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

(11) EP 1 535 855 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
01.06.2005 Bulletin 2005/22

(51) Int Cl.[7]: **B65D 47/12**

(21) Application number: **04019260.1**

(22) Date of filing: **13.08.2004**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL HR LT LV MK

(30) Priority: **15.10.2003 IT GE20030080**

(71) Applicant: **Invat S.r.l.**
16013 Campoligure (Genova) (IT)

(72) Inventor: **Rossi, Pietro**
16013 Campoligure (GE) (IT)

(74) Representative: **Faraggiana, Vittorio, Dr. Ing.**
Ingg. Guzzi & Ravizza S.r.l.
Via Vincenzo Monti 8
20123 Milano (IT)

(54) Cap for containers with breakable seal

(57) Cap for containers with seal breakable by unscrewing of the lid, where such cap is made up of a lid (1) and a body (7), where the lid (1) is screwed onto the body (7) and the body (7) is mounted by snap fitting with axial pressure on the container (13), where the lid (1) is fitted in its lower zone with a guarantee ring (2, 2',15) linked to the lid itself by means of breakable peduncles (3), where said guarantee ring (2, 2',15) is fitted on its lower part with serrations (4), where the body (7) of the cap is fitted with a central pouring spout (8) with a drip catching upper rim (9), where the body (7) of the cap is fitted with a bowl (10) with a closed bottom having the function of stopping the formation of bubbles, where said bowl (10) is sustained by radial (11) or circular (18, 19) beams, where the body (7) of the cap is fitted in the lower part with a ring conformation (12), aimed at receiving by snapping on the upper mouth of the container (13), where the body (7) of the cap is fitted on the outside of the upper part of the ring conformation (12) with serrations (14) turned upwards and corresponding to the serrations (4) turned downwards of the guarantee ring (2, 2',15), so that in order to carry out pouring of the content, one unscrews the lid (1) and this provokes, by opposition to that manoeuvre created by the serrations (4, 14), breakage of the breakable peduncles (3) and of the guarantee ring (2, 2',15).

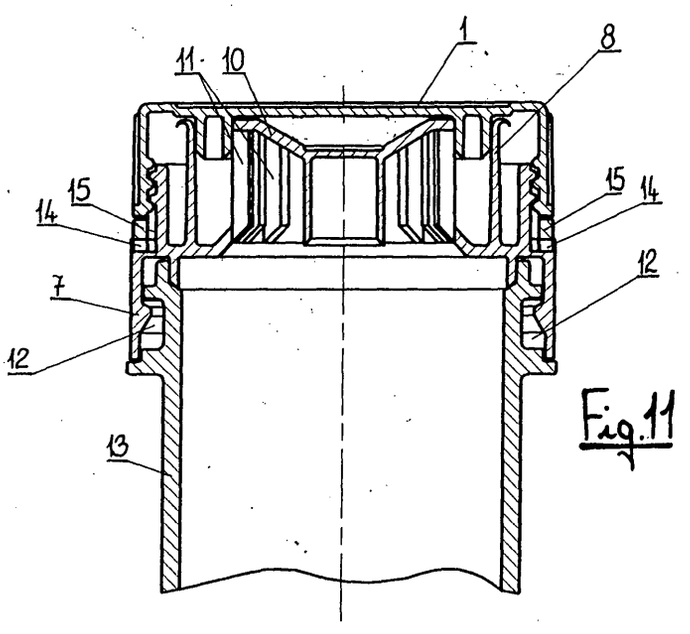

Fig.11

EP 1 535 855 A1

Description

[0001] Various types of caps for containers are commonly known and in particular caps fitted by screwing or snapped under pressure onto the mouth of the container itself and in this invention particular reference is made to caps made up of a body to be mounted by pressure on the container and a lid.

[0002] These caps have certain inconveniences, the first of which is due to the sealing against tampering. Indeed, the sealing of such caps is normally carried out by means of a removable partition, which is connected to the pouring spout by means of a weakened line, in such way that the partition can be removed, after opening of the lid, by means of pulling on an eyelet connected to the partition itself. Removing this sealing partition, the pouring spout is freed and, once the lid is removed, one can pour the contents totally or partially, replacing the lid to protect the content remaining in the container.

[0003] This seal made up of a tearaway partition may create problems for the user since it must be removed with a manoeuvre of the fingers.

[0004] A further inconvenience of the known caps is due to the fact that the anti-bubble making function is created by thin plates, which extend toward the centre from the central body of the cap, and this solution does not satisfy the need for allowing a constant and homogeneous flow of the liquid coming out.

[0005] Yet another inconvenience is due to the fact that these known caps do not permit a flow of liquid to come out in a variable pre-established entity, nor do they allow dosage of the liquid. This is an important inconvenience in that especially housewives and cooks sometimes need doses different from liquids with established quantities or pre-fixed doses.

[0006] The cap according to this invention, allows total elimination or great reduction of the aforesaid inconveniences. In fact the cap is made up of two elements and that is of a body to be mounted by pressure or snapping onto the mouth of the container and of a lid.

[0007] The seal, according to the invention, is created by means of serrations envisaged upward on the lower outer part of the body of the cap, while corresponding counter-serrations are envisaged on the lower edge of a ring fixed with breakable peduncles to the lid. This ring acts as a guarantee against tampering and is circular with a constant height or with different semi-circular heights or with variable sectors.

