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(54) **A container**

(57) The present invention provides a container (2) comprising a body (4) having an opening (8) therein and a lid (6) adapted to close the opening (8). The peripheral edge (10) of the body having a first tapered section (11) defined by a first interior angle (y) and the lid (6) having

a second tapered section (13) defined by a second interior angle (z). The first interior angle (y) being greater than the second interior angle (z) and the second tapered section (13) enclosing the first tapered section (11) when a sealing engagement is formed between the lid (6) and the body (4).

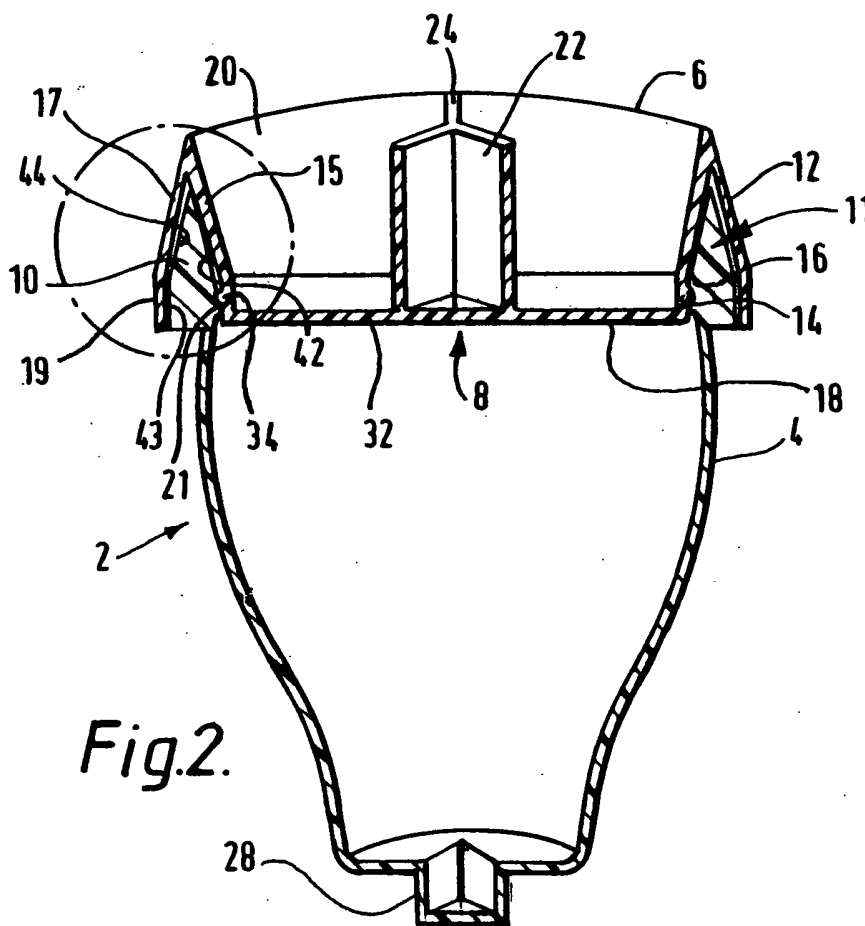


Fig.2.

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Description

Field of the Invention

[0001] The present invention relates to containers. In particular, although not exclusively the present invention relates to closure means for containers.

Background of the Invention

[0002] It is known to package goods in containers from which the goods can be used directly. For example, water is generally packaged in bottles with screw fastening lids, carbonated drinks are packaged in aluminium cans with ring pull openings and soft drinks are often packaged in cartons sealed with a metal or plastic foil which is simply pierced or peeled off to facilitate consumption of the drink.

[0003] For containers in relation to which the goods are to be used directly from the container, in particular for foodstuffs, it is important that the opening in the container is hygienically sealed. A disadvantage of some of the conventional containers described above is that the peripheral edge of the opening from which the goods are dispensed is frequently uncovered during storage of the container. Whilst containers such as the water bottle having the screw top lid may be considered more hygienic than a ring-pull can, they are not ideal containers for goods such as foodstuffs which are intended to be consumed directly from the container. This is because the threaded section on the lip engagement area of the container is unpleasant for the consumer.

[0004] It is an aim of preferred embodiments of the present invention to provide an improved container.

Summary of the Invention

[0005] According to a first aspect of the invention, the present invention provides a container comprising a body, having an opening therein, and a lid adapted to close said opening, said opening being defined by a peripheral edge of said body, said peripheral edge comprising a first tapered section, which first tapered section is defined by a first interior angle, said lid comprising a lip, which lip comprises a second tapered section, which second tapered section is defined by a second interior angle, said first interior angle being greater than said second interior angle and said lip being adapted to enclose said first tapered section and form a sealing engagement with said peripheral edge.

[0006] Generally, unless otherwise stated, the term "lid" as used herein means a cover for an opening. The term "lid" is not intended to be restricted to a top of a container but could also provide a base or other surface, or part of a surface, of a container.

[0007] Suitably, the first interior angle is at least 2°, preferably at least 5°, more preferably at least 9° and most preferably at least 12°.

[0008] Suitably, the first interior angle is less than 90°, preferably less than 45°, more preferably less than 35° and most preferably less than 30°.

