(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 823 385 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
11.02.1998 Bulletin 1998/07

(51) Int Cl.[6]: **B65D 41/48**, B65D 51/18

(21) Application number: **97305805.0**

(22) Date of filing: **01.08.1997**

(84) Designated Contracting States:
AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

(30) Priority: **09.08.1996 EP 96305871**

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(54) A beer keg cap

(57) A beer keg cap 10 comprises a continuous cup shaped member to receive the neck of the beer keg. The cup shaped member comprises a top 12 and a depending skirt 14. The skirt 14 includes lines of weakness 20 extending upwardly from its lower edge to provide tamper evidence by breaking. The cap 10 further includes a plurality of inwardly directed tabs 16, to engage under the neck of a beer keg. The tabs 16 are elongate in the circumferential direction.

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Description

The invention relates to a beer keg cap.

A known beer keg cap is described in EP 0652162. The document discloses a tamper evident cap for a keg spear comprising a flat, circular top and a depending skirt. The skirt includes a large number of apertures and from the base of each aperture a tooth extends inwardly and upwardly. Each tooth is substantially rectangular and elongate inwardly. The teeth are arranged to snap onto the neck of the keg spear and engage under the annular projection of the neck to retain the cap. There are axial slots spaced around the skirt and a radial tab is defined in the top of the cap between a pair of parallel lines of weakness which terminate at two adjacent slots in the skirt. A tamper evident ring is provided connected to the skirt by frangible tags.

According to one aspect of the invention there is provided a beer keg cap comprising a continuous cup shaped member to receive the neck of the beer keg, and means for engaging the beer keg to retain the cap.

As the cup shaped member is continuous, moisture and dirt cannot readily enter the cap to contaminate the keg unlike the known cap described above which has a large number of apertures in the skirt.

The cup shaped member may comprise a top and a depending skirt and the skirt may include at least one line of weakness extending upwardly from its lower edge to provide tamper evidence by breaking.

Indeed, according to another aspect of the invention there is provided a beer keg cap comprising a cup shaped member comprising a top for the keg neck and a skirt depending from the top to lie around the neck in use, the skirt including at least one line of weakness extending upwardly from its lower edge to provide tamper evidence by breaking.

While the known cap includes a ring which is broken away from the main part of the cap on tampering, this is entirely different from the tamper evident arrangement of the present invention. The separation of the ring is inconvenient as the ring then remains on the keg while in the present invention tampering does not result in separation of the cap into two parts. The use of lines of weakness in the skirt is also significantly easier to manufacture.

Preferably the lines of weakness are imperforate and may for example be score lines.

Preferably, there are at least two lines of weakness extending upwardly from the lower edge of the skirt and at least four lines of weakness may be provided. Preferably, at least two opposite lines of weakness are provided.

The or at least one line of weakness may extend over the whole of the height of the skirt and preferably the or at least one line of weakness extends over the whole of the height of the skirt and continues over at least part of the top, preferably at least half of the top. Breaking of the cap along the or each line of weakness will assist in removal of the cap.

Preferably, the section between two lines of weakness includes means to enable the section to be pulled to thereby break the said two lines of weakness. The means may comprise a finger loop.

The cap may include a plurality of inwardly directed tabs to engage under the neck of a beer keg, each tab being elongate in a circumferential direction.

According to a further aspect of the invention, there is provided a beer keg cap including a skirt carrying a plurality of inwardly directed tabs to engage under the neck of a beer keg, each tab being elongate in the circumferential direction characterised in that the inner edge of each tab curves in a convex manner to where it meets the skirt.

Circumferentially elongate tabs of this type are strongly resilient and also act to spread stresses on the cap.

The tabs may be provided in a ring around the circumference and the edges of neighbouring tabs in the ring are preferably closely adjacent.

The entire inner edge of each tab may be convex. Each tab may be substantially symmetrical about a chord of the cap.

