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

(11) EP 1 116 663 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
18.07.2001 Bulletin 2001/29

(51) Int Cl.[7]: **B65B 55/02**

(21) Application number: **00311398.2**

(22) Date of filing: **19.12.2000**

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

(30) Priority: **10.01.2000 GB 0000455**

(71) Applicant: **DAVID S. SMITH PACKAGING LIMITED**
London SW1P 1RZ (GB)

(72) Inventors:
- **Shipway, Malcolm**
  Rudgeway, Bristol BS12 2RS (GB)
- **Lambert, Roger**
  London SW1P 1RZ (GB)

(74) Representative: **Johnson, Terence Leslie**
Edward Evans & Co.,
Clifford's Inn,
Fetter Lane
London EC4A 1BX (GB)

(54) Apparatus for filling a container

(57) The invention relates to apparatus for filling a container with product under sterile conditions during filling thereof in a filling cycle, characterised by means (3) having a part (2) for dispensing product in a sterile manner during the filling cycle, by a part (4) adapted for sterilising at least a part of the container during the filling cycle, and by means (5) adapted to provide flushing of the second-mentioned part (4) during the filling cycle. The means (5) comprises a closure of the second-mentioned part (4), the arrangement being such that there is a relative reciprocable motion between the means (5) and the remainder of the second mentioned part (4) whereby to effect a pulsating flushing action in the second-mentioned part.

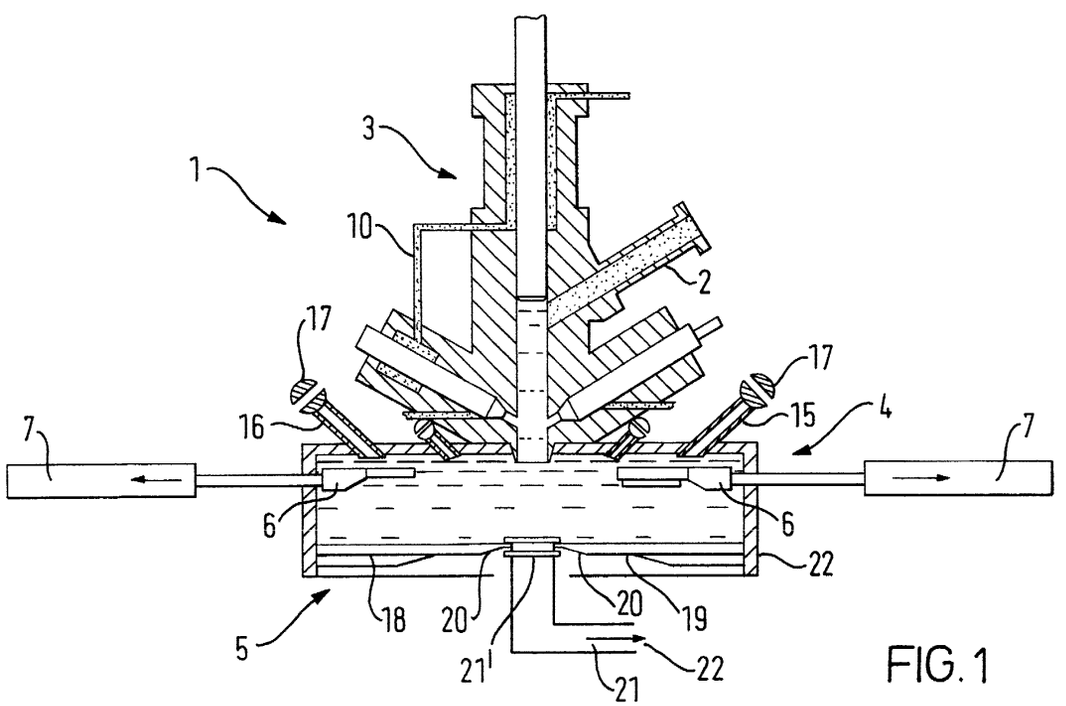

FIG. 1

EP 1 116 663 A1

Description

[0001] The invention relates to an apparatus for filling, and particularly to the filling of a container such as a plastic bag with product and in a sterile manner.

[0002] It is often necessary that a container such as a plastic bag is filled with a product which can be a food or drink product. In such circumstances, it is usually necessary or desirable that the bag is filled and closed with a closure such as a cap under sterile conditions.

[0003] Fill valves as part of a filling apparatus are used, and these have a facility for maintaining the product flow path therethrough sterile, before, during and after filling, but often such valves cannot provide for flushing of the operational parts during a filling cycle to provide a filled bag.

