



- (51) International Patent Classification:
B29C 49/00 (2006.01)
- (21) International Application Number:
PCT/CA2015/000104
- (22) International Filing Date:
19 February 2015 (19.02.2015)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
61/941,955 19 February 2014 (19.02.2014) US
- (71) Applicant: MEDONYX INC. [CA/CA]; 341 Lesmill Road, Toronto, Ontario M3B 2V1 (CA).
- (72) Inventor: SHOHAM, Gilad; 75 Cottingham Street, Toronto, Ontario M4V 1B9 (CA).
- (74) Agent: FASKEN MARTINEAU DUMOULIN LLP; 333 Bay Street, Suite 2400, Bay Adelaide Centre, Box 20, Toronto, Ontario M5H 2T6 (CA).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: AN OPEN-CLIP BLOW MOLDING METHOD AND A BLOW MOLDED ARTICLE WHICH INTEGRALLY PROVIDE A CLIP FOR SECUREMENT TO ANOTHER ITEM

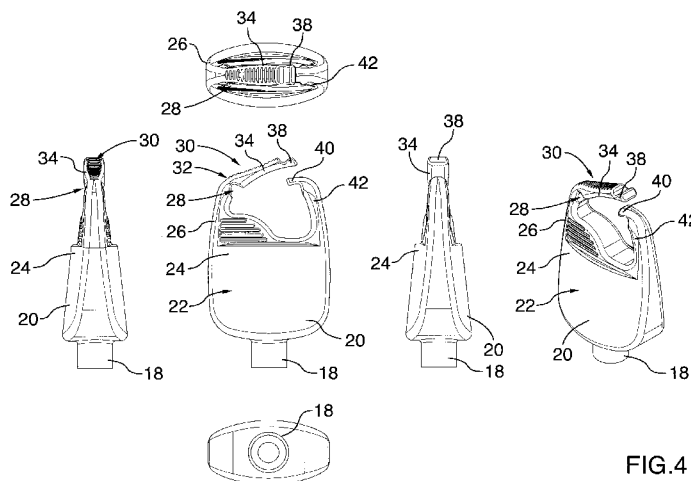


FIG.4

(57) Abstract: In a method, an article of unitary construction is blow molded and integrally provided with a clip for securement to another item. The clip has an arm initially blow molded into an open elevated configuration. The arm is pivotable into closed and open configurations. When closed, the arm is in selectively releasable and secure engagement with a catch on the article. The arm is biased towards the catch. When open, the arm is depressed relative to and biased towards the closed configuration. The open configuration is traversed to secure the article to the item. In the open elevated configuration, the arm is elevated relative to the closed configuration. The arm is preferably a carabiner-type arm. The article is preferably formed of a composition of matter including polyethylene and plastic additives to provide the arm with sufficient pre-built tension to stay in the aforesaid selectively releasable and secure engagement.

WO 2015/123760 A1

**AN OPEN-CLIP BLOW MOLDING METHOD AND A
BLOW MOLDED ARTICLE WHICH INTEGRALLY PROVIDE
A CLIP FOR SECUREMENT TO ANOTHER ITEM**

FIELD OF THE INVENTION

[0001] The present disclosure relates generally to a blow molding method and a blow molded article and, more particularly, to an open-clip blow molding method, a blow molded article integrally provided with a clip for securement to another item, and such an article and clip formed of a composition of matter.

BACKGROUND OF THE INVENTION

[0002] It frequently may be useful to secure a container to another item. For example, it may be useful to readily secure a hand sanitizer bottle to a backpack.

[0003] As illustrated in Figure 1, some prior art bottles have been provided with an opening or ring, potentially for attachment of a clip, such as a traditional carabiner and/or spring clip. However, one of the shortcomings of the prior art in this regard may have been the need for additional components, such as a separate clip, and/or any related time, trouble and/or effort required for assembly.

[0004] There may have existed blow molded bottles having clip portions in the prior art. Such prior art bottles may have been blow molded with their clip portions in a closed configuration -- i.e., molded with one or more parts in a net-shape.

[0005] In use, an arm portion of a clip on such a prior art container may have been semi or fully depressed from the closed configuration to permit the container's clip to pass through a detente or catch provided on another item. Ideally, the arm portion of such container's clip

would then be returned to the closed configuration (from the depressed or semi-depressed configuration) to secure the container to the other item.

[0006] Alternately, such prior art bottles may have been molded with their clip portions in a semi-depressed (i.e., slightly *closed*) configuration, potentially relying upon a desired shrinkage of the bottles' plastic material during cooling to cause their clip portions to warp and/or deform into a closed clip configuration.

[0007] Other prior art methods for providing a clip portion in a blow molded bottle may have involved molding the clip portion in a semi-depressed geometry and then -- as a post-process -- manually pushing and/or positioning the clip into a closed configuration, and applying heat to a hinge-point of the bottle's clip portion, such as to encourage material of the hinge-point to thermally set into the closed configuration.

[0008] Prior art polyethylene materials may have provided mechanical "springback" properties.

[0009] Prior art containers (and/or clip portions thereof), materials and/or related blow molding and/or materials technologies may have inadequately provided for secure releasable fastening of such containers to other items, for clips biased towards a securely closed configuration, and/or for any "springback" properties which may have been sought. It may be readily appreciated by or suggested to those skilled in the art -- in view of the disclosures herein -- that there have been one or more disadvantages or shortcomings associated with the prior art, or that the prior art has failed to meet one or more needs or to provide certain previously unforeseen advantages such as now afforded by the invention.

[0010] It is an object of the present invention to obviate or mitigate one or more disadvantages and/or shortcomings associated with the prior art, to meet or provide for one or

more needs and/or advantages, and/or to achieve one or more objects of the invention -- one or more of which may preferably be readily appreciable by and/or suggested to those skilled in the art in view of the teachings and/or disclosures hereof.

SUMMARY OF THE INVENTION

[0011] According to the invention, there is disclosed a method to produce an article having a clip for securing the article to another item. The method includes a step of blow molding the article to have a unitary construction and to integrally provide the clip as a part of the article. This blow molding step is such that the clip has a carabiner-type arm which is initially blow molded into an open elevated configuration. The carabiner-type arm is resiliently pivotable from the open elevated configuration into (i) a closed configuration and (ii) a depressed open configuration. In the closed configuration, the carabiner-type arm is biased into selectively releasable and secure engagement with a catch portion provided on the article. In the depressed open configuration, the carabiner-type arm is depressed relative to and biased towards the closed configuration. The depressed open configuration is traversed to secure the article to the aforesaid item. The blow molding step is also such that, in the open elevated configuration, the carabiner-type arm is elevated relative to the closed configuration.

[0012] According to an aspect of one preferred embodiment of the invention, the article may preferably, but need not necessarily, be blow molded such that the clip preferably has a hinge where the clip bends. The carabiner-type arm may preferably, but need not necessarily, be resiliently pivotable from the open elevated configuration, preferably about the hinge, into the closed configuration and/or the depressed open configuration.

[0013] According to an aspect of one preferred embodiment of the invention, preferably in the closed configuration, the carabiner-type arm may preferably, but need not necessarily, be biased with sufficient pre-built tension to stay in selectively releasable and secure engagement with the catch portion.

[0014] According to an aspect of one preferred embodiment of the invention, preferably after the carabiner-type arm is initially blow molded into the open elevated configuration, the carabiner-type arm may preferably, but need not necessarily, be selectively pivotable -- preferably by hand -- from the open elevated configuration into the closed configuration, and/or from the closed configuration into the depressed open configuration.

[0015] According to an aspect of one preferred embodiment of the invention, preferably after the carabiner-type arm is initially blow molded into the open elevated configuration, the carabiner-type arm may preferably, but need not necessarily, be initially moved from the open elevated configuration into the closed configuration, preferably by one or more automated processes.

[0016] According to an aspect of one preferred embodiment of the invention, preferably after the carabiner-type arm is blow molded into the open elevated configuration, the clip may preferably, but need not necessarily, be allowed to cool and/or set in the elevated open position, preferably before the carabiner-type arm may be moved to the closed configuration.

[0017] According to an aspect of one preferred embodiment of the invention, the article may preferably, but need not necessarily, be extrusion blow molded, and/or the carabiner-type arm may preferably, but need not necessarily, be initially extrusion blow molded into the open elevated configuration.

[0018] According to an aspect of one preferred embodiment of the invention, the article may preferably, but need not necessarily, be injection blow molded, and/or the carabiner-type arm may preferably, but need not necessarily, be initially injection blow molded into the open elevated configuration.

[0019] According to an aspect of one preferred embodiment of the invention, the carabiner-type arm may preferably, but need not necessarily, be biased with sufficient pre-built tension to return to the closed configuration, preferably after the carabiner-type arm may be mechanically moved to the depressed open configuration.

[0020] According to an aspect of one preferred embodiment of the invention, the article may preferably, but need not necessarily, be blow molded as a hollow container.

[0021] According to the invention, there is also disclosed a blow molded article of unitary construction comprising an integral clip for securing the blow molded article to another item. The clip has a catch portion and a carabiner-type arm initially blow molded into an open elevated configuration. The carabiner-type arm is resiliently pivotable from the open elevated configuration into (i) a closed configuration and (ii) a depressed open configuration. In the closed configuration, the carabiner-type arm is biased into selectively releasable and secure engagement with the catch portion. In the depressed open configuration, the carabiner-type arm is depressed relative to and biased towards the closed configuration. The depressed open configuration is traversed to secure the article to said item. In the open elevated configuration, the carabiner-type arm is elevated relative to the closed configuration.