According to another aspect of the invention there is provided a cap for an undercut beer keg neck, the cap comprising a skirt carrying a plurality of inwardly directed resilient tabs, the tabs extending inwards so far that when the cap is on the neck, the tabs resiliently engage the neck.

As the tabs are forced against the neck and resiliently deformed, when the cap is on the neck, any attempt to remove the cap will tend to increase the deformation of the tabs and therefore be resisted by them. This is quite different from the arrangement of EP 0652162, for example, where the internal teeth from the skirt snap-engage over the neck but then sit clear of the neck when the cap is on the neck.

The inner edges of the tabs may be arranged such as to lie on a notional circle of diameter at least 50mm.

Indeed, according to another aspect of the invention there is provided a cap for an undercut beer keg neck, the cap comprising a skirt carrying a plurality of inwardly directed resilient tabs, a notional circle contacting the inner ends of the tabs having a diameter of at least 50mm.

This will ensure that, on a standard beer keg neck, the tabs will remain deformed when pushed over the undercut neck to resist removal.

The notional circle preferably has a diameter of at least 51mm and suitably may have a diameter of at most of 53mm.

Preferably, the skirt includes at least one line of weakness extending upwardly from its lower edge. The line of weakness can thus provide evidence of tampering by breaking and/or aid removal of the cap when the keg is to be used. While the cap is difficult to remove because of the arrangement of the tabs, it is useful to

provide evidence of tampering and see resilient engagement of the tabs with the neck mean that it is virtually impossible for the cap to be removed without breakage of the line of weakness.

In a preferred embodiment, the skirt is continuous. Preferably, the cap includes a top and the top and skirt comprise a continuous, cup-shaped member. This prevents moisture and dirt from entering the cap to contaminate the keg. The fact that the tabs are long and resilient means that this cap can in fact be moulded in a two-part tool. Previously, it has been necessary to use a tool in at least three parts to mould a cap with a continuous skirt, because previously the tabs have always pointed upwards, as in EP 0652162, at a pronounced angle. The tabs of the present invention can point substantially radially inwardly, or even downwardly as they are likely to do as a result of removable of the cap from the mould, but the resilience of the tabs will mean that they are pushed in the correct direction by engagement with the undercut keg neck and will securely attach the cap to the keg neck. The two parts of the mould thus approach axially and the tabs will resiliently resume their position once the cap has been rejected from the mould.

The cap preferably includes a pull element to assist in removal of the cap, and the pull element may be connected to the skirt at or towards the top and at or towards the base of the skirt.

According to another aspect of the invention there is provided a beer keg cap comprising a top and a depending skirt and a pull element on the skirt, the skirt being arranged to break on lifting of the pull element, characterised in that the pull element is connected to the skirt at or towards the top and at or towards the base of the skirt.

In this way, the pull element can pivot at or adjacent the top providing leverage to the position at or adjacent the base of the skirt to assist in breaking of the skirt while providing a strong connection to the skirt.

The pull element may be connected at spaced positions to the skirt, but preferably is connected to the skirt over an elongate region from at or towards the top to at or towards the base of the skirt.

The skirt preferably includes at least one line of weakening at or adjacent the pull element which is arranged to break on lifting of the pull element.

In a preferred embodiment the pull element is connected to the skirt in two circumferentially spaced positions to form a finger loop. The user thus does not have to grasp the pull element but can simply put his finger through the loop and pull.

The pull element may be of any suitable shape. Conveniently the profile of the underside of the pull element may slope upwardly away from the skirt. In use, the keg is moved to engage the cap, which is held at an angle so that engagement of the front edge of the keg with the rear inner surface of the skirt causes the cap to fall over the keg neck with the skirt around the keg neck. By sloping the underside of the pull element in this way, the keg cannot engage the pull element if for some reason it does not engage the skirt.

According to further aspect of the invention there is provided a beer keg cap comprising a top and a depending skirt characterised in that formations are provided at or adjacent the junction of the top and depending skirt at spaced positions around the cap to locate the neck of a beer keg.

