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(71) Applicant: **Imperial Chemical Industries PLC**  
**London W1U 3AN (GB)**

(72) Inventors:  
• **Booth, Peter**  
**Malborough Wiltshire SN8 1GJ (GB)**

• **Peacop, Alexander James**  
**Flat 4, The Stable Block**  
**Malborough Wiltshire SN8 3BD (GB)**

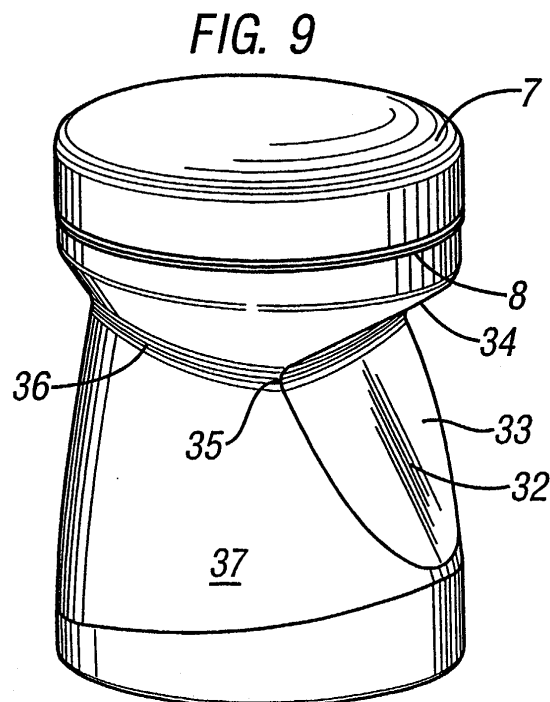
(74) Representative: **Cooper, Alan Victor et al**  
**Patents and Trade Marks Section,**  
**ICI Paints,**  
**ICI Group Intellectual Property,**  
**P.O. Box 1883,**  
**Wexham Road**  
**Slough PDO, Berkshire SL2 5FD (GB)**

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(54) **Ergonomically shaped paint container**

(57) A large can (1) suitable for containing a brush-  
able coating composition of the type applied at ambient  
temperatures to surfaces of buildings and which can be  
comfortably held by an adult hand. One portion of the  
can contains a re-entrant concavity (32) in its side wall  
(37) and an adjacent portion contains a waist (36) which  
extends around the side wall rising vertically relative to  
the concavity enabling a user to hold the can with a more  
comfortable grip. The waist and concavity combination  
can also serve as a means for guiding the user to hold  
the can in a preferred orientation during painting.



## Description

**[0001]** This invention relates to a large can for a brushable coating composition which has a capacity of above 0.2 litres yet which can be comfortably held by an adult human hand. The invention has been divided from that disclosed in European patent Application EP 02 076047.6 which relates to a large can for a brushable coating composition which can has a capacity of above 0.2 litres and is conveniently closeable by a screw-thread lid. The can is large enough to be useful as a container for paints, lacquers, varnishes, woodstains and any other coating compositions of the type which are commonly applied using large brushes (usually at least 20mm wide and at least 5mm broad)) at ambient temperatures (say 5 to 40°C) to surfaces found in buildings. Such compositions are often applied by amateur, that is to say "do-it-yourself" or "DIY" painters. For brevity the cans will be frequently referred to as "paint cans" even though they are useful for containing other brushable coating compositions.

**[0002]** Artists' materials, touch-up paints for motor vehicles, nail varnishes and other specialist paints which are conveniently sold in relatively small volumes are often supplied in small tubes or small jars having openings which are closeable by means of a screw-thread lid where threads on the lid co-operate with threads extending around the opening in order to hold the lid in a closing position on the tube or jar. One such tube is disclosed in British Patent Specification GB 835 862 published in 1958 which also discloses the provision of a circular brushwipe located below the rim of the opening into the tube. Screw-thread lids on small tubes or small jars are easy to use and easy to hold by amateurs provided that the container is small. Attempts to use screw-thread lids on larger paint containers (such as paint cans bigger than say 0.2 litres) have never survived on the market because if the screw-threads become jammed with dried paint, they make the screwing on or off of the lid very difficult, especially if the can is difficult to hold. Manufacturers of paint for buildings who have tried to introduce screw threaded lids have always quickly reverted to using press-fit lids even though press-fit lids require the use of a relatively sharp tool such as a screw driver to remove the lids from the press-fits which they make in openings into paint cans. Less sophisticated amateur painters resent the need to look for, find and then use a sharp tool merely to open a paint can, especially if they have previously suffered injury when an inexpertly inserted screw driver has slipped.

**[0003]** Hitherto, screw-threads have not been successful in use on conventionally large paint cans because the larger the can, the more likely is an amateur painter to overload the paint brush with paint and overloaded brushes are frequently associated with jamming. It seems that overloading is likely to happen because the larger brushes used when painting surfaces in buildings, and more particularly the larger weight and volume

of paint they carry, all contribute to decreasing the degree of control which an amateur has over loading the paint brush. But whatever the explanation, amateurs do overload brushes whereupon they remove excess paint by wiping the brush against the rim of the opening into the can. At least some of the removed paint flows from the rim and into the area of the can which receives the lid when the can is closed. If that area has screw threads designed to co-operate with a screw-thread lid, the paint will flow into the clearance between threads and then subsequently solidify or "dry". If the paint dries before the screw-thread lid is re-positioned on the can, the dried paint will jam the screw-threads and interfere with the screwing back on of the lid. Worse still, if the paint dries after the lid has been screwed back on, then the dried paint will bond the threads on the lid to those around the opening, so making re-opening of the can by removal of the lid either very difficult or even impossible. For these reasons, screw-thread lids have not been thought suitable for use on paint cans of the size used for supplying paint used in painting buildings.

**[0004]** In addition to overloading their brushes, careful observation of amateur painters revealed that they have a significant tendency to rest their loaded brushes across the opening into a paint can with the loaded bristles supported on the rim of the opening. This increases the likelihood of paint transferring from the bristles to the rim and then running into areas which receive the lid when the paint can is being closed.

**[0005]** An object of this invention is to provide a large can for containing a brushable coating composition which is more comfortable to hold so that it is easier to control the loading of the brush with the coating composition and hence overloading is less likely.

