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54 **Packages of carbonated beverages.**

57 A low-cost multipack (10) of carbonated soft drinks for children has three bottles (12) arranged in line within a packaging sleeve (14). The bottles are thin-walled and have pressure-resistant hemispherical bases (20). The sleeve (14A) is made from a cartonboard blank and is held intact by end panels (52,64) of the blank which are overlapped and glued (82) together beneath the bases of the bottles. The blank (14A) is formed with two lines of weakening (84) so as to subdivide the sleeve into three portions each of which contains one bottle. The multipack (10) may be separated along these lines of weakening (84) as desired, so as to form packages for individual consumption.

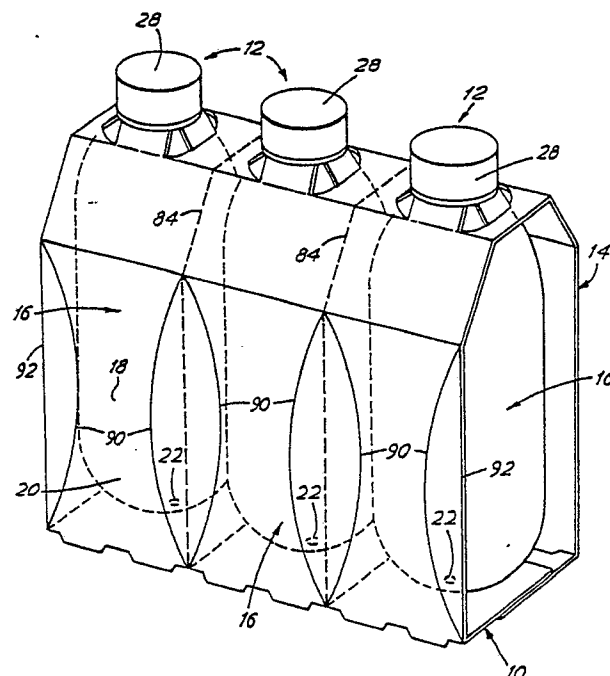


FIG.1

PACKAGES OF CARBONATED BEVERAGES

This invention relates to the packaging of carbonated beverages particularly, but not necessarily, carbonated soft drinks for children.

It is well known to package carbonated beverages in bottles made of thermoplastics material, in particular polyethylene terephthalate (PET). Hitherto such bottles have been self-standing, that is to say, they have been provided with a standing base having a standing surface on which they may be stood upright. The standing bases have been essentially of two kinds, a first kind of which is a separate cup-like standing member which is moulded separately of the bottle from a suitable thermoplastics polymer e.g. polyethylene, and into which the bottom end of the bottle is received and attached by adhesive and/or by mechanical engagement. With such an arrangement the bottom end of the bottle may be generally hemispherical and therefore highly resistant to distortion by the carbonation pressure within the bottle. However, the moulding and attachment of the standing member represent a substantial part of the total cost of the bottle; further contributing to the cost of the bottle has hitherto been a paper or plastics label which has been attached or sleeved over the bottle body above the standing member for informative and/or promotional purposes.

The second kind of standing base which has hitherto been provided for PET bottles for carbonated beverages has been formed integrally with the bottle, either in the form of downwardly projecting feet or lobes or in the form of a champagne-type base having an annular standing rim and a central recess which lies within the standing rim and is strengthened against inversion by carbonation pressure by means of radially directed ribs.

In order however, to enable it successfully to withstand substantial carbonation pressures without distortion, each of these two forms of integral standing base requires sophisticated design and careful moulding; moreover, a considerably greater quantity of the PET polymer is needed to be provided in an integral base in comparison with the generally hemispherical base of the bottle discussed above and having a generally separate standing member attached to it. As with the bottle with standing member, the cost of the bottle with integral base has conventionally been further increased by a paper or plastics label attached to or sleeved over its body wall.

From the foregoing it will therefore be understood that the PET bottles hitherto proposed for carbonated beverages have involved considerable expense in providing their self-standing capability; moreover, in order that they may safely exist in-

dependantly of the coupler the bottles have hitherto been moulded with a substantially greater wall thickness than is required merely to contain the carbonated pressures within them.

