

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
9 October 2008 (09.10.2008)

PCT

(10) International Publication Number
WO 2008/120252 A1

(51) International Patent Classification:
F16K 11/078 (2006.01) *E03C 1/04* (2006.01)

(74) Agents: **CHIMINI, Francesco** et al.; Jacobacci & Partners S.p.A., Piazza Della Vittoria, 11, I-25122 Brescia (IT).

(21) International Application Number:
PCT/IT2007/000242

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, 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, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(22) International Filing Date: 30 March 2007 (30.03.2007)

(25) Filing Language: Italian

(26) Publication Language: English

(71) Applicant (for all designated States except US): **CRS S.p.A.** [IT/IT]; Via Indipendenza 4/A, I-28066 Galliate (Novara) (IT).

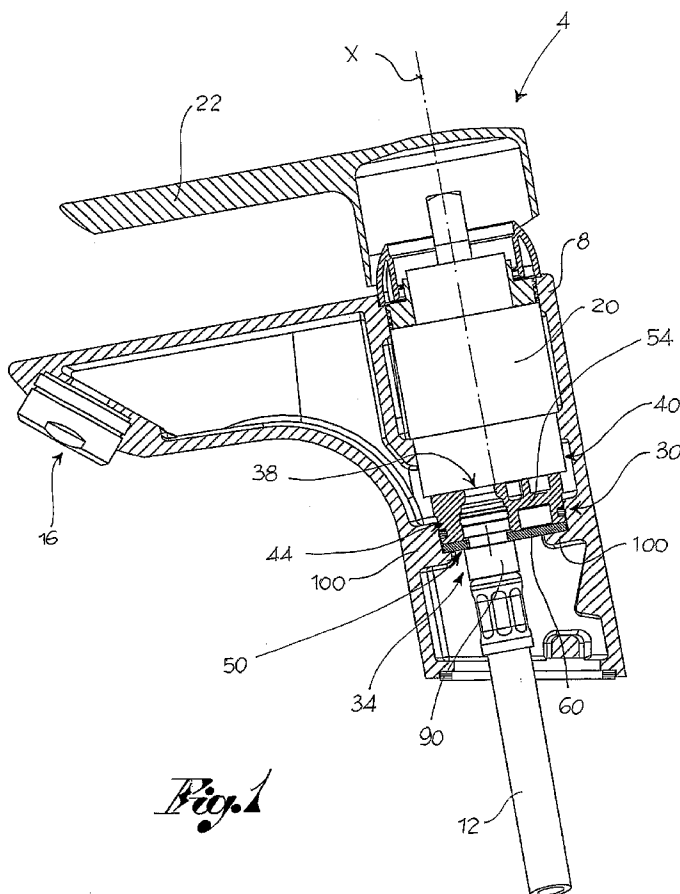
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, 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).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **CRISTINA, Alberto** [IT/IT]; c/o CRS S.p.A., Via Indipendenza, 4/A, I-28066 Galliate (Novara) (IT). **BAKI, Gyoza** [HU/IT]; c/o CRS S.p.A., Via Indipendenza 4/A, I-28066 Galliate (Novara) (IT).

Published:
— with international search report

(54) Title: TAP



(57) Abstract: A tap (4) provided with a coupling element (30) suitable for making a connection with the water outlet flexible pipes (12) without using threaded connections. The coupling element (30) allows quick and safe connection of the flexible pipes (12), preventing the pipes from twisting and the connections from loosening over time.

WO 2008/120252 A1

DESCRIPTION**"Tap"**

[0001] The present invention relates to a tap, and in particular, a tap provided with a fixing element suitable for the fluid-seal locking of the ends of flexible pipes in the tap body. It should be noted that tap generally refers to any means, for example of the valve type, suitable for intercepting and distributing fluids, such as water.

10 [0002] As known, water outlets in taps are connected to tap bodies by pipes, preferably flexible. The pipes are usually inserted and sealingly screwed in ends of the tap bodies and in particular in ends of mixing cartridges fitted in the tap bodies. Moreover at opposite ends, the flexible pipes are usually screwed to water outlets, too. Typically, taps are provided with two flexible pipes, for the hot water and the cold water outlets, respectively.

[0003] Prior art solutions exhibit several disadvantages. In fact, due to the presence of the threaded connections at both ends of the flexible pipes, during assembly the pipes get twisted and the connections themselves could loosen, thus causing harmful water leaks.

[0004] Moreover, during normal maintenance operations that could require the removal of one of the two ends of the flexible pipe, the unintentional unscrewing or loosening

of the other end of the pipe or in any case, the twisting and the consequent damaging of the pipe itself could occur.

[0005] The problem of the present invention is to provide a
5 connection for pipes which should solve the disadvantages mentioned with reference to the prior art.

[0006] Such disadvantages are solved by a tap in accordance with claim 1.

[0007] Further embodiments of the fixing element according
10 to the invention are described in the following claims.