**[0006]** Accordingly this invention provides a large can (for example a paint can) for a brushable coating composition which can has a capacity of above 0.2 litres (and preferably above 0.5 litres) and is formed with a side wall (37) wherein one portion of the side wall contains a re-entrant angled concavity (32) created by two mutually inclined webs (33 and 34) which extend into the can and meet along an essentially horizontal angled edge portion (35) characterised in that an adjacent portion of the side wall contains a waist (36) extending around the side wall along a path rising vertically away from the edge portion whereby the angled concavity and vertically rising waist allow the can to be comfortably held by an adult human hand.

**[0007]** The invention is most suitable for use with the can having a capacity of from 0.2 to 1.5 litres because such sizes are very comfortably held in an adult human hand and so greater control during loading of a paint brush is possible with less risk of overloading.

**[0008]** The invention also provides a combination of the can and a screw-thread lid in position on the can so as to close the opening and particularly such a combination which contains a brushable coating composition such as paint, lacquer, varnish or woodstain.

**[0009]** The re-entrant rebate or "concavity" is provided in the side wall of the can to assist users in gripping the can comfortably and to guide them to more favourable orientation of the brushwiping edge. A suitable rebate comprises an angled concavity created by two mutually inclined webs which extend into the can and meet along the angle forming an angled edge portion. If the brushwipe has a distal brushwiping edge comprising portions of larger and smaller curvatures (for example if it is elliptical) then it is preferred that the curve of a portion of larger curvature should at least in part approximately follow the line of the angled edge portion. In particular, if the edge portion is elliptical, it is preferred that the line of the angled edge portion be approximately parallel to the tangent to the elliptical brushwiping edge at the extremities of its minor diameter. If the concavity is also dimensioned so as to receive a human thumb comfortably, then on gripping the can between the fingers and thumb of one hand with the thumb in the concavity, the user will automatically be guided to align the brushwipe favourably. A favourable alignment results in a wiping action comprising a movement towards or away from the user as opposed to transversely of the user. Such movement allows good control over the wiping action. The length of the angled edge portion is preferably from 30 to 75 mm.

**[0010]** The top surface of the upper web also serves as a brush-rest so avoiding the need to rest an overloaded brush on the rim of the opening. For this purpose, it is preferred that the top web be inclined at an angle of from 20 to 50° to the horizontal so as to provide a good rest whilst allowing paint to flow back into the can.

**[0011]** Gripping and alignment of the can may be further assisted by providing a circumferentially extending waist which preferably extends around from 40 to 75% of the girth of the can. The waist may be dimensioned to receive human fingers comfortably. Alternatively the waist may be dimensioned to receive a thumb whilst the concavity is dimensioned to receive the fingers.

**[0012]** It is preferred that the side wall of the can should lead to a screw-threaded opening closeable by a correspondingly screw-threaded lid. If such screw-threads are used, it is preferred that any brushwipe should terminate in a distal brushwiping edge. This reduces the risk of paint splashing onto the rim of the opening from where it could flow into the screw-threads. It is also preferred that the brushwiping edge should extend completely around the opening so as to offer some degree of brushwiping capability irrespective of the orientation of the can relative to the user.

**[0013]** It is also preferred that a brushwiping edge should comprise portions of different curvatures. A portion having a large curvature is useful for wiping the edge bristles of a rectangular brush whilst a portion of smaller curvature is useful in wiping the lateral bristles. Conveniently a brushwiping edge may map out an elliptical or semi-elliptical shape. An elliptical shape allows greater spacing from the opening in an area where the

front and back lateral faces of an overloaded brush are most likely to be wiped. The elliptical shape also has the advantage of a relatively sharp curve around the extremities of the major diameter which can be used to wipe edge bristles of a brush and also can be used as a lip to guide paint when being poured from the can. A semi-elliptical shape is less obstructive in the opening and so broader brushes can be received into the opening.

**[0014]** It is advantageous for the brushwipe to slope downwardly into the can. Such a slope both helps removed paint to flow back into the can and to fall back into the can along a path well clear of the side wall. Preferably the slope should be from 20 to 60° to the horizontal.

**[0015]** The brushwipe can be provided as a separate component which is fitted into the opening for example by press-fitting, snap-fitting or push-fitting followed by adhesive bonding if necessary. Alternatively the brushwipe can be formed in a compound injection/blow moulding process during which the rest of the can is also formed. In such a process, the opening and the screw-threads can be formed very precisely in the injection moulding operation along with a parison from which the lower portion of the can is subsequently formed during the blow moulding operation. If the lid and its screw-threads are also formed by a precision injection moulding process, it is possible to achieve a good fluid-tight engagement when the lid is screwed onto the can. Likewise, precision injection moulding allows precise control of the thickness of the parison so that the thickness can be varied to accommodate the different degrees of stretching undergone by different portions of the parison during blow moulding.

**[0016]** Once the opening and its threads have been formed by injection moulding, they can be cooled until they are form-stable. They then do not need to be deliberately re-heated because they do not take part in the blow moulding operation. This means that if the opening is also formed with an integral inwardly extending shoulder, the shoulder on cooling can provide a shape-defining surface for a portion of the parison. This allows a portion of the parison to be blown back onto the shoulder to form the brushwipe.

**[0017]** The cans may be moulded from various thermo deformable materials. Preferred materials are plastics including polyamides, polyethylenes, polypropylenes, butadiene-styrene polyesters and polyethylene terephthalates. Crystalline thermoplastics which can be orientated during blow moulding are especially preferred.

**[0018]** The invention is further illustrated by the following preferred embodiments described with reference to the drawings of which

Figure 1 is a front elevation of a paint can according to the parent invention.

Figure 2 is a perspective view on a slightly smaller

- scale of a combination of the can shown in Figure 1 and a lid.
- Figure 3 is a perspective view of the can shown in Figure 1 but angled to reveal a brushwipe.
- Figure 4 is a plan view on a smaller scale of the can shown in Figure 3.
- Figure 5 is a section on a slightly larger scale taken on the line A-A in Figure 3.
- Figure 6 is a section through an injection moulded parison used in the manufacture of the can shown in Figure 1.
- Figure 7 is a section of the parison shown in Figure 6 and of a blow mould in which the parison has been placed.
- Figure 8 is a section of the blow mould and parison after blow moulding has occurred.
- Figure 9 is a perspective view of a paint can according to this invention and which is a modification of the can shown in Figures 1 and 2 which modification provides a re-entrant concavity and a waist.
- Figure 10 is the rear elevation of the can shown in Figure 9.
- Figure 11 is the front elevation of the can shown in Figure 9.
- Figure 12 is the side elevation of the can shown in Figure 9.
- Figure 13 is a perspective view on a slightly smaller scale of the can shown in Figure 9 and angled to reveal the re-entrant concavity and waist.
- Figure 14 is a perspective view of a lid for use in combination with a can according to this invention.
- Figure 15 is a section on the line B-B through the lid shown in Figure 14.
- Figure 16 is a plan view showing a modification of the brushwipe of Figure 4.
- Figure 17 shows on a large scale a modification to the can of Figure 5.