[0009] Suitably, the second interior angle is at least 2°, preferably at least 5°, more preferably at least 9° and most preferably at least 12°.

[0010] Suitably, the second interior angle is less than 90°, preferably less than 45°, more preferably less than 35° and most preferably less than 30°.

[0011] Suitably, the peripheral edge comprises an extension of the body of the container.

[0012] Suitably, the peripheral edge has an inverted substantially V-shaped cross-section providing the first tapered section. The peripheral edge may comprise a solid cross-section. Alternatively, the peripheral edge may comprise a hollow cross-section.

[0013] Suitably, the peripheral edge has a first surface, which extends outwards and upwards of the body of the container, and a second surface, which extends outwards and downwards of the distal end of the first surface to provide the first tapered section. The peripheral edge may further comprise a third surface, which extends substantially downwards of the distal end of the second surface when the container is arranged in a substantially upright position.

[0014] Suitably, the second surface is situated to the exterior of the container. Suitably, the third surface is situated to the exterior of the container.

[0015] A portion at least of the second surface suitably provides a lip engagement area for the container when in use as a drinking vessel.

[0016] Suitably, the lip of the lid is adapted to provide an interference fit with the peripheral edge of the body of the container so as to provide the sealing engagement.

[0017] Suitably, when in a sealing engagement with the peripheral edge the lip is spaced apart from a proportion at least of the first tapered section of the peripheral edge. Suitably, when in a sealing engagement with the peripheral edge, the lip is spaced apart from a proportion at least of the second surface of the peripheral edge.

[0018] Suitably, the lip of the lid forms a sealing engagement with the third surface of the peripheral edge.

[0019] Suitably, the lid comprises a base from which said lip extends. Preferably, the lip extends about the full periphery of the base of the lid.

[0020] Suitably, the lip comprises a first surface, which extends upwards and outwards of the base, and a second surface, which extends outwards and downwards of the distal end of the first surface to provide a second tapered section. The lip may further comprise a third surface, which extends substantially downwards of the distal end of the second surface when the container is arranged in a substantially upright position.

[0021] Suitably, the lip has an inverted, substantially V-shaped cross-section. Preferably, the cross-sectional shape of the lip corresponds with the cross-sectional

shape of the peripheral edge of the body of the container.

[0022] When in use, the lid is placed over the opening in the body of the container such that the second tapered section of the lip covers the first tapered section of the peripheral edge of the body. A sealing engagement between the lid and the peripheral edge is provided by application of a force to push the lid and the body of the container together. Upon application of such a force, the convergent surfaces of the second tapered section of the lip are forced apart due to contact with the convergent surfaces of the first tapered section of the peripheral edge. A sealing engagement is formed between the lid and the peripheral edge by way of a compression fit between the first tapered section and the second tapered section.

[0023] When the container is in a closed condition and the base of the lid is horizontal, the first tapered section and the second tapered section are suitably asymmetric relative to the vertical axis running through the apex of each respective tapered section. Suitably the angle between the first surface of each tapered section and the vertical axis running through the apex of the tapered section is less than the angle between each second surface and the vertical axis. In this case, when the lip of the lid is placed over the peripheral edge, the outer surface of the tapered section of the lip will contact the outer surface of the tapered section of the peripheral edge drawing the inner surface of the tapered section of the lip across towards the inner surface of the peripheral edge. The lid is therefore self-centring.

[0024] Suitably when the lid and base are engaged together, the base of the lid extends into the cavity of the body of the container. Preferably, the base of the lid extends towards the surface of any foodstuff contained in the cavity of the body of the container. Such a lid design advantageously eliminates as much air as possible from the container when closed.

[0025] The interior surface of the peripheral edge of the body of the container and the lip of the lid of the container may comprise a coupling means to attach the lid and the body-together. The coupling means may comprise corresponding threaded sections or a ridge a groove arrangement, for example.

[0026] Suitably, the peripheral edge comprises a peripheral wall extending between the first tapered section and the body of the container, at which peripheral wall the coupling means is located.

[0027] Suitably, the lid comprises a peripheral surface extending between the second tapered section and the base, at which peripheral surface the coupling means is located.

[0028] A container in accordance with the present invention may be a container for foodstuffs, in particular for beverages.

[0029] Suitably, a container in accordance with the present invention may be used as both a container for storage of goods and a serving means for said goods.

Preferably, a container in accordance with the present invention provides a container for storage of beverages which can also serve as a drinking vessel.

[0030] If the container is intended to provide both a container and drinking vessel for a beverage, the lid of the container may be used to provide a base for the container when in use as drinking vessel.

[0031] Suitably, the lid is removable from the container, thus uncovering the opening in the container. Suitably, the lid is adaptable for attachment to an exterior surface of the container to provide a base for the container.

[0032] Alternatively, the container may be so shaped as to be self-supporting and thus requiring no additional base to support it. In this case, the lid may simply be removed and discarded.

[0033] Suitably, the lid may be retained for re-sealing the container.

[0034] If the lid is to be used as a base, then the container and the lid suitably comprise fixing means to attach the lid to the base of the container. The fixing means may be either temporary or permanent fixing means, as appropriate. Suitably, the fixing means comprises a protrusion and a corresponding socket.