[0008] Further features and advantages of the present invention will appear more clearly from the following description of a preferred non-limiting embodiment, wherein:

15 [0009] figure 1 shows a section view in assembled configuration of a tap comprising a fixing element according to an embodiment of the present invention;

[0010] figure 2 shows an exploded perspective view of some details of the tap of figure 1;

20 [0011] figure 3 shows a perspective view of a detail of figure 1;

[0012] figure 4 shows a plan view of the detail of figure 3 from the side of arrow IV of figure 3;

[0013] figure 5 shows a plan view of the detail of figure 3
25 from the side of arrow V of figure 3;

[0014] figure 6 shows a section view of the detail of figure 3, along plane VI-VI of figure 4;

[0015] figure 7 shows a section view of the detail of figure 3, along plane VII-VII of figure 4;

5 [0016] figure 8 shows a perspective view of a detail of figure 1;

[0017] figure 9 shows a plan view of the detail of figure 8 from the side of arrow IX of figure 8;

[0018] figure 10 shows a plan view of the detail of figure 10 8 from the side of arrow X of figure 8;

[0019] figure 11 shows a side view of the detail of figure 8, from the side of arrow XI of figure 9.

[0020] With reference to the above figures, reference numeral 4 generally denotes a tap comprising a tap body 8 with prevailing extension X suitable for receiving water from at least one outlet piping 12 and for dispensing it through a dispensing outlet 16. Tap generally refers to any means, for example of the valve type, suitable for intercepting and distributing fluids, such as water.

20 [0021] Tap 4 comprises water collecting and/or mixing means 20 in fluid connection in input with the outlet piping 12 and in output with the dispensing outlet 16. According to an embodiment, the water collecting and/or mixing means comprise a mixing cartridge, actuable by a control lever 25 22. Collecting and/or mixing means also indicate baffle

type cartridges or devices with opening and closing function, of progressive type or on-off type.

[0022] Advantageously, tap 4 comprises a coupling element 30 suitable for constraining, with hydraulic seal, a
5 delivery end 34 of said pipes 12 and for connecting them to said water collecting and/or mixing means 20.

[0023] The coupling element 30 comprises at least one seat 38 suitable for obtaining a shape coupling with said
10 delivery end 34 of the outlet pipes, so as to allow a relative rotation between the delivery end 34 of the pipe and seat 38 which preventing an axial movement of extraction of the delivery end 34 from the relevant seat 38.

[0024] According to a possible embodiment, the coupling
15 element 30 is integral with the tap body 8.

[0025] According to a further embodiment, the coupling element 30 is mechanically separate from the tap body 8 and is associable to a water collecting chamber 40 of the tap body. Said chamber 40 is suitable for seating the
20 collecting means 20, typically a mixing cartridge.

[0026] Preferably, the coupling element 30 is directly associated to the collecting and/or mixing means 20 so as to ensure a fluid connection between pipes 12 and the collecting means 20.

25 [0027] According to a further embodiment, the coupling

element 30 is made integral with the collecting and/or mixing means 20; in other words, the mixing cartridge, opposite the relevant control lever 22, is made integral with the coupling element 30.

5 [0028] According to an embodiment, the at least one seat 38 of the coupling element 30 is axially open along said prevailing extension X, so as to allow an axial introduction of the delivery end 34 directly into seat 38.

[0029] For example, the delivery end 34 makes a snap-wise
10 shape coupling with seat 38.

[0030] According to a further embodiment, the delivery end 34 makes a joint-wise shape coupling with seat 38.

[0031] According to a possible embodiment, the at least one seat 38 is laterally open along said prevailing extension
15 X, so as to allow a aside introduction of end 34 of the pipe into seat 38 through an outer side wall 44 of the coupling element 30.

[0032] Preferably, end 30 and seat 38 are respectively counter-shaped relative to one another, so as to
20 determine at least one undercut 50 relative to said prevailing extension X; undercut 50 is suitable for obtaining an axial locking of the coupling end 30 and for preventing an axial movement of extraction of end 30 from seat 38 itself.

25 [0033] Preferably, the coupling element 30 is comprised of

at least two portions, and comprises a base 54 and a bottom 60 sealingly associated to one another.

[0034] Base 54 comprises a base body 64 having at least one fluid connection hole 68 with the associable collecting and/or mixing means 20 and at least one seat 38 suitable for seating said delivery end 34.

[0035] Preferably, base 54 is sealingly associated to the collecting and/or mixing means 20.

[0036] According to an embodiment, on the end of the collecting and/or mixing means 20, base 54 comprises a seal suitable for ensuring water seal at a connection wall 70 with the collecting and/or mixing means 20.

[0037] For example, at the connection wall 70, base 54 comprises first joint-wise connection means 74, suitable for axially locking base 54 e and the collecting and/or mixing means 20 to each other. For example, the first connection means 74 comprise holes suitable for coupling joint-wise with special pegs or pins of the mixing cartridge 20 or vice versa.

