

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
4 May 2006 (04.05.2006)

PCT

(10) International Publication Number
WO 2006/046730 A1

(51) International Patent Classification:
B65D 51/28 (2006.01)

(21) International Application Number:
PCT/JP2005/019951

(22) International Filing Date: 25 October 2005 (25.10.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2004-309535 25 October 2004 (25.10.2004) JP

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

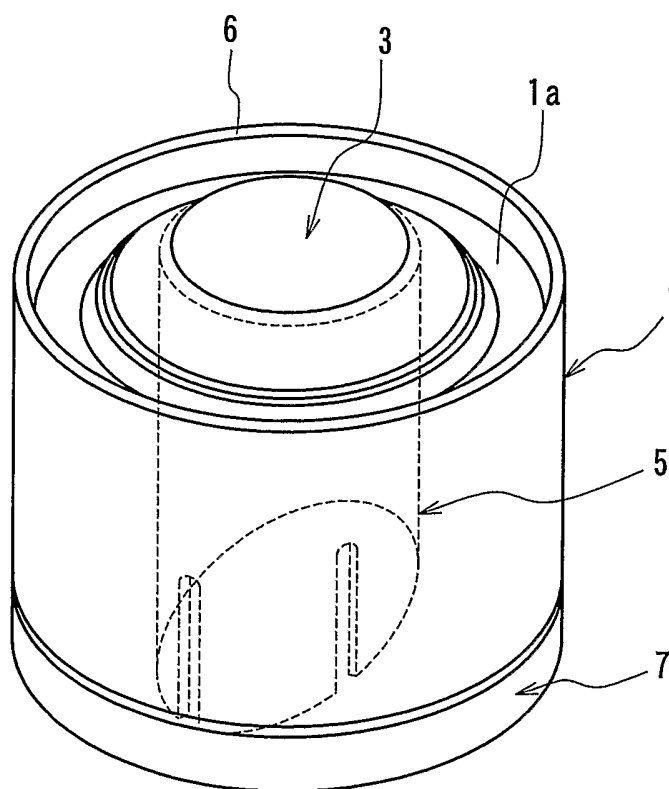
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

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(54) Title: BOTTLE CAP



(57) Abstract: A bottle cap comprises an outer cylinder (1) attached to the mouth portion of a bottle, and an inner cylinder (2) connected to the outer cylinder (1) and suspended in a cavity within the mouth portion. The inner cylinder (2) includes a barrier (3) at its one end, which can be displaced toward the bottom of the bottle, and a thin sheet (4) at the other end, thereby forming a closed chamber (M) for storing an ingredient to be added to the liquid content in the bottle. The barrier (3) has a perforator (5) which can be displaced to open the thin sheet (4), thereby allowing the ingredient in the chamber (M) to fall into the bottle.

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DESCRIPTION
BOTTLE CAP

TECHNICAL FIELD

[0001] The present invention relates to a synthetic resin-made bottle cap to be attached to the mouth portion of a container, such as a PET bottle, which is suitable for adding an ingredient stored therein to a liquid content in the interior space of the bottle for mixture before the bottle is opened for use.

BACKGROUND ART

[0002] Recently, with regard to bottles filled with soft drinks such as tea, fruit juice, healthy drink, mineral water or the like, there are widely available on the market bottles equipped with a cap having a chamber which stores an ingredient in the form of powder, liquid or solid. When the bottle is opened for use, the ingredient is added to a liquid content in the interior space of the bottle and mixed therewith (see, for example, Japanese Unexamined Utility Model Application Publication No. JP05-77054U). Such a cap is applied in order to maintain the quality of the ingredient as long as possible by avoiding the adverse effects due to the external temperature, UV rays and oxidation as much as possible.

[0003] Conventional bottle cap of this type is made of many components, and it has been difficult to reduce the number of the components and lower the production cost. Moreover, in order to add the ingredient to the liquid content in the bottle, it is necessary to further screw the cap and to thereby allow the ingredient to fall into the bottle. Thus, there has been demand for the development of a new ingredient-containing cap, which is simple in structure and will allow the addition of the ingredient to the liquid content in the bottle by a simple manipulation.

DISCLOSURE OF THE INVENTION

[0004] It is an object of the present inventors to provide a new bottle cap, which comprises as few components as possible, and allows the addition of the ingredient to the liquid content by a simple manipulation.