[0022] According to an aspect of one preferred embodiment of the invention, the carabiner-type arm may preferably, but need not necessarily, be in the closed configuration.

[0023] According to the invention, there is also disclosed a blow molded article of unitary construction which includes an integral clip for securing the blow molded article to another item. The clip has a catch portion and an arm resiliently pivotable between an open configuration and a closed configuration. In the closed configuration, the arm is in selectively releasable and secure engagement with the catch portion. The arm is biased towards the closed configuration with sufficient pre-built tension for the arm to stay in the aforesaid selectively releasable and secure engagement with the catch portion. The blow molded article of unitary construction is formed of a composition of matter which includes one or more polyethylene materials and one or more plastic additives so as to thus provide the arm with the aforesaid sufficient pre-built tension.

[0024] According to an aspect of one preferred embodiment of the invention, the composition of matter may preferably, but need not necessarily, be adapted for forming the blow molded article by extrusion blow molding and/or by injection blow molding.

[0025] According to an aspect of one preferred embodiment of the invention, the composition of matter may preferably, but need not necessarily, also include at least one of a polypropylene material, a polycarbonate material, and a polyvinyl chloride (“PVC”) material.

[0026] According to an aspect of one preferred embodiment of the invention, the polyethylene materials of the composition of matter may preferably, but need not necessarily, include a combination of one or more high-density polyethylene (“HDPE”) materials and/or one or more low-density polyethylene (“LDPE”) materials.

[0027] According to an aspect of one preferred embodiment of the invention, the combination may preferably, but need not necessarily, include a controlled blend of (a) the HDPE materials preferably so as to thus provide the arm and/or the clip with rigidity in

mechanical structure, and/or (b) the LDPE materials preferably so as to thus provide the arm and/or the clip with flexibility, together preferably so as to thus provide the arm with the aforesaid sufficient pre-built tension.

[0028] According to an aspect of one preferred embodiment of the invention, the additives may preferably, but need not necessarily, include at least one of a flexibilizer material, a plasticizer materials, and an impact modifier material.

[0029] According to an aspect of one preferred embodiment of the invention, the additives may preferably, but need not necessarily, include at least one structural modifier material.

[0030] According to an aspect of one preferred embodiment of the invention, the structural modifier material may preferably, but need not necessarily, include at least one fiber material.

[0031] According to an aspect of one preferred embodiment of the invention, the fiber material may preferably, but need not necessarily, include at least one of a glass fiber material and a carbon fiber material.

[0032] According to an aspect of one preferred embodiment of the invention, the structural modifier material may preferably, but need not necessarily, include at least one mineral filler material.

[0033] According to an aspect of one preferred embodiment of the invention, the mineral filler material may preferably, but need not necessarily, include a talc material.

[0034] According to an aspect of one preferred embodiment of the invention, the arm may preferably, but need not necessarily, be a carabiner-type arm. The open configuration

may preferably, but need not necessarily, be a depressed open configuration wherein the carabiner-type arm is preferably depressed relative to the closed configuration. The depressed open configuration may preferably, but need not necessarily, be traversed to secure the article to the aforesaid item. The carabiner-type arm may preferably, but need not necessarily, be initially blow molded into and/or resiliently pivotable from an open elevated configuration whereat the carabiner-type arm may preferably, but need not necessarily, be elevated relative to the closed configuration.

[0035] According to an aspect of one preferred embodiment of the invention, the blow molded article of unitary construction may preferably, but need not necessarily, be blow molded as a hollow container.

[0036] Other advantages, features and/or characteristics of the present invention, as well as methods of operation and/or functions of the related elements of the blow molded article and method, and/or the combination of steps, parts and/or economies of manufacture, will become more apparent upon consideration of the following detailed description and the appended claims with reference to the accompanying drawings, the latter of which are briefly described hereinbelow.

BRIEF DESCRIPTION OF THE DRAWINGS

[0037] The novel features which are believed to be characteristic of the blow molded article and method according to the present invention, as to their structure, organization, use, and/or method of operation, together with further objectives and/or advantages thereof, will be better understood from the following drawings in which presently preferred embodiments of the invention will now be illustrated by way of example. It is expressly understood,

however, that the drawings are for the purpose of illustration and description only, and are not intended as a definition of the limits of the invention. In the accompanying drawings:

[0038] **Figure 1** depicts a prior art bottle having a ring with a prior art carabiner attached thereto;

[0039] **Figure 2A** is a front elevational view of a bottle formed according to the invention, shown with a knock-out member and with an arm of the bottle in an open elevated configuration;

[0040] **Figure 2B** is a front elevational view of the bottle of Figure 2A, shown without the knock-out member and with the arm in a closed configuration;

[0041] **Figure 2C** is a front elevational view of the bottle of Figure 2A, shown without the knock-out member and with the arm in a depressed open configuration;

[0042] **Figure 3** depicts front, left and rear elevational views, an enlarged view of encircled portion A, and a top front left perspective view of the bottle of Figure 2B, all shown with the arm in the closed configuration;

[0043] **Figure 4** depicts right, front, left and rear elevational views, and top and bottom views of the bottle of Figure 2A, all shown with the arm in the open elevated configuration;

[0044] **Figure 5** is a front elevational view of a rear mold for forming a bottle according to the invention;

[0045] **Figure 6** is a bottom front right perspective view of the rear mold of **Figure 5** and a bottom rear left perspective view of a front mold for forming a bottle according to the invention;

[0046] **Figure 7** includes top and front elevational views of the rear mold of **Figure 5**, showing blow molding chambers thereof in phantom outline;

[0047] **Figure 8A** is a front elevational view of three different bottles formed according to the invention, each shown with an arm thereof in the closed configuration; and

[0048] **Figure 8B** includes two front elevational views of a further bottle formed according to the invention, alternately showing an arm thereof in the closed configuration and in a depressed open configuration.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0049] Figure 1 illustrates a prior art bottle 10 having a ring 12 which defines a punch-out opening and a prior art carabiner 14 attached thereto. The bottle 10 is shown with a flip-top cap 18.

[0050] Herein is described, according to the invention and with reference to Figures 2A through 8B, a novel and inventive method of producing improved clips 30 in blow molded plastic components 20, preferably by an "open clip" blow molding method to produce an improved integral clip 30 in a blow molded apparatus 20, and/or preferably by using one or more additives to enhance mechanical flex and/or springback properties in an improved blow-molded clip 30.

[0051] Such blow molded plastic components 20 -- e.g., blow molded apparatus, blow molded articles, and other potential materials that can be blow-molded -- preferably include bottles, canisters, and other hollow items which make use of blow molding.

[0052] Also described herein is a method and composition of matter to produce an integral clip 30 in an apparatus 20 and, more specifically, to an "open clip" blow molding

method and composition of matter to produce an improved integral clip 30 in a blow molded apparatus 20.

[0053] According to the invention, clip 30 geometry is preferably incorporated right into the geometry of a blow molded article 20, and a method of preferably producing such a blow molded article 20 is disclosed herein.

[0054] According to the invention, a clip portion 30 (in many respects similar to, for instance, a carabiner) is preferably molded right into a geometry of a blow-molded container 20 itself. Figure 2A shows a bottle 20 which, according to some preferred embodiments of the invention, may be formed with a knock-out member 44 for later removal. According to the invention, and possibly with the aid of the knock-out member 44, the clip portion 30 is preferably molded in an open elevated configuration (as shown in Figures 2A and 4). In this respect, the open elevated configuration is preferably to be distinguished from the fully and/or semi-depressed open configuration (as shown in Figure 2C) -- the latter of which may preferably be traversed to secure the container 20 to another item. That is, in the open elevated configuration (and preferably unlike any depressed open configuration), the arm portion 34 of the clip 30 is preferably elevated (rather than depressed) relative to the closed configuration (as shown in Figures 2B and 3).

[0055] Figure 2A shows the bottle 20 with the knock-out member 44 and with the arm 34 of the bottle 20 in the open elevated configuration. The bottle 20 is molded in the open configuration and, as also described elsewhere herein, integrally molded with hinge point 32 geometry and "catch" 38, 40 geometry.

[0056] Figure 2B does not show the knock-out member 44 of Figure 2A and shows the arm 34 in the closed configuration, bent around hinge-point 32. The arm 34 as shown

provides constant pre-tension force, preferably due to molded-in tension on the plastic, applied by the arm 34 at the catch 38, 40 area. The geometry of the catch 38, 40 is preferably angled such that inherent spring tension applied by the arm 34 draws together the arm 34 and the catch arm 42.

[0057] Molding the clip portion 30 of a blow molded container 20 in the open configuration preferably provides the following benefits: it preferably eases manufacturing methods of removing excess flash material and/or, perhaps significantly, it preferably creates a pre-load on the integrally molded spring clip portion 30. That is, in this last respect, the clip 30 is preferably biased towards the closed configuration when its arm portion 34 is moved into a depressed configuration to secure the container 20 to another item (not shown).