[0038] Bottom 60 comprises at least one opening 78 open at a side wall 80 of bottom 60, so as to allow the side introduction of the end of pipe 34.

[0039] Preferably, opening 78 narrows moving from side wall 80 inwards of the bottom so as to allow the introduction of end 34 at the side wall 80 and axially lock into

position the end of pipe 34 following the introduction thereof into opening 78 itself. In other words, opening 78 exhibits a bottom 82 suitable for making an axial constraint to the extraction of the delivery end 34.

5 [0040] According to an embodiment, bottom 60 is associated to base 54, opposite the collecting and/or mixing means 20, by second joint-wise connection means 86, such as teeth, preferably inserted by forcing into special holes 88 of base 54. According to a further embodiment, bottom
10 60 is associated to base 54, opposite the collecting and/or mixing means 20, by snap-wise connection means.

[0041] According to a possible embodiment, the delivery end 34 comprises a cylindrical portion 90 suitable for being inserted in seat 38 and a collar suitable for making an
15 undercut for axially constraining the end to seat 38.

[0042] According to a further possible embodiment, the delivery end 34 comprises a cylindrical portion 90 suitable for being inserted in seat 38 and a circular groove 94 suitable axially constraining end 30 to seat 38.

20 [0043] Preferably, ends 34 comprise at least one sealing element 98 suitable for obtaining the water seal with the respective seat. For example, the sealing element 98 is an o-ring seal.

[0044] According to a possible embodiment, relative to said
25 prevailing extension X, the sealing element is arranged

at the shape coupling between seat 38 and end 30.

[0045] According to a possible further embodiment, relative to said prevailing extension X, the sealing element 98 is arranged in a portion comprised between seat 38 and the
5 water collecting and/or mixing means 20.

[0046] Preferably, the tap body 8 comprises at least one stop 100 suitable for making an axial stop to the introduction of the collecting and/or mixing means 20.

[0047] According to an embodiment, said stop 100 comprises
10 side openings suitable for making seats for locking said delivery ends of the pipes.

[0048] The assembly and the removal of a tap according to the present invention will now be described.

[0049] In particular, the flexible pipe ends are connected
15 for example to the bottom, by the side openings and the bottom is axially associated to the base so as to close the coupling element pack-wise. The coupling element is then inserted into the tap body up to abutment against the tap body stop.

20 [0050] The mixing cartridge is then inserted and is fluid connected to the base of the coupling element which axially locks the coupling element against the tap body.

[0051] The same assembly operations may be carried out in the reverse order to disassemble.

25 [0052] To upgrade the prior art taps according to the

present invention, it is sufficient to replace the flexible pipes with threaded connections with a coupling element according to the present invention provided with the relevant flexible pipes having counter-shaped ends relative to the seats of the fixing element.

[0053] The fixing element may be adapted to the existing tap cartridge, or the mixing cartridge group with relevant fixing element may be replaced. Such replacement may be necessary, for example when the axial overall dimensions of the fixing element to be applied to the existing cartridge are larger than the inside dimensions of the tap body.

[0054] As we can appreciate from the description, the tap of the present invention allows overcoming the disadvantages exhibited by the taps of the prior art.

[0055] In particular, the fixing element allows quick assembly of the flexible pipes without requiring any screwing action at the connections to the tap body.

[0056] The connection between the fixing element and the pipes allows the pipe rotation without any risk of loosening and consequent water leak.

[0057] Assembly is very quick to be carried out and always ensures the axial locking of the pipe that cannot draw out of the relevant seat in any way.

[0058] The system according to the present invention is

inexpensive to make and does not require making threaded ends in the pipes.

[0059] Moreover, it is possible to make fixing elements also free from threads and thereby inexpensive to make.

5 [0060] Also the costs for making the pipes are thereby reduced.

[0061] Moreover, the system of the present invention may be adapted to existing tap bodies, without requiring structural modifications of the tap bodies.

10 [0062] In fact, it is possible to associate a mixing cartridge to a fixing element according to the present invention and then replace the flexible pipe with a pipe having a counter-shaped end relative to the seats of the fixing element.

15 [0063] A man skilled in the art may make several changes and adjustments to the fixing elements described above in order to meet specific and incidental needs, all falling within the scope of protection defined in the following claims.

Claims

1. Tap (4) comprising
a tap body (8) with prevailing extension (X) suitable for
receiving water from at least one outlet piping (12) and
5 for dispensing it through a dispensing outlet (16),
water collecting and/or mixing means (20) in fluid
connection in input with the outlet piping (12) and in
output with the dispensing outlet (16)
characterised in that
- 10 the tap (4) comprises a coupling element (30) suitable
for constraining, with hydraulic seal, a delivery end
(34) of said pipes (12) and for connecting them to said
water collecting and/or mixing means (20),
the coupling element (30) comprising at least one seat
15 (38) suitable for obtaining a shape coupling with said
delivery end (34) of the outlet pipes, so as to allow a
relative rotation between the delivery end (34) of the
pipe and seat (38) which preventing an axial movement of
extraction of the pipe end (34) from the relevant seat
20 (38).
2. Tap (4) according to claim 1, wherein said coupling
element (30) is integral with the tap body (8).
3. Tap (4) according to claim 1, wherein said coupling
element (30) is mechanically separate from the tap body
25 (8) and is associable to a water collecting chamber (40)

of the tap body (8).