[0035] Suitably, the protrusion is provided on the container and the socket is provided in the lid. However, the protrusion may be provided on the lid and the socket may be provided in the container.

[0036] The protrusion and socket may comprise a circular cross-section. The protrusion and socket may comprise a polygonal cross-section.

[0037] The interior cross-section of the socket may decrease in size progressively from the opening to provide for a forced (interference) fit of the protrusion in the socket. Alternatively, the protrusion and the socket may comprise corresponding threaded sections to provide a twist fit fixing means. As a further alternative, the protrusion and the socket may comprise a ridge and groove arrangement to provide snap fit fixing means.

[0038] Suitably, the container is shaped such that a plurality of containers generally tessellate one adjacent another when stacked together for transport and/or storage thereof.

Suitably, the containers are shaped such that a plurality of containers may be arranged to nest one inside another, when open.

[0039] Advantageously, the lid may provide a coaster when detached from said container, which lid may carry advertising material.

[0040] Suitably, the shape of the container is such that it is strong enough to withstand any crushing forces to which it is likely to be exposed during packaging, storage, transport and use.

[0041] According to a second aspect of the present invention, there is provided a container comprising a body having an opening therein, and a lid, which lid comprises a projection adapted to fit inside said opening, said body and said projection comprising a coupling means so as to provide a means of attaching said body

and said lid together.

[0042] Suitably said coupling means provides a locking engagement between said body and said projection.

[0043] Said coupling means may be provided by a threaded section on an interior surface of said body and a corresponding threaded section on said projection.

[0044] Alternatively, said coupling means may be provided by a groove and corresponding projection to provide a snap fit closing engagement.

[0045] Suitably, the coupling means is spaced from a distal end of a peripheral edge defining the opening in the body.

[0046] The coupling means may comprise a click such as the arrangements used in pharmaceutical packing etc, which indicate that a container is being opened for the first time. The click is also used to avoid over-pressure when re-sealing the container with the lid.

[0047] Containers in accordance with the present invention are suitably comprised of polyethylene terephthalate (PET), polyethylene naphthalate (PEN), polyvinyl chloride (PVC), nylon, polythene, polypropylene, composites thereof, or glass. Preferably, the containers are comprised of PET, PEN or mixtures thereof. Preferably, the container body and the container lid are comprised of different materials.

[0048] Containers in accordance with the present invention may be produced using conventional injection moulding or blow moulding techniques, which may be carried out with or without the use of a preform.

[0049] The thickness of the walls of a container in accordance with the present invention may be adapted to suit the particular application of the container and the type of material.

[0050] Suitably, the lid may be attached to the container to provide a base for the container when in use as a drinking vessel by means of a snap fit, interference fit or a twist fit attachment.

[0051] In order to extend the shelf life of product stored in a container in accordance with the present invention, the container may be back filled with an inert gas such as carbon dioxide or nitrogen, to expel the air from the container once the product to be stored has been charged into the container.

[0052] A third aspect of the present invention provides a container in accordance with the first aspect of the invention having features in accordance with the second aspect of the invention.

[0053] The present invention finds particular advantage as a container for drinks such as, wine, beer, minerals, fruit juices, water, milk and spirits. Furthermore, the present invention may provide containers for hot drinks such as coffee, tea and hot chocolate for reheating when required for consumption.

[0054] The present invention finds particular advantage in providing containers for goods to be stored in areas where space is limited for example in aeroplanes or on trains. The need for a separate container and drinking vessel is negated. Furthermore, the shape of

the container can be adapted such that the containers tessellate when packed in trays for transport and storage.

[0055] A container in accordance with the present invention advantageously provides a drinking vessel which has a lip engagement area which is smooth and free from attachment means and has been hygienically packaged for direct consumption of the packaged beverage.

[0056] Furthermore, a container in accordance with the present invention can advantageously be used to contain a single measure of a drink, for example a glass of wine or a measure of a spirit pre-mixed with a suitable mixer.

[0057] The present invention advantageously provides a means of hygienically sealing an opening in a container.

[0058] A container in accordance with the present invention may advantageously be provided with a larger opening than a conventional container for use in low pressure atmospheres.

Brief Description of the Drawings

[0059] The invention will now be described, by way of example only, with reference to the following drawings, in which:

Figure 1 shows a side view of a container in accordance with the present invention with the lid positioned to close the opening in the container body;

Figure 2 is a cut away section of the container as shown in figure 1;

Figure 3 is a side view of the container body of figure 1;

Figure 4 is a cut away section of the container body of figure 3;

Figure 5 is a plan view of the lid of the container of figure 1;

Figure 6 is a cross-section along A-A figure 5;

Figure 7 is a side view of the container of figure 1, where the lid has been removed from the opening of the container body and is providing a base for the container body; and

Figure 8 shows an enlarged view of the ringed section of figure 2.

Figure 9 shows an exploded view of the section shown in figure 8.

Description of Preferred Embodiments

[0060] Figure 1 shows a container 2 in accordance with the present invention having a body 4 and a lid 6.

