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

(11) EP 1 046 592 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
25.10.2000 Bulletin 2000/43

(51) Int Cl.[7]: **B65D 47/24**

(21) Application number: **99119834.2**

(22) Date of filing: **07.10.1999**

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

(30) Priority: **22.04.1999 IT MI990844**

(71) Applicant: **Eurovetrocap S.R.L.**
20090 Trezzano sul Naviglio (Milano) (IT)

(72) Inventor: **Cattaneo, Carlo**
20123 Milano (IT)

(74) Representative: **Cicogna, Franco**
Ufficio Internazionale Brevetti
Dott.Prof. Franco Cicogna
Via Visconti di Modrone, 14/A
20122 Milano (IT)

(54) Closure with means for controllably delivering liquids

(57) An improved plug for controllably delivering liquids comprising an inner cap (3), provided with an upwardly projecting inner sealing ring element (19) and ending with a top liquid-scraping element (4), defining on the outside thereof a funnel top ring-like element adjoining with outlet conical slots (8) and for recovering the liquid.

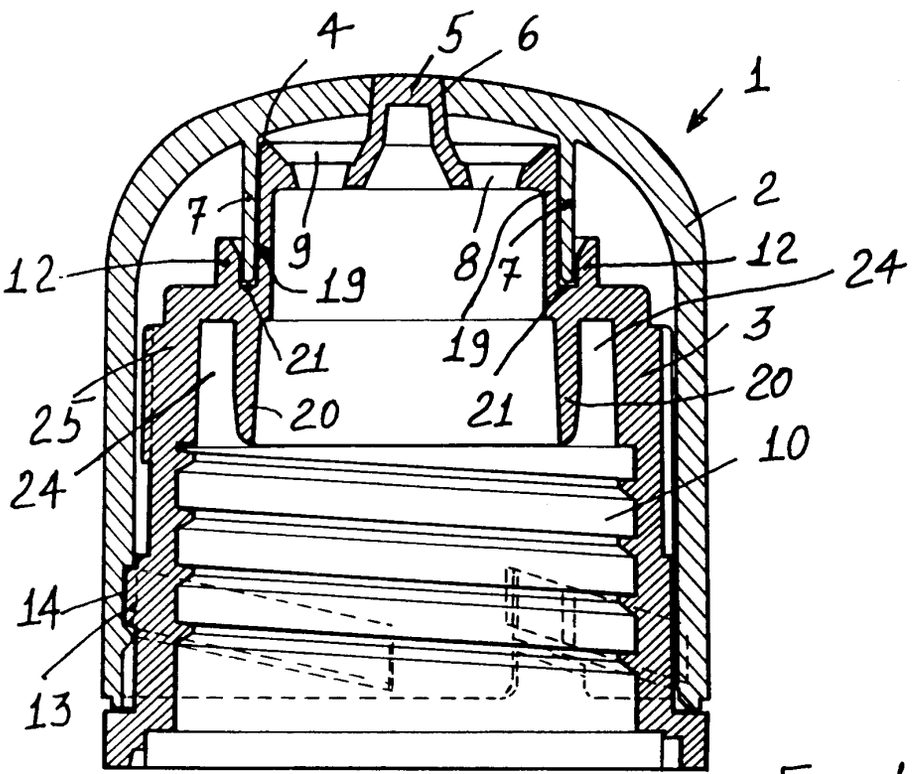

FIG. 1

EP 1 046 592 A1

Description

BACKGROUND AND SUMMARY OF THE INVENTION

[0001] The present invention relates to an improved plug for delivering liquids in bottles, vials or the like, characterized in that said plug comprises an inner cap, having an upwardly projecting inner sealing ring element and ending with a top liquid scraping element.

[0002] Said liquid scraping element defines, on the outside thereof, a top funnel-like ring or annular element, joining with conical slots, therethrough the liquid is ejected, and allowing the liquid held in the gap of the two plug elements to be easily recovered.