4. Tap (4) according to claim 1, 2 or 3, wherein said coupling element (30) is directly associated to the collecting and/or mixing means (20) so as to ensure a
5 fluid connection between pipes (12) and the collecting means (20).

5. Tap (4) according to any one of the previous claims, wherein said coupling element (30) is made integral with the collecting and/or mixing means (20).

10 6. Tap (4) according to any one of the previous claims, wherein the at least one seat (38) of the coupling element (30) is axially open along said prevailing extension (X), so as to allow an axial introduction of the end (34) directly into the seat (38).

15 7. Tap (4) according to any one of claims 1 to 6, wherein said end (34) makes a snap-wise shape coupling with the seat (38).

8. Tap (4) according to any one of the previous claims, wherein said end (34) makes a joint-wise shape coupling
20 with the seat (38).

9. Tap (4) according to any one of the previous claims, wherein the at least one seat (38) is laterally open along said prevailing extension (X), so as to allow a side introduction of the end (34) of the pipe (12) into
25 the seat (38) through an outer side wall (44) of the

coupling element (30).

10. Tap (4) according to any one of the previous claims, wherein the end (34) and the seat 38 are respectively counter-shaped relative to one another, so as to
5 determine an undercut (50) relative to said axial direction, suitable for obtaining an axial locking of the end (34) of the pipe and for preventing an axial movement of extraction of the end (34) from the seat (38) itself.

11. Tap (4) according to any one of the previous claims,
10 wherein said coupling element (30) is comprised of at least two portions, and comprises a base (54) and a bottom (60) sealingly associated to one another.

12. Tap (4) according to claim 11, wherein said base (54) comprises a base body (64) having at least one fluid
15 connection hole (68) with the associable collecting and/or mixing means (20) and at least one seat (38) suitable for seating said delivery end (34).

13. Tap (4) according to claim 11 or 12, wherein said base (54) is sealingly associated to the collecting
20 and/or mixing means (20).

14. Tap (4) according to claim 13, wherein on the end of the collecting and/or mixing means (20), the base (54) comprises a seal suitable for ensuring water seal at a connection wall (70) with the collecting and/or mixing
25 means (20).

15. Tap (4) according to any one of claims 11 to 14, wherein the base (54) comprises first joint-wise connection means (74), suitable for axially locking the base (54) e and the collecting and/or mixing means (20) to each other.
16. Tap (4) according to any one of claims 11 to 15, wherein said bottom (60) comprises at least one opening (78) open at a side wall (80) of the bottom (60), so as to allow the side introduction of the pipe end (34).
- 10 17. Tap (4) according to claim 16, wherein said the opening (78) narrows moving from the side wall (80) inwards so as to axially lock into position the pipe end (34).
18. Tap (4) according to any one of claims 11 to 17, 15 wherein the bottom (60) is associated to the base (54), opposite the collecting and/or mixing means (20), by second joint-wise connection means (86).
19. Tap (4) according to any one of claims 11 to 17, 20 wherein the bottom (60) is associated to the base (54), opposite the collecting and/or mixing means (20), by snap-wise connection means.
20. Tap (4) according to any one of the previous claims, wherein the end (34) comprises a cylindrical portion (90) suitable for being inserted in the seat (38) and a collar 25 suitable for making an undercut (50) for axially

constraining the end (34) to the seat (38).

21. Tap (4) according to any one of claims 1 to 19, wherein the end (34) comprises a cylindrical portion (90) suitable for being inserted in the seat (38) and a
5 circular groove (94) suitable for axially constraining the end (34) to the seat (38).

22. Tap (4) according to claim 20 or 21, wherein said ends (34) comprise at least one sealing element (98) suitable for obtaining the water seal with the respective
10 seat (38).

23. Tap (4) according to claim 22, wherein the sealing element (98) is an o-ring seal.

24. Tap (4) according to claim 22 or 23, wherein relative to said prevailing extension (X), the sealing
15 element (98) is arranged at the shape coupling between the seat (38) and the end (34).

25. Tap (4) according to claim 22 or 23, wherein relative to said prevailing extension (X), the sealing element (98) is arranged in a portion comprised between
20 the seat (38) and the water collecting and/or mixing means (20).

26. Tap (4) according to any one of the previous claims, wherein the tap body (8) comprises at least one stop (100) suitable for making an axial stop to the
25 introduction of the collecting and/or mixing means (20).

27. Tap (4) according to claim 26, wherein said stop (100) comprises side openings suitable for making seats (38) for locking said delivery ends (34) of the pipes (12).