The formations may take any suitable form and may comprise ribs. The formations are preferably equally spaced around the cap.

According to another aspect of the invention there is provided a beer keg cap comprising a top, a depending skirt and a plurality of inwardly directed tabs to engage under the neck of a beer keg, characterised in that line of connection of each tab to the skirt does not lie in a single plane.

This adds strength to the tab.

Preferably the line of connection is a single smooth curve. Preferably the line is curved upwardly. This lifts the tabs into the cap to reduce the chance of accidental damage or premature contact with the keg neck.

Four embodiments of the invention will now be described by way of example and with reference to the accompanying drawings, in which:

Fig. 1 is a front elevation of the cap of the first embodiment;
Fig. 2 is an underneath plan view of the cap of Fig. 1;
Fig. 3 is a view of Fig. 2 with the tabs not shown;
Fig. 4 is a side elevation in cross-section at A-A of Fig. 2;
Fig. 5 is the view of Fig. 4 with the cap fitted onto a beer keg;
Fig. 6 is a front elevation of the cap of the second embodiment;
Fig. 7 is an underneath plan view of the cap of Fig. 6;
Fig. 8 is a side elevation in cross-section at B-B of Fig. 7;
Fig. 9 is an underneath plan view of the cap of the third embodiment;
Fig. 10 is a side elevation in cross section at C-C of the cap of Fig. 9; and,
Fig. 11 is an underneath plan view of the cap of the fourth embodiment.

The cap 10 of the embodiment comprises a planar circular top 12 and a depending skirt 14. The skirt 14 includes a slight flare to be frusto-conical in shape. A circumferential ring of inwardly directed tabs 16 project from the inner surface of the skirt 14. The tabs 16 are each elongate in the circumferential direction and are substantially symmetrical about a chord of the skirt 14 parallel to the top 12. There are six tabs 16. The tabs 16 extend from the skirt 14 at about one-third of the height of the skirt 14 from the lower edge 18 of the skirt 14.

Four lines of weakness 20 are provided in the skirt

14. Each line of weakness 20 is parallel to the axis of the cap 10 and intersects the small gap between two neighbouring tabs 16. The lines of weakness 20 are provided in two opposite pairs. Each line of weakness 20 continues for a short distance into the top 12 radially and then extends in a circumferential direction around the top 12 and includes a further short radial section to connect to the more distant neighbouring line of weakness 20.

A finger loop 28 is provided and each end of the loop 28 is connected to the lower edge 18 of the skirt 14 immediately adjacent a line of weakness 20 such that the loop 28 is connected to a section between two closely spaced lines of weakness 20. The finger loop 28 is symmetrical and each arm 32 of the loop 28 extends radially outwardly initially and then circumferentially before curving upwards and then linking with the other arm to form a U-shape such that the loop 28 is substantially the same height as the skirt 14.

The cap may be injection moulded from polypropylene, high temperature polyethylene or polystyrene.

In use, the cap 10 is forced over the annular projection 32 on the neck 34 of a beer keg. In this action, the tabs 16 are bent upwardly and engage under the annular projection 32 to retain the cap 10 on the beer keg neck 34. The tabs 16 will be resiliently bent in this position. If someone should attempt to tamper with the beer keg, attempted removal of the cap will lead to splitting of the skirt 14 along one of the lines of weakness 20 which provides evidence of tampering. Dirt and moisture are prevented from entering the keg as the top 12 and skirt 14 of the cap 10 are continuous. When it is desired to open the keg, the cap 10 is removed by inserting a finger through the finger loop 28 and pulling upwardly. The cap 10 will break along the lines of weakness 20 adjacent the loop 28 and further pulling of the tab 28 will cause the top 12 of the cap 10 to be broken along the lines of weakness therein such that the cap 10 can be pulled off the beer keg neck 34.

In a further embodiment, two additional lines of weakness 20 are provided in the remaining two positions between adjacent tabs 16.

