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(54) **Bottle-type plastic container having an integrated hand-grip**

(57) The bottle-shaped plastic container (1) comprises a hollow body with an integrated hand-grip (2). The said hand-grip (2) is constituted by a palm-recess (20) and two opposite finger-recesses (21); said palm-recess

(20) has preferably a depth of at least 5mm; said two opposite finger-recesses are an extension of the bottom (202) of said palm-recess (20), and the bottom (202) of said palm-recess (20) comprising ribs (23) that extend in the finger-recesses (21).

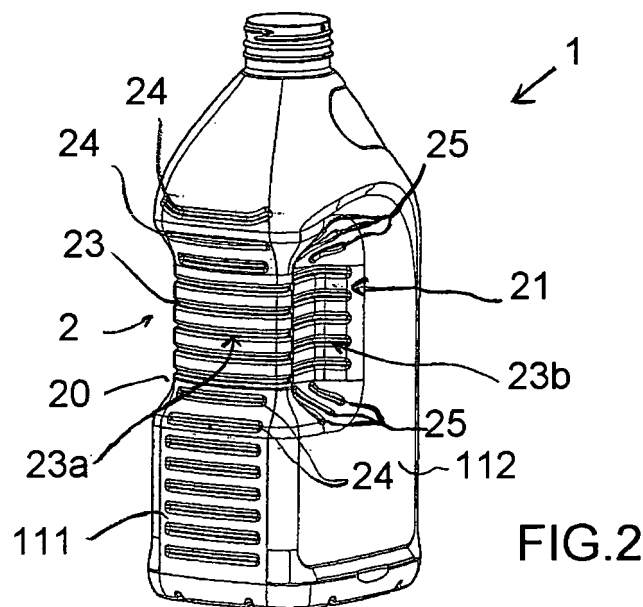


FIG. 2

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Description**Technical field**

[0001] The present invention relates to bottle-shaped plastic containers comprising an integrated hand-grip.

Prior art

[0002] Plastic bottle-shaped containers, such as, for example, PET bottles, are widely used for storing different kind of products.

[0003] In order to facilitate the handling of said plastic containers, it is -known to date to provide these containers with a specific handle.

[0004] Pursuant to a first known technical solution, the handle is a add-on piece that is fixed, e.g. welded, onto the hollow body of the container. This solution is however costly, because it involves the manufacture of a separate handle and an additional manufacturing step for fixing the handle onto the hollow body of the container.

[0005] A second and advantageous technical solution consists in manufacturing plastic containers having an integrated pinch-grip handle. Said integrated handle is essentially constituted by two opposite recesses made in two opposite sidewalls of the hollow body of the container. This solution is described, for example, in European patent applications EP 1 459 990 and EP 1 431 190, and in US patent No 6,739,467.

[0006] The pinch-grip plastic containers described in these publications are however not completely satisfactory. When the user handles these pinch-grip containers by pinching the container in his hand, the thumb of the hand's user being put in one recess and the four remaining fingers of the hand's user being put in the opposite recess, there is a high tendency of the container to slip and to escape from the hand's user under the weight of the container, especially when the container is filled. Furthermore, the rigidity of these integrated hand grips is weak. These known structures of pinch-grip plastic containers are thus not really suitable for making containers having a large filling volume (i.e. typically containers having a filling volume of 2 litres or more).

Objectives of the invention

[0007] One main objective of the invention is to obtain a bottle-type plastic container having an integrated hand-grip that improves the handling of the container.

[0008] A further and optional objective of the invention is to obtain a bottle-type plastic container having a fill volume of at least 3 litres and comprising an integrated hand-grip that improves the handling of such a large-sized container.

[0009] A further and optional objective of the invention is to obtain a bottle-type plastic container having an integrated hand-grip that improves the handling of the container, said container being manufactured by injection-

stretch blow moulding.

Summary of the invention

[0010] The plastic container of the invention comprises a hollow body with an integrated hand-grip. Said hand-grip is constituted by a palm-recess and two opposite finger-recesses ; said two opposite finger-recesses are an extension of the bottom of said palm-recess; the bottom of said palm-recess comprises ribs that extend in the finger-recesses.