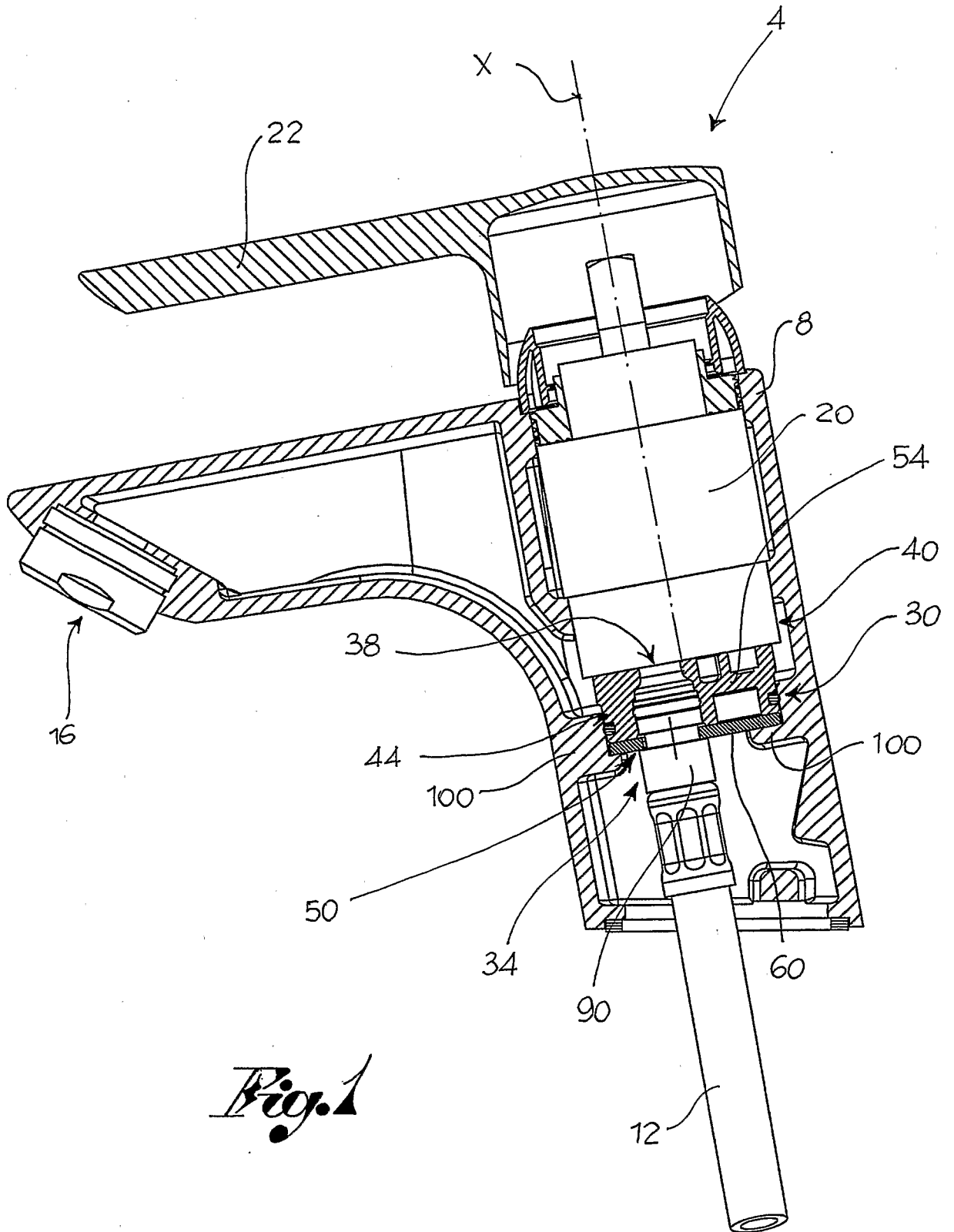


Fig. 1

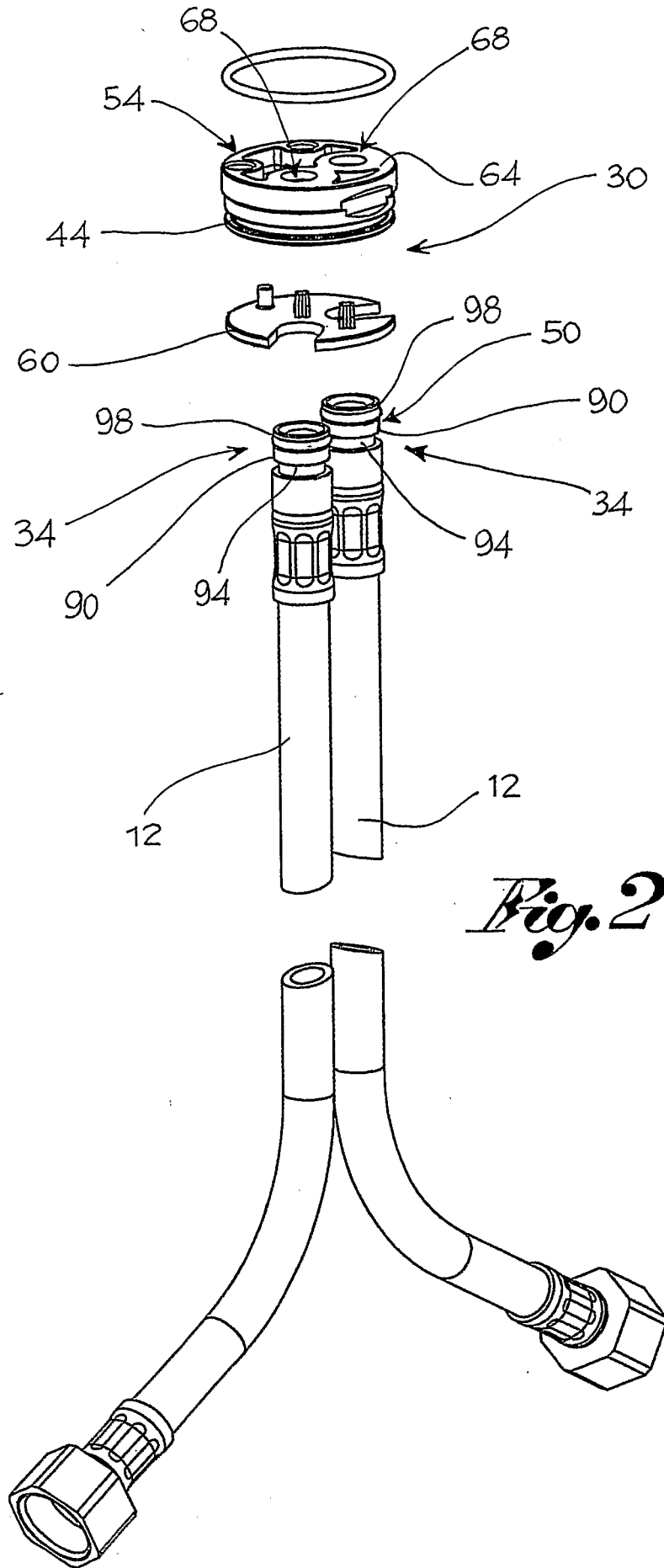
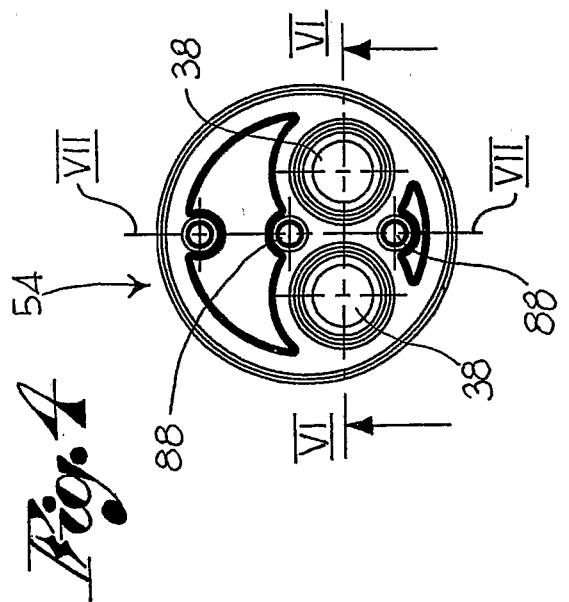
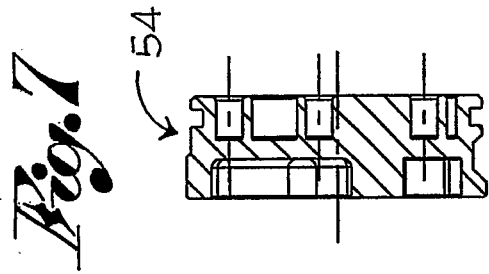