In another embodiment, the part of the line of weakness 20 which extends circumferentially in the top 12 of the cap 10 does not meet up with another line of weakness but terminates after a distance of no less than one sixth of the circumference of the cap 10. In removal, the cap can be broken across the top 12 to at least half way across, the remainder of the cap 10 will flex sufficiently for the cap 10 to be removed.

The second embodiment is shown in Figs 6, 7 and 8. The cap10 of the embodiment is similar to the cap of the first embodiment and only the differences between the caps will be described. The same reference numerals will be used for equivalent features.

The slim uniform thickness finger loop 28 of the first embodiment is replaced in the second embodiment by a tall pull ring 50. The pull ring 50 is part circular in plan and, like the finger loop 28, is connected to the skirt 14 just inside the lines of weakness 20. Each side of the pull ring 50 is connected to the skirt 14 from the base of the skirt 14 up to close to the top 12 along a line parallel to the axis of the cap 10. The top surface 52 of the pull ring 50 slopes downwards in a shallow manner while the underneath surface 54 of the pull ring 50 curves upwardly and outwardly in a more pronounced fashion.

A plurality of equispaced triangular ribs 56 is provided around the edge of the top 12 at the junction between the top 12 and the skirt 14.These provide extra strength but also serve to locate the cap 10 centrally on a keg neck.

In use, the tall pull ring 50 is very strong and exerts leverage about a fulcrum point near the tip of the skirt 14 to break the skirt 14 at the base or the lines of weakness 20 adjacent the pull ring 50. The pull ring 50 is then easier to use and more reliable than the finger loop 28.

The cap 10 of the third embodiment is similar to the cap 10 of the second embodiment and only the differences will be described. The same reference numerals will be used for equivalent features.

In the cap 10 the third embodiment there are twice as many tabs 16. The tabs 16 are half the length but of the same inwards extent and smoothly curved symmetrical shape. The breaks between the tabs 16 correspond to the lines of weakness 20 as in the other embodiments. Where, in the other embodiments, the line of connection of each tab 16 to the skirt 14 was in a single plane and straight in horizontal elevation in the third embodiment the line of connection 58 is a convex upwards curve. This adds strength to the tabs 16 and also raises them up into the cap 10.

Claims

1. A cap for an undercut beer keg neck, the cap comprising a skirt carrying a plurality of inwardly directed resilient tabs, the tab extending inwards so far that when the cap is on the neck the tabs resiliently engage the neck.

2. A cap as claimed in claim 1, wherein the inner edges of the tabs lie on a notional circle of diameter at least 50mm.

3. A cap for an undercut beer keg neck, the cap comprising a skirt carrying a plurality of inwardly directed resilient tabs, a rotational circle contacting the inner ends of the tabs having a diameter of at least 50mm.

4. A cap as claimed in claim 2 or claim 3, wherein the internal circle has a diameter of at least 51mm.

5. A cap as claimed in claim 2, 3 or 4, wherein the notional circle has a diameter of at most 53 mm.

6. A cap as claimed in any preceding claim wherein the skirt includes at least one line of weakness extending upwardly from its lower edge.

7. A cap as claimed in any preceding claim, wherein the skirt is continuous.

8. A cap as claimed in any preceding claim, wherein the cap includes a top and the top end skirt comprise a continuous cup-shaped member.

9. A cap as claimed in any preceding claim, wherein the cap includes a pull element.

10. A cap as claimed in claim 9, wherein the pull element is connected to the skirt at or towards the top and at or towards the base of the skirt.

11. A beer keg cap comprising a top and a depending skirt and a pull element on the skirt, the skirt being arranged to break on lifting of the pull element, characterised in that the pull element is connected to the skirt at or towards the top and at or towards the base of the skirt.

12. A cap as claimed in claim 10 or claim 11, wherein is connected to the skirt over an elongate region from at or towards the top to at or towards the base of the skirt.

13. A cap as claimed in claim 10, 11 or 12, wherein the skirt includes at least one line of weakening at or adjacent the pull element which is arranged to break on lifting of the tab.