[0011] Other additional and optional technical characteristics of the invention are mentioned in the claims.

Short description of the drawings

[0012] Other characteristics and advantages of the invention will appear more clearly on reading the following detailed description which is made by way of non-exhaustive and non-limiting example, and with reference to the accompanying drawings, in which:

- Figure 1 and Figure 2 are perspective views of a bottle-type container made in accordance with a preferred embodiment of the invention;
- Figure 3 is a side view of the container of figure 1,
- Figure 4 is a left view of the container of figure 3 (front view),
- Figure 5 is a right view of the container of figure 3 (rear view),
- Figure 6 is an horizontal cross-section view of the container in the horizontal plane VI-VI of figure 3,
- Figure 7 is a vertical cross-section view of the container in the vertical plane VII-VII of figure 5,
- Figure 8 is a photography of the empty container handled by a hand and viewed from the top of the container,
- Figure 9 is photography of the empty container handled by a hand and viewed for the side of the container, the container being inclined away from the vertical in a ready to pour position.

Detailed description

[0013] In the particular embodiment of figures 1 to 9, the plastic bottle-shaped container 1 is constituted by a hollow body comprising a closed base portion 10, a main body portion 11, a shoulder portion 12, and a neck portion 13 terminated by an opening 14 for filling or emptying the container. This hollow body comprises an integrated and moulded hand-grip generally referred 2 in the drawings, and enabling a user to securely and easily handle the container 1.

[0014] In this example, the plastic hollow body of the container 1 is preferably obtained by the well-known technique of injection-stretch blow moulding, the plastic material used for making the container being any known polymer(s) that can be used in such a technique. The

structure of the container can be of the monolayer-type or multilayer-type. For example, when no specific gas-barrier properties for the container are required, the plastic container 1 can have a monolayer structure and is preferably made of PET. The invention is however not limited to such a particular polymer. One skilled in the art will select, in a known manner, the suitable structure (monolayered or multilayered structure) and the polymer (s) for making the container according to the properties required for the container.

[0015] In the particular example of figures 1 to 9, the base portion 10 of the container has a substantially rectangular profile in an horizontal cross-section, and the main body portion 11 essentially comprises four vertical panels, namely: a front panel 110, a rear panel 111, and two opposite lateral panels 112 and 113. The invention is however not limited to this particular geometry of the container and the integrated hand-grip of the invention can be applied to any kind of geometry, and for example to a container having a profile, in an horizontal cross-section, that is substantially circular, elliptical,...

[0016] The integrated and moulded hand-grip 2 of container 1 is now going to be described in details.

[0017] This hand-grip 2 is constituted by:

- one recess 20, made in the rear panel 111 of the main body portion 11, and dimensioned for receiving the palm of a user ; said recess 20 is designed therein as "palm-recess";
- two opposite recesses 21 and 22, made respectively in the two lateral panels 112 and 113, and designed therein as "finger-recesses".

[0018] According to the preferred embodiment shown on the drawings, the finger-recesses 21 and 22 are substantially identical and are both dimensioned in order to receive four fingers of a user. Thus can the container advantageously be handled both by a left-handed or right-handed user.

[0019] Referring to figure 7, the palm-recess 20 is constituted by upper and lower inward sloping portions 201, 203, and by a bottom 202 extending between both upper and lower inward sloping portions 201, 203. The depth of the palm-recess 20 is referenced (d) on figure 7.

[0020] Referring to figures 1, 2, 3, and 6, the two finger-recesses 21 and 22 are extensions of the bottom 202 of the palm-recess 20. Referring to figure 6, each finger recess 21 (22) comprises a first inward sloping portion 21a (22a) joining the bottom 202 of the palm-recess 20, a second inward sloping portion 21c (22c) opposite to the first inward portion 21a (22a), and a bottom 21b (22b) that extends between first and second inward sloping portions 21a and 21c (22a and 22c).

[0021] The hand-grip 2 comprises five main reinforcing ribs 23 for strengthening the hand-grip 2. The number of main ribs 23 can however be different in other embodiments of the invention, and will be defined by one skilled in the art according to the level of rigidity required for the

hand-grip. The ribs 23 also advantageously improve the friction contact of the hand with the container, and thereby also reduce the risks of slipping out of the hand.