[0061] Figure 2 shows more clearly how the lid 6 is attached to the body 4. The body 4 has an opening 8 and the lid 6 serves to close the opening 8 as shown. The opening 8 is defined by a peripheral edge 10 of the body 4.

[0062] The peripheral edge 10 has an inverted, substantially V-shaped cross-section, providing a first tapered section 11. The first tapered section 11 comprises a first surface 42, extending outwardly and upwardly of the body 4 and a second surface 44, extending outwards and downwards of the distal end of the first surface 42. The peripheral edge 10 further comprises a third surface 43, extending substantially downwards of the distal end of the second surface 44 and a peripheral wall 21.

[0063] The first tapered section 11 has an interior angle Y, which is about 18°.

[0064] The first surface 42 and the second surface 44 of the first tapered section 11 may be separated by a solid body of the peripheral edge 10, as shown in the drawings. Alternatively, the peripheral edge 10, may comprise a first tapered section 11 which is (not shown). In this case, the first surface 42 is suitably spaced apart from the second surface 44 of the first tapered section 11.

[0065] The lid 6 comprises a lip 12, which lip 12 forms a sealing engagement with said peripheral edge 10. The lip 12 has an inverted, substantially V-shaped cross-section providing a second tapered section 13.

[0066] The second tapered section 11 comprises a first surface 15, extending outwards and upwards of a base 32 and a second surface 17 extending downwards and outwards of the distal end of the first surface. The lip 12 further comprises a third surface 19, extending substantially downwards of the distal end of the second surface 17.

[0067] The second tapered section 13 has an interior angle Z, which is about 16.4°.

[0068] The lid 8 further comprises a base 32 and a peripheral edge 34.

[0069] The ringed section of figure 2 is more clearly shown in figure 8. It can be clearly seen from figures 2 and 8 that the tapered section 13 of the lip 12 is spaced apart from a proportion at least of the second surface 44 of the tapered section 11 of the peripheral edge 10.

[0070] Figure 8 also clearly shows the sealing engagement between the lip 12 and the peripheral edge 10.

[0071] When then lid 6 is placed on the body 4 of the container 2, the base 18 of the lid 6 fits into the opening 8 of the body 4. The tapered section 13 of the lip 12 fits over the tapered section 11 of the peripheral edge 10.

[0072] When an external force is applied to the lid 6 and the body 4 the first surface 15 of the second tapered section 13 contacts the first surface 42 of the first ta-

pered section 11 and the second surface 17 of the second tapered section 13 contacts the second surface 44 of the first tapered section 11, as shown in figures 2 and 8. The second surface 17 of the second tapered section 13 is pushed away from the first surface 15, in the direction indicated by arrow A. This occurs because the interior angle Y of the first tapered section 11 is greater than the interior angle Z of the second tapered section 13.

[0073] A sealing engagement is thereby formed by way of a compression fit between the lower regions of the second surfaces 17,44 of the first and second tapered sections 11,13 and the upper regions of the first surfaces 15,42 of the first and second tapered sections 11,13. A sealing engagement by way of compression fit is also formed between the third surfaces 19,43 of the lip 12 and the peripheral edge 10 respectively.

[0074] Figures 2 and 8 further illustrate coupling means suitable for attaching the lid 4 to the body 6 when the lid 4 is in sealing engagement with the peripheral edge 10.

[0075] The coupling means comprises a first threaded section 14 on the peripheral wall 21 of the peripheral edge 10 of the body 4, which first threaded section 14 can be more clearly seen in figure 4. The coupling means further comprises a second threaded section 16 on the peripheral edge 34 of the lip 12, which can be more clearly seen on figure 6. The first threaded section 14 and the second threaded section 16 are adapted to engage together to provide a means of attaching the body 4 and the lid 6 together.

[0076] As can be seen from the figures, providing the coupling means on the interior surface of the peripheral edge 10 of the opening 8, allows for the second surface 44 of the first tapered section 11 to be smooth. A proportion at least of the second surface 44 of the first tapered section 11 provides the lip engagement area if the container is used to provide a drinking vessel, and thereby provides a more pleasant surface to drink from as well as one that is hygienically cleaner.

[0077] Figure 7 shows the container 2 with the lid 6 arranged to provide a base for the body 4. In this arrangement the opening 8 in the body is not sealed and the container 2 can be used as a drinking vessel or the like.

[0078] Figure 5 illustrates the plan view of the lid 6 as the lid would be seen from direction B of figures 1 or 6. As can be seen most clearly from figures 2 and 6, the protrusion 18 of the lid 6 is substantially hollow being open at the upper surface 20 thereof. A socket 22 is provided inside the protrusion 18 by means of insert 24. The insert 24, may provide a socket having any cross-sectional shape, but is preferably polygonal. In this case the insert 24 provides a socket 22 with a hexagonal cross-section.

[0079] The insert 24 may be a separate article which is fixed into the protrusion 18, or the insert 24 may be formed as an integral part of the lid 6. Furthermore,

whilst the insert is shown here as comprising a socket supported by three supporting arms 26. The socket 22 could be a self-supporting integral part of the protrusion 18.

[0080] As can be seen from figure 6, the interior diameter of the socket 22 decreases slightly from the opening towards the base of the socket 22.