[0004] It is accordingly an object of the invention to seek to mitigate this disadvantage.

[0005] According to a first aspect of the invention there is provided apparatus for filling a container with product under sterile conditions during filling thereof in a filling cycle, comprising means having a part for dispensing product in a sterile manner during the filling cycle, a part adapted for sterilising at least a part of the container during the filling cycle, and means adapted to provide flushing of the second-mentioned part during the filling cycle.

[0006] The means may comprise a closure of the second-mentioned part, and the arrangement may therefore be such that there is relative reciprocal motion between the means and the remainder of the second-mentioned part, whereby to effect a pulsating flushing action in the second-mentioned part. This provides a pulsating, turbulent flow of flushing medium.

[0007] There may be means to reciprocate the closure with respect to the remainder of the second-mentioned part. Alternatively there may be means to reciprocate the remainder of the second-mentioned part with respect to the closure. In either case, the relative reciprocation provides oscillation which in turn creates the pulsating, turbulent flow during a cleaning or flushing step.

[0008] There may be means to provide a flushing liquid medium within the interior of the second-mentioned part, suitably the means to provide a flushing liquid medium may comprise means to provide a sterile water flushing medium. This is relatively inexpensive, yet effective.

[0009] The closure may comprise a door of the second-mentioned part. This is a relatively simple yet effective construction, particularly when the door may comprise opposed jaws which are adapted to hold a drain during flushing. The jaws also in use to fill a container, are adapted to hold the container too.

[0010] The jaws and drain may have complementary interengageable support means. This provides for simple engagement and disengagement.

[0011] The means to provide a sterile water flushing medium may comprise a fixed inlet of the second-mentioned part. Suitably, there may be two inclined inlets.

[0012] It will be understood that the invention extends to a container, whenever filled with product using apparatus as hereinbefore defined.

[0013] Apparatus embodying the invention is hereinafter described, by way of example, with reference to the accompanying drawings.

[0014] Fig. 1 is a schematic longitudinal sectional view of apparatus according to the invention during one step of a filling cycle; and

[0015] Fig. 2 is a similar view to that of Fig. 1 during a second step of a filling cycle, showing an intermediate flush step during a filling cycle.

[0016] Referring to the drawings there is shown apparatus 1 for filling a container such as a plastic bag (not shown) with product 2 such as a food powder or a liquid such as wine under sterile conditions during filling thereof in a filling cycle, comprising means 3 having a part for dispensing product 2 in a sterile manner during the filling cycle, a part 4 adapted for sterilising at least a part of the container during the filling cycle, and means 5 adapted to provide flushing of the second-mentioned part during the filling cycle.

[0017] The apparatus 1 includes the means 3 which is in the form of a fill valve for dispensing product 2 in a sterile manner during a fill cycle. The means 3 is the first-mentioned part.

[0018] The apparatus 1 also includes a pressing device (not shown) such as a bag pad for holding the container or bag to a gland (also not shown) when necessary, and retractable gripping devices or jaws 6 for gripping or holding the gland, which is ribbed to allow for such gripping. The gripping devices or jaws 6 are oppositely facing and have free ends complementary in shape to grip the gland. The devices or jaws 6 are mounted on a mechanism 7 for securing and lowering them, and for moving them into and out of contact with the gland. The part 4 is a second-mentioned part in the form of a chamber in which the bag with the gland can be received when raised thereinto by the jaws 6 during the filling cycle, the chamber having a retractable capper mechanism. Thus the second-mentioned part 4 is for sterilising at least a part of the container or bag during the filling cycle.

[0019] Above, as viewed, the chamber 4 there is the fill valve 3 which has means 8, 9 to sterilise various path or flow ways therethrough, the sterilising medium in the embodiment being steam. There is a path 10 providing a steam barrier round a reciprocable plunger 11 (Fig. 2), an inlet 12 for the product 2, the steam inlet and exhaust being controlled by means in the form of plungers 13, 14 to control flow of steam to the chamber 4 and bag. The fill valve 3 is a single unit which serves both to sterilise the flow paths therethrough for product 2, and the bag into which the product is to be charged.

[0020] The operation of the apparatus 1 and an operational cycle to fill a bag with product under sterile con-

ditions are as described in U.K. patent application No. 9916215.8.