[0022] Each main rib 23 has a central portion 23a, that is made on the whole width (L) of the bottom 202, and that extends at both extremities in the finger-recesses 21, 22. In the particular example shown on the drawings, the ribs 23 are substantially horizontal. This particular orientation of the ribs 23 is not a limitation however for the invention. In other embodiments of the invention, the ribs 23 could have a different orientation, and/or the orientation of the ribs 23 is not necessary the same over the whole length of the rib.

[0023] The extensions of the main ribs 23 in the finger-recesses 21, 22 are referenced 23b in the drawings. Preferably, but not necessarily, each extension 23b of a main rib 23 in the finger-recess 21 (22) terminates in the second inward sloping portion 21c (22c). In another embodiment of the invention, an extension 23b of a main rib 23 could terminate in the bottom 21b (22b) of the finger-recess 21 (22) or even in the first inward sloping portion 21a (22a) of the finger-recess 21 (22).

[0024] The rigidity of the hand-grip 2 also depends obviously of the thickness of the hand-grip. One skilled in the art will knowingly choose the appropriate thickness for the hand-grip 2 in accordance with the rigidity that has to be achieved. By way of example only, for the particular container of the attached drawings, when PET is being used, good results in terms of rigidity are achieved with an average wall thickness of approximately 0.75mm for the container wall in the region corresponding to the hand-grip 2.

[0025] For handling the container 1, one user positions his hand in the hand-grip 2 and pinches the hand-grip 2 in the way shown on figures 8 and 9. The palm of the hand's user is positioned more or less against the bottom 202 of the palm-recess 20 of the hand-grip 2 ; the thumb of the hand's user is positioned inside one finger-recess 21 (or 22), and the four remaining fingers of the hand's user are positioned inside the opposite finger-recess 22 (or 21).

[0026] Preferably and optionally, as shown on figures 6 and 8, the bottom 202 of the palm-recess 20 is convex in order to better fit the palm of the hand's user. Additionally, this convexity of the bottom 202 advantageously increases the rigidity of the grip. For sake of clarity, the wording "convex" is not limited to a continuous radius curve as the one shown on figure 6, but encompasses any external surface for the bottom 202 that is orientated outwardly ; The convex-bottom 202 can, for example, be made of several facets.

[0027] When the user lifts up the container, the hand of the user is blocked essentially by the upper portion 201 of the palm-recess 20. Thanks to this vertical blocking of the hand's user, it is possible to avoid accidental slipping of the container out of the hand, under the weight of the container, especially when the container is filled and thus heavier. In order to obtain an optimum vertical

blocking of the hand, the depth (d) of the palm recess is preferably at least equal to 5mm, and even more preferably at least equal to 8mm.

[0028] Furthermore, when a user handles the container 1, the fingers of the hand-user are pinching the hand-grip and are advantageously blocked by the two opposite first inward sloping portions 21 a, 22a of the finger-recesses 21,22.

[0029] Preferably, referring to figure 6, in order to improve the handling of the container 1 and optimally reduce the risk of slipping out of the hand, the inward slope angle (A) of each first inward sloping portions 21a, 22a is preferably at least equal to 20°, and more preferably at least equal to 40°, and the depth (e) of each first inward sloping portions 21a, 22a is preferably at least equal to 5mm, and more preferably at least equal to 10mm. Said depth (e) can be substantially constant over the whole height (H) of the bottom 202 or can vary along the height (H) of the bottom 202. Thanks to these preferred characteristics, the container 1 can be advantageously handled without applying on the hand-grip any squeezing force to prevent the slipping out of the hand.

[0030] Preferably, in the particular embodiment of figures 1 to 9, in order to advantageously increase the rigidity of the hand-grip 2, optional small and horizontal ribs 24 are made in at least the upper sloping portion 201 of the palm-recess 20, and also in the lower sloping portion 203 of the palm-recess 20; optional small ribs 25 are also made at least in the upper part of the finger-recess 21, 22 and also in the lower part of the finger-recess 21, 22.