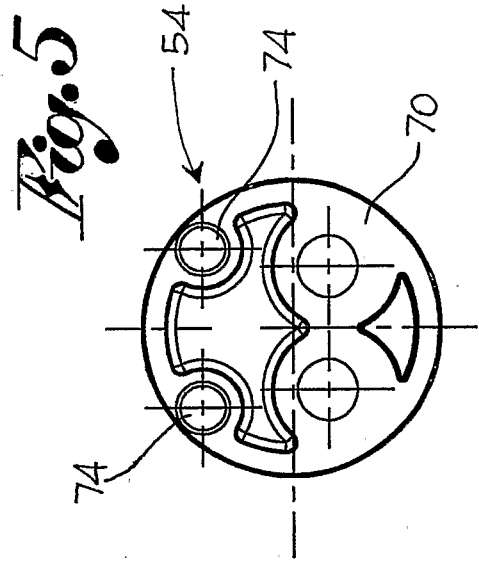
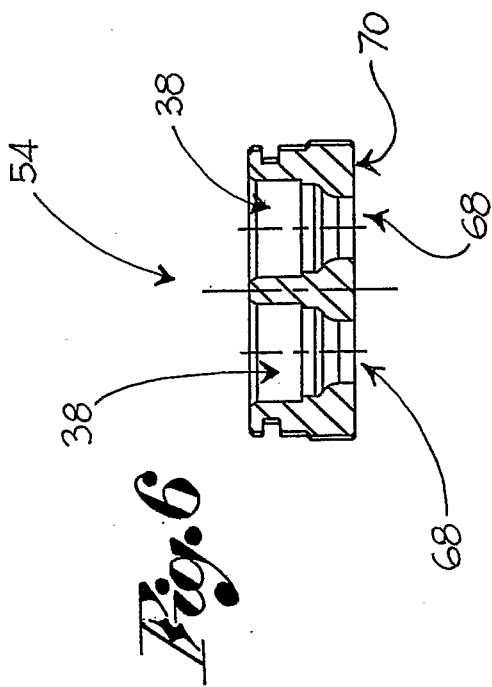
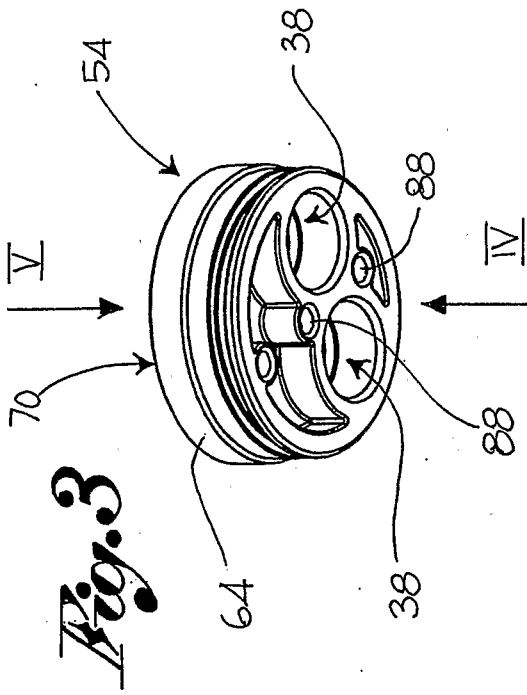