[0058] Various depictions of a container 20 having a clip portion 30 according the invention are provided in Figures 2A to 4. The container 20 is shown with a flip-top cap 18. The container 20 is preferably hollow and defines an interior chamber 22. The clip portion 30 preferably includes a body 24, a hinge arm 26 extending from one side of the body 24, and a hinge 32 on the hinge arm 26. The hinge 32 is preferably provided with a notch 28, and the arm portion 34 extends from the hinge 32. A catch arm 42 preferably extends from another side of the body 24. Preferably, in the closed configuration, an arm catch 38 provided on the arm portion 34 securely engages a catch portion 40 provided on the catch arm 42 in selectively releasable relation.

[0059] By molding the clip 30 OPEN and elevated, and by incorporating into the design a “living hinge point” 32, it is preferably possible to dictate (by means of design) exactly where the clip 30 will bend, and to ensure that it will have enough pre-built tension to stay in the closed position and have sufficient spring-back to return to its original shape and position.

[0060] Figures 5 to 7 below show an example mold 50A, 50B which employs a preferable method of “open molding” the clip 30 according to the invention. Figure 5 shows a rear mold 50A. The rear mold 50A defines rear mold chambers 52, 52. The rear mold 50A and the rear mold chambers 52, 52 shown in Figure 5 are preferably used in forming two bottles 20, 20, each with an arm 34 molded in the open configuration according to the invention. Figure 6 shows both the rear mold 50A and a front mold 50B for forming a bottle 20 according to the invention. The front mold 50B defines front mold chambers 54, 54. Together, the rear mold 50A and front mold 50B and their mold chambers 52, 52, 54, 54 are preferably used to form bottles 20 provided, each provided with a clip 30, according to the invention. Figure 7 shows, in phantom outline, blow molding chambers of the rear mold 50A, which are used to so form the bottles 20.

[0061] The part 30, once molded in the open elevated position, is preferably manually closed. It is preferably closed after molding by automated processes or manually by hand. The part 30 is preferably closed either immediately after molding or, preferably for enhanced spring-back performance, the part 30 (especially when plastic and blow molded) is preferably allowed to cool or set in the open position, and then closed at a later date. This may preferably provide increased spring-back strength and stiffness.

[0062] According to the invention, in this method of manufacturing (herein called “open clip blow-molding”), the spring clip 30 dynamics are preferably impacted by the material properties. For instance, a strong clipping and spring action is preferably achieved by means of a combination of high-density and low-density polyethylene. Other materials may be suitable as well. For instance, alternate embodiments of this method are preferably suitable for polypropylene, polycarbonate, PVC, and the like. Additionally, the blow-molding manufacturing method according to the invention preferably allows for different wall

thicknesses, preferably during each molding cycle. Varying the wall thickness at the spring points (e.g., at the hinge 32) preferably further enhances control over spring-dynamics and clip-dynamics.

[0063] The geometry and method according to the invention are preferably not limited to the shapes shown in the illustrations above. For instance, other shapes may be used such as (but not limited to) those shown in Figures 8A and 8B.

[0064] As well, this geometry and method are preferably not limited in size. A wide range of sizes may preferably be employed while achieving the clip geometry discussed here, including very small (e.g., single-servicing, sampling sized, <10ml) and up to and beyond large sizes (e.g., >1 liter and above).

[0065] Manufacturing Method

[0066] There are preferably several suitable manufacturing methods for creating blow-molded clips 30 using the method(s) described herein. These preferably include methods such as extrusion blow molding, injection blow molding, and other methods of blow molding (among others). All of these are preferably molded using the open-clip molding technique according to the invention which is described herein.

[0067] Springback Enhancement

[0068] When a spring clip 30 (such as has been described here) is mechanically depressed (i.e., opened), it preferably returns to its original (i.e., closed) position. The speed at which it returns may be immediate and/or it may take some time -- from moments to even several hours to return to a fully closed position. The speed at which it returns may be governed by the amount of initial deformation (i.e., how far the spring was flexed), as well as

and/or in addition to the material properties (i.e., what type of plastic may be used). This property we may refer to herein as “springback.”

[0069] According to the invention, by controlling the plastic, the springback is preferably enhanced. Certain springback properties are preferably achieved by controlling the blend ratios of LDPE and HDPE (e.g., low vs. high-density polyethylene), whereby the LDPE preferably provides flexibility while the HDPE preferably provides rigidity in mechanical structure, preferably to cause a higher spring force and optimized springback.

[0070] According to the invention, by including certain plastic additives, springback is preferably controlled and improved. For instance, according to the invention, springback is preferably improved to a point of immediate springback (i.e., having the clip 30 return to its original position after a full depression, substantially immediately), preferably by including in the raw plastic material additives such as (but not limited to) flexibilizers, plasticizers, impact modifiers, and/or structural modifiers such as fibers (e.g., glass, carbon, and the like) and/or mineral fillers (e.g., talc and the like). According to the invention, additives are preferably used to enhance the mechanical flex and springback properties of a blow-molded clip 30.

[0071] Supplementary Description

[0072] A method according to the invention produces an article 20 -- preferably a hollow container 20 defining an interior chamber 22 -- having a clip 30 for securing the article 20 to another item (not shown). In the method according to the invention, the article 20 is formed of a composition of matter and blow molded to have a unitary construction and to integrally provide the clip 30 as a part of the article 20.

[0073] This blow molding is such that the clip 30 has a hinge 32 where the clip bends, and a carabiner-type arm 34 which is initially blow molded into an open elevated

configuration. The article 20 is preferably extrusion and/or injection blow molded, with the carabiner-type arm 34 initially extrusion and/or injection blow molded into the open elevated configuration.

[0074] The carabiner-type arm 34 is resiliently pivotable from the open elevated configuration, preferably about the hinge 32, into a closed configuration and into a depressed open configuration. In the closed configuration, the carabiner-type arm 34 is in selectively releasable and secure engagement with a catch portion 40 provided on the article 20. The carabiner-type arm 34 is biased towards the catch portion 40. In the closed configuration, the carabiner-type arm 34 is preferably biased with sufficient pre-built tension to stay in the aforesaid selectively releasable and secure engagement with the catch portion 40.

[0075] The aforesaid pre-built tension is sufficient to bias the carabiner-type arm 34 to return to the closed configuration after it is mechanically moved to the depressed open configuration.

[0076] In the depressed open configuration, the carabiner-type arm 34 is depressed relative to and biased towards the closed configuration. The depressed open configuration is traversed to secure the article 20 to the aforesaid item.

[0077] The blow molding step is also such that, in the open elevated configuration, the carabiner-type arm 34 is elevated relative to the closed configuration.

[0078] After the carabiner-type arm 34 is initially blow molded into the open elevated configuration, the carabiner-type arm 34 is selectively pivotable -- by hand -- from the open elevated configuration into the closed configuration, and from the closed configuration into the depressed open configuration.

[0079] Preferably, the carabiner-type arm 34 is in the closed configuration. The carabiner-type arm 34 is preferably initially moved from the open elevated configuration into the closed configuration, preferably by automated processes. The clip 30 is preferably allowed to cool or set in the elevated open position, before the carabiner-type arm 34 is moved to the closed configuration.

[0080] The composition of matter includes one or more polyethylene materials and one or more plastic additives to provide the arm with the aforesaid sufficient pre-built tension. (The composition of matter may also or instead include a polypropylene material, a polycarbonate material, and/or a PVC material.) The polyethylene materials preferably include a combination of one or more HDPE materials and/or one or more LDPE materials. The combination is preferably a controlled blend of (a) the HDPE materials to provide the arm 34 and the clip 30 with rigidity in mechanical structure, and (b) the LDPE materials to provide the arm 34 and the clip 30 with flexibility. Together, this blend preferably provides the arm 34 with the aforesaid sufficient pre-built tension.

[0081] The additives preferably include a flexibilizer material, a plasticizer material, an impact modifier material and/or a structural modifier material. The structural modifier material is preferably a fiber material (e.g., a glass fiber material, a carbon fiber material) and/or a mineral filler material (e.g., a talc material).

[0082] Conclusion

[0083] The invention is contemplated for use in association with blow molding and containers, to afford increased functionality and/or advantageous utilities in association with same. The invention, however, is not so limited.

[0084] The foregoing description has been presented for the purpose of illustration and is not intended to be exhaustive or to limit the invention to the precise form disclosed.

[0085] Naturally, in view of the teachings and disclosures herein, persons having ordinary skill in the art may appreciate that alternate designs and/or embodiments of the invention may be possible (e.g., with substitution of one or more components for others, with alternate configurations of components, etc). Although some of the components, relations, configurations and/or steps according to the invention are not specifically referenced in association with one another, they may be used, and/or adapted for use, in association therewith. All of the aforementioned, depicted and various structures, configurations, relationships, utilities and the like may be, but are not necessarily, incorporated into and/or achieved by the invention. Any one or more of the aforementioned structures, configurations, relationships, utilities and the like may be implemented in and/or by the invention, on their own, and/or without reference, regard or likewise implementation of any of the other aforementioned structures, configurations, relationships, utilities and the like, in various permutations and combinations, as will be readily apparent to those skilled in the art, without departing from the pith, marrow, and spirit of the disclosed invention.

[0086] Other modifications and alterations may be used in the design, manufacture, and/or implementation of other embodiments according to the present invention without departing from the spirit and scope of the invention, which is limited only by the claims hereof.

