(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
13 March 2003 (13.03.2003)

PCT

(10) International Publication Number
WO 03/020645 A3

(51) International Patent Classification[7]: A47L 15/42, C02F 1/469, B01D 61/46

(21) International Application Number: PCT/IB02/03578

(22) International Filing Date:
4 September 2002 (04.09.2002)

(25) Filing Language: Italian

(26) Publication Language: English

(30) Priority Data:
TO2001A00847 5 September 2001 (05.09.2001) IT

(71) Applicant *(for all designated States except US)*: **ELTEK S.p.A.** [IT/IT]; Strada Valenza 5A, I-15033 Casale Monferrato (IT).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **GADINI, Costanzo** [IT/IT]; Via Verona 10, I-15033 Casale Monferrato (IT). **FIORINI, Andrea** [IT/IT]; Corso Valentino 231, I-15033 Casale Monferrato AL (IT).

(74) Agent: **DINI, Roberto**; Via Castagnole 59, I-10060 None TO (IT).

(81) Designated States *(national)*: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZW.

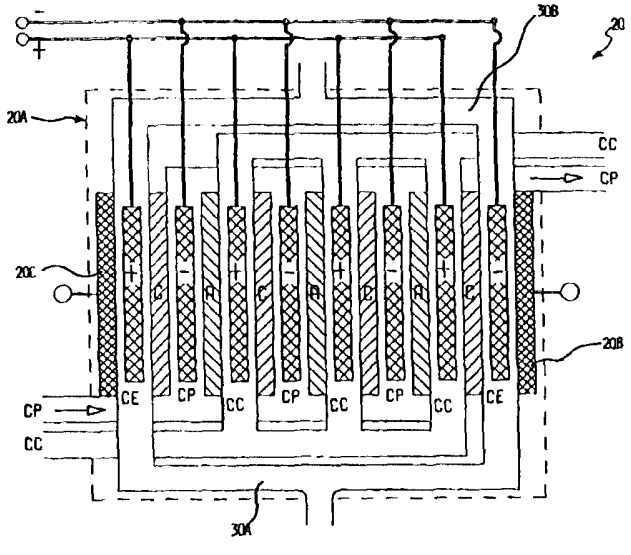
(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

(88) Date of publication of the international search report:
30 May 2003

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: HOUSEHOLD APPARATUS WITH ELECTROCHEMICAL TREATMENT DEVICE FOR A LIQUID AND TREATMENT METHOD OF A FLUID USING THIS DEVICE



(57) Abstract: Household apparatus, in particular a washing machine, comprising an electrochemical treatment device (20), in particular a water softener, in which two electrodes (20B,20C) are provided, with ion exchange membranes (C,A) arranged between them for delimiting a plurality of channels (CE,CC,CP). According to the invention, means (+ ,-) are provided for periodic filling of some channels (CE,CC,CP) of the electrochemical device (20) with a cleaning substance or solution, the latter being apt to dissolve and/or remove saline precipitates eventually formed inside the device .

WO 03/020645 A3

INTERNATIONAL SEARCH REPORT

Inter al Application No
PCT/IB 02/03578

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A47L15/42 C02F1/469 B01D61/46

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)
IPC 7 A47L C02F B01D

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.
E	WO 02 079098 A (ELTEK SPA ;FIORINI ANDREA (IT); GADINI CONSTANZO (IT)) 10 October 2002 (2002-10-10) page 24, line 3 -page 26, line 26	1
X	US 5 705 046 A (KOTAKE SHINICHIRO ET AL) 6 January 1998 (1998-01-06) column 13, line 29 -column 14, line 64	86
Y		1
X	US 4 925 541 A (GIUFFRIDA ANTHONY J ET AL) 15 May 1990 (1990-05-15) column 7, line 49 -column 8, line 11	86
Y		1
A	FR 1 282 890 A (AMERICAN MACH & FOUNDRY) 27 January 1962 (1962-01-27) the whole document	1

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in 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	Date of mailing of the international search report
28 February 2003	07/03/2003

Name and mailing address of the ISA	Authorized officer
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	Devisme, F

