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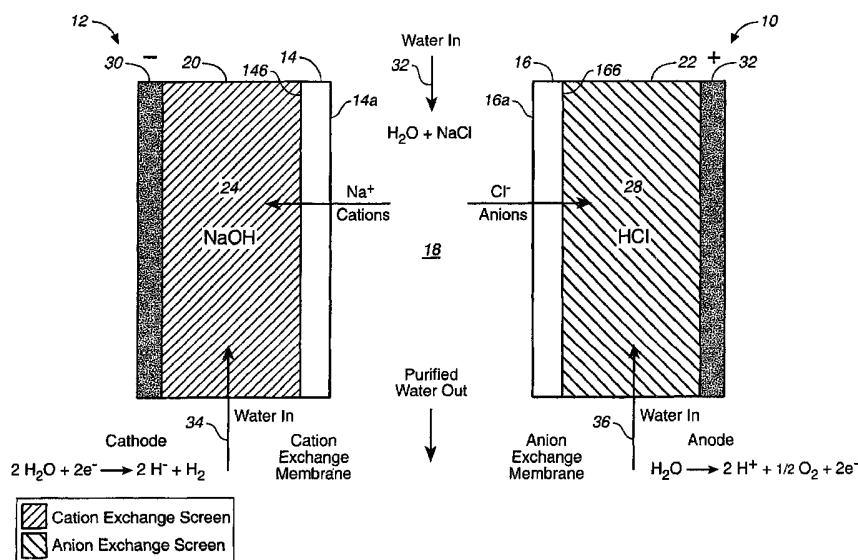
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Declaration under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,

[Continued on next page]

(54) Title: ELECTRODIALYTIC WATER PURIFIER WITH ION EXCHANGE MATERIAL AND METHOD FOR REMOVING IONIC CONTAMINANTS



(57) Abstract: An apparatus for removing charged contaminants from a water stream. The apparatus can be figured to provide the decontaminated water stream to an analytical system. Methods of use of the same are also disclosed. In one embodiment the apparatus comprises (a) a cation exchange membrane (14) and an anion exchange membrane (16), their walls (14a, 16a) defining a purifying flow channel (18) therebetween, (b) a cation chamber (20) defining a cation flow channel, (c) an anion chamber (22) defining an anion flow channel, (d) a cathode (30) and an anode (32), (e) flow-through first ion exchange medium (24) in the cation flow channel, (f) flow-through second ion exchange medium (28) in the anion flow channel, and (g) a zone within the purifying flow channel (18) free of flow-through ion exchange medium.



CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, 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, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, 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,

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INTERNATIONAL SEARCH REPORT

Internati Application No
PCT/US 03/07803

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C02F1/469 B01J47/08 B01D61/48

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 C02F B01J 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, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 41 35 166 A (IONICS ITALBA SPA) 7 May 1992 (1992-05-07)	1,6,7, 11,12, 17,21,22
Y	column 7, line 26 - line 37; figure 2 column 8, line 16 - line 21 ---	2,4,13, 15,25, 33,34
Y	US 4 148 708 A (GRANT PHILIP J) 10 April 1979 (1979-04-10) cited in the application column 3, line 39 - column 4, line 51; figure 1 ---	2,4,13, 15
X	EP 0 867 224 A (GLEGG WATER CONDITIONING INC ;ASAHI GLASS CO LTD (JP)) 30 September 1998 (1998-09-30)	23,24,31
Y	page 4, line 26 - line 32; figure 1 ---	25,33,34
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Further documents are listed in the continuation of box C.



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

14 November 2003

Date of mailing of the international search report

01.12.03

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INTERNATIONAL SEARCH REPORT

Internatic Application No
PCT/US 03/07803

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 197 13 977 A (ELGA GROUP SERVICES LTD) 30 October 1997 (1997-10-30) figure 1 -----	23, 26-28, 31,32

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 03/07803

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-11,12-22

The inventive idea is:

An apparatus and a method for purifying a water stream by removing charged contaminants comprising

- (a) a cation exchange membrane and an anion exchange membrane, their inner walls defining a purifying flow channel therebetween,
- (b) a cation chamber and (c) an anion chamber defining a cation flow channel and an anion flow channel, respectively,
- (d) a cathode and an anode,
- (e) first ion exchange medium in the cation flow channel and
- (f) second ion exchange medium in the anion flow channel, and
- (g) a zone within the purifying flow channel free of ion exchange medium or having ion exchange medium with a capacity no greater than 25% of the first and second ion exchange media.

2. Claims: 23-30,31-35

The inventive idea is:

An apparatus comprising

- (a) flow-through water purifier,
- (b) a pressurized source of impure water,
- (c) a pump,
- (d) a first conduit between the purifier outlet and the pump,
- (e) a splitter, having a diversion outlet, between the water source and the purifier inlet, or between the purifier outlet and the pump, and
- (f) a second conduit providing fluid communication between the diversion outlet and the purifier.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US 03/07803

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