[0005] The present invention provides a bottle cap comprising an outer cylinder to be detachably attached to a mouth portion of a bottle to surround the mouth portion, and an inner cylinder integrally connected to the outer cylinder so

as to be suspended in a cavity within the mouth portion of the bottle. The inner cylinder comprises a barrier at its one end, which seals the mouth portion of the bottle, and which can be displaced toward a bottom of the bottle, and a thin sheet at the other end of the inner cylinder, for sealing an interior space of the inner
5 cylinder together with the barrier, thereby forming a closed chamber for storing an ingredient. The barrier has a perforator which, when the barrier is displaced toward the bottom of the bottle, is displaced to break and open the thin sheet, thereby allowing the ingredient in the chamber to fall into the bottle.

[0006] With such a structure of the bottle cap according to the present
10 invention, when the barrier integrally connected to the inner cylinder is pressed down toward the bottom of the bottle, the perforator barrier is displaced to break and open the thin sheet so that the ingredient stored in the chamber falls through the opening into the bottle. It is therefore possible to realize a bottle cap, which is made of small number of components, and which allows the addition of the
15 ingredient to the liquid content in the bottle by a simple manipulation.

[0007] It is preferred that the barrier has a dome-like shape and exhibits a convex profile directed outward.

[0008] It is preferred that the outer cylinder has a one-end opened annular wall, which surrounds the barrier of the inner cylinder with its upper edge being
20 disposed at a level higher than the barrier. In this instance, the annular wall preferably comprises a cover, which can be detachably attached to the open end of the annular wall, to form a closed space together with the annular wall, for protecting the barrier.

[0009] It is preferred that a virgin belt is provided at a junction of the outer
25 cylinder with the mouth portion of the bottle, for retaining the outer cylinder to the mouth portion of the bottle.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The present invention will be more specifically described below with reference to the attached drawings.

30 [0011] FIG. 1 is a perspective view showing the bottle cap according to one embodiment of the present invention.

[0012] FIG. 2 is a sectional view of the bottle cap shown in FIG. 1.

[0013] FIG. 3 is a sectional view showing the bottle cap according to another embodiment of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

[0014] In FIGS. 1 and 2, reference numeral 1 denotes an outer cylinder which
5 can be detachably attached to the mouth portion of a bottle to surround the mouth portion from outside. Reference numeral 2 denotes an inner cylinder integrally connected to the outer cylinder 1 via a top plate 1a. When the bottle cap is attached to a bottle, the inner cylinder 2 is suspended in a cavity within the mouth portion of the bottle.

10 [0015] Reference numeral 3 denotes a dome-shaped barrier integrally connected to the upper end of the inner cylinder 2, exhibiting an upward directed convex profile. The barrier 3 serves to seal the mouth portion of the bottle, and is displaceable toward the bottom of the bottle.

[0016] Reference numeral 4 denotes a thin sheet provided to the lower end of
15 the inner cylinder 2 to seal the latter, thereby forming a closed chamber M in the interior space of the inner cylinder 2, for storing an ingredient to be added to the liquid content in the bottle. Reference numeral 5 denotes a perforator integrally connected to the lower surface of the barrier 3. Reference numeral 6 denotes an outer annular wall that is provided to the upper end of outer cylinder 1 such that
20 it surrounds inner cylinder 2 with its upper end being disposed at a level higher by an amount "h" than the upper end of the inner cylinder 2. The upper end of outer annular wall 6 is an open end. Reference numeral 7 denotes a virgin belt for retaining the outer cylinder 1 to the mouth portion of the bottle.

[0017] According to the bottle cap configured as described above, when the
25 barrier 3 is pressed down toward the bottom of the bottle, the barrier 3 is displaced as indicated by imaginary lines of FIG. 2, so that the perforator 5 connected to the barrier 3 is similarly displaced to break and open the thin sheet 4. Thus, the ingredient stored in the chamber M readily falls through the opening into the bottle.

30 [0018] After the breakage of the sheet 4, the ingredient can be actively mixed with the liquid content in the bottle, for example, by shaking the bottle vigorously until a uniform solution is obtained. Then, the virgin belt 7 is torn

off by slightly unscrewing the outer cylinder 1 so that the outer cylinder 1 together with the inner cylinder 2 is detached from the bottle. Now, the solution within is ready to be poured.