[0008] When the lid is screwed on, the serrations of the lid slide jumping on the serrations of the body, until with the cap closed, the two serrations arrange themselves stably in superimposition.

[0009] To open the cap for the first time, one unscrews the lid from the body and, due to the blocking of the serrations on the lid on the serrations of the body, the breakable peduncles are broken as is the guarantee ring.

[0010] This facilitates the opening of the cap without removing the removable partition and shows immediately any possible tampering with the cap by anyone with bad intentions.

[0011] Then according to the invention, the anti-bubble making function is created by a bowl with a closed bottom, sustained centrally by means of radial or circular partitions, inside the body of the cap. With this solution one obtains a perfect action of anti-bubble making, creating a liquid, homogeneous and constant flow.

[0012] Then according to the invention, the bowl for anti-bubble making, may be sustained on the inside of the body of the cap, by means of two cylindrical elements on a vertical axis, said cylindrical elements separated one from the other with opportune special openings of different width. Pouring the liquid through the opening with limited width, a limited quantity of liquid comes out, while if one pours the liquid through the opening with greater width, the liquid coming out will be greater. These differentiated pourings are obtained simply by turning the container and the relative cap upside down.

[0013] This possibility of automatically dosing different quantities of liquid of the container may be of considerable help to the housewife or cook who can use different flows dosed according to the orientation of the container.

[0014] Finally, on the basis of a second solution of the invention, the cap may also function as a measuring device for a determined quantity of liquid. To this end a shell is envisaged with closed bottom and open top, on the bottom of which a cannula is grafted with the upper edge fitted with an external expansion ring. With this solution, the anti-bubble making bowl is formed with a pierced central bottom through which the cannula is forced in such way as to come out above said bowl. With this solution, inside the lid a prominent circular ridge is envisaged, aimed at hooking itself onto the ring expansion of the cannula.

[0015] When the lid is closed, shaking the container or turning it upside down, the shell of liquid fills and when one removes the lid for pouring, one raises the shell, by means of the cannula, until its upper external mouth rests on the lower internal zone of the body of the cap. In this way, the liquid contained in the shell is isolated. Completely removing the lid, one can pour the quantity of liquid contained in the shell in one go, while the liquid remaining in the container is prevented from coming out. Therefore it is possible to pour at a later time established and dosed quantities of liquid.

[0016] The invention in words is clarified in its practical and exemplary realization in the attached drawings, where:

Fig. 1 shows the side view of the lid with the guarantee ring with different heights,

Fig. 2 shows the central vertical cross-section of the lid in Fig. 1,

Fig. 3 shows the side view of the body of the cap,

Fig. 4 shows the central vertical cross-section of the

body of the cap in Fig. 3,
Fig. 5 shows the side view of the cap complete with lid fitted with guarantee ring of constant height,
Fig. 6 shows the central vertical cross-section of the cap in Fig. 5,
Fig. 7 shows the perspective view of the body of the cap in Fig. 3,
Fig. 8 shows the perspective view of the lid in Fig. 1,
Fig. 9 shows the perspective view of the group of the cap according to Figs. 7 and 8 with initial breakage of the guarantee ring,
Fig. 10 shows the perspective view of the lid with guarantee ring with constant height,
Fig. 11 shows the central vertical cross-section of the group of the cap in Fig. 5 mounted on an example container,
Fig. 12 shows the central vertical cross-section of the body of the cap with the possibility of pouring with different determined flows with the turning upside down of the container and the cap,
Fig. 13 shows the view from above of the body in Fig. 11,
Fig. 14 shows in side and partial view the central vertical cross-section of the lid of the measuring device cap of the second solution, with ring of constant height,
Fig. 15 shows in side and partial view the central vertical cross-section of the body of the cap according to said second solution of Fig. 14,
Fig. 16 shows the central vertical cross-section of the measuring device shell,
Fig. 17 shows the central vertical cross-section of the group of the measuring device cap, according to Figs. 14, 15 and 16 with lid mounted,
Fig. 18 shows the central vertical cross-section of the cap in Fig. 17, with lid in the opening phase.

[0017] With reference to said figures, Figs. 1 and 2 show respectively in side view and the central vertical cross-section, lid 1 fitted, in the lower zone, with a guarantee ring 2, 2' with different heights, connected to the lid itself by means of breakable peduncles 3. This guarantee ring has on its lower part a serration 4. Inside said lid 1, a profile 5 is envisaged for sealing of the pouring spout of the cap and a thread 6 for mounting of the lid on the body of the cap.

[0018] In Figs. 3 and 4 the body 7 of the cap is illustrated in a shape that is almost a hollow cylinder, which has in the upper central zone a pouring spout 8, with drip-stopping rim 9, inside which there is a bowl 10 with closed bottom with the function of anti-bubble making, sustained by radial beams 11. In the lower part of the body 7 of the cap a ring-shaped conformation is envisaged, inside which there is a ring groove 12, aimed at receiving by pressure the upper mouth of the container 13; this ring conformation has on its upper external part a serration 14 turned upwards, corresponding to the serration 4 of the lid 1. In the upper zone of the ring conformation a thread is envisaged corresponding to the thread 6 of the lid 1.

[0019] After filling of the container 13 with the liquid, the cap is mounted on the container 13 through axial thrust so that the cap itself blocks by snap, through the ring groove 12 of joint on the mouth of the container itself.