[0003] This feature constitutes one of the advantages of the plug according to the present invention, with respect to the commercially available plugs conventionally including shutter means.

[0004] In this connection, another advantage of the subject improved plug is that it provides, under any conditions, a perfect sealing with respect to the delivered liquid, which cannot be ejected from possible gaps which, in conventional plugs, are formed between the inner cap and the outer cap of the plug.

[0005] The subject improved plug, in particular, is very simple construction-wise, can be easily made starting from a lot of easily available plastic materials, since it has a contour that is suitable for an injection molding process, and can be easily applied to the liquid vial or vessel by very simple assembling operations.

[0006] Another advantage of the subject plug is that the inner cap ends, at its top central portion, with a shutter element cooperating with the liquid delivery hole, thereby opening and closing, to a desired degree, the inventive plug, thereby allowing a controlled variable amount of liquid to be easily delivered.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The above and other characteristics, of functional and constructional nature, of the subject improved plug, will become more apparent hereinafter from the following detailed disclosure thereof, with reference to the figures of the accompanying drawings, where:

Figure 1 is a cross-sectioned side view illustrating the improved plug according to the invention, in a closing position thereof;

Figure 2 is a further cross-sectioned side view illustrating the plug according to the invention in a closing position thereof;

Figure 3 is yet another cross-sectioned side view illustrating the improved plug according to the invention, in an opening position thereof; and

Figure 4 is a top cross-sectioned view illustrating that same plug.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0008] With reference to the number references of the figures of the accompanying drawings, the subject improved plug, generally indicated by the reference number 1, has been specifically designed for controllably delivering liquids and is provided with an inner cap 3, including an upwardly projecting inner sealing ring element 19.

[0009] Said sealing inner ring element 19 ends with a top liquid scraping element 4, defining on the outside thereof a funnel-like top ring or annular element 9.

[0010] This funnel-like ring element is adjoining with a series of conical slots 8, therethrough the liquid is delivered and recovered, i.e. is recovered that portion of the liquid which is not used in the specific application.

[0011] The inner cap 3 ends, at the top thereof, with a central shutter element, cooperating with the liquid delivery hole 6, to open and close the subject plug, thereby allowing a controlled amount of liquid to be delivered or metered.

[0012] The plug 1 comprises moreover an outer cap 2, which is adapted to rotate with respect to the inner cap 3, and it performs, in addition to a partial rotary movement, also an upward and downward vertical displacement movement.

[0013] Such an effect will cause a variable opening of the delivery hole 6 which engages, under given conditions and in a different degree, with the central shutter element 5 formed in the body of the inner cap 3.

[0014] The outer cap 2 is moreover provided with a downward projecting sealing ring 7 provided for engaging with an annular hollow, as the plug is clamped between an outer guide and sealing ring 12 and an inner sealing ring 19, which projects upward for a distance larger than the projecting distance of the first ring.

[0015] The outer guide and sealing ring 12 and the inner sealing ring 19, in turn, define an annular hollow 21, in which the downward projecting annular element 7 is caused to tightly engage.

[0016] The inner cap 3 is moreover provided with a bottom lug 20 entering the inside of the neck of the bottle 24.

[0017] The above mentioned axial movement performed by the outer cap 2 with respect to the inner cap 3 is obtained by a partial rotary movement of the outer cap 2, which is provided with helical contour hollows 14 engaging with projecting tooth elements 13 formed on the outer surface of the inner cap 3.

[0018] In this connection it should be pointed out that the inner cap 3 is provided with an inward projecting annular lug 20, adapted to be arranged between and enters the inside of a portion 24 of the bottle neck, contacting a top portion 25 of the inner cap 3.

[0019] Said inner cap 3, together with the downward projecting annular lug 20 provides a perfect sealing for the liquid, under any use conditions.

[0020] With reference to Figure 4, a helical contour

hollow 14 is herein provided, housing therein the three projecting tooth elements 13 formed on the inner cap and spaced from one another at 120°.