[0081] As shown clearly in figures 1-4, the body 4 is provided with a protrusion 28, which protrusion has a cross-section which corresponds with the cross-section of the socket 22 of the lid. Such that, when arranged as shown in figure 7, the protrusion 28 of the body 4 fits into the socket 22 of the lid 6 as a force (interference) fit.

[0082] The protrusion 28 of the body 4 may be an integral part of the body 4 as shown in the drawings. Alternatively, the protrusion 28 of the body 4 may be a separate article which is fixed onto the body 4.

[0083] Furthermore, although the figures show the body 4 being provided with a protrusion 28 to fit into socket 22 on the lid 6, it is feasible, and may even be preferred, that the protrusion is provided in the lid 6 and the socket is provided in the body 4 (not shown).

[0084] As a further alternative (not shown) the body 4 may be provided with a base 30 which is sufficiently wide to support the container. In which case the protrusion 28 may be omitted and the lid may be either discarded once the container has been opened, or retained for re-sealing the container. In this case, the socket 22 need not be provided in the lid 6.

[0085] Whilst the figures show a protrusion 28 and socket 22 which attach together by means of a force fit, it is feasible that a ridge and groove arrangement may be used to provide a snap fit attachment means. Alternatively, the protrusion 28 and the socket 22 may have threaded contacting surfaces to provide a twist fit attachment means, or a bayonet fitting may be used.

[0086] Figure 9 more clearly shows the interior angles Y and Z of the first tapered section 11 and the second tapered section 13, of figure 8.

[0087] The tapered section 11 is asymmetric relative to the vertical axis X. The angle Q between the inner surface 42 and the vertical axis X is about 3°. The angle P between the second surface 44 and the vertical axis X is about 15°.

[0088] The second tapered section 13 is asymmetrical relative to the vertical axis X. The angle S between the first surface 15 and the vertical axis X is about 3°. The angle R between the second surface 17 and the vertical axis X is about 13.4°.

[0089] The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

[0090] All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or proc-

ess so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

[0091] Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

[0092] The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

Claims

1. A container comprising a body, having an opening therein, and a lid adapted to close said opening, said opening being defined by a peripheral edge of said body, said peripheral edge comprising a first tapered section, which first tapered section is defined by a first interior angle, said lid comprising a lip, which lip comprises a second tapered section, which second tapered section is defined by a second interior angle, said first interior angle being greater than said second interior angle and said lip being adapted to enclose said first tapered section and form a sealing engagement with said peripheral edge.
2. A container according to Claim 1, wherein the peripheral edge further comprises a third surface, which extends substantially downwards of the distal end of the second surface when the container is arranged in a substantially upright position.
3. A container according to Claim 2, wherein the third surface is situated to the exterior of the container.
4. A container according to any one of the preceding claims, wherein a portion at least of the second surface provides a lip engagement area for the container when in use as a drinking vessel.
5. A container according to any of the preceding claims, wherein an interior surface of the peripheral edge of the body of the container and the lip of the lid comprise a coupling means to attach the lid and the body together.
6. A container according to Claim 5, wherein the coupling means comprises corresponding threaded sections or a ridge and groove arrangement.

7. A container according to Claim 5 or 6, wherein the peripheral edge comprises a peripheral wall extending between the first tapered section and the body of the container, at which peripheral wall the coupling means is located. 5
8. A container according to any one of the preceding claims, wherein the lid is adaptable for attachment to the exterior surface of the container to provide a base for the container. 10
9. A container according to Claim 8, wherein the container and the lid comprise fixing means to attach the lid to the base of the container. 15
10. A container comprising a body having an opening therein, and a lid, which lid comprises a projection adapted to fit inside said opening, said body and said projection comprising a coupling means so as to provide a means of attaching said body and said lid together. 20
11. A container according to Claim 10, wherein the coupling means provides a locking engagement between the body and the projection. 25
12. A container according to Claim 10 or 11, wherein the lid is attachable to the container to provide a base for the container when in use. 30
13. A container according to any one of Claims 1-9, having features in accordance with any one of Claims 10-12. 35

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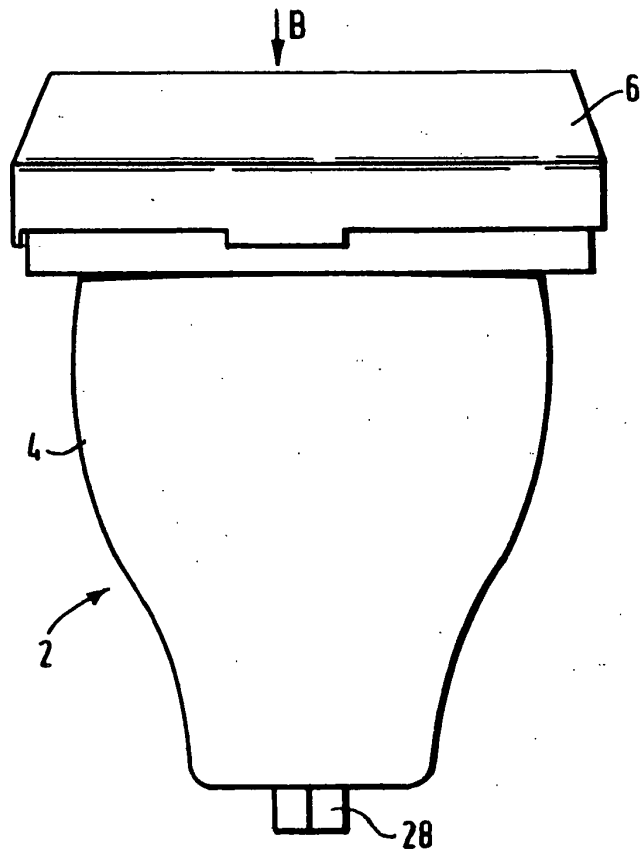


Fig.1.