[0020] To open the cap one unscrews the lid and the serrations 4 and 14 oppose such a manoeuvre, provoking the breakage of the breakable peduncles 3 and the guarantee ring 2, 2'.

[0021] In the figures from 1 to 4 is shown the solution with the guarantee ring formed by two parts 2, 2' with different heights and covering two sectors developing at about 180°. These two sectors 2, 2', may also cover different angles, such as for instance 270/90°, 240/120°, etc.

[0022] According to this invention, the solution may also be envisaged where the guarantee ring 15 is of constant height, as shown in Figs. 5 and 10. However, the guarantee ring 2, 2', 15, has in a suitable position, a transverse line of interruption 16 that divides the ring and the open extremities of the ring itself and connected with a breakable peduncle 17, in such way that with the opening by unscrewing of the lid 1 one can easily obtain the breakage of the guarantee ring, as per Figs. 8, 9 and 10.

[0023] Adoption of the guarantee ring with different heights, or with constant height, depends on the functionality and dimensions of the cap, as well as its preferred external aspect.

[0024] Pouring of the liquid occurs according to the flow indicated by the arrow F in

[0025] Fig. 4.

[0026] As a variant compared to the cap shown in the figures from 1 to 11, the vertical radial beams 11 of support and fixing for the anti-bubble forming bowl 10, may be substituted by two cylindrical sectors 18, 19 on a vertical axis that are divided from one another by two opposing slits 20, 21 of different dimensions, one larger and one smaller.

[0027] With this solution, turning the container 13 upside down through 180°, one can pour different quantities of liquid through the two different slits (see arrows X and Y), permitting the housewife or cook, better dosing for instance of detergents or cooking ingredients.

[0028] The cap described here is also used on the basis of a further solution, as a measuring device of liquid, as shown in the figures from 14 to 18, in which the parts shared with the previous solutions are indicated with the same reference numbers.

[0029] In Fig. 14, the lid 1 has, on the inside, a circular prominent ridge 22, while in Fig. 15, the body 7 of the cap has an anti-bubble forming bowl 23 fitted in the centre with a passing hole 24. In said Fig. 14 the guarantee ring 15 is shown as an example with constant height, but this ring may be substituted with the ring 2, 2' with different heights.

[0030] Fig. 16 shows the measuring device formed of a shell 25 with closed bottom and open top and formed of a vertical cannula 26 grafted onto the centre of the bottom of the shell and coming out towards the top until it arrives below the lid 1 of the cap. On the tip of said cannula 26, appears a double external ring ridge 27, which may be hooked up by the ring prominence 22 of the lid 1. Said cannula 26 is forced inside the penetrating hole 24 of the bowl 23 and is held in place by means of its upper ring ridge 27.

[0031] When the lid is closed, shaking or turning the container upside down, the shell 25 fills with liquid, according to the flow indicated with the arrow R of Fig. 17, while when one unscrews the lid 1, the ring prominence 22 of the lid 1 acts on the external ridge 27 of the cannula 26 and provokes the raising of the shell 25 according to the arrow S of Fig. 18, until it rests with its upper edge 28 against the lower ring expansion 29 of the body 7. In these conditions, the liquid of the shell in dosed quantity, is separated from the remaining liquid in the container 13 and after having removed the lid, one can pour the dosed liquid according to the arrow T of Fig. 18. After pouring of the dosed quantity, one screws the lid 1 back on which causes the shell 25 to move down due to thrust on the cannula 27, in order to perform a new action of dosing.

[0032] Naturally the invention described as an example is not limitative, and it may undergo variants and adaptations on the basis of the vast range and quality of liquids to pour or to dose, always staying in the framework of the following claims.

Claims

1. Cap for containers with seal breakable by unscrewing of the lid, where said cap is made up of a lid (1) and a body (7), where the lid (1) is screwed onto the body (7) and the body (7) is mounted by axial pressure on the container (13), **characterized by** that:

   - the lid (1) is fitted in the lower zone with a guarantee ring (2, 2', 15) connected to the lid itself by means of breakable peduncles (3),
   - said guarantee ring (2, 2', 15) is fitted on the lower part with serrations (4),
   - said lid (1) is fitted with a profile (5) of sealing for the pouring spout (8) and a thread (6) for the mounting on the body (7) of the cap,
   - the body (7) of the cap is fitted with a central pouring spout (8) with an upper drip stopping rim (9),
   - the body (7) of the cap is fitted with a bowl (10) with closed bottom having the function of stopping the formation of bubbles, where said bowl (10) is sustained by means of radial beams (11),
   - the body (7) of the cap is fitted in its lower part with a ring conformation (12), aimed at receiving, by snap fitting, the upper mouth of the container (13),
   - the body (7) of the cap is fitted on the outside of the upper part of the ring conformation (12), with serrations (14) turned upward and corresponding to the serrations (4) turned downward on the guarantee ring (2, 2', 15),
   - the body (7) of the cap is fitted with a thread corresponding to the thread (6) of the lid (1),

   so that to be able to pour the content, one unscrews the lid (1) and this provokes, due to opposition to such a manoeuvre created by the serrations (4, 14), breakage of the breakable peduncles (3) and the guarantee ring (2, 2', 15), and so that one can pour indefinite quantities of liquid.

2. Cap according to claim 1, **characterized by** that the guarantee ring (2, 2') may have different heights or a single height (15).