**[0019]** Figure 1 shows a paint can 1 according to the parent invention and which is suitable for containing 0.5 litres of paint and which has a circular opening 2 as shown in Figure 3 which opening 3 is defined by cylindrical inner surface 3 and cylindrical outer surface 4. Screw-threads 5 extend around outer surface 4 and are dimensioned so as to be able to receive screw-threads 6 formed on the inside of screw-thread lid 7 as shown in Figure 15. Threads 5 and 6 can co-operate to retain screw-thread lid 7 on can 1 as shown in Figure 2 whereby lid 7 closes opening 2. Can 1 also has a circumferential rib 8 which acts as a stop for lid 7 to prevent over-tightening which might increase the risk of jamming.

**[0020]** Figure 3 shows a circumferential brushwipe 9 located within opening 2 and which extends inwardly and downwardly of opening 2 at an angle of 50° to the horizontal and terminating in an elliptical distal brush-

wiping edge 10. Edge 10 throughout its whole extent is spaced inwardly from inner surface 3 of opening 2. Such spacing ensures that the brushwiping means constituted by edge 10 is always remote from both inner surface 3 and even more so from outer surface 4 and screw-threads 5 which receive lid 7 during closing. The remoteness virtually eliminates any risk of outer surface 4 and threads 5 being contaminated by paint wiped from an overloaded brush by use of edge 10. Therefore, lid 7 can be conveniently screwed on and off can 1 with little risk of jamming.

**[0021]** The elliptical shape of brushwiping edge 10 provides a portion 10a of small curvature which is useful in wiping the front and back faces presented by the bristles of a rectangular paint brush whilst also providing a sharp angular portion 10b of high curvature which is useful in wiping the end bristles of the brush. Portion 10b of high curvature also serves as a sort of lip when paint is poured from can 1 so that the flow of paint can be guided during pouring.

**[0022]** The inwards and downwards extension of brushwipe 9 helps to return paint wiped from a brush back to can 1.

**[0023]** Can 1 is conveniently made by a compound injection/blow moulding process in which opening 2, screw threads 5, rib 8 and shoulder 16 shown in Figure 6 are all formed together with parison 11 by injection moulding a suitable thermoplastics material. The use of injection moulding allows very precise reproduction particularly of opening 2 and screw-threads 5 which is important to the achievement of the best possible fluid-tight fit between screw-threads 5 and 6 when lid 7 is screwed into its closing position on can 1.

**[0024]** Figure 7 shows opening 2 and integral parison 11 in a blow mould 12 which comprises shape-defining elements 13 and 14 which define side walls 17 and base 18 of can 1 as shown in Figure 8. Blow mould 12 also comprises a plug 19 fitted with nozzle 20 for admitting air under high pressure into cavity 21. Plug 19 serves to prevent any inwards distortion of opening 2 and shoulder 16 should they become unavoidably heated during the time when the thermoplastics material comprising parison 11 is heat-softened to permit blow-moulding to occur.

**[0025]** Blow moulding is performed by heating the thermoplastics parison 11 to allow it to become deformable and then admitting air under high pressure into cavity 21 via nozzle 20 where it blows parison 11 into conformity with shape-defining elements 13 and 14 as shown in Figure 8. Formation of opening 2 and shoulder 16 by injection moulding prior to the blow moulding process has the important additional advantage of avoiding the need for their further positive heating because they do not have to be shaped under air pressure as does the parison 11. This means that opening 2 and shoulder 16 remain form-stable and so shoulder 16 can serve as a shape-defining surface for portion 19 of parison 11. Therefore during blow moulding, portion 19 is blown

back against shoulder 16 with the result that an initially two-leaved brushwipe 9 is formed. Heat from portion 19 then partially melts the underside of shoulder 16 causing portion 19 to integrate with shoulder 16 to form a single piece brushwipe 9. The ability of shoulder 16 to remain form-stable during blow moulding allows brushwipe 9 to be formed as part of the blow moulding process.

**[0026]** Figure 9 shows a paint can 31 according to this invention. Can 31 is identical with can 1 in every respect except for the shape of its side wall 37 below rib 8. Side wall 37 has been modified to enable it to be held more comfortably and in particular to guide a user of can 31 into orientating it so that small curvature portion 10a of brushwiping edge 10 is presented in the most comfortable alignment for wiping the flat faces of a rectangular paint brush. A comfortable alignment encourages efficient removal of excess paint from the brush which in turn reduces the risk of paint dripping from the brush onto threads 5 as the brush is withdrawn from can 31.

**[0027]** Side wall 37 is modified by the introduction of a re-entrant angled concavity 32 comprising two partially elliptical webs 33 and 34 joined along the line of angled edge portion 35 as shown in Figures 9 and 11 to 13. The line of the angled edge portion 35 is approximately parallel to the tangent to elliptical brushwiping edge at an end of its minor diameter shown as C-C in Figure 13. Angled edge portion 35 is 60 mm in length and is dimensioned to accommodate a human thumb comfortably.

**[0028]** Can 31 also has a partially circular waist 36 which extends around 75% of the circumference of can 31 and it too is dimensioned so as to accommodate human fingers comfortably when together with their associated thumb, they grip can 31. When gripped in this way, the natural orientation of can 31 presents angled edge portion 35, (and hence brushwiping portion 10a) in an alignment relative to the user of can 31 such that the most comfortable brush wiping action involves a movement of the brush towards or away from the user (as opposed to a lateral movement relative to the user) which allows for greater control of the wiping action.

**[0029]** Figures 9 and 10 show that the line of waist 36 follows a path which is arcuate in a vertical plane, that is to say, the path extends around the side wall from points where the waist is contiguous with the ends of angled edge portion 35 and rises vertically away from the line of horizontal edge portion 35. It has been found that this accommodates a natural tendency for users to be more comfortable if the middle portion of their gripping figures rise slightly upwards relative to their thumb.

**[0030]** Figure 14 shows precision injection moulded lid 7 suitable for use on either can 1 or can 31 and Figure 15 shows screw threads 6 formed on the inside of lid 7.