[0031] In the preferred embodiment shown on the drawings, the width (L) of the bottom 202 of the palm-recess 20 is smaller than the width (W) of the palm-recess 20 in the region of its upper or lower edges 201,203, in order to be adapted to an average hand size of a user. It has to be noted that in the particular embodiments shown on the drawings, the width (L) of the bottom 202 of the palm-recess 20 is substantially constant over the whole height (H) of the bottom 202. This particular feature is not a limitation however for the invention. In other embodiments of the invention, the width (L) of the bottom 202 of the palm-recess 20 can vary along the height of the bottom 202. Typically, the width (L) of the whole bottom 202 of the palm-recess 20 or of a part of bottom 202 of the palm-recess 20 is preferably substantially equal to 75mm.

[0032] Furthermore, referring to figure 7, the height (H) of the bottom 202 of the palm-recess 20 has to be great enough in order to be adapted to an average hand size of a user. Preferably, this height (H) is at least equal to 50mm, and more preferably at least equal to 60mm. The integrated hand-grip 2 described in reference to the attached drawings is particularly suitable for plastic container having a large fill volume, especially for containers having a fill volume of at least 2 litres (and more preferably of at least 3 litres) and used, for example, for storing liquids (such as washing liquids, detergents,

beverages, ...). The invention can however be applied for containers having a smaller fill volume.

5 Claims

1. Plastic container (1) comprising a hollow body with an integrated hand-grip, wherein the said hand-grip (2) is constituted by a palm-recess (20) and two opposite finger-recesses (21;22), said two opposite finger-recesses (20 ; 21) being an extension of the bottom (202) of said palm-recess (20), and the bottom (202) of said palm-recess (20) comprising ribs (23) that extend in the finger-recesses (21 ;22).
2. Container according to claim 1, **characterized in that** said palm-recess (20) has a depth (d) of at least 5mm,
3. Container according to claim 2, **characterized in that** the depth (d) of said palm-recess (20) is at least equal to 8mm,
4. Container according to anyone of claims 1 to 3, **characterized in that** each finger-recess (21/22) comprises an inward sloping portion (21a/22a) joining the bottom (202) of the palm-recess (20), and having a slope angle (A) at least equal to 20°.
5. Container according to claim 4 **characterized in that** the slope angle (A) of said inward sloping portion (21a/22a) of a finger-recess (21/22) is at least equal to 40°.
6. Container according to anyone of claims 1 to 5, **characterized in that** each finger-recess (21/22) comprises an inward sloping portion (21a/22a) joining the bottom (202) of the palm-recess (20), and having a depth (e) at least equal to 5mm.
7. Container according to claim 6, **characterized in that** the depth (e) of said inward sloping portion (21a/22a) of a finger-recess (21/22) is at least equal to 10mm.
8. Container according to anyone of claims 1 to 7, **characterized in that** the bottom (202) of the palm-recess (20) is convex.
9. Container according to anyone of claims 1 to 8, **characterized in that** the width (L) of the bottom (202) of the palm-recess (20) is smaller than the width (W) of the palm-recess (20) in the region of its upper or lower edges (201; 203).
10. Container according to anyone of claims 1 to 9, **characterized in that** the width (L) of the whole bottom (202) of the palm-recess (20) or of a part of bottom

(202) of the palm-recess (20) is preferably substantially equal to 75mm.

11. Container according to anyone of claims 1 to 10,
characterized in that the height (H) of the bottom
(202) of the palm-recess (20) is at least equal to
50mm, and more preferably at least equal to 60mm. 5
12. Container according to anyone of claims 1 to 11, and
having a fill volume of at least 2 litres, and more pref-
erably of at least 3 litres. 10