3. Cap according to claim 2, **characterized by** that the parts of different height (2, 2') of the guarantee ring, cover sectors with variable angles 180/180°, 270/90°, 240/120°, etc.

4. Cap according to claim 1, **characterized by** that the guarantee ring (2, 2', 15) has a transverse interruption (16) with its extremities free of the ring connected to each other by a breakable peduncle (17), thereby favouring breakage of said ring with the unscrewing of the lid.

5. Cap according to claim 1, **characterized by** that the bowl (10) is sustained by two cylindrical sectors (18, 19) on a vertical axis, substituting the radial beams (11), where said sectors (18, 19) are separated from each other by open opposed slits (20, 21) with different dimensions, one larger and the other smaller, so as to obtain, turning the container through 180°, different predetermined flows of liquid.

6. Cap for containers with seal breakable by unscrewing of the lid (1), where said cap is made up of a lid (1) and a body (7), where the lid (1) is screwed onto the body (7) and the body (7) is mounted by axial pressure on the mouth of the container (13), **characterised by** that:

   - the lid (1) is fitted in its lower zone with a guarantee ring (2, 2', 15) connected to the lid itself by means of breakable peduncles (3), where said guarantee ring may have parts of different heights or have a single height,
   - said guarantee ring (2, 2', 15) is fitted on its lower part with serrations (4),
   - said lid (1) has a profile (5) for sealing on the

pouring spout (8) and a thread (6) for mounting on the body (7) of the cap,

- said lid (1) is fitted on its inside with a prominent circular ridge (22),
- the body (7) of the cap has a central pouring spout (8) fitted with a drip stopping rim(9),
- the body (7) of the cap has a bowl to stop the formation of bubbles (23) fitted with a passing central hole (24) where said bowl (23) is sustained by radial beams (11),
- the body (7) of the cap has in its lower part a ring conformation (12) aimed at receiving by snap fit the upper mouth of the container (13),
- the body (7) of the cap is fitted, on the outside of the upper part of the ring conformation (12), with serrations (14), turned upward and corresponding to the serrations (4) turned downward, of the guarantee ring (2, 2', 15),
- the body (7) of the cap has a thread corresponding to the thread (6) of the lid (1),
- the cap presents a measuring device made up of a shell (25) with closed bottom and open top and made up of a vertical cannula (26) grafted in the centre of the bottom of the shell (25) and coming out a the top until reaching the space below the lid (1), where said cannula (26) has at its top an external ring ridge (27) onto which one engages or disengages the internal ring ridge (22) of the lid (1) and where said cannula (26) is forced into the hole (24) of the bowl (23) to stop bubble formation,
- said shell (25) is fitted with an upper rim (28) that may close itself onto a ring expansion (29) of the body (7),

so that said shell (25) receives by shaking of the container (13), a dosed quantity of liquid, it is raised by means of unscrewing and removal of the lid (1), it creates a hold between its own rim (28) and the ring expansion (29) of the body (7) and allows poring of one or more dosed quantities of liquid.