**[0031]** Internal upper surface 34 of angled re-entrant rebate 35 is also used as a brush rest allowing a paint brush to be rested with its bristles inside can 35 so further reducing the likelihood of paint contaminating screw threads 6 by providing an alternative to resting a loaded

brush on the rim of opening 2. Upper web 34 is inclined at 45° to the horizontal.

**[0032]** Figure 16 shows a modification to the brushwipe 9 of Figure 4. In Figure 16, brushwiping edge 10c is concentric with inner surface 3 of opening 2 so producing a semi-elliptical shape for brushwipe 9. The semi-elliptical shape allows broader wide brushes to be received into opening 2.

**[0033]** Figure 17 shows a modification to the brushwipe 9 of Figure 5. In Figure 17, brushwipe 9 is formed separately from the rest of can 1 but it makes an interference fit into opening 2 in which its outer surface 9a abuts against inner surface 3 of opening 2.

## Claims

1. A large can (1) for a brushable coating composition which can has a capacity of above 0.2 litres and is formed with a side wall (37) wherein one portion of the a side wall contains a re-entrant angled concavity (32) created by two mutually inclined webs (33 and 34) which extend into the can and meet along an essentially horizontal angled edge portion (35) **characterised in that** an adjacent portion of the a side wall contains a waist (36) extending around the side wall along a path rising vertically away from the edge portion whereby the angled concavity and vertically rising waist allow the can to be comfortably held by an adult human hand.
2. A can as claimed in Claim 1 wherein the waist is contiguous with the angled portion.
3. A can as claimed in Claim 1 or Claim 2 wherein the mutually inclined webs are partially elliptical.
4. A can as claimed in any one of the preceding Claims wherein the waist extends around from 40 to 75% of the girth of the can.
5. A can as claimed in any one of the preceding Claims wherein the line of the angled edge portion is curved.
6. A can according to any of the preceding Claims wherein the length of the angled edge portion is from 30 to 75 mm.
7. A can according to any one of the preceding Claims wherein the can is provided with a brushwipe (9) located within the can and terminating in a distal brushwiping edge (10) comprising a portion (10b) of larger curvature and a portion (10a) of smaller curvature **characterised in that** the line of the smaller curvature follows approximately the line of the angled portion whereby when the can is held by a user, the brushwipe is guided into a favourable

orientation for wiping the flat face of a rectangular paint brush.

8. A can according to any of the preceding Claims wherein the side wall of the can leads to a screw-threaded opening closeable by a correspondingly threaded lid (7). 5
9. A can according to Claim 8 when closed by a screw-threaded lid. 10
10. A closed can according to Claim 9 when containing a paint, lacquer, varnish, woodstain or other coating composition of the type commonly applied using a brush. 15