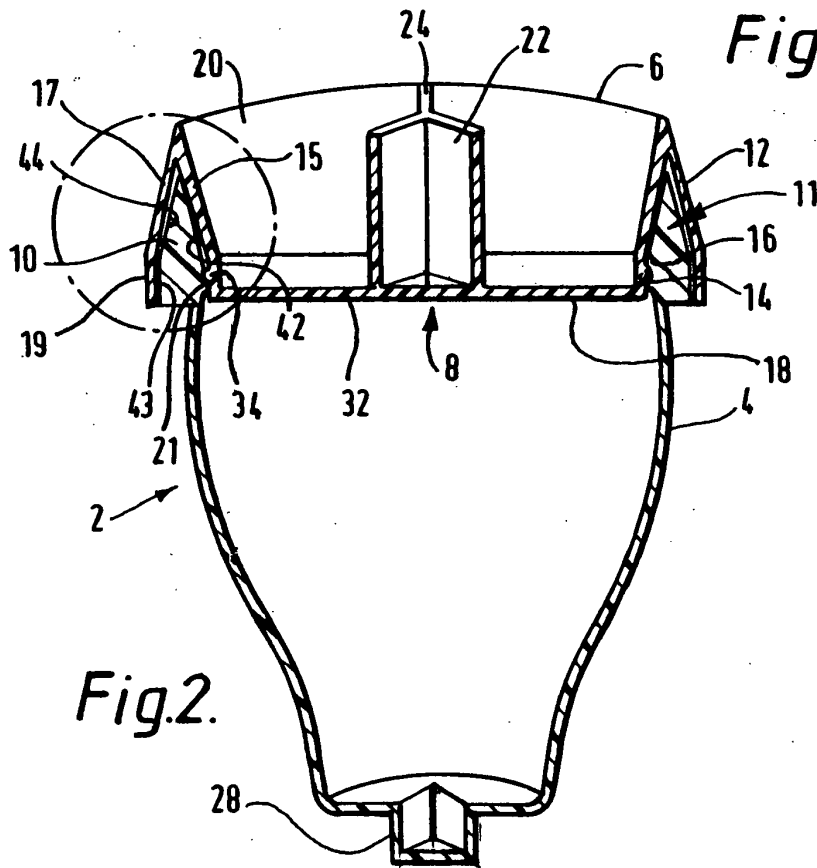


Fig.2.

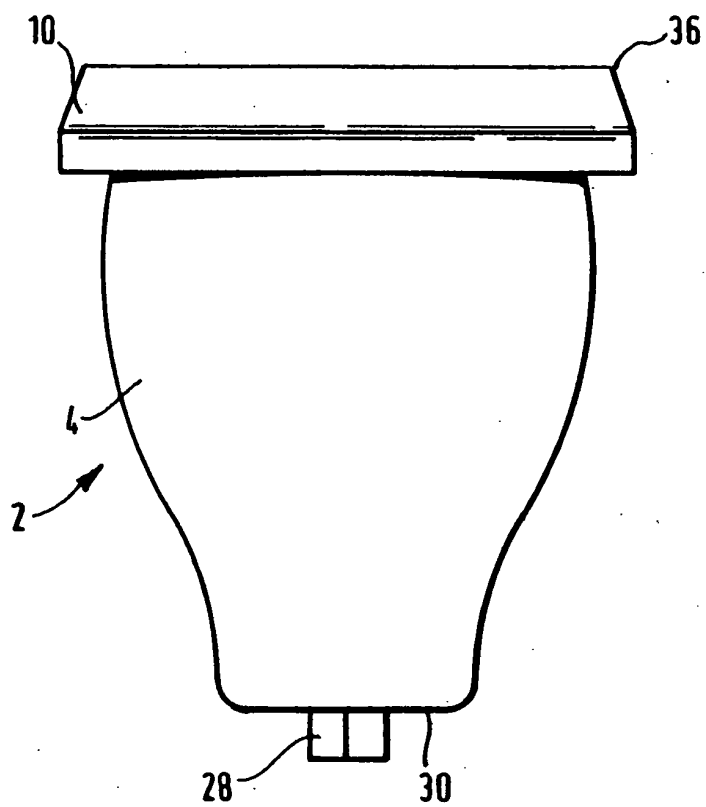


Fig.3.