[0021] Moreover, at the inner wall of the outer cap 2 small teeth 27 are also provided.

[0022] At the top portion of the inner cap 3, moreover, are ridge elements 15 adapted to facilitate the draining and recovering of the liquid are moreover provided.

[0023] As shown, the small teeth 27 engage with corresponding small teeth 18 formed on the outer side surface of the inner cap 3, in order to clearly indicate a full opening and closing position thereof.

[0024] The lugs 20 and 25 formed in the inner cap 3 are so designed and sized as to clamp the top lug 24 of the bottle neck, thereby preventing the plug from being accidentally thread off or disengaged as it is opened.

[0025] From the above disclosure it should be apparent that the subject improved plug is provided with very advantageous functional and constructional characteristics, allowing both an easy delivering and an easy and quick recovering of liquids in general.

[0026] While the inventive improved plug has been hereinabove disclosed by way of an illustrative and not limitative example, it should be apparent that it is susceptible to many modifications and variations all of which will come within the scope of the invention, as defined by the accompanying claims.

Claims

1. An improved plug for controllably delivering liquids, characterized in that said plug comprises an inner cap (3) provided with an upward projecting inner sealing ring (19) ending with a top liquid scraping element (4), defining, on an outside thereof, a funnel top annular element adjoining a plurality of liquid delivering and recovering conical slots (8).

2. An improved plug according to the preceding claim, characterized in that said plug comprises an inner cap (3), ending, at a top thereof, with a central shutter element (5), cooperating with a liquid delivery hole (6), thereby opening and closing said plug, to allow a delivery of a controlled variable amount of liquid.

3. An improved plug according to one or more of the preceding claims, characterized in that said plug comprises an outer cap (2), adapted to rotate with respect to said inner cap (3), thereby providing, in addition to a partial rotary movement, also a vertical translation movement, and that said outer cap is provided with a downward projecting sealing ring (7) adapted to be engaged, as the plug (1) is closed, between an outer guide and sealing ring (12) and a further inner sealing ring (19) which projects for a projecting distance greater than that of said outer sealing ring (12).

4. An improved plug according to one or more of the preceding claims, characterized in that said plug comprises moreover an outer guide and sealing ring (12) and an inner sealing ring (19) defining therebetween an annular hollow (21) therein a downward projecting annular element (7) is engaged.

5. An improved plug according to one or more of the preceding claims, characterized in that said downward projecting annular or ring element (20) enters the neck (24) of a bottle so that the top portion of said bottle is clamped between the lugs (20) projecting downward with respect to the inner cap (3) and the outer top portion of said cap (25).

6. An improved plug according to one or more of the preceding claims, characterized in that between the annular lug (20) projecting downward from the body of the inner cap (3) and the top portion (25) of said inner cap is formed a hollow in which can be tightly engaged a top end portion of the bottle neck (24).

7. An improved plug according to one or more of the preceding claims, characterized in that said outer cap (2) is provided, at the inner surface thereof, with helical contour hollows (14) therein are engaged projecting tooth element (13) formed on an outer surface of said inner cap (3) and being spaced from one another at 120°,

8. An improved plug according to one or more of the preceding claims, characterized in that said plug comprises moreover a plurality of small teeth (27) formed at the inner wall of said outer cap (2).

9. An improved plug according to one or more of the preceding claims, characterized in that said inner cap (3) is provided, at a top thereof, with ridges (15) for facilitating the draining and recovering of said liquid.

10. An improved plug according to one or more of the preceding claims, characterized in that said lugs (20 and 25) formed in the inner portion (3) of said plug (1) are so arranged and designed as to forcibly clamp the top lug of the neck (24) of the bottle, to prevent the plug (1) from being accidentally disengaged as said plug is opened.

11. An improved plug according to one or more of the preceding claims, characterized in that said plug comprises specifically designed, contoured, sized and arranged elements, and as broadly disclosed and illustrated in the preceding disclosure and in the figures of the drawings enclosed in the present Industrial Invention Patent Application.