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FIG. 1

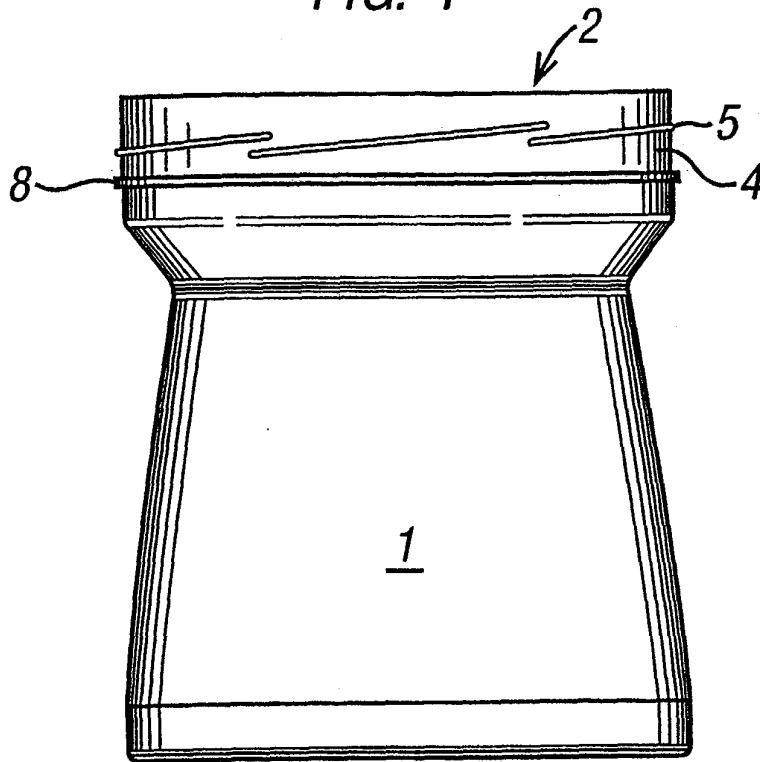


FIG. 2

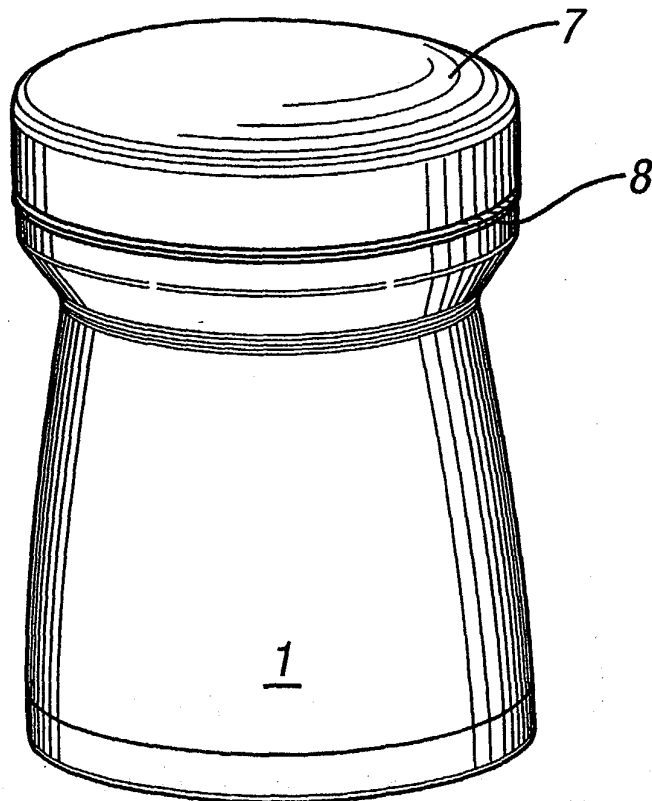


FIG. 3

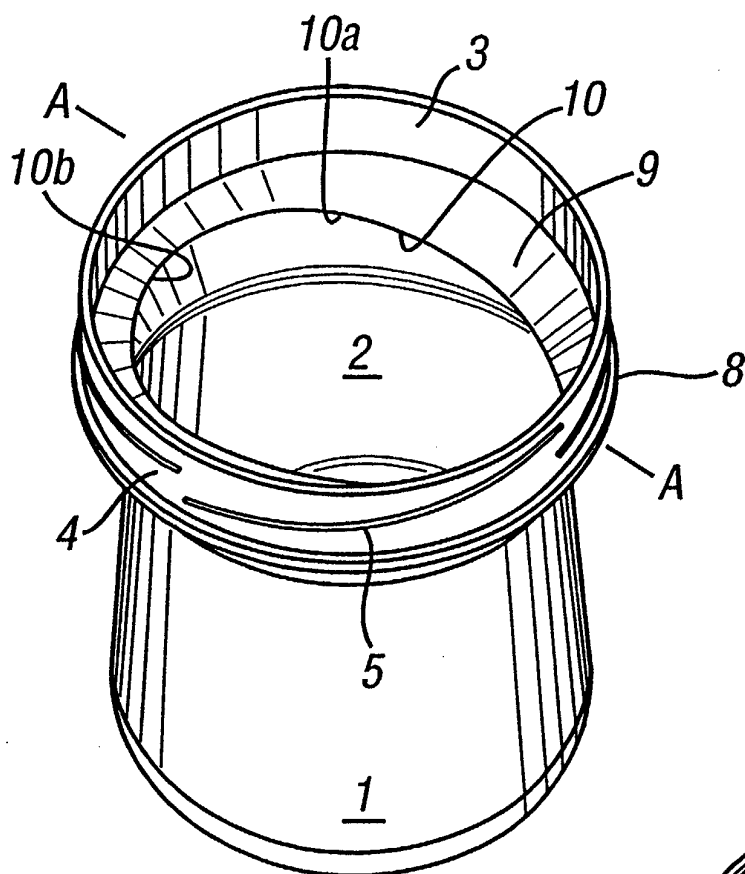


FIG. 4

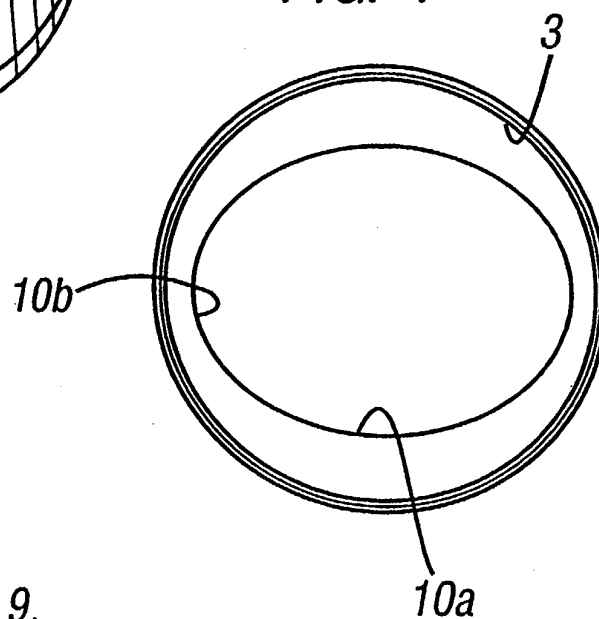


FIG. 5