Also well known for the packaging of carbonated products are container multipacks, in which a plurality of bottles or cans of a carbonated beverage are attached together for marketing as a group by means of a packaging coupler essentially of board or plastics material. Various forms of coupler have been proposed, amongst which are sleeves or jackets of board material such as are marketed for bottles or cans in UK under the trade name JAK-ET-PAK (Registered Trade Mark), and apertured plastics sheets designed to fit resiliently over the upper ends of cans and such as are marketed in UK under the trade name HI-CONE. To Applicants' knowledge, however, in the multipacks proposed hitherto the containers have been capable of existing in their own right as vendable items, that is to say, they have been self-standing and individually labelled, and in the case of plastics bottles they have had an increased polymer content and body wall thickness as is mentioned above.

With the added costs arising from the provision of the coupler and its combination with the containers, the known multipacks have therefore been relatively expensive; moreover, the couplers have been essentially indivisible, and because of, for example, consumer protection legislation it has hitherto been undesirable for the retailer to sell the containers of the multipack individually, even though a demand may exist for individual sales, for example, to school children for carbonated soft drinks.

Further known in the art of packaging carbonated beverage products are containers (marketed under the trade name RIGELLO) which are formed of a fabricated plastics body with pressure-resistant hemispherical base, and a tubular base member of board material which is sleeved over the bottom part of the body and which projects below the hemispherical base to provide an annular standing surface for the container at its own bottom end. The base member is printable for information and promotional purposes, and provides protection for the part of the body which it covers. The hemispherical base and the remainder of the body within the sleeve accordingly need only be sufficiently thick to withstand the carbonation pressures; above the top edge of the sleeve, however, the body has a substantial wall thickness provided by an injection-moulded member which is formed separately from the remainder of the body

and is attached to it around a peripheral flange abutting the top edge of the sleeve. This separate member forms a generally frustoconical shoulder for the body, and tapers towards a central neck onto which a removable closure is fitted.

Because of its fabricated nature and the costs attendant upon forming and attaching the sleeve, the container described in the preceding paragraph is relatively expensive in its own right. Further costs would be involved in forming the container into a multipack with other, like containers, if this were required.

The present invention seeks to provide a multipack of containers for a carbonated beverage, which combines cheapness with separability of the containers from the multipack for individual sale. In accordance with the invention from a first aspect there is accordingly provided a multipack of containers for a carbonated beverage, which comprises a group of thin-walled bottles arranged in line, and a substantially open-ended board sleeve generally surrounding the group of bottles, the bottles being each unitary and moulded from thermoplastics polymer to have a neck portion adapted for receiving a closure, and a body formed with the neck portion at one end and at its other end formed with a substantially hemispherical base, the sleeve having apertures through which the neck portions of the bottles project but otherwise enclosing the bottles, and a line of weakening being formed around the sleeve between each two adjacent bottles so that the bottles can be detached individually from the multipack together with their respective portions of sleeve.

In the arrangement of the preceding paragraph the bottles are preferably unlabelled to minimise cost. Informative and promotional data may be printed on the sleeve, which may be arranged to provide a large display area on each side of the multipack; at least some of this data may be repeated for each bottle so that each bottle will be provided with the data after detachment from the multipack.

In accordance with the invention from a second aspect there is provided a package, comprising a single thin-walled bottle for a carbonated beverage, and a substantially open-ended board sleeve generally surrounding the bottle, the bottle being unitary and moulded from thermoplastics polymer to have a neck portion adapted for receiving a closure and a body formed with the neck portion at one end and at its other end formed with a substantially hemispherical base, the sleeve having an aperture through which the neck portion of the bottle projects but otherwise enclosing the bottle, the bottle being un-labelled but the sleeve being printed with informative and/or promotional data.