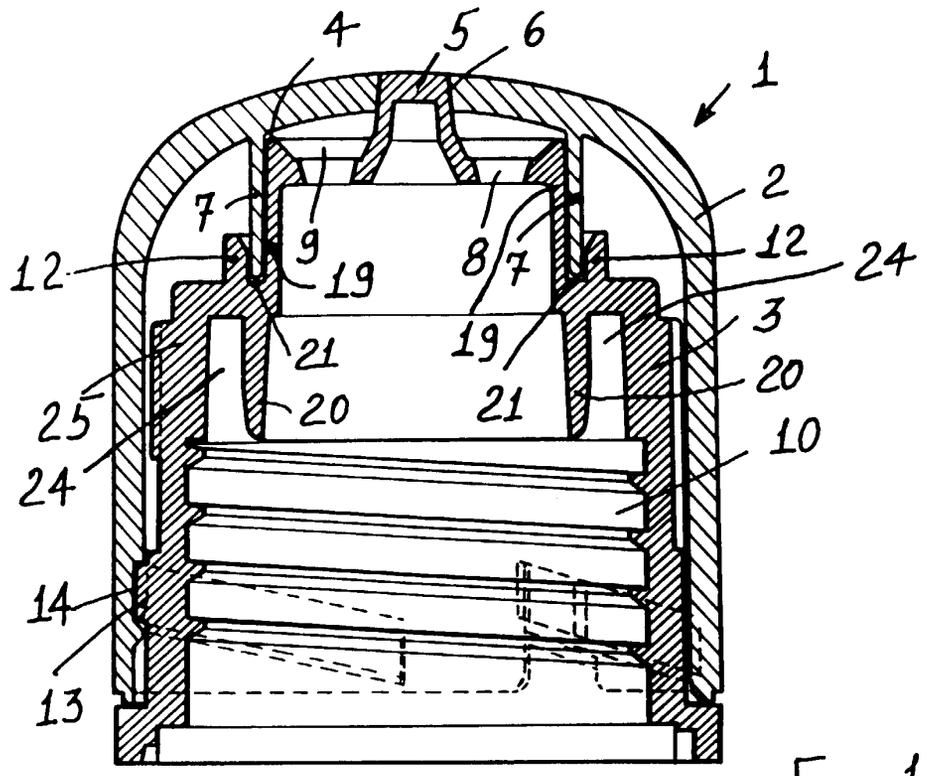
4
5
6
1
2
7
9
8
7
12
12
24
19
19
3
21
19
20
25
20
21
10
24
14
13

FIG. 1

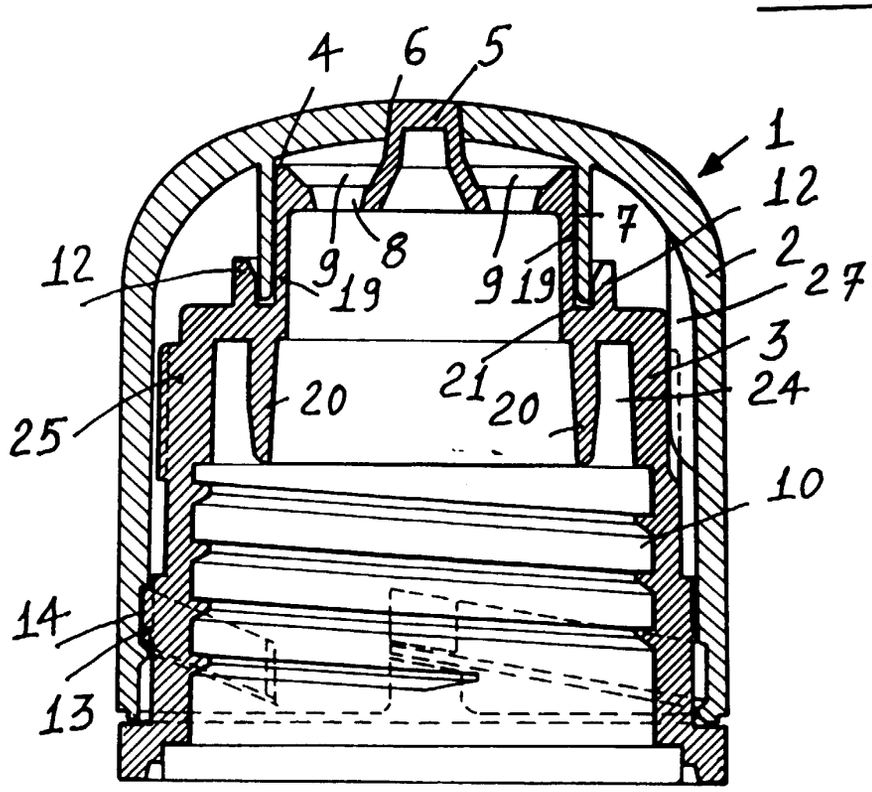
4
6
5
1
12
7
12
9
8
9
19
2
27
19
21
3
20
21
20
24
25
10
14
13