WHAT IS CLAIMED IS:

1. A method to produce an article having a clip for securing the article to another item, wherein the method comprises a step of blow molding the article to have a unitary construction and to integrally provide the clip as a part of the article, such that the clip has a carabiner-type arm which is initially blow molded into an open elevated configuration and resiliently pivotable therefrom into (i) a closed configuration wherein the carabiner-type arm is biased into selectively releasable and secure engagement with a catch portion provided on the article and (ii) a depressed open configuration wherein the carabiner-type arm is depressed relative to and biased towards the closed configuration, with the depressed open configuration being traversed to secure the article to said item; and such that in the open elevated configuration, the carabiner-type arm is elevated relative to the closed configuration.
2. A method according to claim 1, wherein the article is blow molded such that the clip has a hinge where the clip bends, and wherein the carabiner-type arm is resiliently pivotable from the open elevated configuration, about the hinge, into the closed configuration and the depressed open configuration.
3. A method according to one of claims 1 and 2, wherein in the closed configuration, the carabiner-type arm is biased with sufficient pre-built tension to stay in selectively releasable and secure engagement with the catch portion.
4. A method according to any one of claims 1 to 3, wherein after the carabiner-type arm is initially blow molded into the open elevated configuration, the carabiner-type arm is selectively pivotable, by hand, from the open elevated configuration into the closed configuration, and from the closed configuration into the depressed open configuration.

5. A method according to any one of claims 1 to 3, wherein after the carabiner-type arm is initially blow molded into the open elevated configuration, the carabiner-type arm is initially moved from the open elevated configuration into the closed configuration by one or more automated processes.
6. A method according to any one of claims 1 to 5, wherein after the carabiner-type arm is blow molded into the open elevated configuration, the clip is allowed to cool and set in the elevated open position, before the carabiner-type arm is moved to the closed configuration.
7. A method according to any one of claims 1 to 6, wherein the article is extrusion blow molded, and the carabiner-type arm is initially extrusion blow molded into the open elevated configuration.
8. A method according to any one of claims 1 to 6, wherein the article is injection blow molded, and the carabiner-type arm is initially injection blow molded into the open elevated configuration.
9. A method according to any one of claims 1 to 8, wherein the carabiner-type arm is biased with sufficient pre-built tension to return to the closed configuration after the carabiner-type arm is mechanically moved to the depressed open configuration.
10. A method according to any one of claims 1 to 9, wherein the article is blow molded as a hollow container.
11. A blow molded article of unitary construction comprising an integral clip for securing the blow molded article to another item, with the clip having a catch portion and a carabiner-type arm initially blow molded into an open elevated configuration and resiliently pivotable therefrom into (i) a closed configuration wherein the carabiner-type arm is biased into selectively releasable and secure engagement with the catch portion and (ii) a depressed open

configuration wherein the carabiner-type arm is depressed relative to and biased towards the closed configuration, with the depressed open configuration being traversed to secure the article to said item; and such that in the open elevated configuration, the carabiner-type arm is elevated relative to the closed configuration.

12. A blow molded article according to claim 10, wherein the carabiner-type arm is in the closed configuration.

13. A blow molded article of unitary construction comprising an integral clip for securing the blow molded article to another item, with the clip having a catch portion and an arm resiliently pivotable between an open configuration, and a closed configuration wherein the arm is in selectively releasable and secure engagement with the catch portion; wherein the arm is biased towards the closed configuration with sufficient pre-built tension for the arm to stay in said selectively releasable and secure engagement with the catch portion; wherein the blow molded article of unitary construction is formed of a composition of matter which comprises one or more polyethylene materials and one or more plastic additives so as to thus provide the arm with said sufficient pre-built tension.

14. A blow molded article according to claim 13, wherein the composition of matter is adapted for forming the blow molded article by extrusion blow molding and/or by injection blow molding.

15. A blow molded article according to one of claims 13 and 14, wherein the composition of matter further comprises at least one of a polypropylene material, a polycarbonate material, and a polyvinyl chloride (PVC) material.

16. A blow molded article according to any one of claims 13 to 15, wherein the polyethylene materials of the composition of matter comprise a combination of one or more

high-density polyethylene (HDPE) materials and one or more low-density polyethylene (LDPE) materials.

17. A blow molded article according to claim 16, wherein the combination comprises a controlled blend of (a) the HDPE materials so as to thus provide the arm and the clip with rigidity in mechanical structure, and (b) the LDPE materials so as to thus provide the arm and the clip with flexibility, together so as to thus provide the arm with said sufficient pre-built tension.

18. A blow molded article according to any one of claims 13 to 17, wherein the additives comprise at least one of a flexibilizer material, a plasticizer materials, and an impact modifier material.

19. A blow molded article according to any one of claims 13 to 18, wherein the additives comprise at least one structural modifier material.

20. A blow molded article according to claim 19, wherein the structural modifier material comprises at least one fiber material.

21. A blow molded article according to claim 20, wherein the fiber material comprises at least one of a glass fiber material and a carbon fiber material.

22. A blow molded article according to claim 19, wherein the structural modifier material comprises at least one mineral filler material.

23. A blow molded article according to claim 22, wherein the mineral filler material comprises a talc material.

24. A blow molded article according to any one of claims 13 to 23, wherein the arm is a carabiner-type arm, with the open configuration being a depressed open configuration

wherein the carabiner-type arm is depressed relative to the closed configuration, wherein the depressed open configuration is traversed to secure the article to said item, wherein the carabiner-type arm is initially blow molded into and resiliently pivotable from an open elevated configuration whereat the carabiner-type arm is elevated relative to the closed configuration.

25. A blow molded article according to any one of claims 13 to 24, wherein the blow molded article of unitary construction is blow molded as a hollow container.