[0021] However, in the present apparatus, the chamber 4 has an inlet, in the embodiment suitably two equidistantly spaced inclined inlets 15, 16 in the form of jets or pipes for the entry of a fluid flushing or rinsing medium in the form of sterile water. There are valves 17 at each inlet 15, 16 to control the flow of sterile water.

[0022] There are jaws 18, 19 which form the closure or door 5 of the chamber 4 and each of which has a nose 20 which noses 20 are opposed and are adapted for complementary engagement with means such as an adaptor or drain 21 for cleaning, rinsing or flushing sterile water. Further, the door 5 is mounted on a device such as a reciprocable plunger device (not shown) which reciprocates the opposed jaws 18, 19 forming the door substanyially vertically as viewed with respect to a body 22 of the chamber 4. Thus, in use, the jaws are offered up to and grip a bush 21' of a clean-in-place (CIP) or drain 21 as shown to produce a liquid tight connection, and the plunger device is reciprocated up and down (as viewed) to provide an up and down oscillation of the closure 5 with respect to the body 6 of the chamber 4 which is fixed relatively thereto, so that a pulsating or turbulent flow of the water introduced into the chamber through the inlets 15, 16 is produced, so providing a thorough rinsing or flushing of the interior of the chamber 4 and the jaws 6, 18, 19 as an intermediate chamber flush step during a filling-operational cycle. The flushing sterile water exits the chamber through the bush 21' and a pipe 22, which with suitable filtering etc, can provide a source of flushing sterile water to the inlets so that recycling is possible.

[0023] It will be understood that modifications are possible. For example, the closure 5 (18, 19) may be fixed and the body 6 may be reciprocable relative thereto to produce the pulsating and/or turbulent motion of the sterile water rinsing or flushing fluid.

Claims

1. Apparatus for filling a container with product under sterile conditions during filling thereof in a filling cycle, characterised by means (3) having a part (2) for dispensing product in a sterile manner during the filling cycle, by a part (4) adapted for sterilising at least a part of the container during the filling cycle, and by means (5) adapted to provide flushing of the second-mentioned part (4) during the filling cycle.

2. Apparatus according to Claim 1, characterised by the means (5) comprising a closure of the second-mentioned part (4), and by the arrangement being such that there is relative reciprocal motion between the means (5) and the remainder of the second-mentioned part (4), whereby to effect a pulsating flushing action in the second-mentioned part.

3. Apparatus according to Claim 2, characterised by there being means to reciprocate the closure with respect to the remainder of the second-mentioned part (4).

4. Apparatus according to Claim 2, characterised by there being means to reciprocate the remainder of the second-mentioned part (4) with respect to the closure.

5. Apparatus according to any of Claims 2 to 4, characterised by there being means (15, 16) to provide a flushing liquid medium within the interior of the second-mentioned part (4).

6. Apparatus according to Claim 5, characterised by the means (15, 16) to provide a flushing liquid medium comprising means to provide a sterile water flushing medium.

7. Apparatus according to Claim 6, characterised by the closure (5) comprising a door of the second-mentioned part (4).

8. Apparatus according to Claim 7, characterised by the door (5) comprising opposed jaws (18, 19) which are adapted to hold a drain (21') during flushing.

9. Apparatus according to Claim 8, characterised by the jaws (18, 19) and drain (21') having complementary interengageable support means.

10. Apparatus according to any of Claims 6 to 9, characterised by the means to provide a sterile water flushing medium comprising a fixed inlet (15, 16) of the second-mentioned part (4).