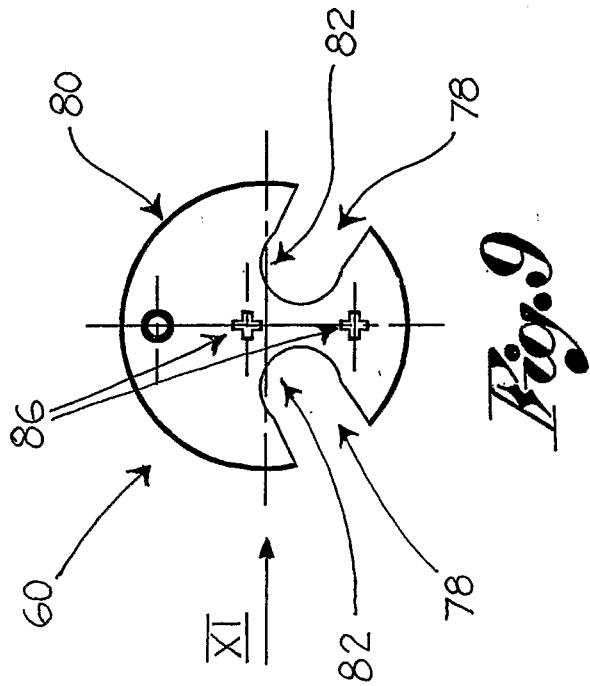
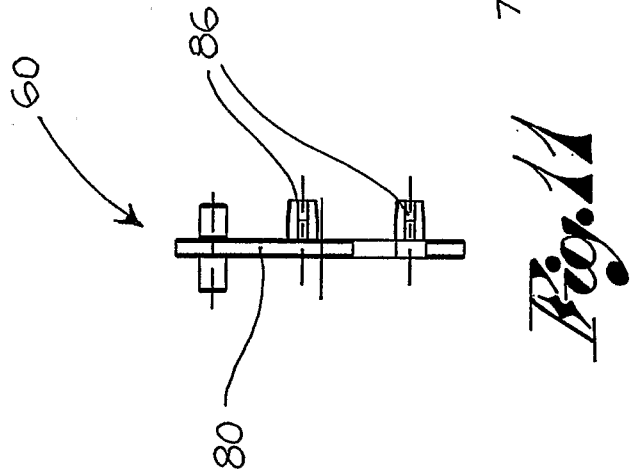
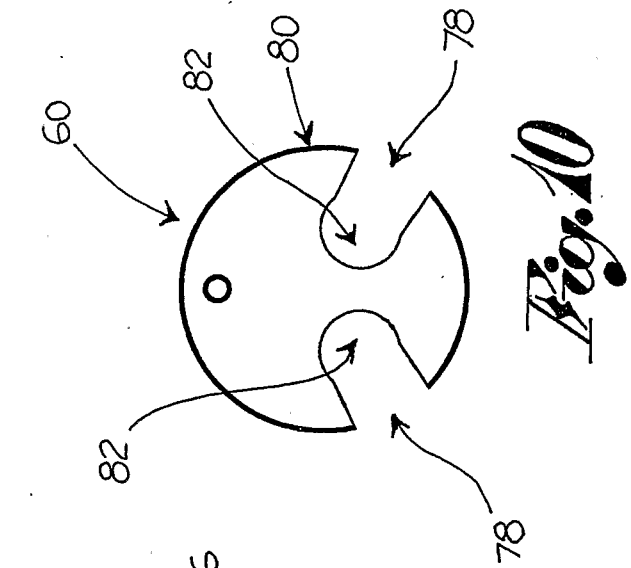
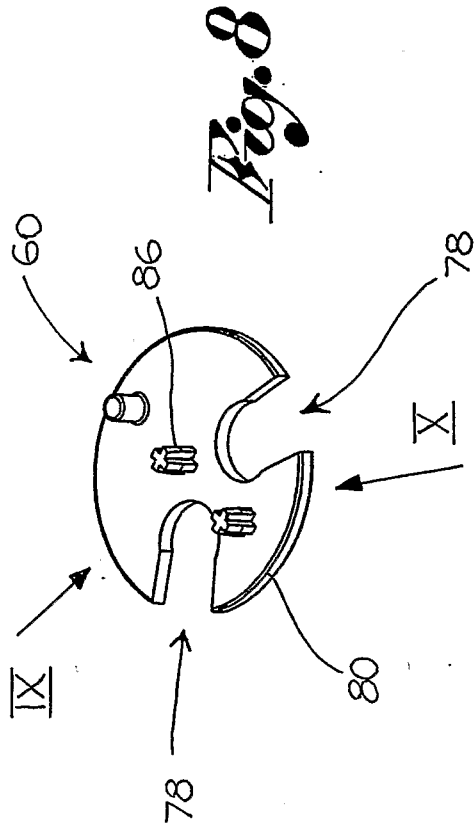