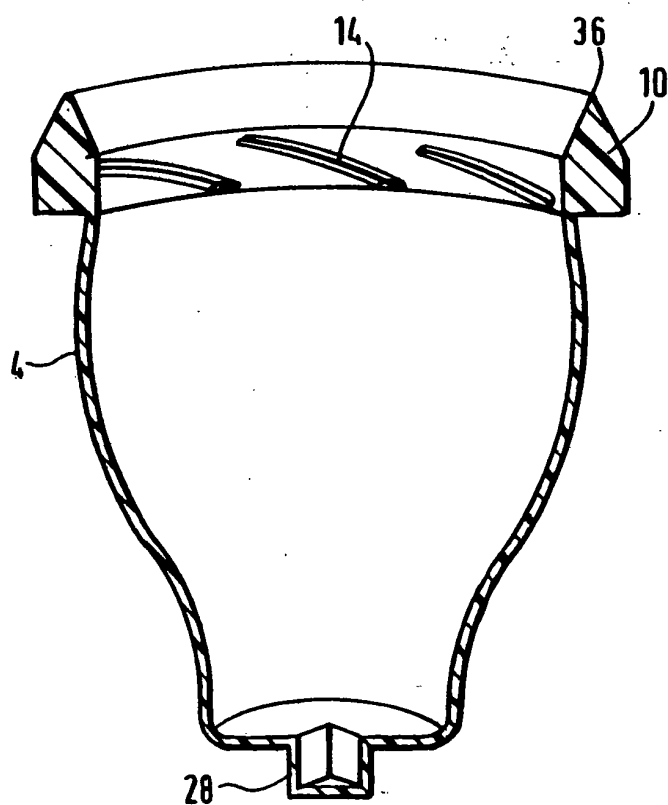


Fig.4.

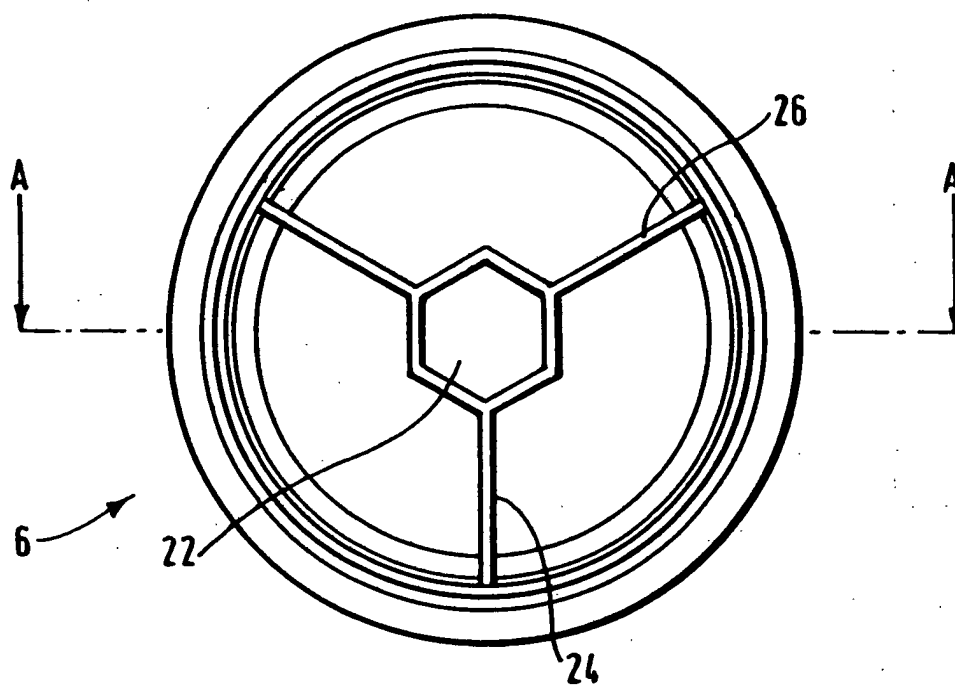


Fig. 5.

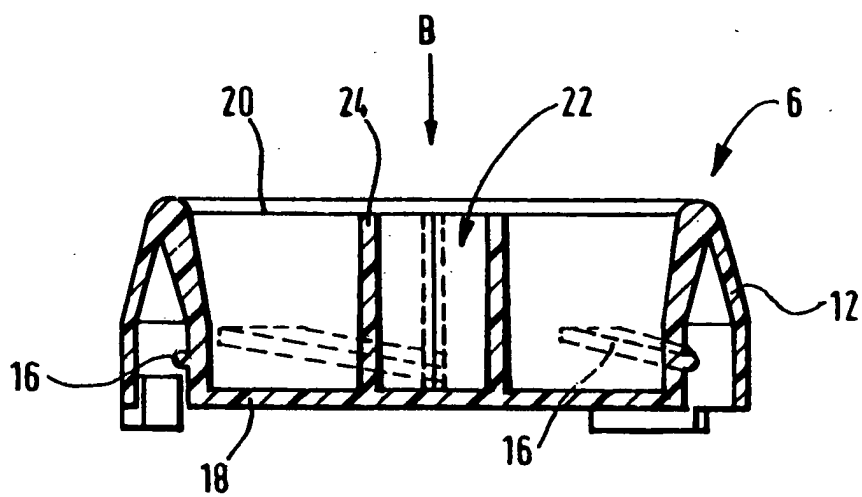


Fig. 6.