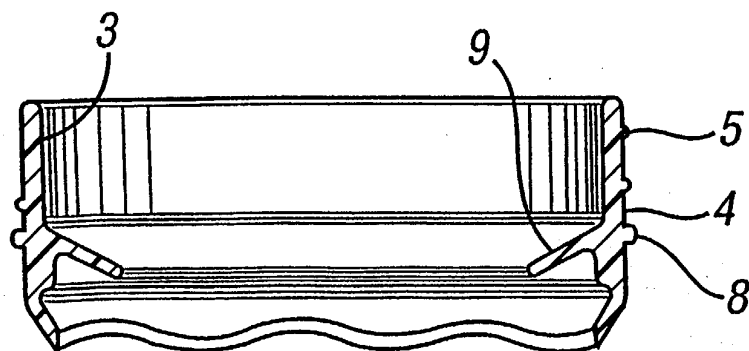


FIG. 6

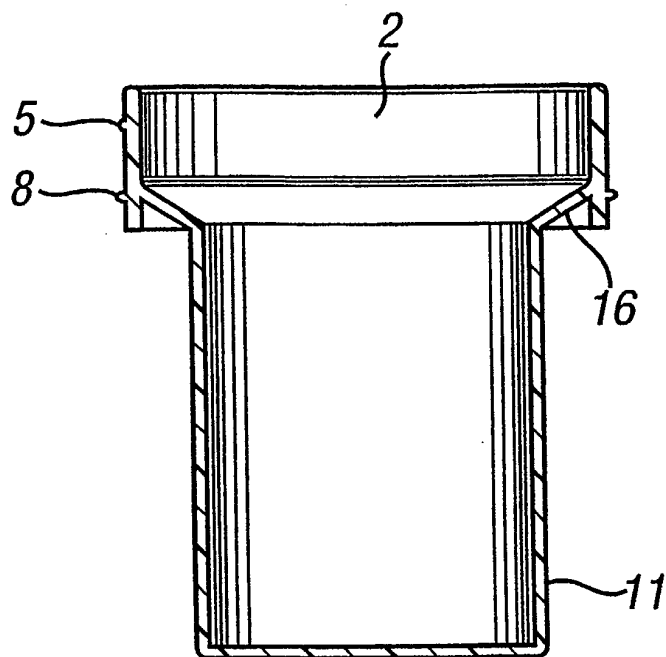


FIG. 7

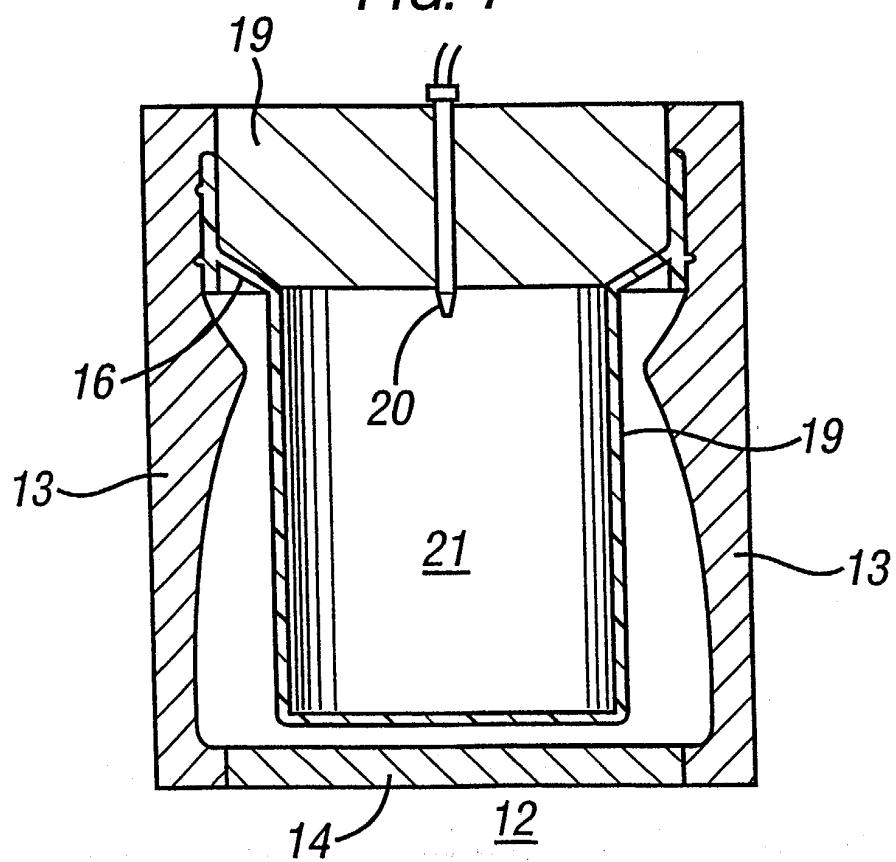


FIG. 8

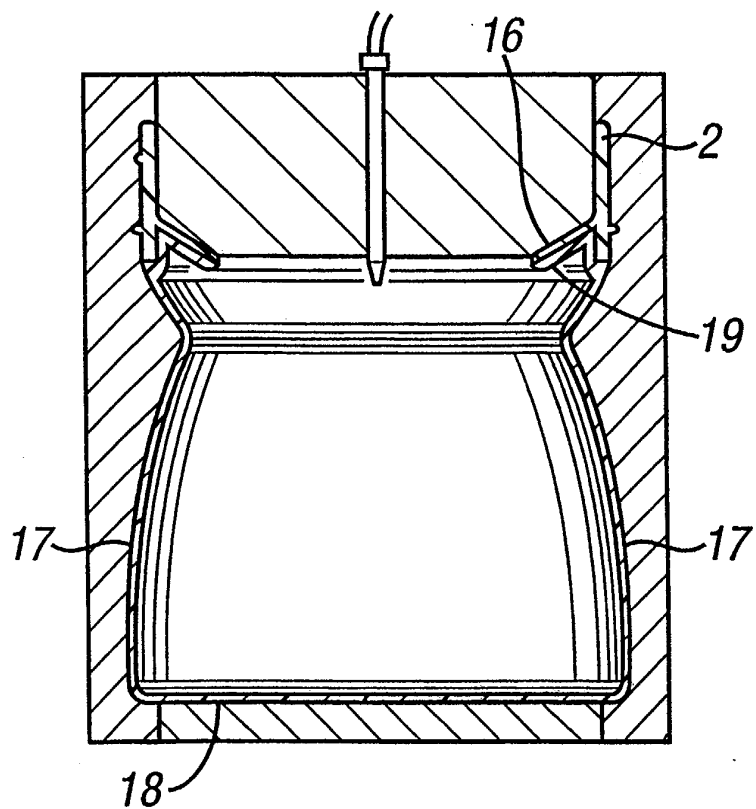
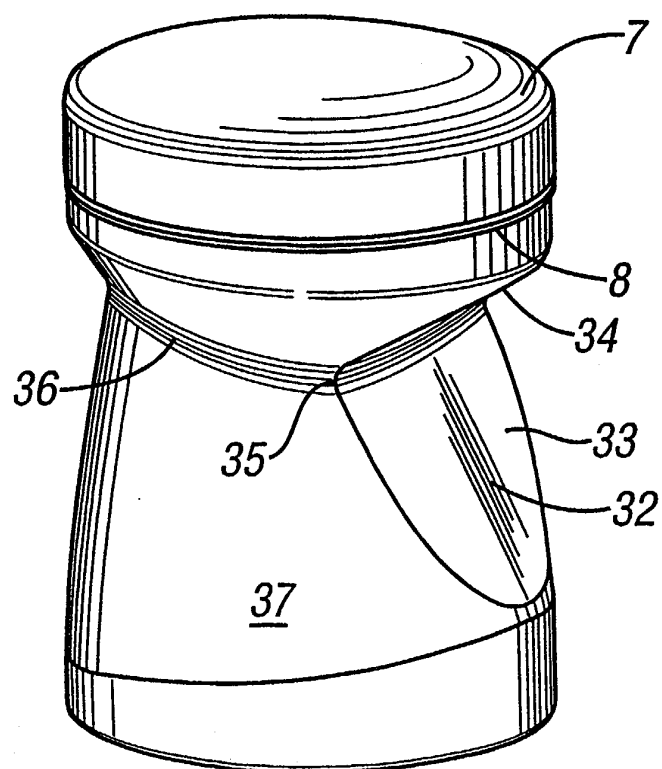
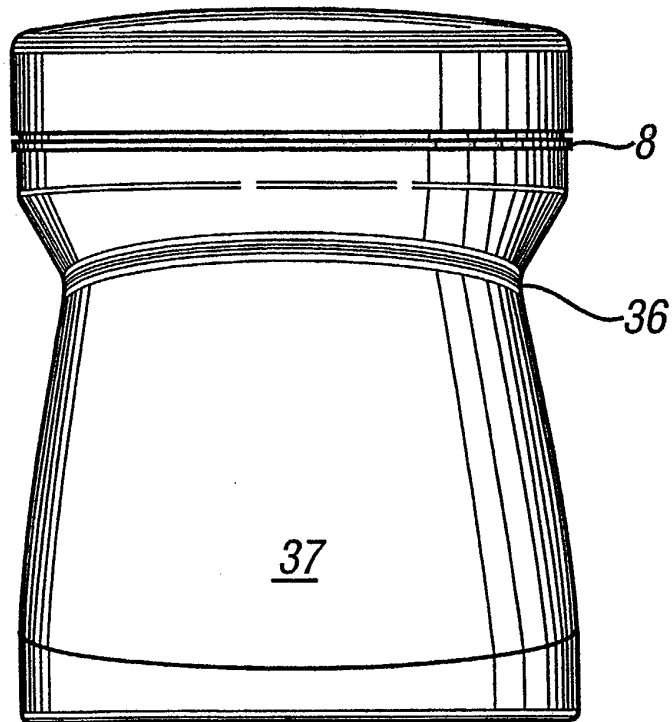