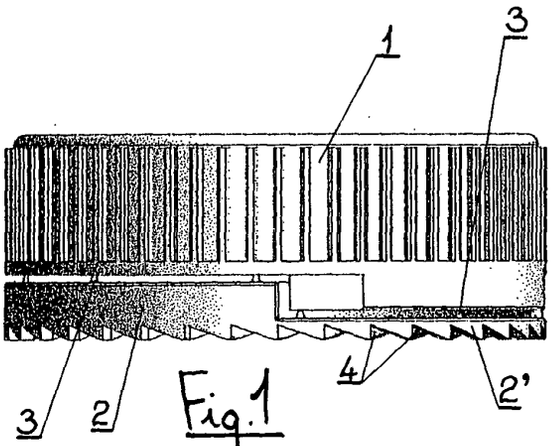

Fig.1

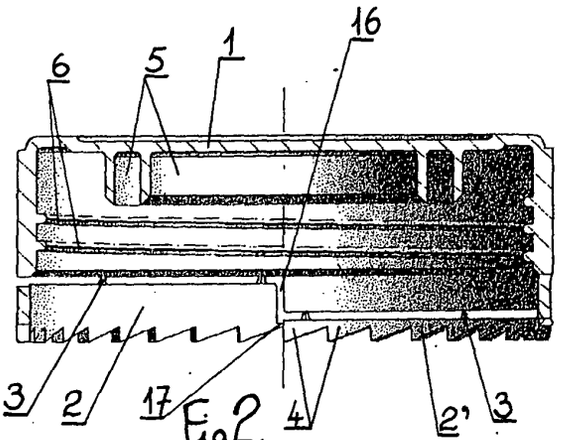

Fig.2

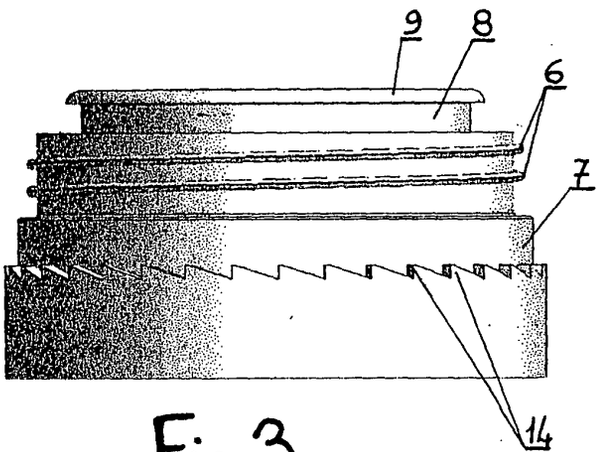

Fig.3

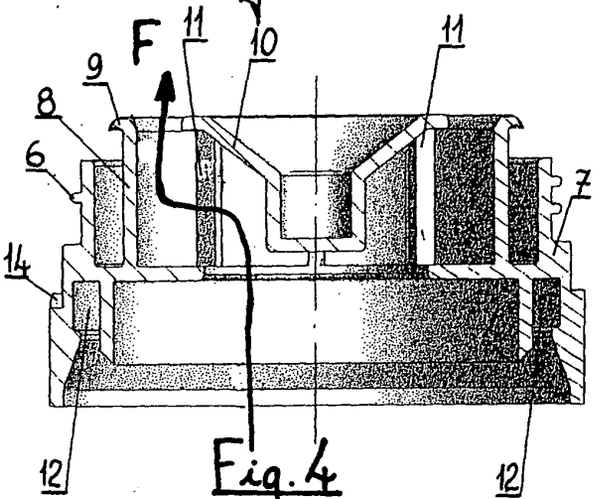

Fig.4

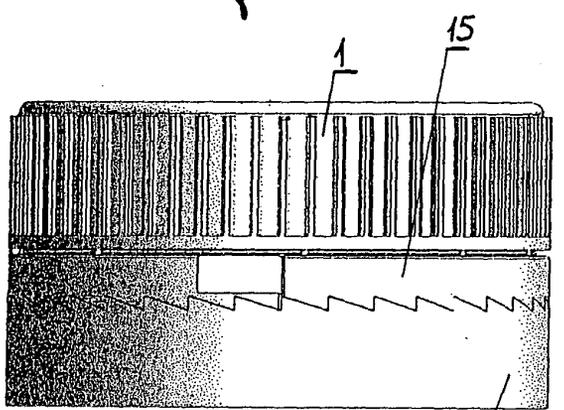

Fig.5

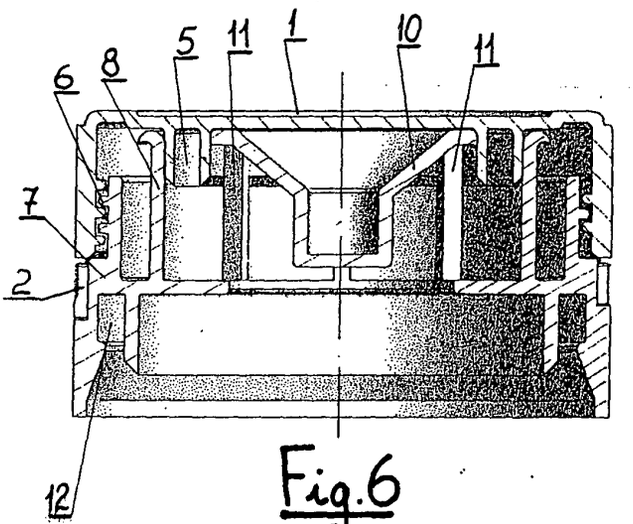

Fig.6

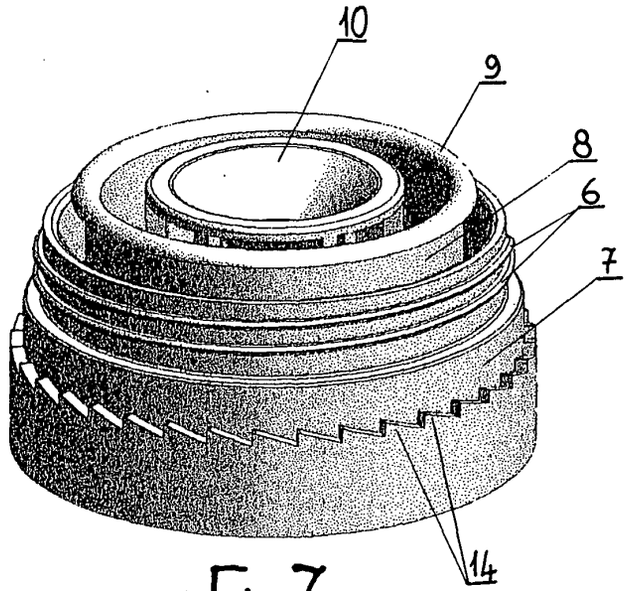

Fig.7

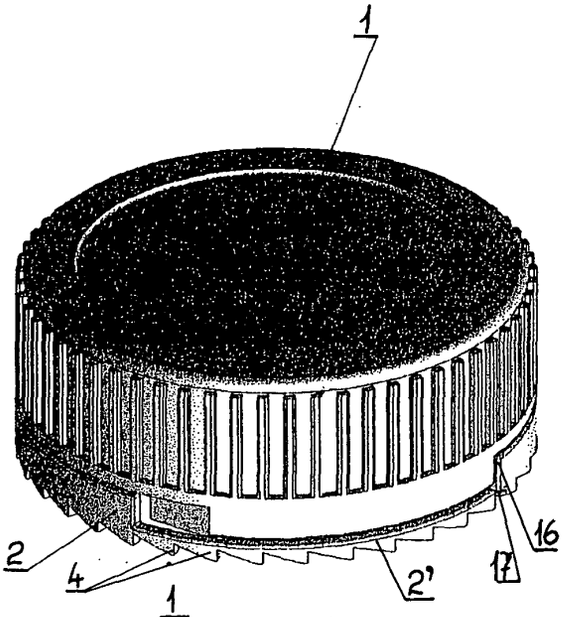

Fig.8

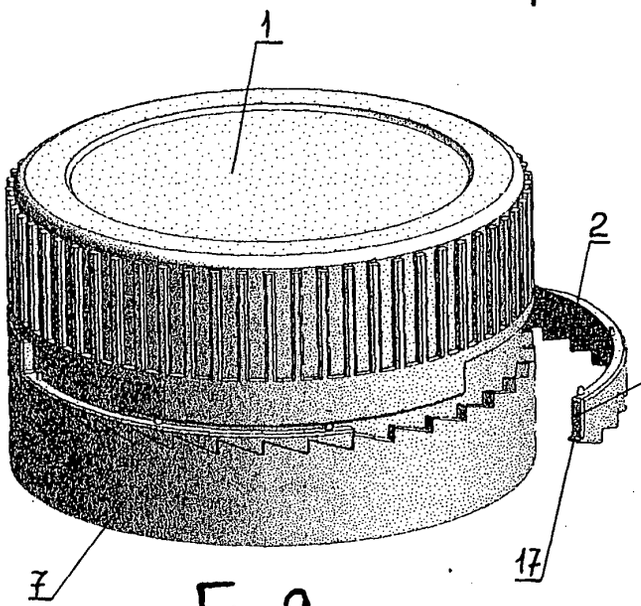

Fig.9

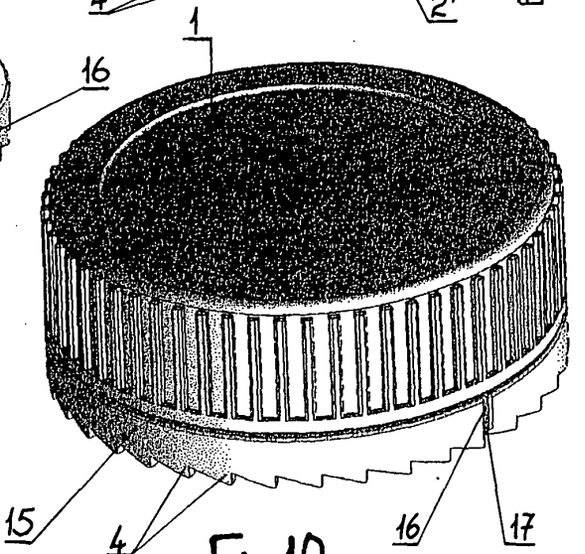

Fig.10

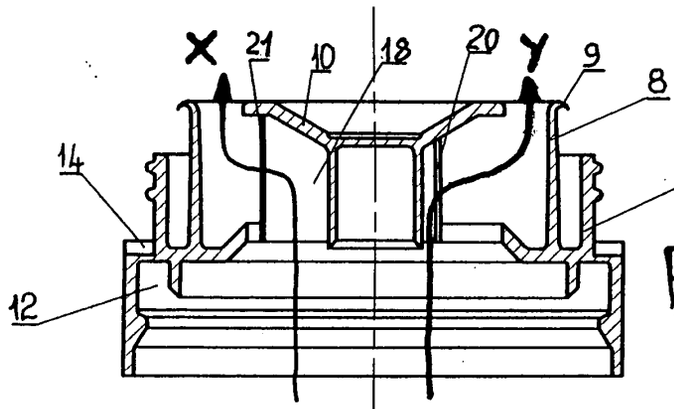

Fig.12

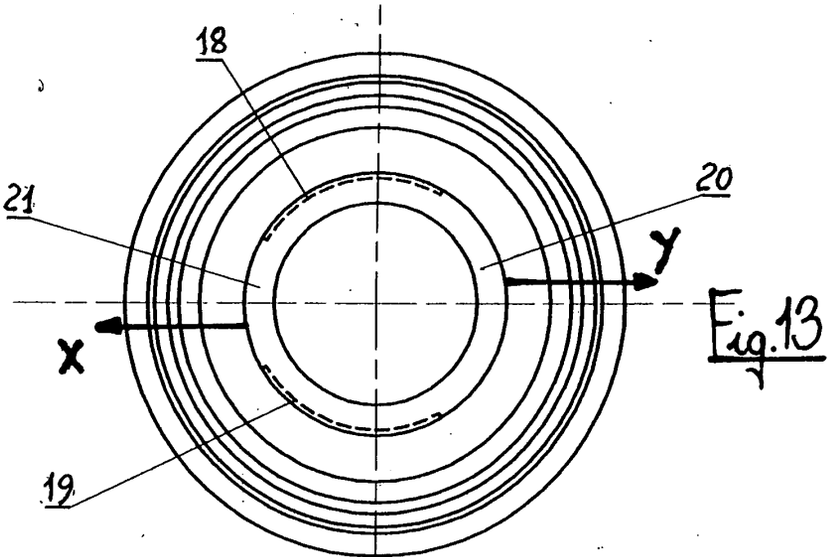

Fig.13

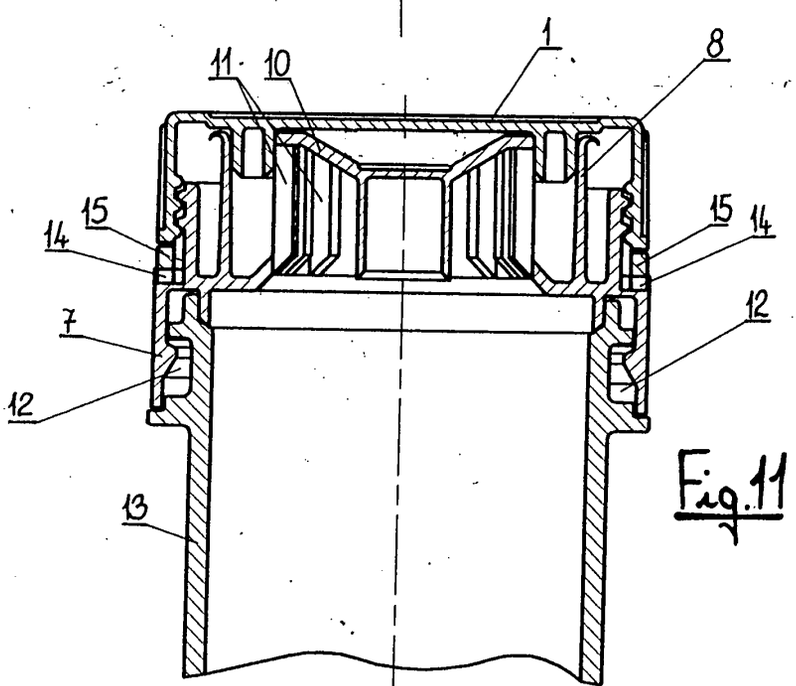

Fig.11

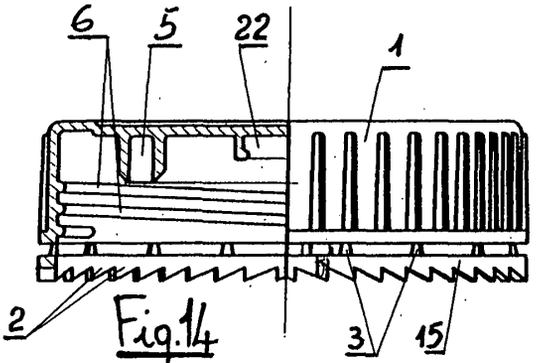

Fig.14

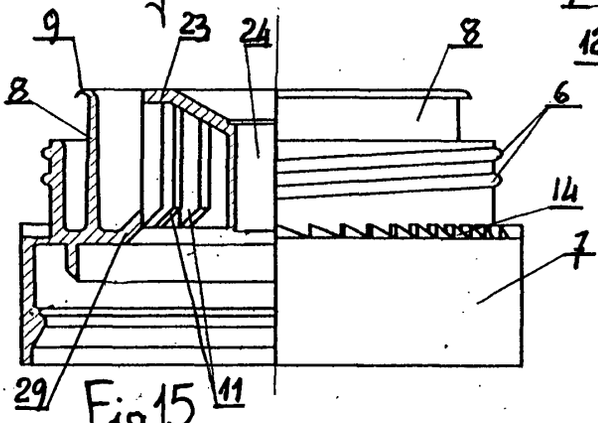

Fig.15

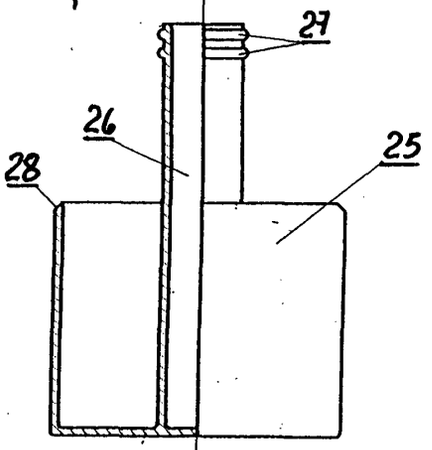

Fig.16

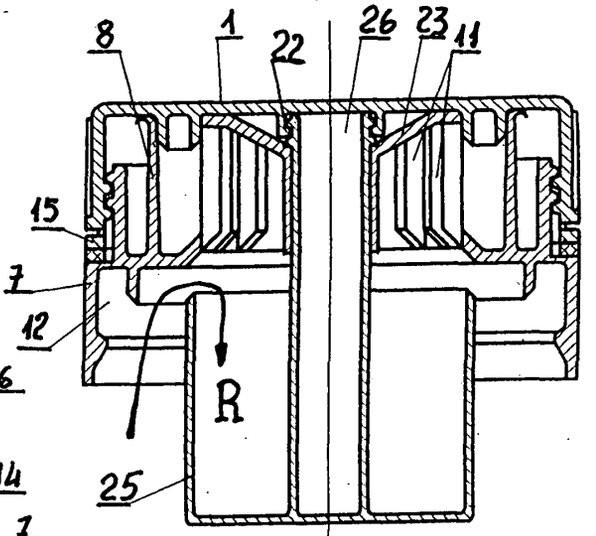

Fig.17

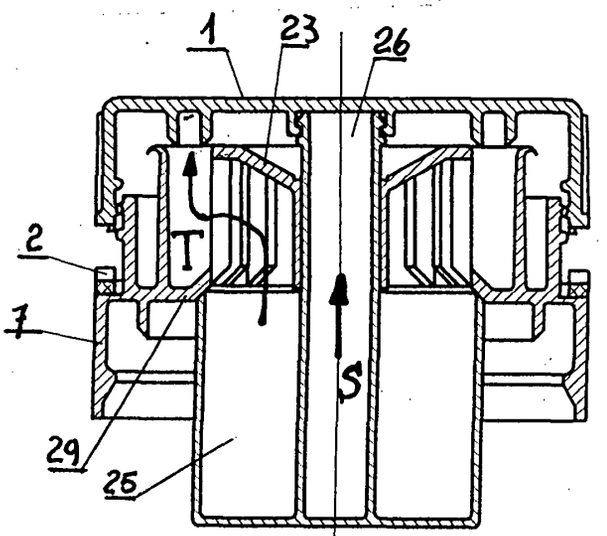

Fig.18

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 01 9260

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)
A	FR 2 565 208 A (RICAL SA) 6 December 1985 (1985-12-06) * the whole document *	1,6	B65D47/12
A	GB 2 172 273 A (BORMIOLI METALPLAST SPA) 17 September 1986 (1986-09-17) * figures *	1	