These and other aspects and features of the

invention will become apparent from a multipack of carbonated beverage bottles embodying the invention and a sleeved bottle after detachment from the multipack, now to be described, by way of example, with reference to the accompanying drawings, in which:-

Fig.1 shows the multipack in perspective view;

Fig.2 shows one of the portions of the multipack after severance from the multipack; and

Fig.3 shows the blank from which the sleeve of the multipack is formed;

Referring firstly to Fig.1 there is shown a low-cost multipack 10 formed of three identical bottles 12 within a packaging sleeve 14. The bottles contain a carbonated beverage product such, for example, as a carbonated soft drink for children.

Each bottle 12 has a body 16 formed in known manner by stretch-blow moulding a preform (not shown) which has been injection-moulded from polyethylene terephthalate (PET) thermoplastics material. As can clearly be seen in Fig.2, the body 16 has a cylindrical central portion 18 which is closed at its bottom end by a base portion 20, this base portion being hemispherical except for a central moulding pip 22 which, in known manner, is left as a witness mark by the gate of the injection mould by which the preform for the bottle is formed.

The top end of the body 16 is formed as a tapering shoulder 24, surmounted by a screw-threaded neck 26 which forms the mouth of the body and onto which is screwed a plastics closure 28. The closure 28 is arranged to make a gas-tight and liquid-tight seal with the neck 26. Immediately below the free edge 30 of the closure the bottle neck is formed with an annular bead 32; if desired, this bead may serve as a projection under which a frangible or detachable tamperproofing ring (not shown) of the closure may be engaged to provide evidence of an unauthorised attempt to unscrew the closure.

Reference is now made also to Fig.3, from which it will be understood that the sleeve 14 is generally rectangular and formed by scoring or creasing a cartonboard blank 14A with six lines 40, 42, 44, 46, 48 and 50 along which the blank can be folded in the formation of the sleeve. These lines extend in parallel relation transversely of the blank so as to subdivide the blank into lower base panel 52, rear (in relation to Fig.1) side panel 54, rear shoulder panel 56, top panel 58, front shoulder panel 60 identical to the panel 56, front side panel 62 identical to the panel 54, and upper base panel 64. The base panels 52, 64 form the ends of the blank.

The fold lines 40 to 50 are each continuous,

with the exception of the lines 40, 50 which are interrupted at tabs 66 struck from the adjacent base panel 52, 64 by U-shaped cut lines 68. The ends of the cut lines 68 intersect the respective fold line 40 or 50; as shown in Figs. 1 and 2, when the sleeve 14 is formed from the blank 14A the tabs 66 therefore remain coplanar with the side panels 54, 62 and project below the bottom of the multipack for stabilising the multipack against toppling over from an upright position.

The bottles 12 are arranged within the sleeve 14 in side-by-side engagement, and for that purpose the top panel 58 of the blank 14A is formed with three identical and generally circular apertures 70, one for each bottle. The diameter of each aperture 70 is such that a closure 28 may be passed through it to allow the top panel 58 of the blank to come to rest on the shoulder portion 24 of the bottle on which the closure is fitted. Tabs 72 are formed at 90° intervals around each aperture 70 of the blank, so as to project inwardly from attachment on the aperture periphery at hinge lines 74; the passage of the closure 28 through the aperture therefore folds the tabs upwardly about their hinge lines 74 until their free ends become lodged beneath the bottle bead 30 to locate the upper end of the bottle firmly in relation to the top panel 58.

The multipack is formed by marshalling and supporting the product-filled and closed bottles in a group of three side-by-side, moving the blank 14A and/or the bottles to move the blank downwardly over the bottle closures 28 and so engage the tabs 72 beneath the bottle beads 30, folding the blank downwardly around the bottles to bring its shoulder panels 56, 60 against the bottle shoulder portions 24 and its side panels 54, 62 against the cylindrical portions 18 of the bottles, and further folding the blank to bring the upper base panel 64 against the base portions 20 of the bottles and thereafter to bring the lower base panel 52 against the underside of the upper base panel and in overlapping relation with that panel.