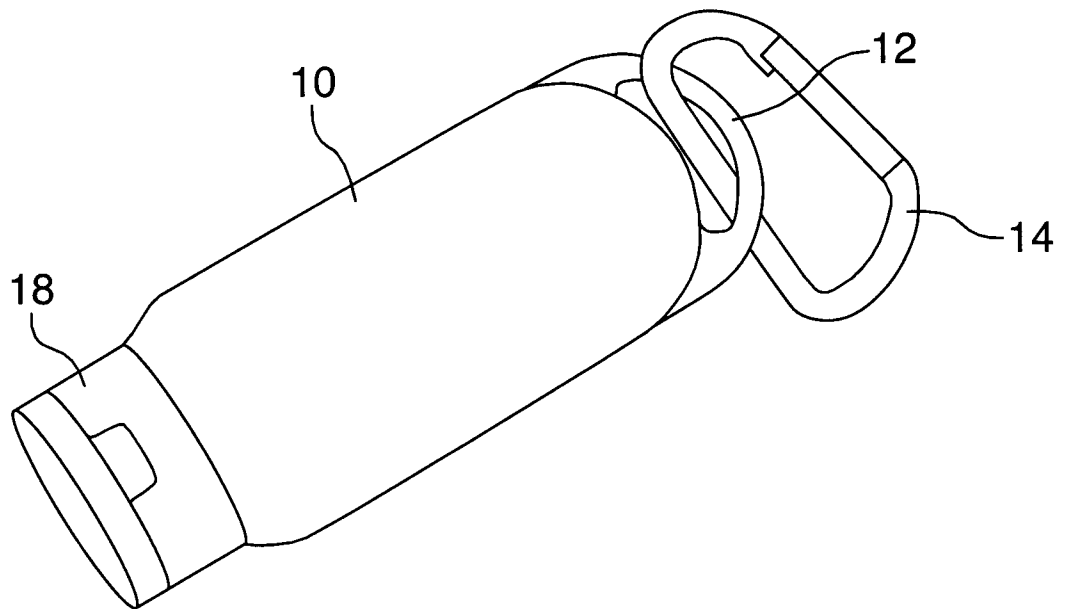


FIG.1
PRIOR ART

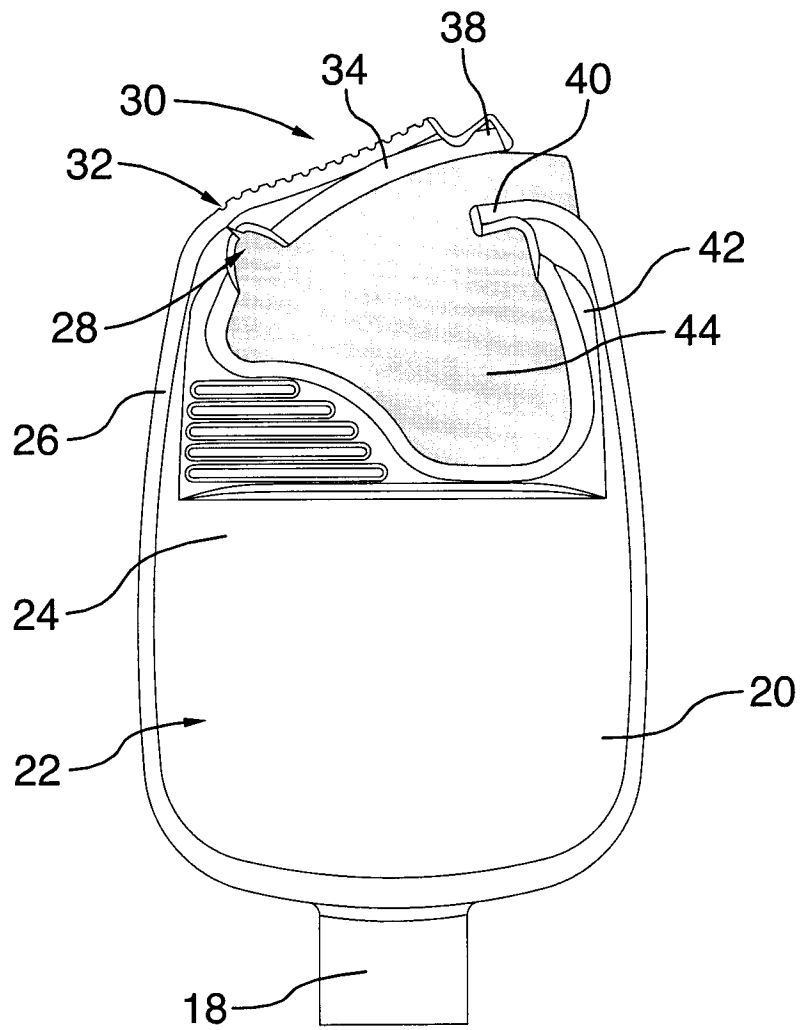


FIG.2A

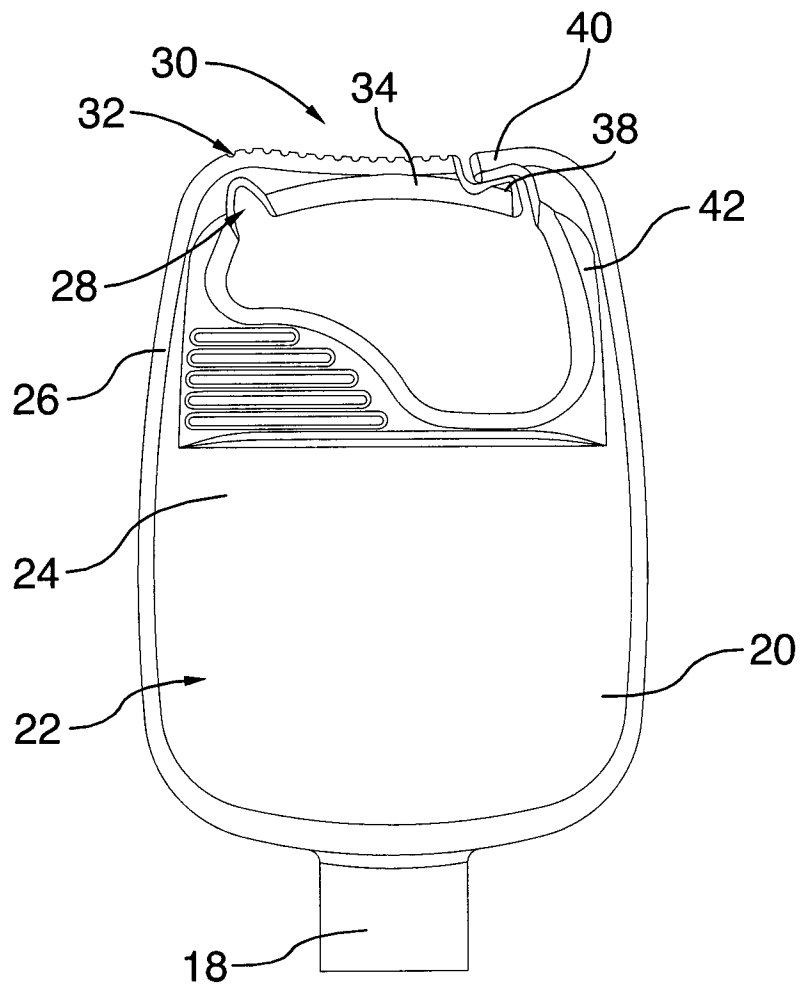


FIG.2B

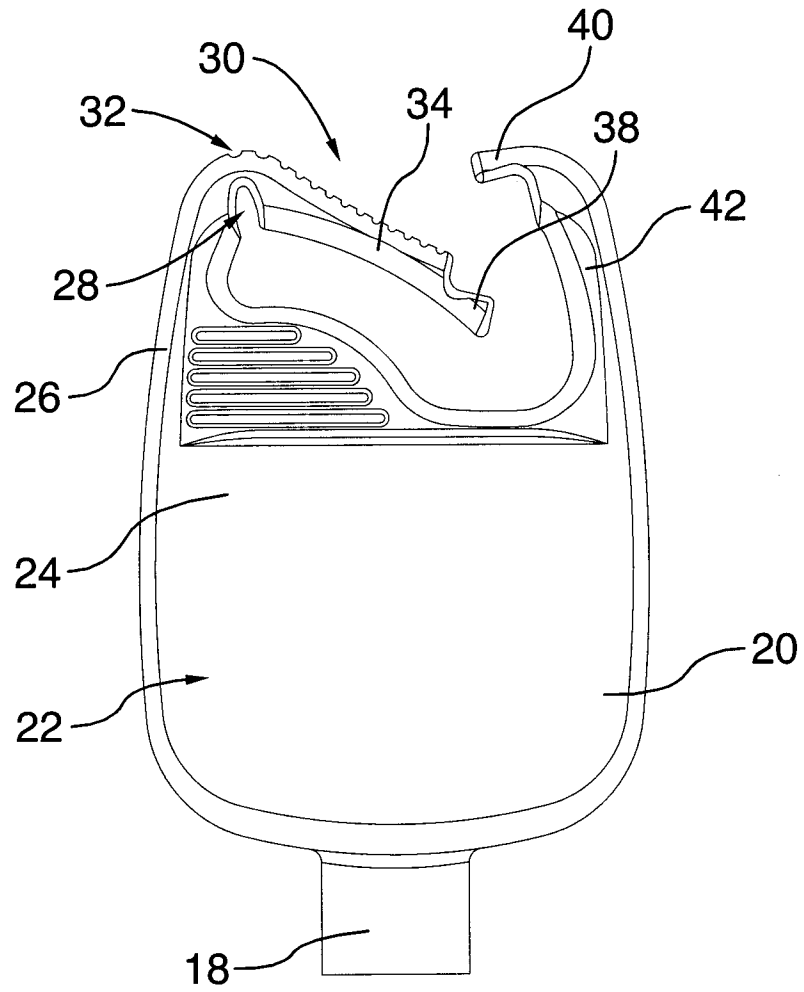


FIG.2C

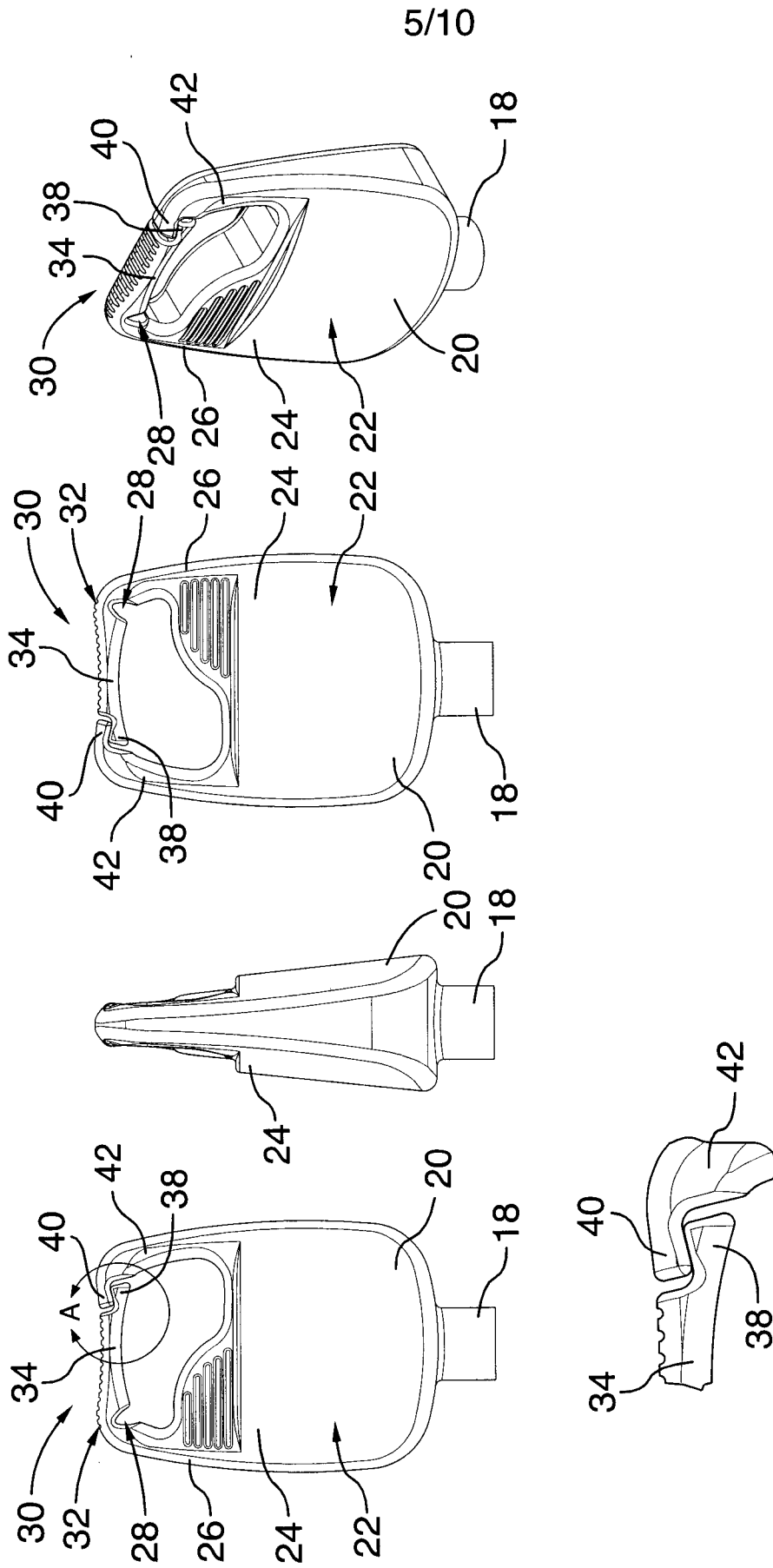


FIG.3

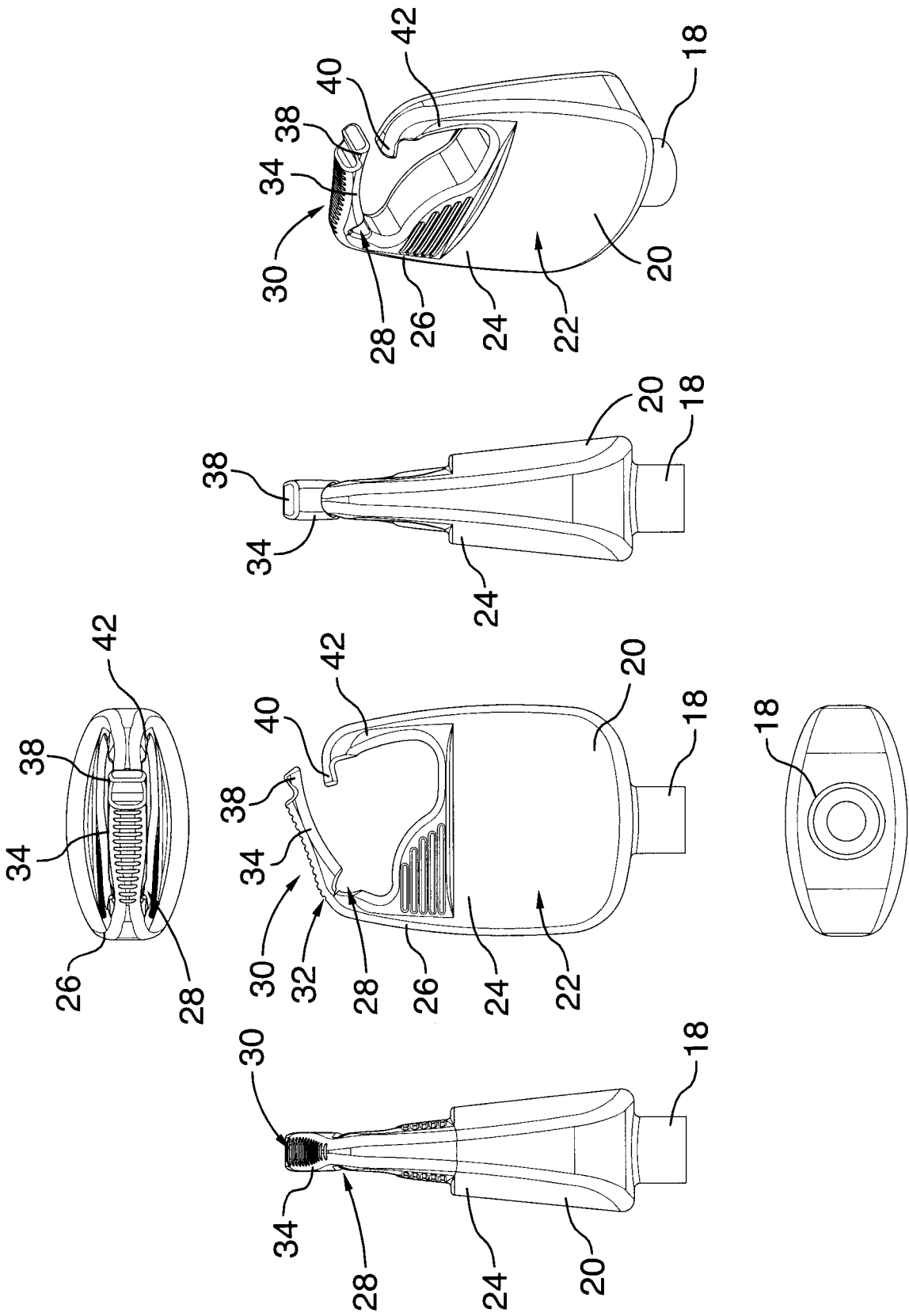