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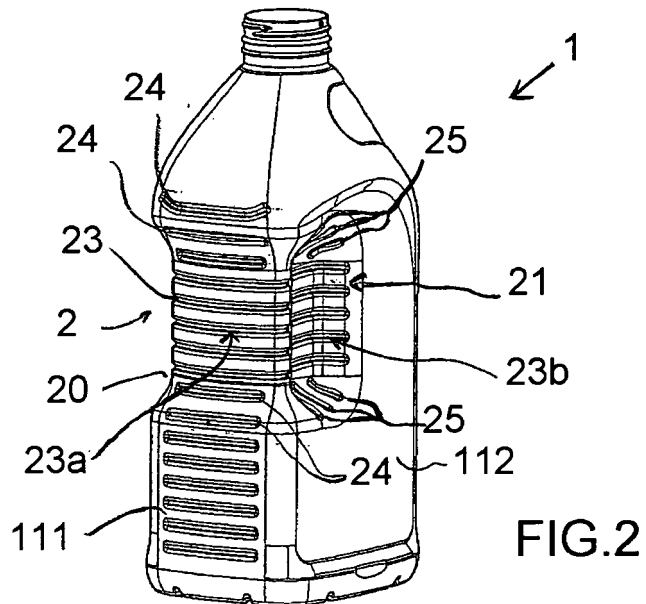
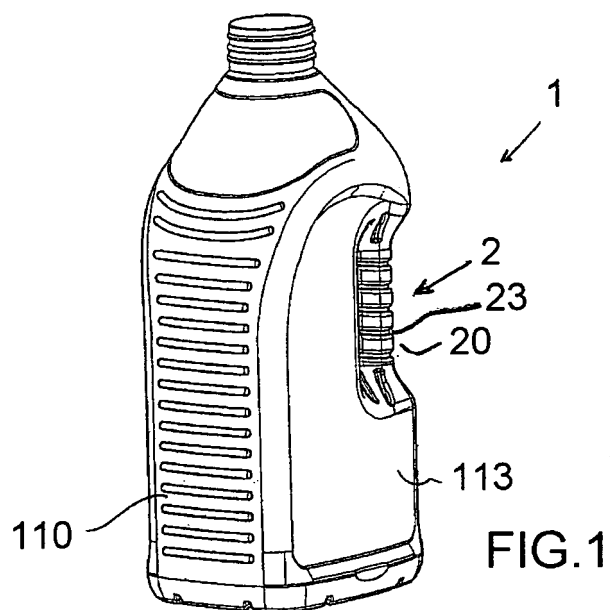
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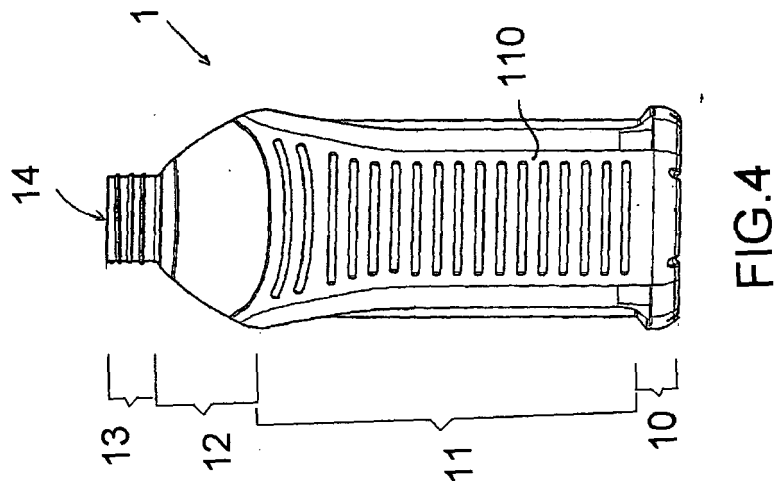