As can be seen from Fig.3, the upper base panel is formed with cutouts 80 in which the moulding pips 22 of the bottles are received when the upper base panel 64 is folded into position against the bottles. Prior to its folding against the upper base panel, the lower base panel 52 is formed with a glue line 82 (Fig.3), located so as to lie immediately beneath the moulding pips. After hardening, the glue line 82 therefore serves not only to attach the base panels 52, 64 together to hold the multipack intact, but by adherence to the moulding pips it also assists the cutouts 80 to locate the bottom ends of the bottles longitudinally in relation to the multipack and to prevent the bottles from rotating.

The bonding of the base panels together by the glue line is achieved at a time when the blank 14A is being held tightly wrapped about the bottles. The bottles are therefore securely held in the sleeve 14 against substantial movement in any direction. The substantial tension left in the sleeve by the forming operation will cause some downward bowing (not shown) of the panels 52, 64 by the bottles, but the tabs 66 project downwards sufficiently below these panels to ensure stability for the multipack when stood on a horizontal surface.

Reverting now to Figs. 1 and 3, the blank 14A is formed with two parallel perforation lines 84 which extend the length of the blank at equal spacings from one another and from the side edges 92 of the blank. In the erected multipack these lines provide lines of weakening enabling each bottle 16 and its associated portion of the sleeve 14 to be torn away from the multipack.

The multipack can therefore be sold by the retailer, if required, as three individual multipack portions each containing one bottle, a facility which is particularly advantageous if, as described, the bottles contain a carbonated beverage drink intended for consumption by school children.

As can be seen in the drawings, in each side panel 54, 62 a bowed score line 90 extends generally alongside each perforation line 84 or sleeve free edge 92 (as appropriate), with its ends intersecting the junctions of the line 84 or edge 92 with the respective fold lines 40, 42 or 48, 50. When the respective portion of the multipack has been detached as described above, the parts of the side panels defined between each score line 90 and its associated line 84 or edge 92 can be folded inwardly against the adjacent bottle 12 so as to give a pleasing, finished appearance to the multipack portion. The panel parts at the ends of the complete multipack can likewise be folded inwards if desired.

Fig.2 shows two of the panel parts, denoted 96, after they have been turned inwards. It is to be understood that they are biased into this position by virtue of the bowing of their score lines 90.

The removal of any of its three portions from the multipack does not destroy the integrity of either the remainder of the multipack or of the multipack portion which has been detached. Applicants believe that there should therefore be no danger from consumer protection legislation if each of the three portions of the sleeve is individually printed to indicate its contents as being one bottle. In the latter respect it is to be noted that the bottles 16 themselves have no label or printing provided except, possibly, on their closures 28.

This is primarily in order to reduce the bottle cost, but has the additional advantage that the carbon-

ated beverage contents can be clearly seen through the bottle wall (which may be tinted if desired). A further feature of the multipack contributing to its low cost is that each bottle is thin-walled, being formed of substantially only the minimum weight of PET polymer commensurate with its ability to withstand the carbonation pressure within it and any external loadings which may be expected.

The sleeve 14 provides a substantial level of cushioning against impact loads on the bottles; moreover the hemispherical shape of the bottle base portions 20 is highly resistant to distortion by internal pressure. Applicants therefore expect that a bottle 16 having a capacity of 1/4 litre should have a PET content of between 10 and 14 grams, and a bottle of 1/2 litre capacity should correspondingly have a PET content between 14 and 18 grams. This is in comparison with typical values of 20 and 30 grams for the PET content of conventional 1/4 litre and 1/2 litre bottles with integral standing bases.

In a non-illustrated modification of the described arrangement each bottle 12 has its moulding pip 22 located in a recess formed in the base of the bottle, the cutouts 80 in the upper base panel 64 of the sleeve 14 being suitably enlarged to receive the bottle base around the recess.

Whilst the invention has been particularly described in relation to a container multipack with separable multipack portions each having one thin-walled thermoplastics bottle, the invention also extends to such a portion in its own right, whether after separation from a multipack or having an independent existence. A container multipack in accordance with the invention may have a number of containers other than 3; specifically, it may have 2, 4 or 5 containers, the latter number being particularly suited for schoolchildren, to provide one drink for each day of a school week.