[0019] The bottle cap according to the present invention is constituted of a single part, if the sheet 4 is not counted. Thus, it is possible to reduce production cost. Furthermore, the present invention makes it possible to fall the ingredient into the bottle by simply pressing the barrier 3 downward.

[0020] The material of sheet 4 is not limited to any specific one, as long as it can stably store the ingredient in the chamber M, ensure a high sealing, and be sufficiently susceptible to breakage as a result of the penetration of the perforator 5. Adhesion of sheet 4 to the end of inner cylinder 2 may be achieved by any appropriate means, including adhesive bonding, heat-activated welding, etc.

[0021] FIG. 3 shows another embodiment of the bottle cap according to the present invention. The bottle cap shown in FIG. 3 is essentially the same in structure as the previous embodiment. Reference numeral 8 in the FIG. 3 denotes a cover that can be detachably attached to the annular wall 6 to form another interior space together with the annular wall 6. The bottle cap configured as above is constituted of two parts, due to the addition of the cover 8. The cover 8 is provided to prevent the sheet 4 from being broken as a result of the impact of a load which otherwise might be inadvertently applied to the sheet 4 during transportation of the bottle, or as a result of fraudulent attempt to abuse the drink in the bottle. The cover 8 is fixed to outer cylinder 1 via a shrink label S disposed around the outer cylinder 1.

[0022] The cover 8 may be made of a hard material or a soft material, but should be made of a material that is sufficiently strong not to cause the displacement of barrier 3, even when exposed to a sudden load.

[0023] The bottle cap according to the present invention may be made of a polypropylene (PP) resin, or a high density polyethylene (HDPE) resin, though its material may be appropriately varied depending on the type of the ingredient to be stored.

[0024] If the bottle cap as described above is made in its entirety by molding a soft resin, during operation for opening the cap attached to a bottle, it may

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happen that the perforator 5 cannot break the sheet 4. To avoid such a risk, at least the perforator 5 alone may be made of a different material.

[0025] It will be appreciated from the foregoing description that the present invention provides a bottle cap, which is made of small number of components,
5 and which allows the addition of the ingredient to the liquid content in the bottle by a simple manipulation.

CLAIMS

1. A bottle cap comprising an outer cylinder to be detachably attached to a mouth portion of a bottle to surround the mouth portion, and an inner cylinder
5 integrally connected to the outer cylinder so as to be suspended in a cavity within the mouth portion of the bottle, wherein:

the inner cylinder comprises a barrier at its one end, which seals the mouth portion of the bottle, and which can be displaced toward a bottom of the bottle, and a thin sheet at the other end of the inner cylinder, for sealing an interior
10 space of the inner cylinder together with the barrier, thereby forming a closed chamber for storing an ingredient; and

the barrier has a perforator which, when the barrier is displaced toward the bottom of the bottle, is displaced to break and open the thin sheet, thereby allowing the ingredient in the chamber to fall into the bottle.

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2. The bottle cap according to Claim 1, wherein the barrier has a dome-like shape and exhibits a convex profile directed outward.

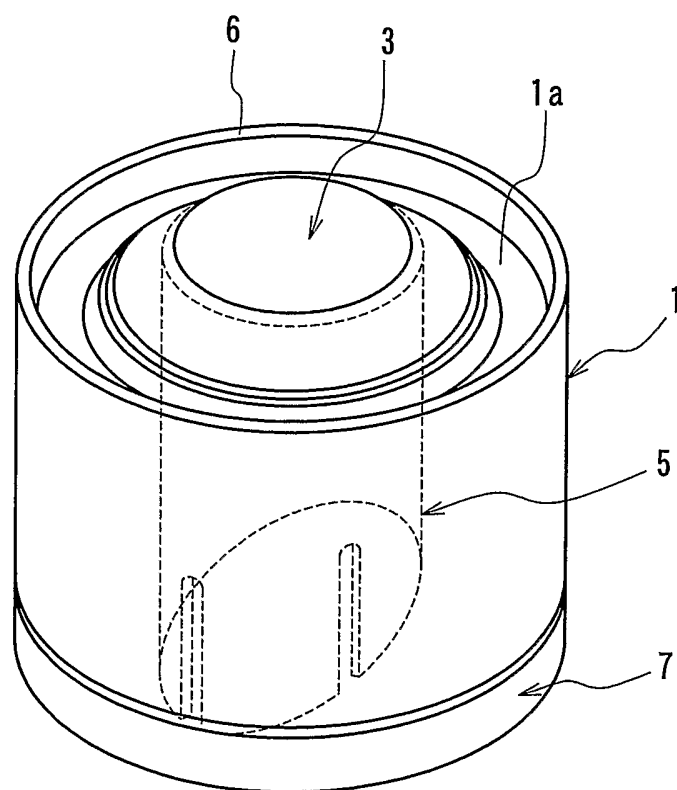
3. The bottle cap according to Claim 1 or 2, wherein the outer cylinder
20 has a one-end opened annular wall, which surrounds the barrier of the inner cylinder with its upper edge being disposed at a level higher than the barrier.

