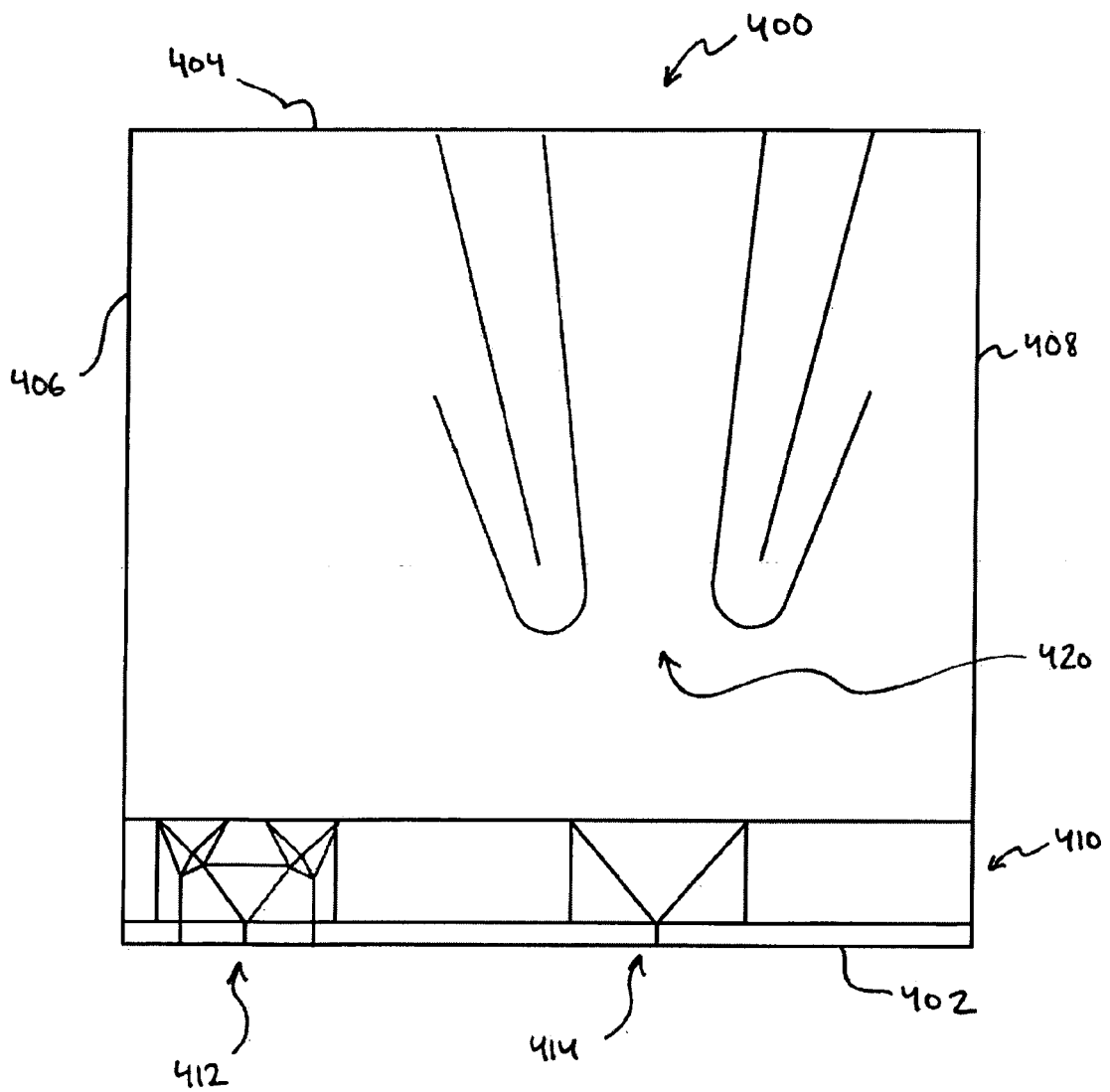


Fig. 5

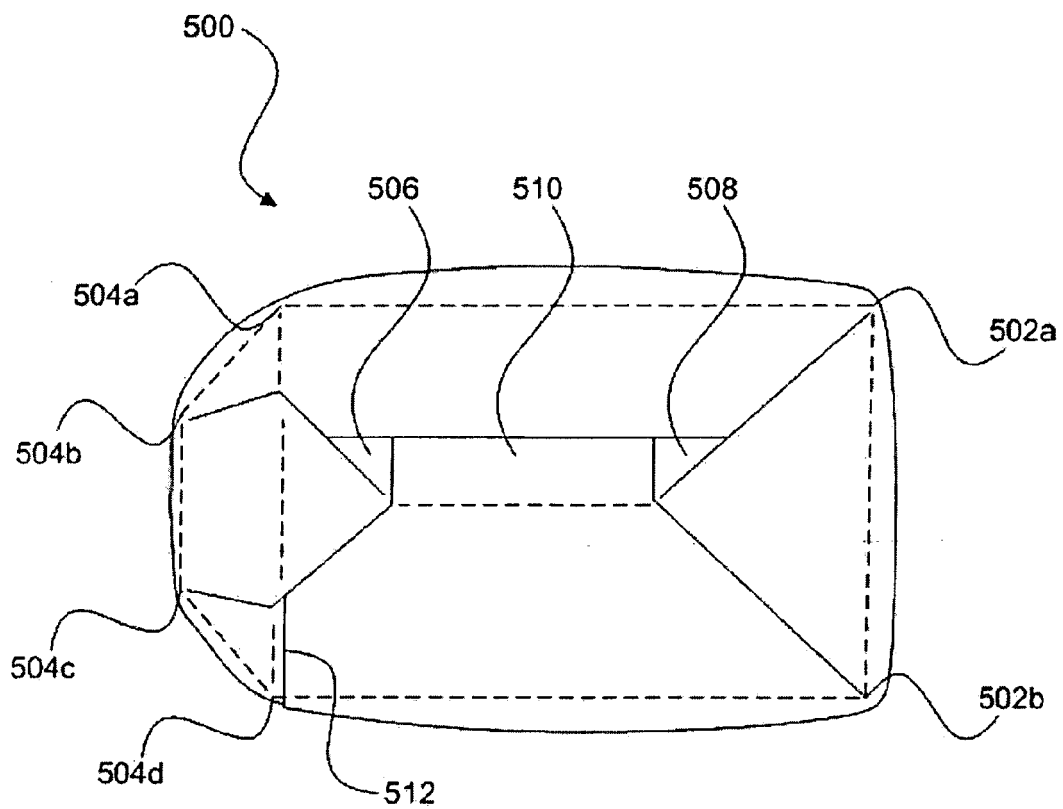


Fig 6



EUROPEAN SEARCH REPORT

Application Number
EP 10 00 3559

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 00/66438 A1 (SONOCO DEV INC [US]; LOWRY JAMES W [US]; GENDREAU STEVE [US]) 9 November 2000 (2000-11-09)	1-5,7,10	INV. B65D3/08 B65D23/10
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