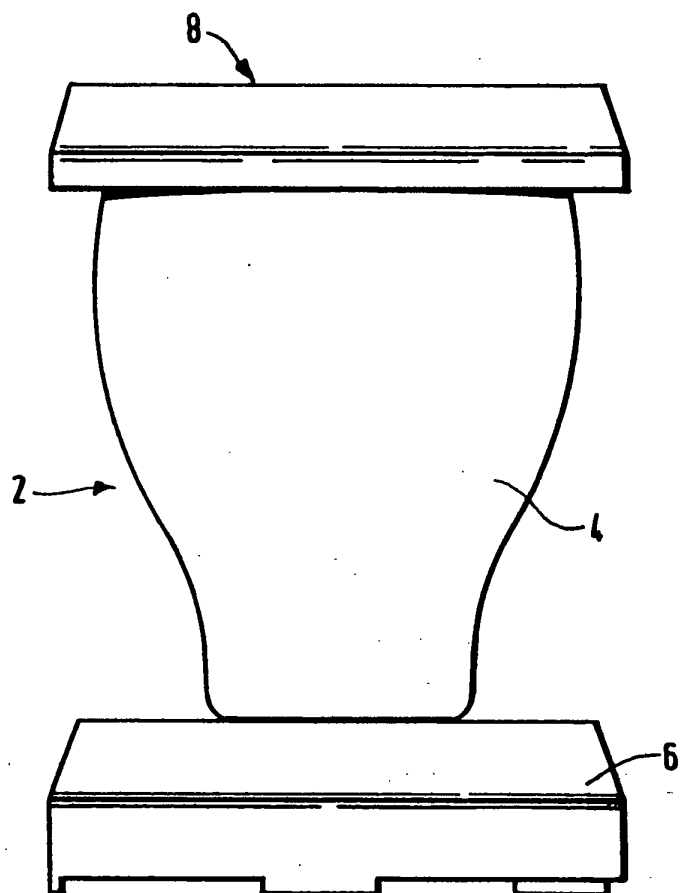


Fig. 7.

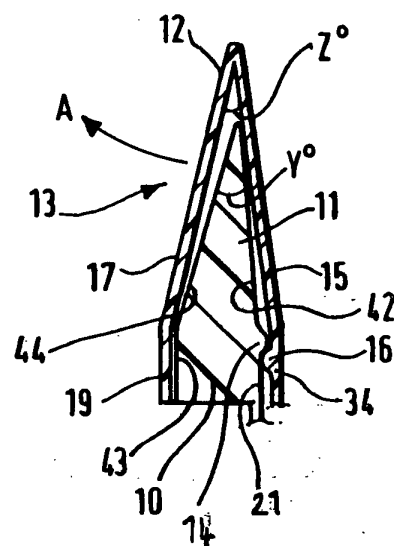


Fig. 8.

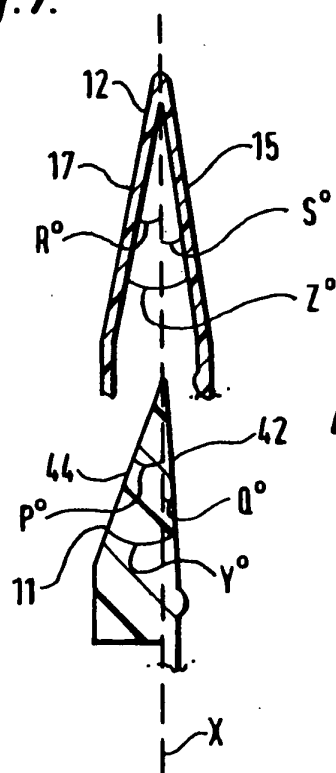


Fig. 9.



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 30 3250

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.7)
X	US 5 531 345 A (NAKAMURA MASAYOSHI ET AL) 2 July 1996 (1996-07-02) * column 1, line 63 - column 2, line 11 * * column 3, line 47 - line 56; figure 2A *	1-3,13	B65D43/02
A	---	4,6,7, 10,11	
X	US 3 592 349 A (BAUGH WILLIAM A) 13 July 1971 (1971-07-13)	1,4-7, 10,11,13	
Y		8,9,12	
A	* column 1, line 39 - line 60; figures 4,6 *	2,3	

Y	CH 431 303 A (ROTH HARRY W) 28 February 1967 (1967-02-28) * claim 3; figure 3 *	8,9,12	
A		1,10,11	

X	GB 1 602 818 A (NAT PLASTICS LTD) 18 November 1981 (1981-11-18) * claims 1,2,5; figures *	1	

X	US 4 966 302 A (HJORDIE JORGEN) 30 October 1990 (1990-10-30) * column 1, line 39 - line 51; figures *	1	

E	GB 2 355 003 A (VINCON LTD) 11 April 2001 (2001-04-11) * the whole document *	1	

The present search report has been drawn up for all claims			

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B65D

Place of search

BERLIN

Date of completion of the search

25 September 2001

Examiner

Scheuer, J

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
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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

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 30 3250

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