Claims

1. A multipack of containers for a carbonated beverage, which comprises a group of thin-walled bottles arranged in line, and a substantially open-ended board sleeve generally surrounding the group of bottles, the bottles being each unitary and blow-moulded from thermoplastics polymer to have a neck portion adapted for receiving a closure, and a body formed with the neck portion at one end and at its other end formed with a substantially hemispherical base, the sleeve having apertures through which the neck portions of the bottles project but otherwise enclosing the bottles, and a line of weakening being formed around the sleeve between each two adjacent bottles so that the

bottles can be detached individually from the multipack together with their respective portions of sleeve.

2. A multipack according to claim 1, wherein the bottles are unlabelled, and the sleeve is printed with informative and/or promotional data at least some of which is repeated for each sleeve portion.

3. A package which comprises a single thin-walled bottle for a carbonated beverage, and a substantially open-ended board sleeve generally surrounding the bottle, the bottle being unitary and blow-moulded from thermoplastics polymer to have a neck portion adapted for receiving a closure and a body formed with the neck portion at one end and at its other end formed with a substantially hemispherical base, the sleeve having an aperture through which the neck portion of the bottle projects but otherwise enclosing the bottle, the bottle being un-labelled but the sleeve being printed with informative and/or promotional data.

4. A multipack or package as claimed in any preceding claim, wherein the sleeve includes a plurality of tabs attached around each aperture and engaged with the neck portion of the respective bottle to locate the sleeve in relation to the bottle in their locality.

5. A multipack or package as claimed in any preceding claim, wherein the sleeve has overlapped upper and lower base panels which are located beneath the base of the or each bottle and mutually secured by an adhesive between them where they overlap, the or each bottle base being also adhered to the lower base panel by the said adhesive.

6. A multipack or package as claimed in claim 5, wherein the upper base panel extends laterally past the base of the or each bottle, but has a cutout allowing the bottle base to adhere to the lower base panel beneath.

7. A multipack or package as claimed in any preceding claim, which adjacent each said open end and any said line of weakening has a bowed score line defining with the open end or line of weakening a panel, the said panel being capable of being intumed against the adjacent bottle and thereafter being resiliently biased to that position by virtue of the bowing of the score line.