Fig. 2





INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2007/000242A. CLASSIFICATION OF SUBJECT MATTER
INV. F16K11/078 E03C1/04

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)
F16K E03C

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, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 073 972 A (RIVERA SAMUEL T [US]) 13 June 2000 (2000-06-13) column 2, line 51 - column 6, line 47; figures 1-18	1-6, 8, 10-16, 18-24, 26
X	EP 0 681 127 A (GROHE ARMATUREN FRIEDRICH [DE]) 8 November 1995 (1995-11-08) column 2, line 18 - column 4, line 9; figures 1-5	1-8, 10-15, 18-24, 26 17
A	EP 1 496 164 A (KLUDI GMBH & CO KG [DE]) 12 January 2005 (2005-01-12) paragraphs [0010] - [0016]; figure 1	1-6, 8, 10-16, 18, 20-24, 26

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

28 January 2008

Date of mailing of the international search report

05/02/2008

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Heneghan, Martin

INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2007/000242

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 036 973 A (HANSA METALLWERKE AG [DE]) 20 September 2000 (2000-09-20) paragraphs [0011] - [0026]; figures 1-4 -----	1
A	DE 31 19 313 A1 (HANSA METALLWERKE AG [DE]) 2 December 1982 (1982-12-02) figures 1-6 -----	1
A	EP 0 716 255 A (GROHE KG HANS [DE]) 12 June 1996 (1996-06-12) figures 1-3 -----	1
A	EP 1 081 297 A (GROHE ARMATUREN FRIEDRICH [DE]) 7 March 2001 (2001-03-07) figures 1-9 -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IT2007/000242

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 6073972	A	13-06-2000	CA	2271613 A1	19-11-1999
EP 0681127	A	08-11-1995	AT	168455 T	15-08-1998
			DE	4415797 A1	09-11-1995
			DK	681127 T3	19-04-1999
			ES	1030971 U	01-11-1995
			ES	2121254 T3	16-11-1998
			JP	3450494 B2	22-09-2003
			JP	7301350 A	14-11-1995
			US	5558128 A	24-09-1996
EP 1496164	A	12-01-2005	AT	312979 T	15-12-2005
			DE	10330685 A1	03-02-2005
			ES	2250809 T3	16-04-2006
EP 1036973	A	20-09-2000	AT	226700 T	15-11-2002
			DE	19911574 A1	02-11-2000
			ES	2182741 T3	16-03-2003
			PL	338913 A1	25-09-2000
DE 3119313	A1	02-12-1982	AT	386663 B	26-09-1988
			AT	190782 A	15-02-1988
			CH	656442 A5	30-06-1986
			IT	1152161 B	31-12-1986
EP 0716255	A	12-06-1996	DE	4443895 A1	13-06-1996
EP 1081297	A	07-03-2001	DE	19941492 A1	15-03-2001