A	US 2001/011649 A1 (FUJIE TAKASHI ET AL) 9 August 2001 (2001-08-09) * figures *	1	
A	WO 01/74678 A (CERBO AB ;NILSSON THOMAS (SE)) 11 October 2001 (2001-10-11) * pages - *	1	
A	FR 2 577 891 A (BORMIOLI METALPLAST SPA) 29 August 1986 (1986-08-29) * figures *	1	
A	DE 24 56 931 A (MAUSER KG) 12 August 1976 (1976-08-12) * figure 3 *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B65D G01F
A	EP 0 052 059 A (BOUCHONS PLASTIQUES) 19 May 1982 (1982-05-19) * figures *	1	
A	EP 0 337 778 A (COLGATE PALMOLIVE CO) 18 October 1989 (1989-10-18) * figures *	1,6	
A	EP 0 793 081 A (SANNER FRIEDR GMBH CO KG) 3 September 1997 (1997-09-03) * figures *	6	

-/--

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	13 January 2005	Fournier, 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
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 01 9260

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)
A	US 5 584 420 A (AWADA HASSAN ET AL) 17 December 1996 (1996-12-17) * figures * -----	6	
A	US 5 407 104 A (SANTAGIULIANA EVANS) 18 April 1995 (1995-04-18) * figures * -----	6	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	13 January 2005	Fournier, 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