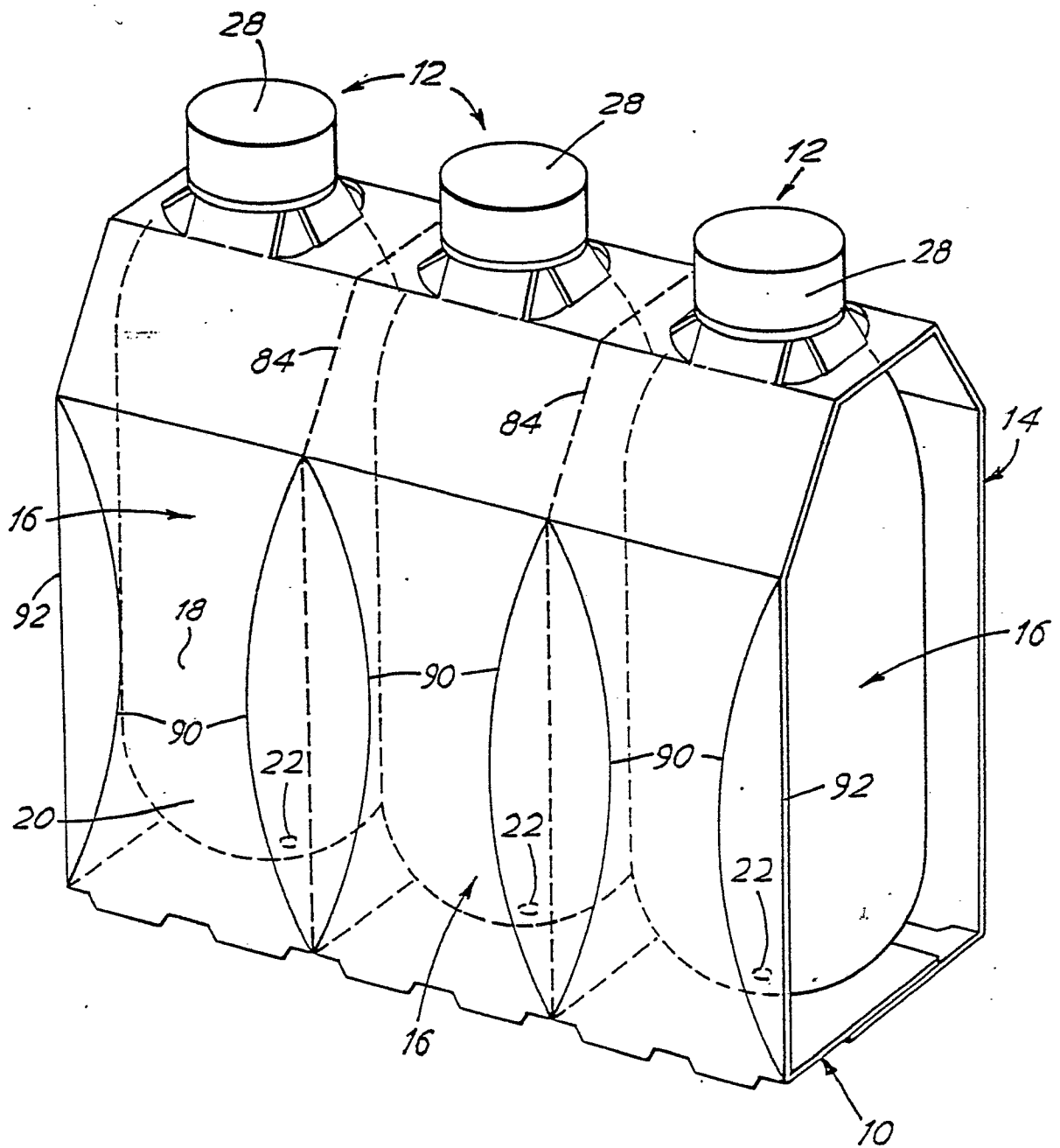


FIG. 1

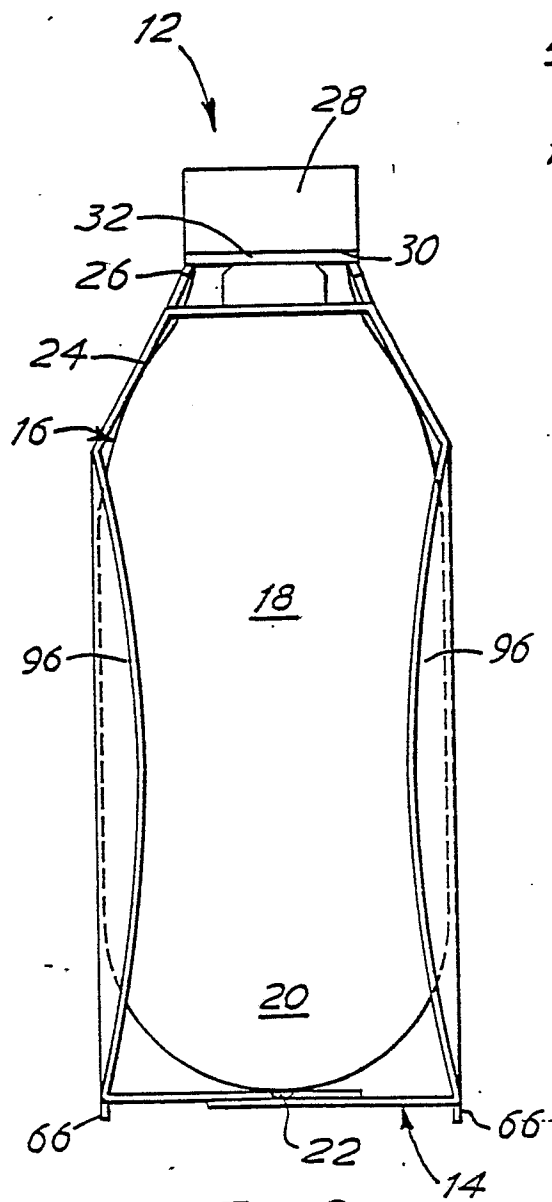


FIG. 2

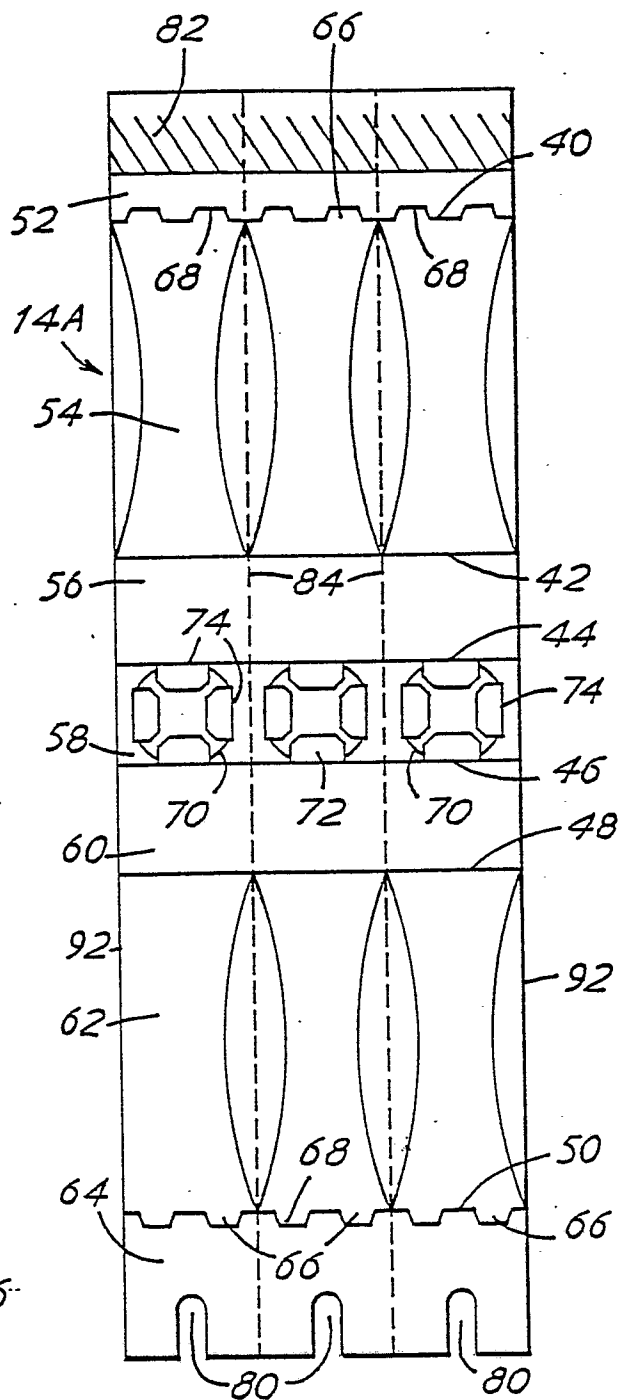


FIG. 3



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	US-A-3 540 582 (WOOD et al.) * Figures 1,3; column 2, lines 5-10,37-42 *	1	B 65 D 71/00
A	---	3,5	
A	US-A-4 403 689 (WOOD) * Figure 5; column 2, lines 2-4,49-53 *	1-4	
A	---		
A	US-A-3 298 513 (KROOSS et al.) * Figures 2,3; column 3, lines 15-21,31-36; column 4, lines 46-53; column 5, lines 40-43 *	1-3,5	
A	---		
A	DE-U-8 512 516 (GÖRTZ et al.) * Figure 2; page 6, lines 7-20 *	1-3,5	
A	---		
A	US-A-3 923 155 (TANZER) * Figures 1,3; column 1, lines 6-10; column 2, lines 1-6 *	1,5	

			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 65 D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 25-07-1989	Examiner STEEGMAN R.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			