14. A cap as claimed in any of claims 9 to 13, wherein the pull element is connected to the skirt in two circumferentially spaced positions to form a finger loop.

15. A cap as claimed in any of claims 9 to 14, wherein the profile of the underside of the pull element slopes upwardly away from the skirt.

16. A cap as claimed in claim 8 or any of claims 11 to 15, wherein formations are provided at or adjacent the junction of the top and depending skirt at spaced positions around the cap to locate the neck of the beer keg.

17. A beer keg cap comprising a top and a depending skirt characterised in that formations are provided at or adjacent the junction of the top and depending skirt at spaced positions around the cap to locate the neck of a beer keg.

18. A cap as claimed in claim 6, or claim 7 wherein the formations comprise ribs.

19. A cap as claimed in claim 6, 7 or 8, wherein the formations are equally spaced around the cap.

20. A cap as claimed in any preceding claim, wherein the cap includes a plurality of inwardly directed tabs to engage under the neck of a beer keg.

21. A cap as claimed in claim 20, wherein each tab is elongate in the circumferential direction.

22. A cap as claimed in claim 21, wherein the inner edge of each tab curves in a convex manner to where it meets the skirt.

23. A beer keg cap including a plurality of inwardly directed tabs to engage under the neck of a beer keg, each tab being elongate in the circumferential direction characterised in that the inner edge of each tab curves in a convex manner to where it meets the skirt.

24. A cap as claimed in claim 22 or claim 23, wherein the tabs are provided in a ring around the circumference.

25. A cap as claimed in claims 22, 23 or 24 wherein the edges of neighbouring tabs are closely adjacent.

26. A cap as claimed in any of claims 22 to 25, wherein the entire inner edge of each tab is convex.

27. A cap as claimed in any of claims 22 to 26, wherein each tab is substantially symmetrical about a chord of the cap.

28. A cap as claimed in any of claims 20 to 27, wherein the line of connection of each tab to the skirt does not lie in a single plane.

29. A beer keg cap comprising a top, a depending skirt and a plurality of inwardly directed tabs to engage under the neck of a beer keg, characterised in that the line of connection of each tab to the skirt does not lie in a single plane.