4. The bottle cap according to Claim 3, wherein the annular wall comprises a cover, which can be detachably attached to the open end of the
25 annular wall, to form a closed space together with the annular wall, for protecting the barrier.

5. The bottle cap according to any one of Claims 1 to 4, wherein a virgin belt is provided at a junction of the outer cylinder with the mouth portion of the
30 bottle, for retaining the outer cylinder to the mouth portion of the bottle.

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FIG. 1



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FIG. 2

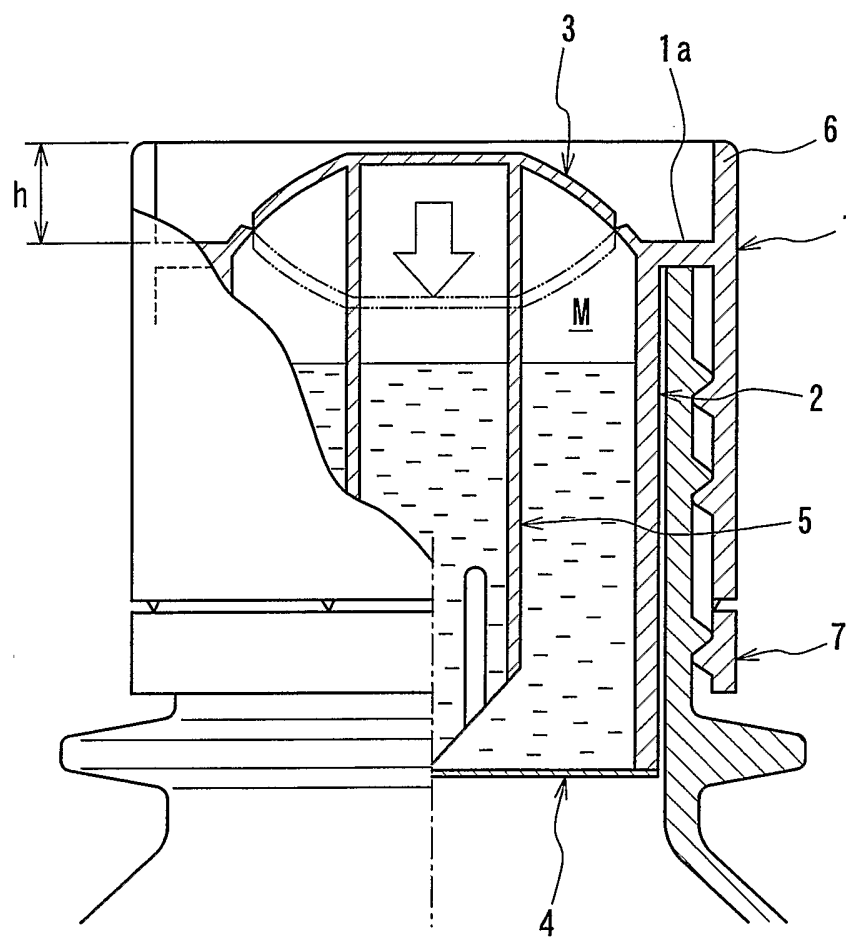
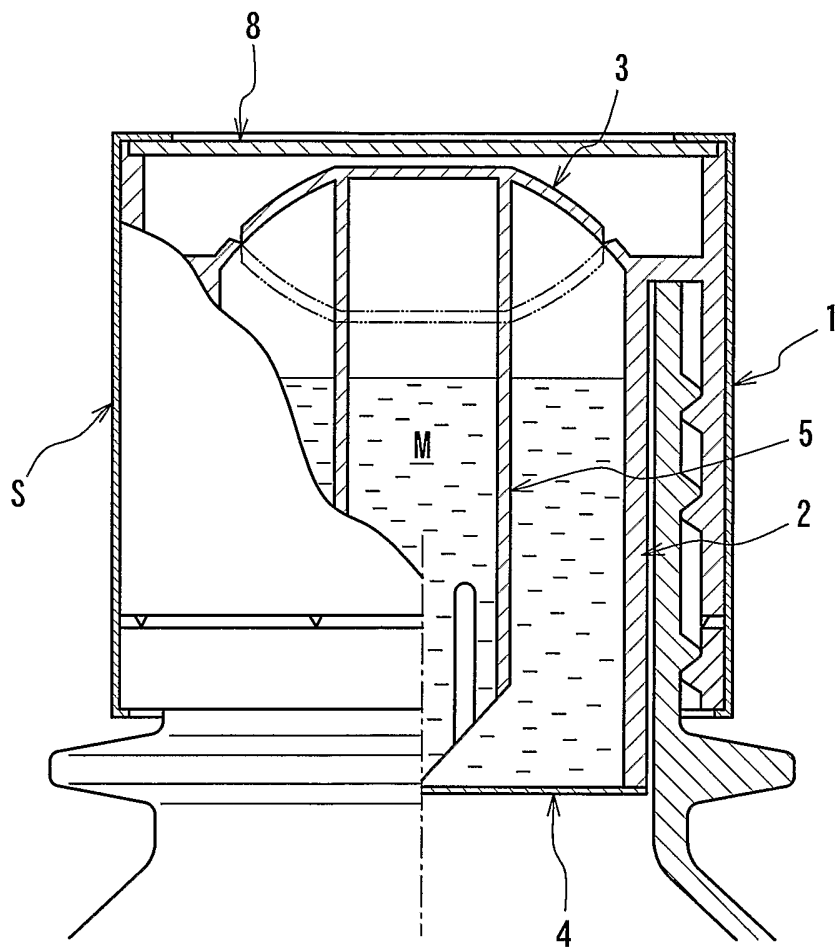