FIG. 4

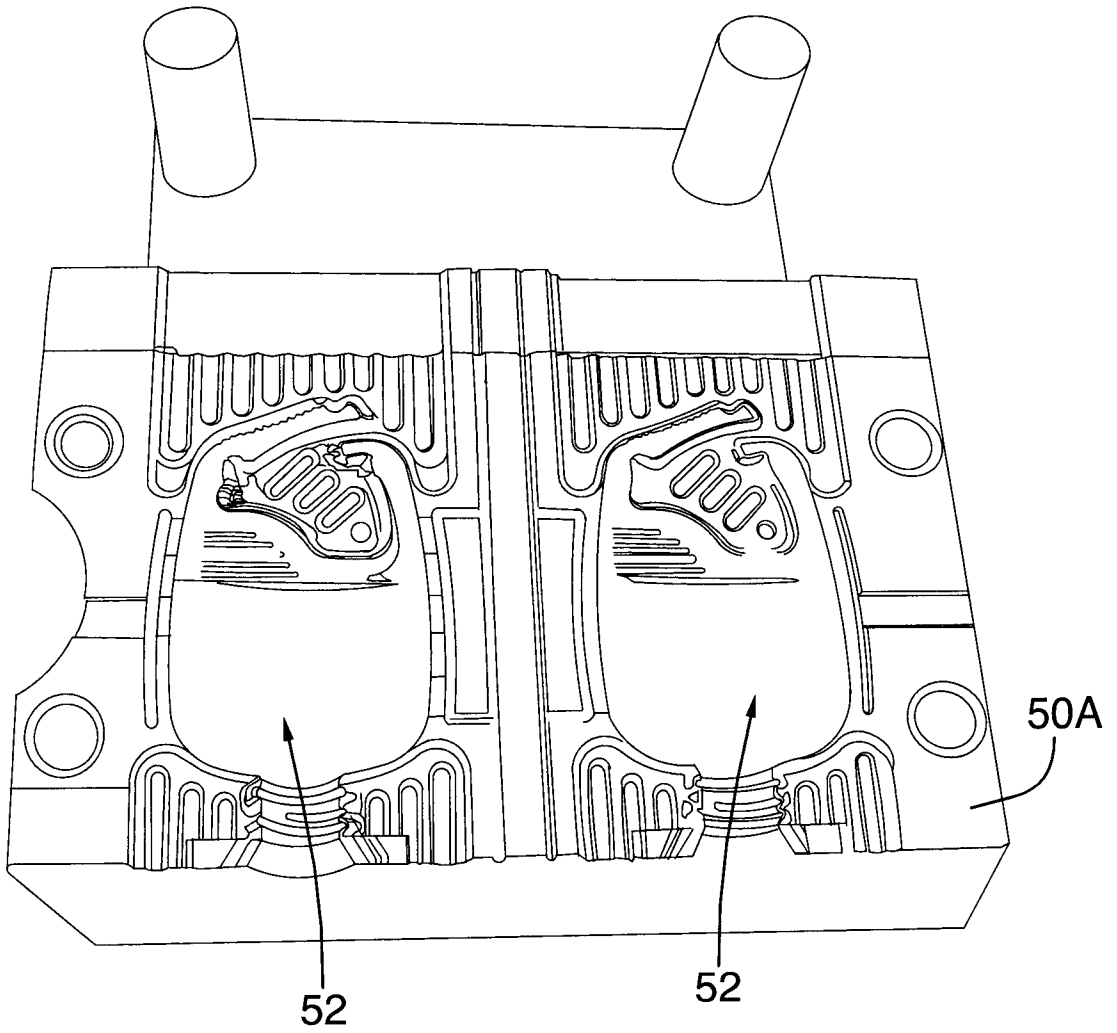


FIG.5

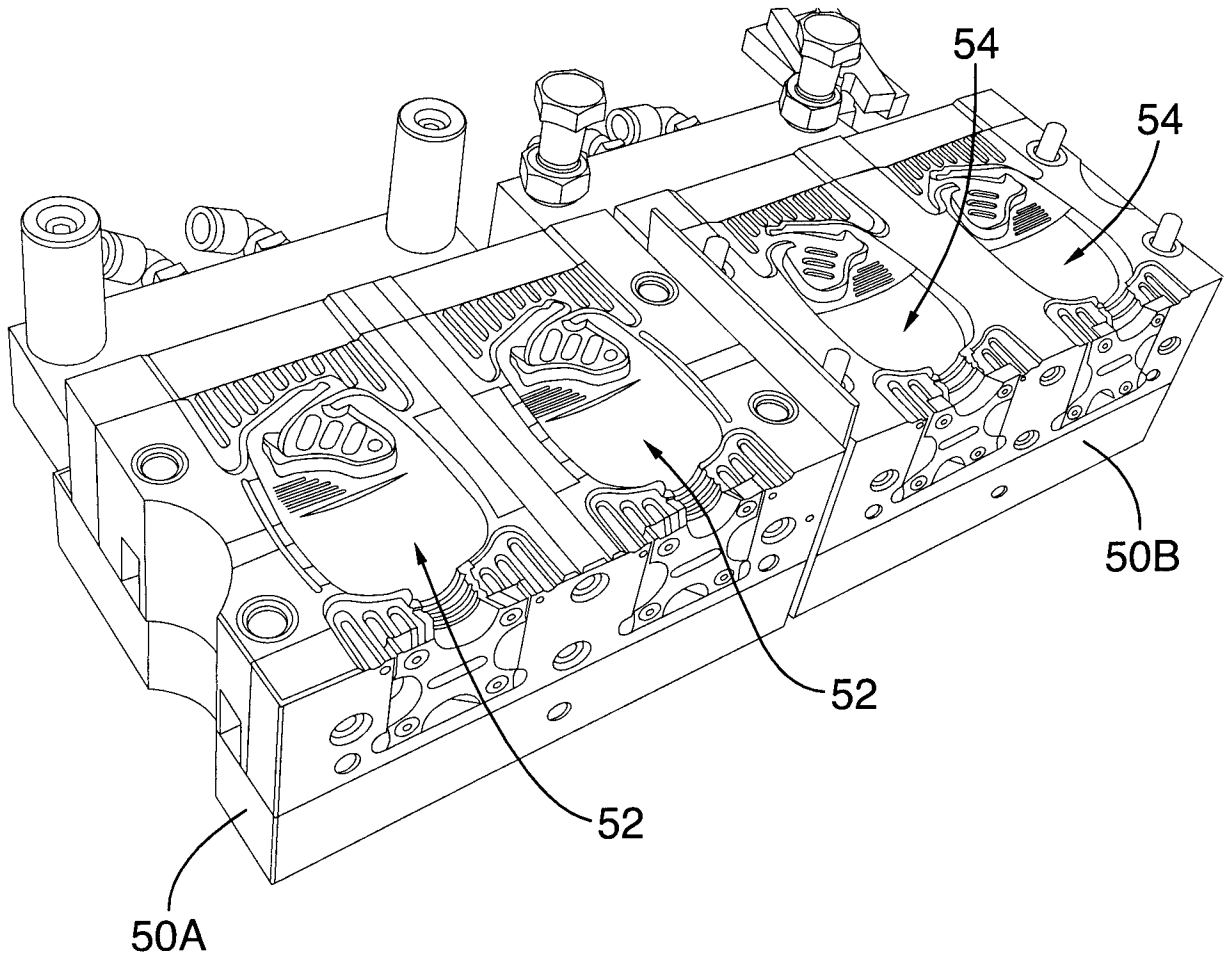


FIG.6

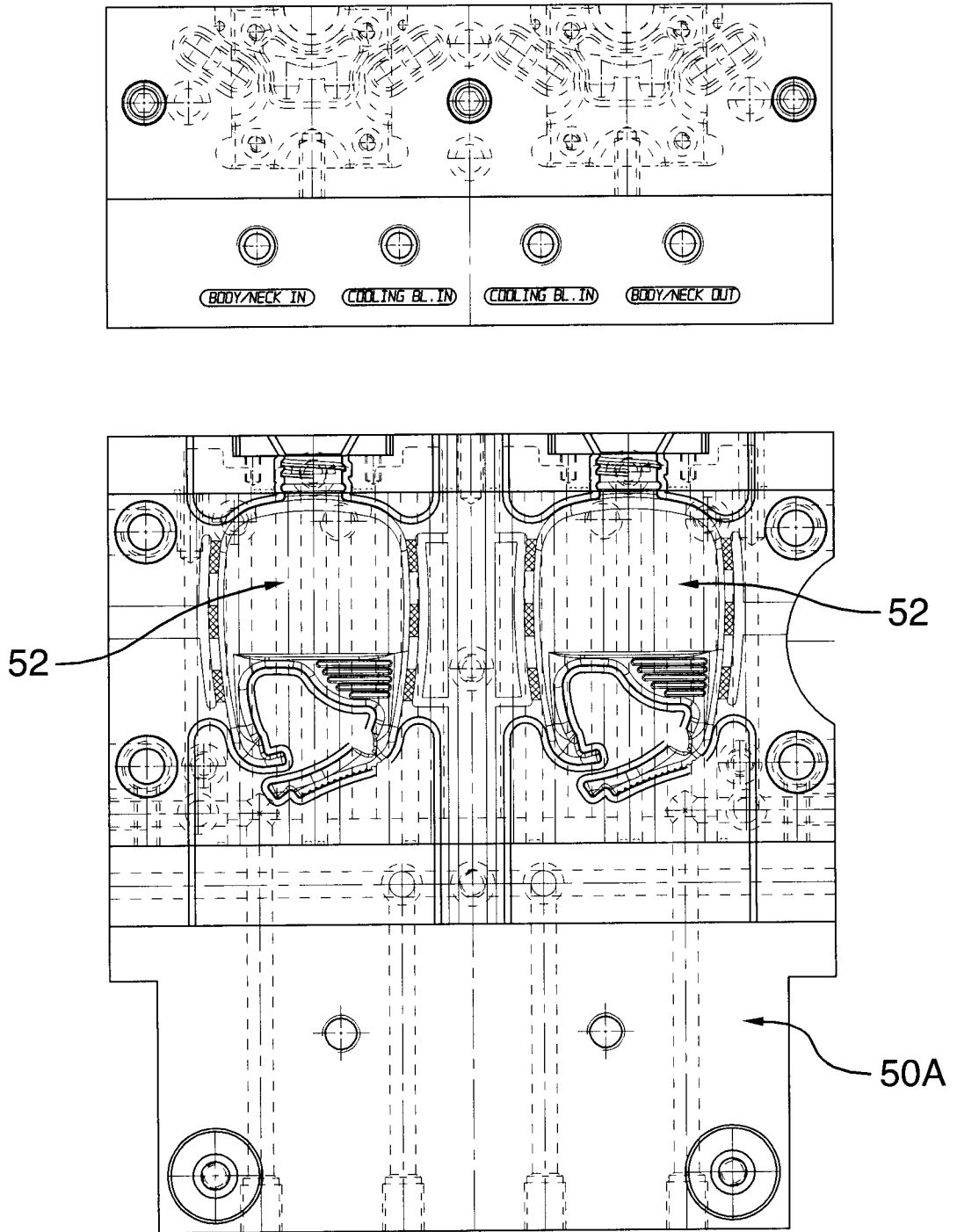


FIG.7

10/10

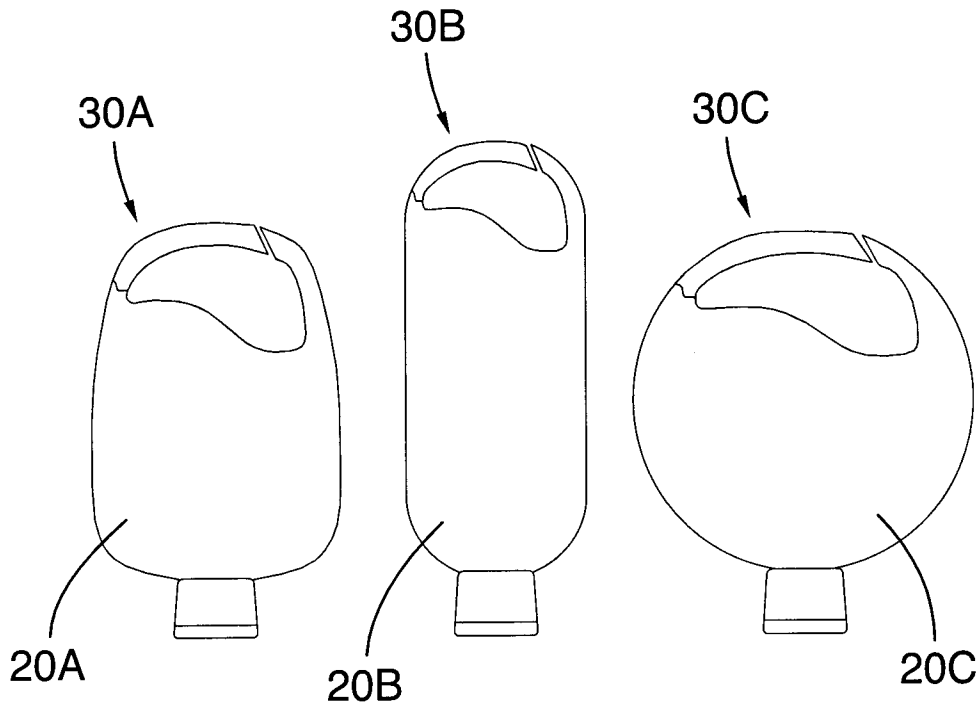


FIG. 8A

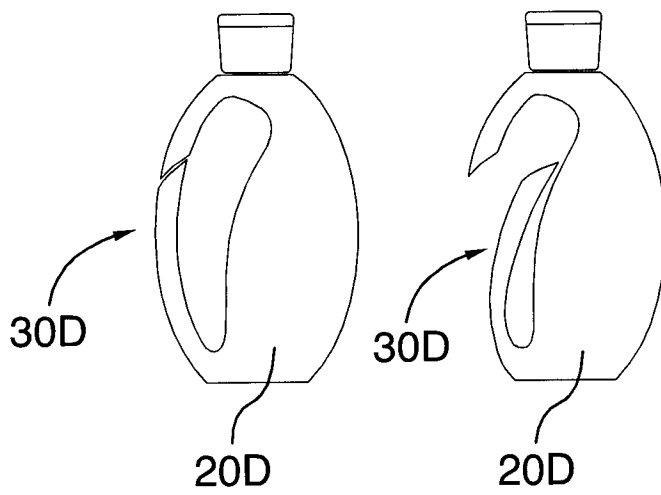


FIG. 8B

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CA2015/000104

A. CLASSIFICATION OF SUBJECT MATTER
IPC: **B29C 49/00** (2006.01)

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)
IPC: **B29C 49/00**

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

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)