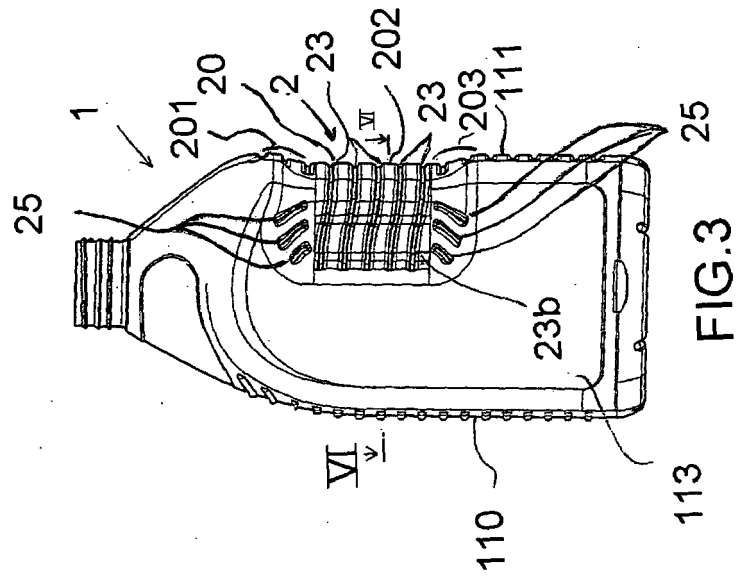
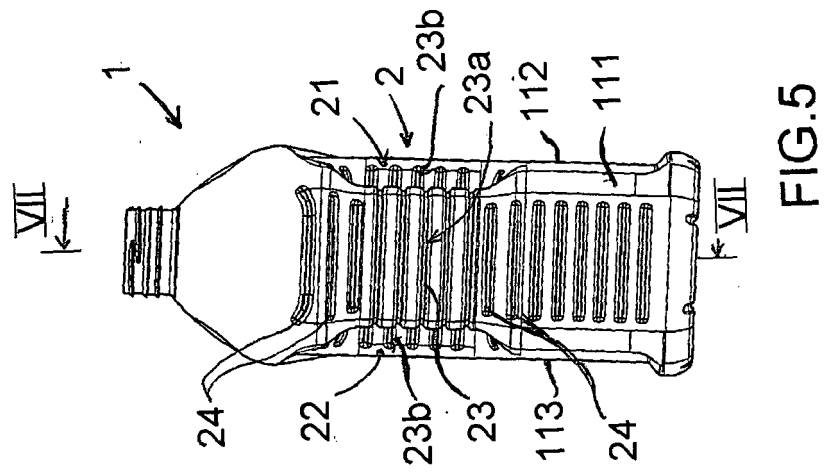
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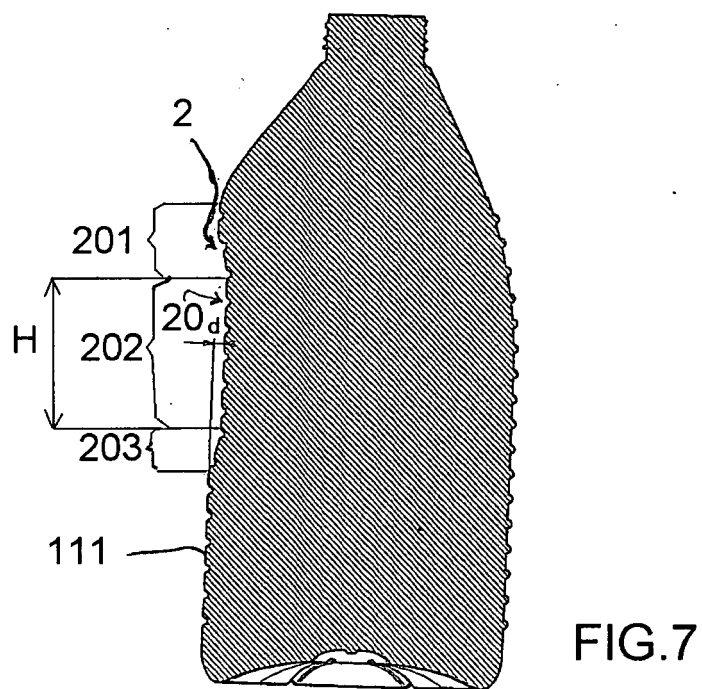
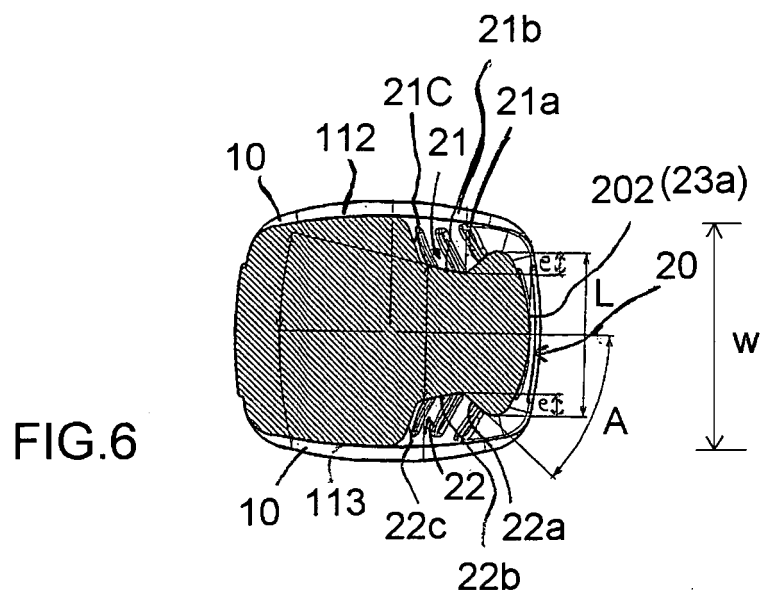