FIG. 3



INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP2005/019951

A. CLASSIFICATION OF SUBJECT MATTER
B65D51/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/089627 A1 (CHELLES GUSTAVO SENNA ET AL) 15 May 2003 (2003-05-15)	1-3,5
Y	paragraph '0033! - paragraph '0039!; claims 1-3; figures 1,6-12	4
X	US 2003/213709 A1 (GIBLER GREGORY A ET AL) 20 November 2003 (2003-11-20) paragraph '0019! - paragraph '0022!; claims 1,2; figures 1-6,9	1,2
X	DE 298 20 062 U1 (KAESMACHER GMBH & CO. KG, 52222 STOLBERG, DE) 25 February 1999 (1999-02-25) page 4, line 26 - page 5, line 19; claims 1,4; figure 1	1,2
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

15 December 2005

Date of mailing of the international search report

11/01/2006

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 772 017 A (KANG ET AL) 30 June 1998 (1998-06-30) column 3, line 39 - column 4, line 48; claims 1,2; figures 1-9a -----	1
X	US 2004/155061 A1 (ROTH DONNA ET AL) 12 August 2004 (2004-08-12) claims 1-9; figures 8-10,16 -----	1
Y	EP 0 577 200 A (LABORATORIOS CUSI, S.A) 5 January 1994 (1994-01-05) column 5, line 49 - line 55; figures 1-6 -----	4
A	EP 0 377 412 A (IMS - INTERNATIONAL MEDICAL SERVICE S.R.L) 11 July 1990 (1990-07-11) claims 1-3; figures 1,2 -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP2005/019951

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2003089627	A1	15-05-2003	BR 0105971 A	05-08-2003
US 2003213709	A1	20-11-2003	NONE	
DE 29820062	U1	25-02-1999	NONE	
US 5772017	A	30-06-1998	AU 2328897 A WO 9818690 A1	22-05-1998 07-05-1998
US 2004155061	A1	12-08-2004	US 2005127101 A1	16-06-2005
EP 0577200	A	05-01-1994	AT 139971 T AU 4166293 A CA 2099744 A1 DE 69303434 D1 DE 69303434 T2 FI 933034 A JP 2602614 B2 JP 6225924 A US 5474209 A	15-07-1996 06-01-1994 03-01-1994 08-08-1996 06-02-1997 03-01-1994 23-04-1997 16-08-1994 12-12-1995
EP 0377412	A	11-07-1990	US 4962852 A	16-10-1990