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons
.....
& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 01 9260

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

13-01-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2565208 A	06-12-1985	FR 2565208 A1	06-12-1985
		ES 281355 U	16-02-1985
GB 2172273 A	17-09-1986	NONE	
US 2001011649 A1	09-08-2001	JP 11334752 A	07-12-1999
		JP 2000085818 A	28-03-2000
		AU 756095 B2	02-01-2003
		AU 3850899 A	13-12-1999
		CA 2297690 A1	02-12-1999
		CN 1446746 A	08-10-2003
		CN 1103725 B	26-03-2003
		DE 69920865 D1	11-11-2004
		EP 1371571 A1	17-12-2003
		EP 1026100 A1	09-08-2000
		WO 9961334 A1	02-12-1999
		SG 100724 A1	26-12-2003
		TW 469249 B	21-12-2001
		US 6247605 B1	19-06-2001
		JP 2000153861 A	06-06-2000
		JP 2000153862 A	06-06-2000
		JP 2000153863 A	06-06-2000
WO 0174678 A	11-10-2001	WO 0174678 A1	11-10-2001
		EP 1280711 A1	05-02-2003
FR 2577891 A	29-08-1986	FR 2577891 A1	29-08-1986
DE 2456931 A	12-08-1976	DE 2456931 A1	12-08-1976
EP 0052059 A	19-05-1982	FR 2492774 A1	30-04-1982