FIG. 2

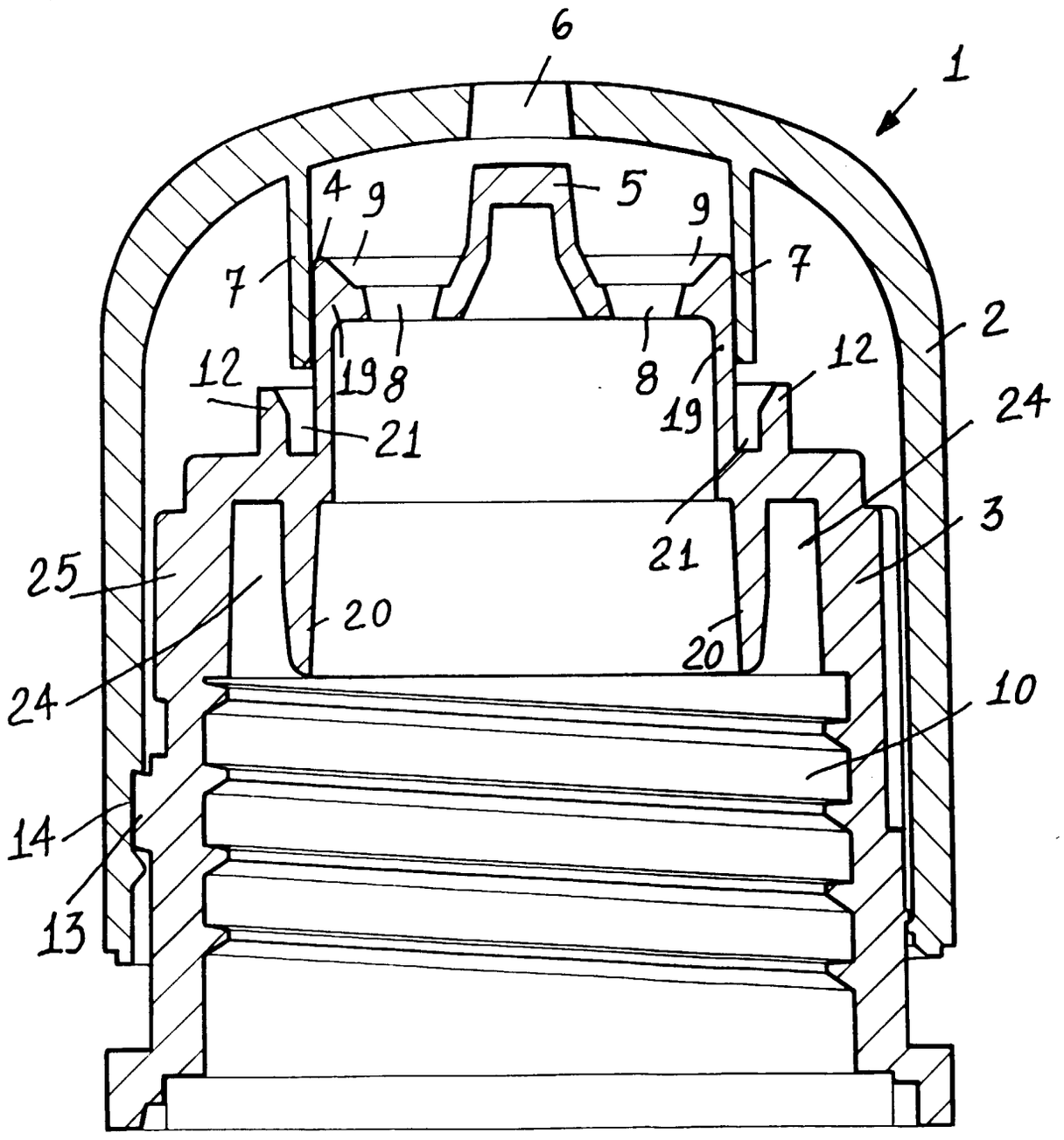

FIG. 3

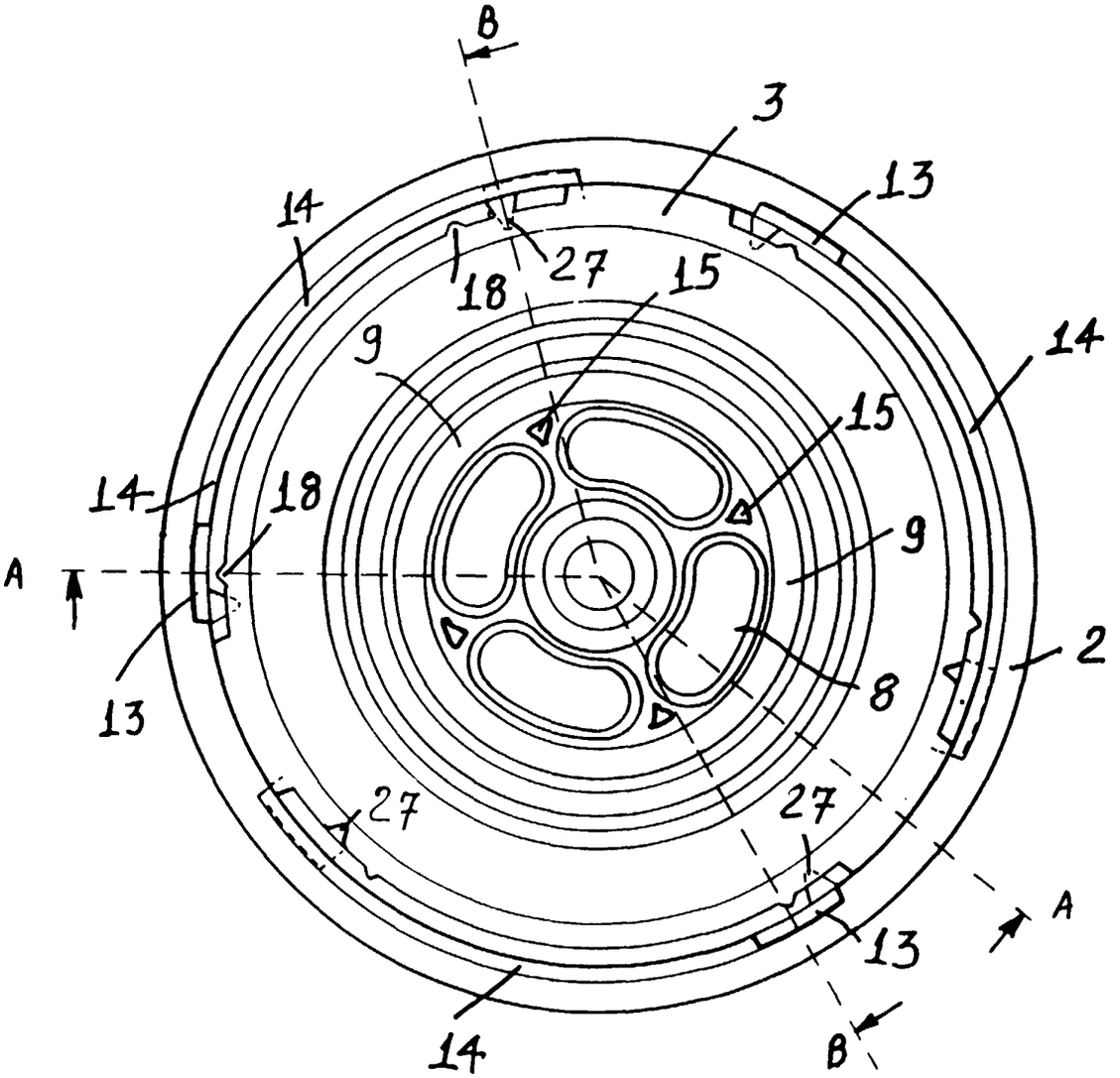

FIG. 4

European Patent Office

PARTIAL EUROPEAN SEARCH REPORT

which under Rule 45 of the European Patent Convention shall be considered, for the purposes of subsequent proceedings, as the European search report

Application Number EP 99 11 9834

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)
Y	FR 77 453 E (VAN BAARN) 30 July 1962 (1962-07-30) * page 2, right-hand column, line 6 - page 3, left-hand column, line 11; figures 1-4 * ---	1-3,5-8, 10	B65D47/24
Y	GB 2 318 114 A (DRAGON PLASTICS) 15 April 1998 (1998-04-15) * page 2, line 11 - line 15 * * page 3, line 11 - page 5, line 14; figure 1 * ---	1-3,5-8, 10	
A	WO 97 31838 A (BORMIOLI ROCCO) 4 September 1997 (1997-09-04) * figure 1 * ---	1-3,5-8, 10	