FIG.8

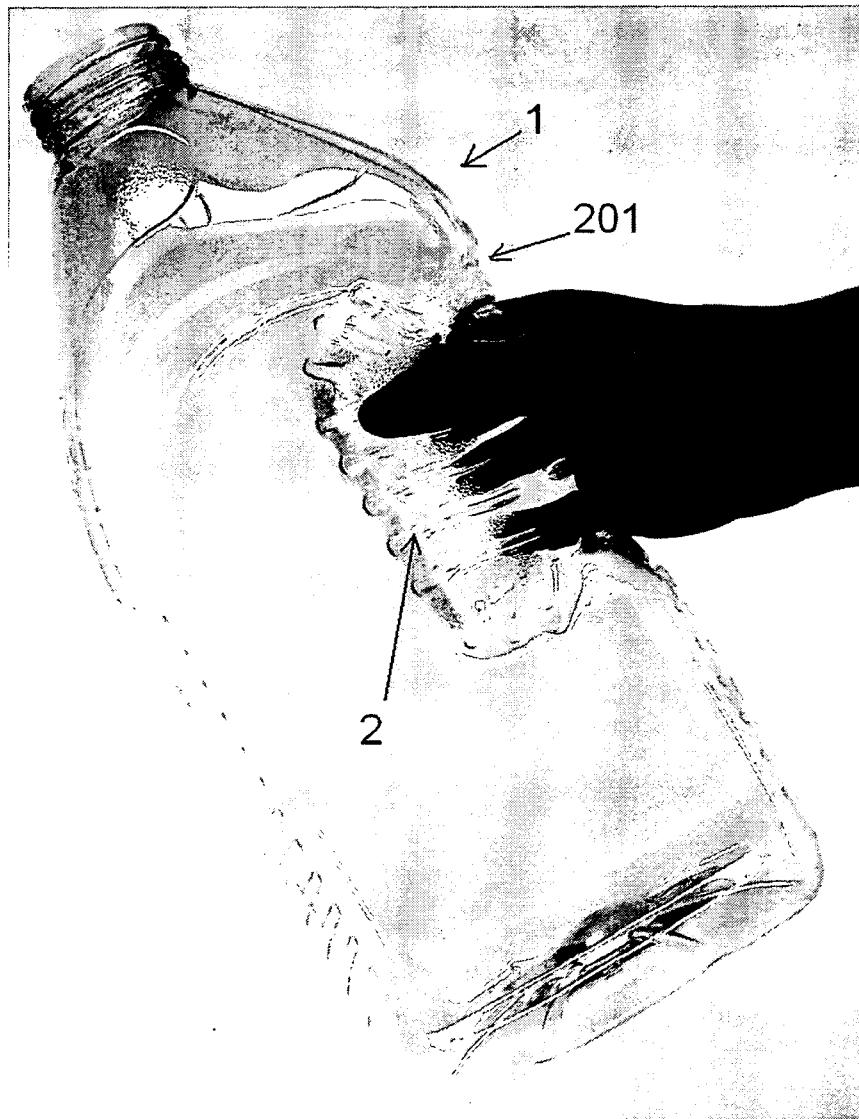


FIG.9



European Patent
Office

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Application Number
EP 06 00 9293

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