		AT 5527 T	15-12-1983
		DE 3161601 D1	12-01-1984
		EP 0052059 A1	19-05-1982
EP 0337778 A	18-10-1989	DK 158289 A	14-10-1989
		AR 243677 A1	31-08-1993
		AT 135461 T	15-03-1996
		AU 628809 B2	24-09-1992
		AU 3275189 A	19-10-1989
		BR 8901764 A	28-11-1989
		CA 1332926 C	08-11-1994
		DE 68925917 D1	18-04-1996
		DE 68925917 T2	31-10-1996
		EP 0337778 A2	18-10-1989
		HK 1007596 A1	16-04-1999

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 01 9260

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

13-01-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0337778 A		JP 2045057 A	15-02-1990
		MX 173740 B	25-03-1994
		NO 891510 A ,B,	16-10-1989
		NZ 228723 A	27-08-1991
		US 4946080 A	07-08-1990
		ZA 8902719 A	28-12-1990
EP 0793081 A	03-09-1997	DE 29603551 U1	30-05-1996
		EP 0793081 A1	03-09-1997
US 5584420 A	17-12-1996	NONE	
US 5407104 A	18-04-1995	IT 1247089 B	12-12-1994
		DE 69205001 D1	26-10-1995
		DE 69205001 T2	15-05-1996
		EP 0586430 A1	16-03-1994
		JP 6504127 T	12-05-1994
		AT 128227 T	15-10-1995
		CA 2108483 C	12-11-1996
		WO 9221942 A1	10-12-1992
		JP 2598863 B2	09-04-1997

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82