FIG. 9



*FIG. 10*



*FIG. 11*

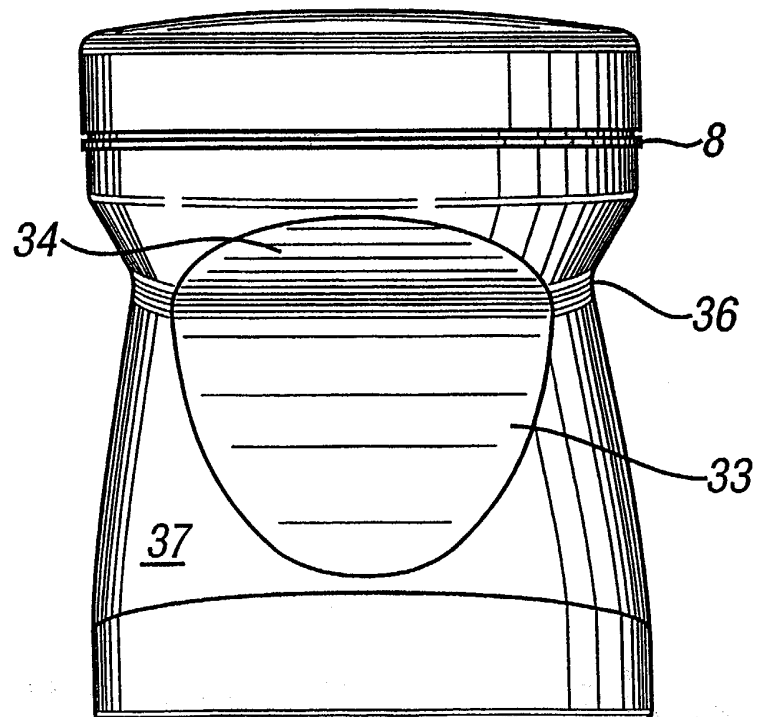


FIG. 12

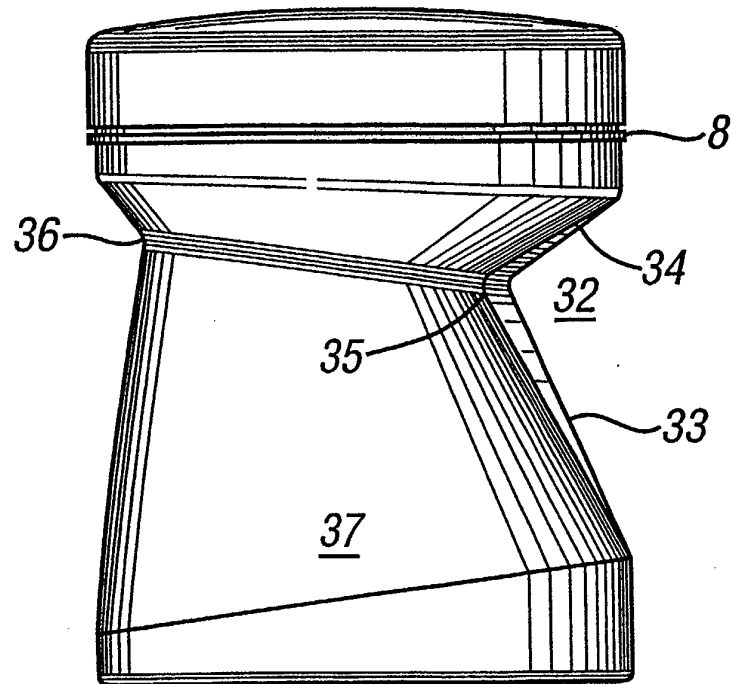
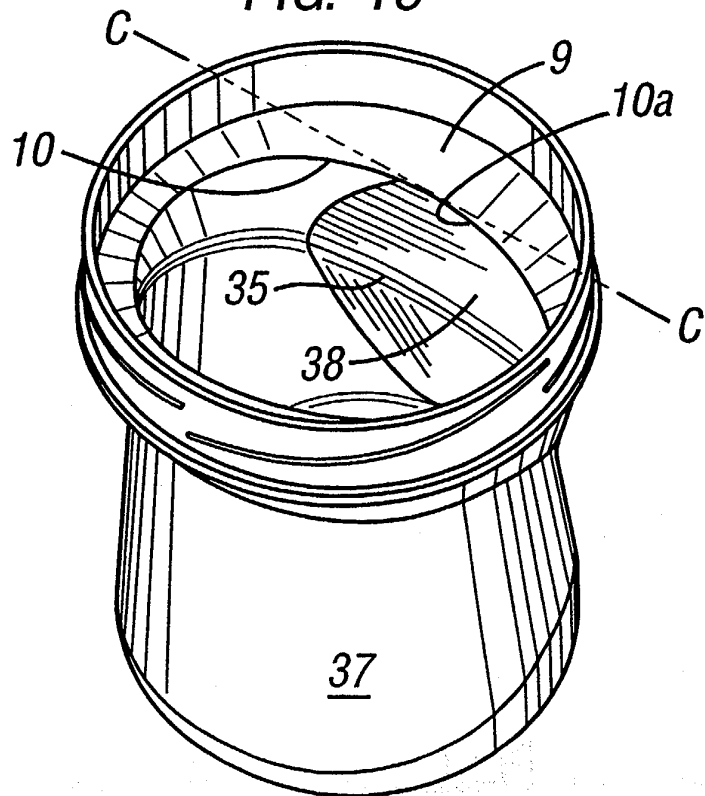
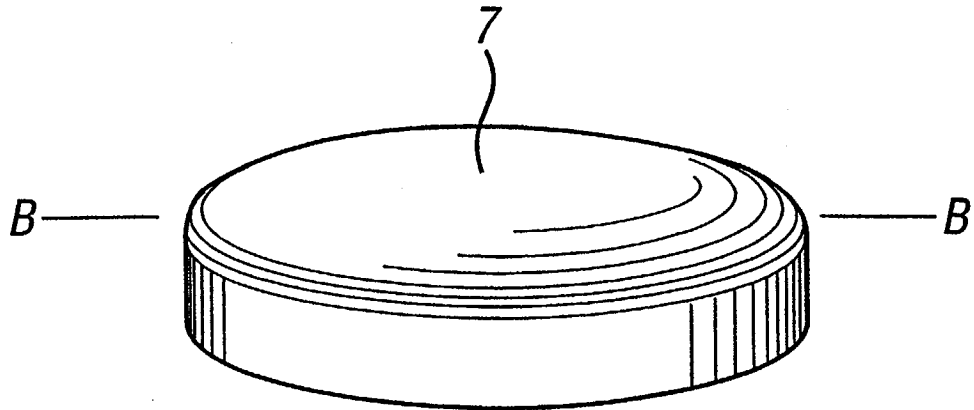