30. A cap as claimed in claimed 28 or claim 29, wherein the line of connection is a single smooth curve.

31. A cap as claimed in claim 28,29 or 30 wherein the line of connection is convex upwardly.

Fig. 1

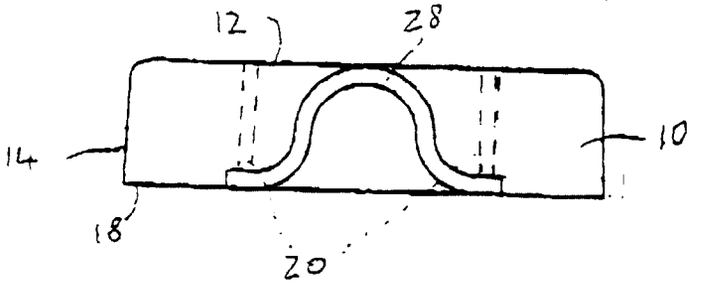


Fig. 2

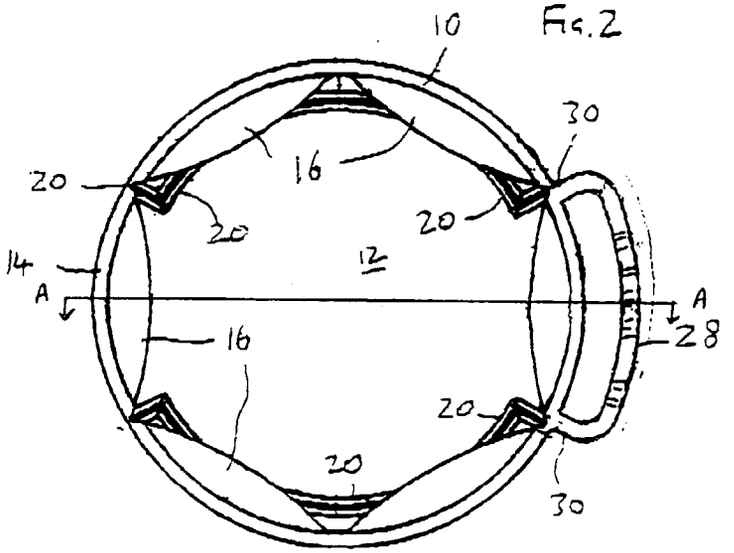
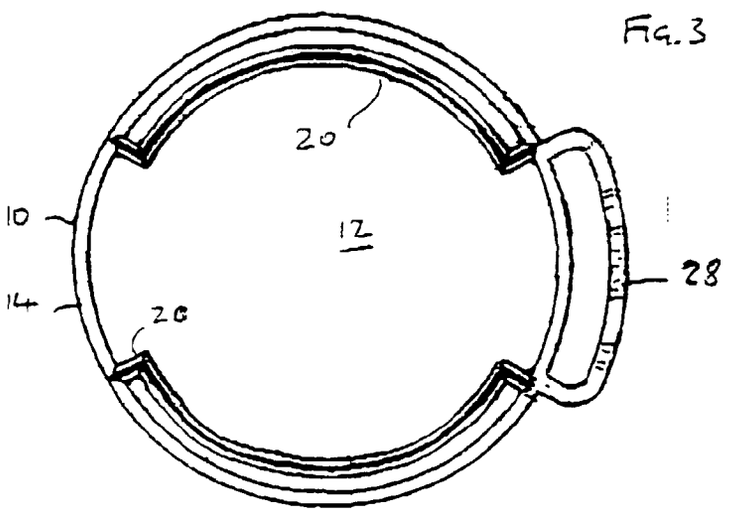