11. Apparatus according to Claim 10, characterised by there being two equidistantly spaced inclined inlets (15 and 16).

12. A container, characterised by being filled using apparatus according to any preceding claim.

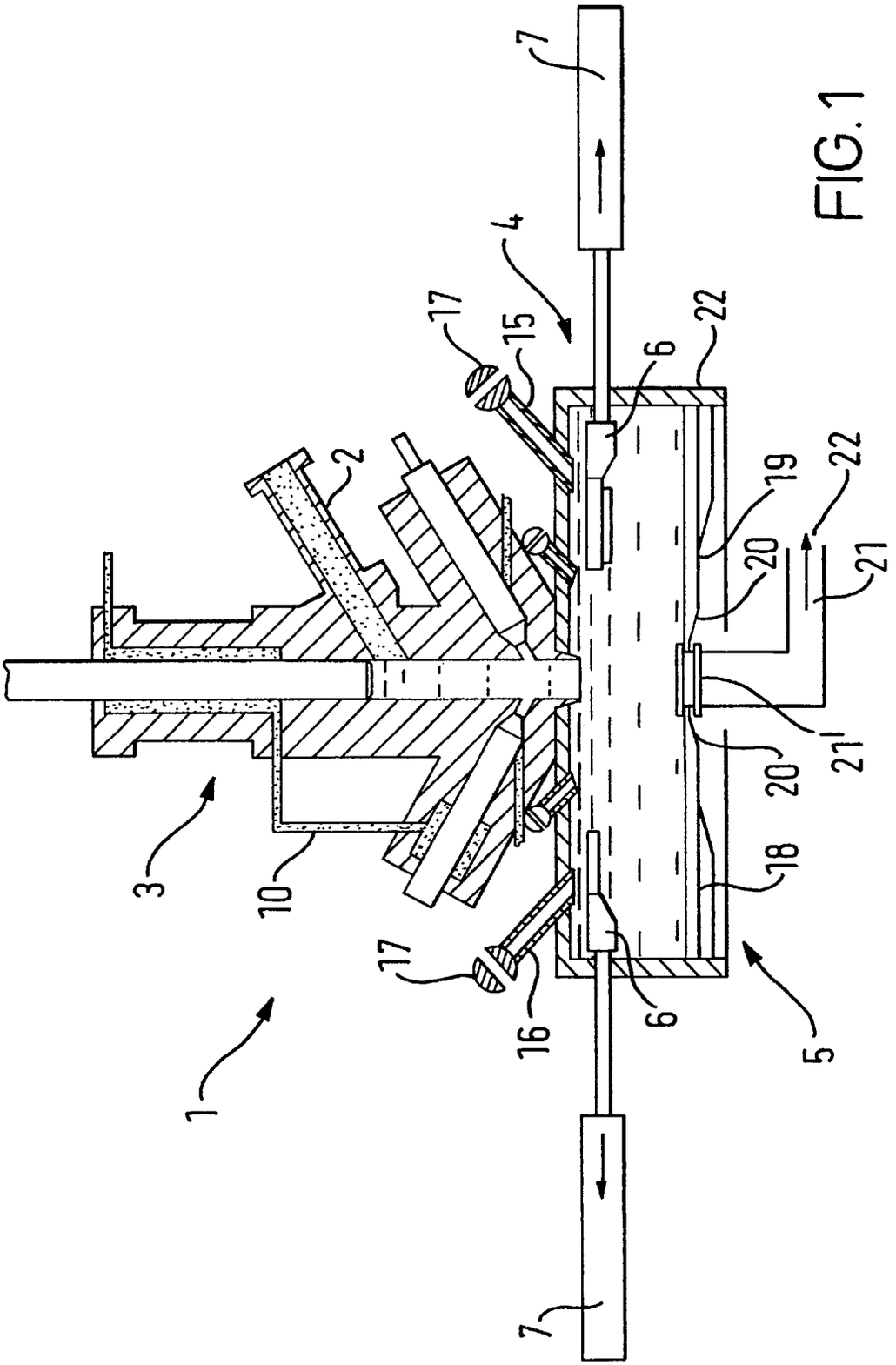

FIG.1

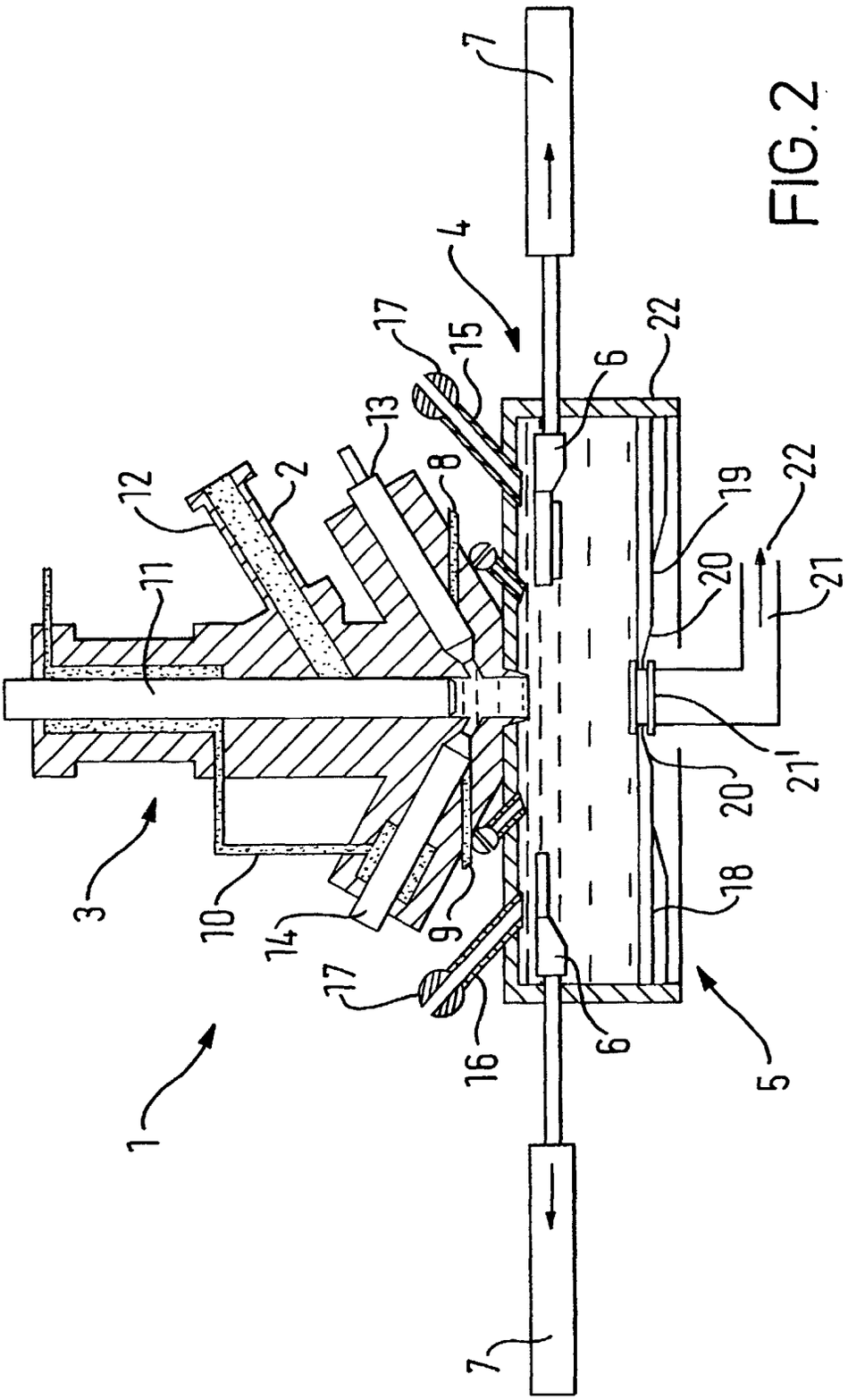

FIG. 2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 31 1398

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	EP 0 088 735 A (EL SRL) 14 September 1983 (1983-09-14) * page 12, line 1 - page 17, line 10; figures *	1,5,12	B65B55/02
A	EP 0 115 963 A (SCHOLLE CORP) 15 August 1984 (1984-08-15) * page 12, line 1 - page 15, line 18; figures *	1,12	
A	US 5 099 895 A (LOELIGER WILLI) 31 March 1992 (1992-03-31) * column 3, line 45 - column 4, line 51; figures *	1,12	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	23 April 2001	Jagusiak, A

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 00 31 1398

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.

23-04-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0088735 A	14-09-1983	IT 1172681 B	18-06-1987
		IT 1201019 B	27-01-1989
		AT 21669 T	15-09-1986
		DE 3365532 D	02-10-1986
		ES 520424 D	01-03-1984
		ES 8402786 A	16-05-1984
		GR 77943 A	25-09-1984
		IN 159651 A	30-05-1987
		JP 59174404 A	02-10-1984
		US 4572252 A	25-02-1986
EP 0115963 A	15-08-1984	US 4498508 A	12-02-1985
		JP 1924924 C	25-04-1995
		JP 6045367 B	15-06-1994
		JP 59174492 A	02-10-1984
US 5099895 A	31-03-1992	CH 679768 A	15-04-1992
		AT 98182 T	15-12-1993
		AU 641387 B	23-09-1993
		AU 5379690 A	08-11-1990
		CA 2015357 A	02-11-1990
		DE 69005018 D	20-01-1994
		DE 69005018 T	31-03-1994
		DK 395933 T	21-03-1994
		EP 0395933 A	07-11-1990
		ES 2048353 T	16-03-1994
		IE 66164 B	13-12-1995
		JP 2302257 A	14-12-1990
		PT 93928 A	08-01-1991

EPO FORM P0459

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