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Interr I Application No
PCT/IB 02/03578

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 062 440 A (MITSUBISHI PETROCHEMICAL CO) 25 June 1971 (1971-06-25) the whole document	1
A	US 3 341 441 A (GIUFFRIDA ANTHONY J ET AL) 12 September 1967 (1967-09-12) the whole document	1
A	US 6 274 019 B1 (KUWATA MASAHIRO) 14 August 2001 (2001-08-14) the whole document	86
A	EP 0 839 762 A (EBARA CORP) 6 May 1998 (1998-05-06) the whole document	86
A	US 3 776 530 A (GRIFFITH J ET AL) 4 December 1973 (1973-12-04) the whole document	2
A	US 5 958 242 A (FENNELL PAUL ANTONY HARRY) 28 September 1999 (1999-09-28) the whole document	2
A	FR 703 253 A (BILLITER JEAN) 28 April 1931 (1931-04-28) the whole document	2
A	EP 0 388 990 A (RAYCHEM CORP) 26 September 1990 (1990-09-26) the whole document	2
A	WO 00 64325 A (ELTEK SPA ;GADINI COSTANZO (IT)) 2 November 2000 (2000-11-02) the whole document	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter al Application No
PCT/IB 02/03578

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
WO 02079098	A	10-10-2002	WO	02079098 A1	10-10-2002
US 5705046	A	06-01-1998	JP	3297062 B2	02-07-2002
			JP	5123532 A	21-05-1993
			JP	3217402 B2	09-10-2001
			JP	5131193 A	28-05-1993
			DE	69227001 D1	22-10-1998
			DE	69227001 T2	25-02-1999
			DK	537694 T3	22-02-1999
			EP	0537694 A1	21-04-1993
			FI	924691 A	18-04-1993
US 4925541	A	15-05-1990	US	4632745 A	30-12-1986
			US	RE35741 E	10-03-1998
			DE	3568946 D1	27-04-1989
			EP	0170895 A2	12-02-1986
			JP	1782943 C	31-08-1993
			JP	4072567 B	18-11-1992
			JP	61107906 A	26-05-1986
			US	4956071 A	11-09-1990
			US	5154809 A	13-10-1992
FR 1282890	A	27-01-1962	NONE		
FR 2062440	A	25-06-1971	DE	2045723 A1	15-04-1971
			FR	2062440 A5	25-06-1971
			NL	7013820 A	23-03-1971
US 3341441	A	12-09-1967	DE	1442431 A1	24-10-1968
			GB	1030090 A	18-05-1966
			JP	51018399 B	09-06-1976
			NL	6500154 A	08-07-1965
US 6274019	B1	14-08-2001	NONE		
EP 0839762	A	06-05-1998	JP	10128338 A	19-05-1998
			EP	0839762 A2	06-05-1998
			US	5837124 A	17-11-1998
US 3776530	A	04-12-1973	CA	958323 A1	26-11-1974
US 5958242	A	28-09-1999	NONE		
FR 703253	A	28-04-1931	NONE		
EP 0388990	A	26-09-1990	AT	70363 T	15-12-1991
			CA	1333381 A1	06-12-1994
			DE	3775097 D1	23-01-1992
			DK	87287 A	21-08-1987
			EP	0242029 A2	21-10-1987
			EP	0388990 A2	26-09-1990
			JP	62258749 A	11-11-1987
			US	4888098 A	19-12-1989
			US	5007989 A	16-04-1991
			US	5049247 A	17-09-1991
			US	5019235 A	28-05-1991
			US	5074988 A	24-12-1991
			US	5045163 A	03-09-1991

INTERNATIONAL SEARCH REPORT

Information on patent family members

Interr il Application No
PCT/IB 02/03578

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0064325 A	02-11-2000	IT T0990320 A1	23-10-2000
		AU 4136100 A	10-11-2000
		AU 4600400 A	08-05-2001
		EP 1204364 A2	15-05-2002
		EP 1199973 A1	02-05-2002
		WO 0064325 A2	02-11-2000
		WO 0130229 A1	03-05-2001