Fig. 3



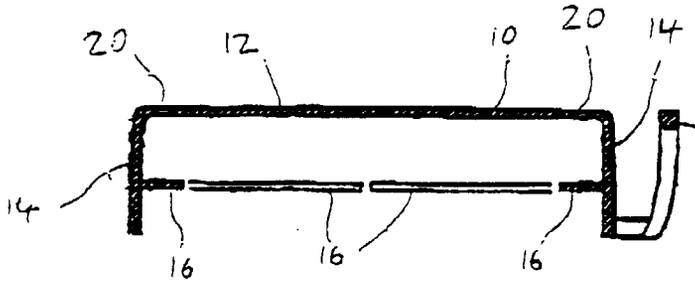


Fig.4

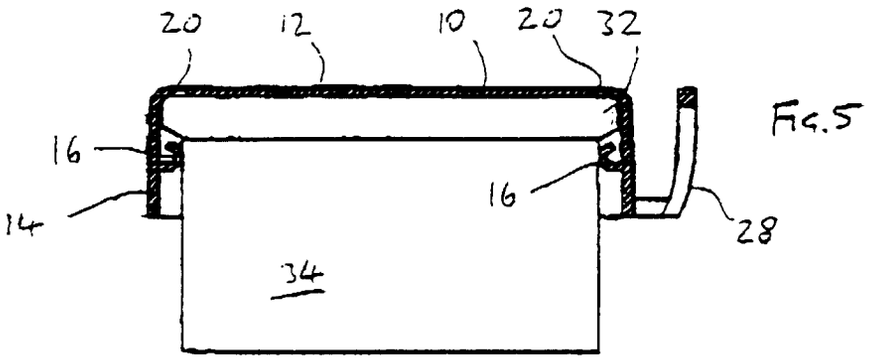


Fig.5

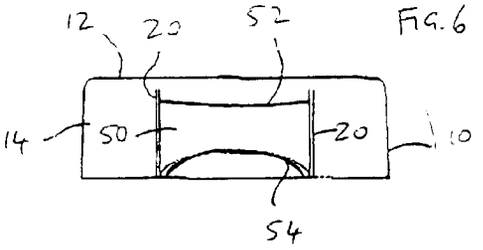


Fig.6

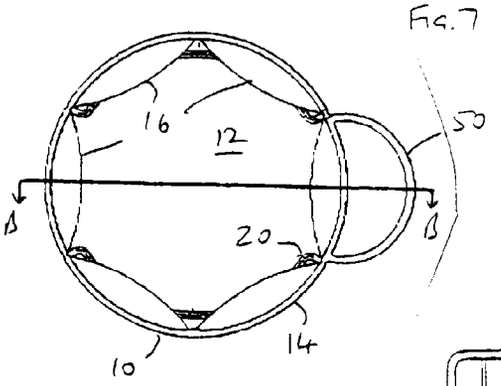


Fig.7

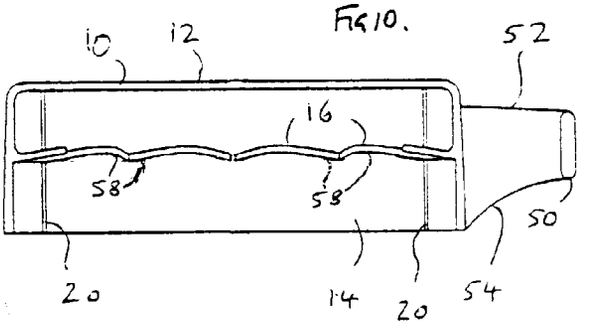


Fig10.

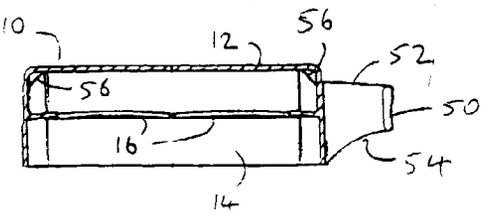


Fig.8

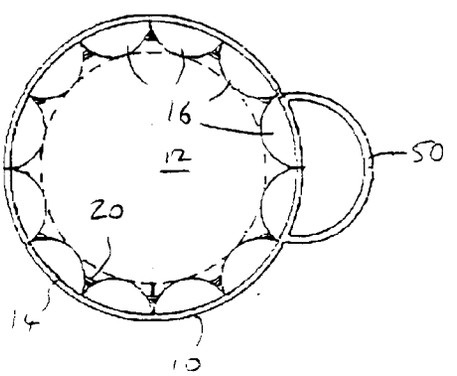


Fig.9

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 30 5805

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.6)
A	GB 2 222 399 A (MAUSER-WERKE GMBH) 7 March 1990 * page 4, line 2-16; figures 1,2 *	1,3,11, 17,23,29	B65D41/48 B65D51/18
A	WO 91 02686 A (CAMPBELL) 7 March 1991 * page 3, line 24 - page 4, line 3; figures 1,2 *	1,3,11, 17,23,29	
A	FR 2 077 521 A (CONTINENTAL CAN COMPANY) 29 October 1971 * page 17, line 4-37; figures 17-19 *	1,3,14	
A	LU 66 661 A (ALCA SA.) 14 December 1972 * page 5, line 17-24; figure 8 *	1,3,14	
A	DE 37 42 858 A (ARMSTRONG) 30 June 1988 * column 1-3; figures 1-3 *	11,17, 23,29,30	
A	EP 0 725 013 A (LAWSON MARDON SUTTON LTD.) 7 August 1996 * column 1-6; figures 1-3 *	11,17, 23,29,30	TECHNICAL FIELDS SEARCHED (Int.Cl.6) B65D
A	DE 34 08 814 C (DALLWITZ) 5 June 1985 * column 1-3; figures 1-4 *	1,3,30, 31	
A	US 1 646 765 A (RAMSEY) 25 October 1927 * page 1-3; figures 1-8 *	1,3,30, 31	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	20 November 1997	Vollering, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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