Keywords searched:

(polyethylene or plastic) and (unitary or integrat*) and clip and (depress* or squeeze*) and open* and clos* and (spring or tension) and blow mo*Id*

Databases searched:

Questel-Orbit & Intellect (CPD)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2012/0132556 A1 (WEBSTER, M.J.) 31 May 2012 (31-05-2012) Whole document.	Nil
A	US 2008/0098952 A1 (HEALY, D.R. et al.) 1 May 2008 (01-05-2008) Whole document.	Nil
A	US 5,433,339 (SARVER, J.W.) 18 July 1995 (18-07-1995) Whole document.	Nil
A	US 2009/0095703 A1 (KEELER, D.) 16 April 2009 (16-04-2009) Whole document.	Nil
A	US 8,316,509 B1 (THOMSON, D.W. et al.) 27 November 2012 (27-11-2012) Whole document.	Nil

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"&" document member of the same patent family
"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	

Date of the actual completion of the international search

7 May 2015 (07-05-2015)

Date of mailing of the international search report

12 May 2015 (12-05-2015)

Name and mailing address of the ISA/CA
Canadian Intellectual Property Office
Place du Portage I, C114 - 1st Floor, Box PCT
50 Victoria Street
Gatineau, Quebec K1A 0C9
Facsimile No.: 001-819-953-2476

Authorized officer

Benjamin Chan (819) 934-3593

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CA2015/000104

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CA 2,872,995 (STANLEY, S. K. et al.) Whole document.	14 November 2013 (14-11-2013) Nik
A	CA 2,770,031 (GERLACH, C.G.F. et al.) Whole document.	10 March 2012 (10-03-2012) Nil
A	CA 1,302,055 (HENDERSON, R.W.) Whole document.	2 June 1992 (02-06-1992) Nil
A	CA 2,617,478 (NENADIC, J.) Whole document.	10 July 2008 (10-07-2008) Nil

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2015/000104

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
US2012132556A1	31 May 2012 (31-05-2012)	None	
US2008098952A1	01 May 2008 (01-05-2008)	None	
US5433339	18 July 1995 (18-07-1995)	None	
US2009095703A1	16 April 2009 (16-04-2009)	None	
US8316509B1	27 November 2012 (27-11-2012)	US8316509B1 WO2013044272A2 WO2013044272A3	27 November 2012 (27-11-2012) 28 March 2013 (28-03-2013) 23 May 2013 (23-05-2013)
CA2872995A1	14 November 2013 (14-11-2013)	CA2872995A1 CA2872999A1 CA2873001A1 CA2873004A1 CA2873107A1 CA2873698A1 CA2879797A1 CA2880644A1 CA2881055A1 CN104271462A CN104271463A CN104284775A CN104284778A CN104284844A CN104284846A CN104334465A CN104520207A EP2846995A1 EP2846998A1 EP2847087A1 EP2847088A1 EP2847089A1 EP2847090A1 EP2847094A1 KR20140146172A KR20140146173A KR20140146174A KR20140146176A KR20150000899A KR20150008162A KR20150020166A MX2014013581A PH12014502473A1 PH12014502474A1 PH12014502475A1 PH12014502476A1 PH12014502477A1 PH12014502478A1 TW201400369A TW201404672A TW201404673A TW201406618A TW201410558A TW201420437A TW201425152A	14 November 2013 (14-11-2013) 14 November 2013 (14-11-2013) 14 November 2013 (14-11-2013) 14 November 2013 (14-11-2013) 14 November 2013 (14-11-2013) 14 November 2013 (14-11-2013) 14 November 2013 (14-11-2013) 13 February 2014 (13-02-2014) 13 February 2014 (13-02-2014) 07 January 2015 (07-01-2015) 07 January 2015 (07-01-2015) 14 January 2015 (14-01-2015) 14 January 2015 (14-01-2015) 14 January 2015 (14-01-2015) 14 January 2015 (14-01-2015) 04 February 2015 (04-02-2015) 15 April 2015 (15-04-2015) 18 March 2015 (18-03-2015) 18 March 2015 (18-03-2015) 18 March 2015 (18-03-2015) 18 March 2015 (18-03-2015) 18 March 2015 (18-03-2015) 18 March 2015 (18-03-2015) 18 March 2015 (18-03-2015) 24 December 2014 (24-12-2014) 24 December 2014 (24-12-2014) 24 December 2014 (24-12-2014) 24 December 2014 (24-12-2014) 05 January 2015 (05-01-2015) 21 January 2015 (21-01-2015) 25 February 2015 (25-02-2015) 04 December 2014 (04-12-2014) 22 December 2014 (22-12-2014) 22 December 2014 (22-12-2014) 22 December 2014 (22-12-2014) 22 December 2014 (22-12-2014) 12 January 2015 (12-01-2015) 01 January 2014 (01-01-2014) 01 February 2014 (01-02-2014) 01 February 2014 (01-02-2014) 16 February 2014 (16-02-2014) 16 March 2014 (16-03-2014) 01 June 2014 (01-06-2014) 01 July 2014 (01-07-2014)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CA2015/000104

US2013292287A1 07 November 2013 (07-11-2013)
 US2013292353A1 07 November 2013 (07-11-2013)
 US2013292395A1 07 November 2013 (07-11-2013)
 US2013292413A1 07 November 2013 (07-11-2013)
 US2013292415A1 07 November 2013 (07-11-2013)
 US2013294711A1 07 November 2013 (07-11-2013)
 US2013337244A1 19 December 2013 (19-12-2013)
 US2014033654A1 06 February 2014 (06-02-2014)
 US2014033655A1 06 February 2014 (06-02-2014)
 WO2013169681A1 14 November 2013 (14-11-2013)
 WO2013169682A1 14 November 2013 (14-11-2013)
 WO2013169683A1 14 November 2013 (14-11-2013)
 WO2013169684A1 14 November 2013 (14-11-2013)
 WO2013169686A1 14 November 2013 (14-11-2013)
 WO2013169688A1 14 November 2013 (14-11-2013)
 WO2013169690A1 14 November 2013 (14-11-2013)
 WO2014025609A1 13 February 2014 (13-02-2014)
 WO2014025610A1 13 February 2014 (13-02-2014)
 WO2014025610A8 19 March 2015 (19-03-2015)

CA2770031A1	10 March 2011 (10-03-2011)	CA2770031A1 10 March 2011 (10-03-2011) CA2770031C 03 June 2014 (03-06-2014) AR078264A1 26 October 2011 (26-10-2011) AT536247T 15 December 2011 (15-12-2011) CN102481718A 30 May 2012 (30-05-2012) EP2292401A1 09 March 2011 (09-03-2011) EP2292401B1 07 December 2011 (07-12-2011) ES2378746T3 17 April 2012 (17-04-2012) JP2013503066A 31 January 2013 (31-01-2013) JP5694329B2 01 April 2015 (01-04-2015) MX2012002699A 21 March 2012 (21-03-2012) US2011057361A1 10 March 2011 (10-03-2011) WO2011028759A1 10 March 2011 (10-03-2011)
CA1302055	02 June 1992 (02-06-1992)	CA1302055C 02 June 1992 (02-06-1992) DE3671788D1 12 July 1990 (12-07-1990) EP0202121A2 20 November 1986 (20-11-1986) EP0202121A3 18 March 1987 (18-03-1987) EP0202121B1 06 June 1990 (06-06-1990) GB8512234D0 19 June 1985 (19-06-1985) US4759103A 26 July 1988 (26-07-1988)
CA2617478A1	10 July 2008 (10-07-2008)	CA2617478A1 10 July 2008 (10-07-2008) CA2617478C 20 December 2011 (20-12-2011) AU2008200108A1 24 July 2008 (24-07-2008) AU2008200108B2 17 September 2009 (17-09-2009) EP1944133A1 16 July 2008 (16-07-2008) EP1944133B1 26 June 2013 (26-06-2013) ES2428879T3 12 November 2013 (12-11-2013) US2008163433A1 10 July 2008 (10-07-2008) US7913591B2 29 March 2011 (29-03-2011) ZA200800319A 27 January 2010 (27-01-2010)