FIG. 13



*FIG. 14*



*FIG. 15*

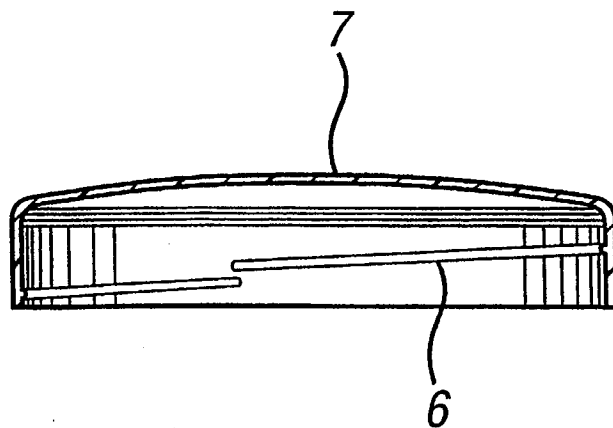


FIG. 16

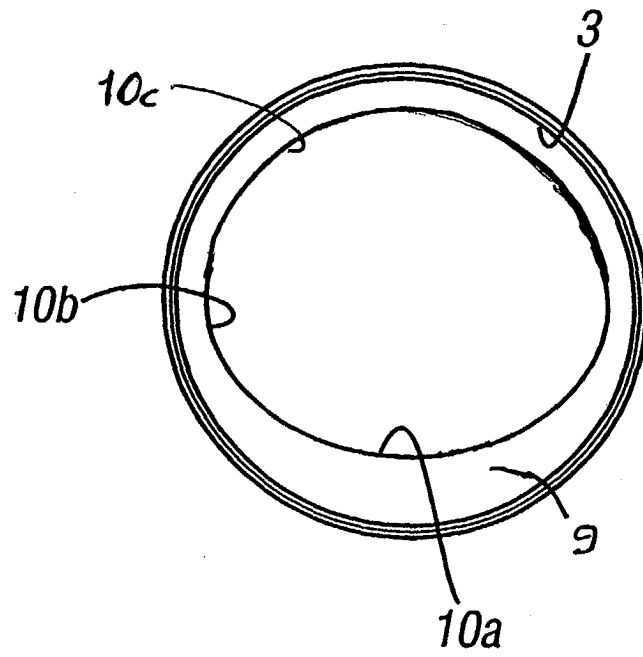
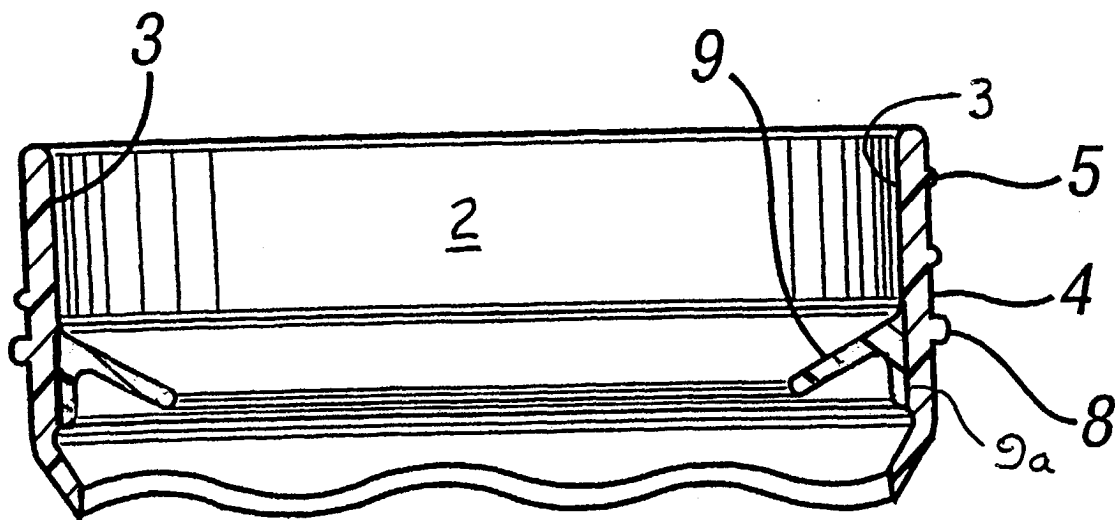


FIG. 17





European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 03 07 6814

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                      |                                  |                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------|----------------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Citation of document with indication, where appropriate, of relevant passages        | Relevant to claim                | CLASSIFICATION OF THE APPLICATION (Int.CI.7) |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | US 5 855 304 A (DEAN RICHARD A ET AL)<br>5 January 1999 (1999-01-05)<br>* abstract * | 1                                | B44D3/12                                     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | BE 507 686 A (JOH. JACOBS & CO)<br>----                                              |                                  |                                              |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | GB 313 080 A (WARREN FREDERICK FLESSELLES)<br>27 August 1930 (1930-08-27)<br>-----   |                                  |                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                      |                                  | TECHNICAL FIELDS SEARCHED (Int.CI.7)         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                      |                                  | B44D<br>B65D                                 |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                      |                                  |                                              |
| Place of search                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                      | Date of completion of the search | Examiner                                     |
| THE HAGUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                      | 12 August 2003                   | Müller, C                                    |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone<br/> Y : particularly relevant if combined with another document of the same category<br/> A : technological background<br/> O : non-written disclosure<br/> P : intermediate document</p> <p>T : theory or principle underlying the invention<br/> E : earlier patent document, but published on, or after the filing date<br/> D : document cited in the application<br/> L : document cited for other reasons</p> <p>&amp; : member of the same patent family, corresponding document</p> |                                                                                      |                                  |                                              |

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