

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

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
29 March 2012 (29.03.2012)

(10) International Publication Number
WO 2012/040335 A2

PCT

(51) International Patent Classification:

B01D 61/10 (2006.01) **B01D 61/02** (2006.01)
B01D 61/06 (2006.01)

(21) International Application Number:

PCT/US2011/052565

(22) International Filing Date:

21 September 2011 (21.09.2011)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/385,296 22 September 2010 (22.09.2010) US
PCT/US2010/054512
28 October 2010 (28.10.2010) US

(71) Applicant (for all designated States except US): **OASYS WATER, INC.** [US/US]; 21 Drydock Avenue - 7th Floor, Boston, MA 02210 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **MCGINNIS, Robert** [US/US]; 195 Binney Street, Apartment 1402, Cambridge, MA 02142 (US).

(74) Agent: **PALMER, Nicole, A.**; Lando & Anastasi LLP, Riverfront Office Park, One Main Street - Suite 1100, Cambridge, MA 02142 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,

CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, 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, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

- without international search report and to be republished upon receipt of that report (Rule 48.2(g))

(54) Title: OSMOTICALLY DRIVEN MEMBRANE PROCESSES AND SYSTEMS AND METHODS FOR DRAW SOLUTE RECOVERY

(57) Abstract: The invention relates to osmotically driven membrane processes and systems and methods for recovering draw solutes in the osmotically driven membrane processes. Osmotically driven membrane processes involve the extraction of a solvent from a first solution to concentrate solute by using a second concentrated solution to draw the solvent from the first solution across a semi-permeable membrane. Draw solute recovery may be carried out by various means including with the use of a membrane device. The draw solute recovery may also include the use of multi-stage solute recovery using distillation columns and/or membranes, where the recovery may be assisted by a heat pump.



WO 2012/040335 A2