A	US 2 060 622 A (JONES) 10 November 1936 (1936-11-10) * figures 1-4 * ---	1	
A	FR 2 201 226 A (ASTRA PLASTIQUE) 26 April 1974 (1974-04-26) * figure 2 * ---	4	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B65D

-/--

INCOMPLETE SEARCH

The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims.

Claims searched completely :

1-10

Claims searched incompletely :

Claims not searched :

11

Reason for the limitation of the search:

Claim 11 contravenes Rule 29(6) EPC

Place of search	Date of completion of the search	Examiner
THE HAGUE	18 July 2000	Berrington, N

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 (P04C07)

European Patent Office

PARTIAL EUROPEAN SEARCH REPORT

Application Number
EP 99 11 9834

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	FR 2 663 300 A (MOREL) 20 December 1991 (1991-12-20) * figures 1,3 * ---	5-7,10	
A	WO 94 12426 A (JOHNSON & SON) 9 June 1994 (1994-06-09) * figures 3,4 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)

EPO FORM 1503 03.82 (P04C10)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 99 11 9834

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.

18-07-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 77453 E	30-07-1962	NONE	
GB 2318114 A	15-04-1998	NONE	
WO 9731838 A	04-09-1997	IT MO960023 A	29-08-1997
		AT 182116 T	15-07-1999
		AU 1208097 A	16-09-1997
		DE 69603290 D	19-08-1999
		DE 69603290 T	23-03-2000
		EP 0883553 A	16-12-1998
US 2060622 A	10-11-1936	NONE	
FR 2201226 A	26-04-1974	NONE	
FR 2663300 A	20-12-1991	NONE	
WO 9412426 A	09-06-1994	AU 5681994 A	22-06-1994
		CA 2150834 A	09-06-1994
		EP 0672017 A	20-09-1995
		US 5609276 A	11-03-1997
		ZA 9309038 A	05-09-1994

EPO FORM P0459

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