

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
18 December 2008 (18.12.2008)

PCT

(10) International Publication Number  
**WO 2008/154654 A1**

(51) International Patent Classification:  
**C30B 15/14** (2006.01) **C30B 15/10** (2006.01)

(21) International Application Number:  
PCT/US2008/066865

(22) International Filing Date: 13 June 2008 (13.06.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/944,017 14 June 2007 (14.06.2007) US

(71) Applicant (for all designated States except US): **EVER-GREEN SOLAR, INC.** [US/US]; 138 Bartlett Street, Marlborough, MA 01752 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **WALLACE, Richard** [US/US]; 51 Nashoba Road, Acton, MA 01720 (US). **HARVEY, David** [US/US]; 19 North Street, Westford, MA 01886 (US). **HUANG, Weidong** [CA/US]; 9 Davis Road, Apt. C15, Acton, MA 01720 (US). **RE-ITSMA, Scott** [US/US]; 112 South Street, Shrewsbury,

MA 01545 (US). **RICHARDSON, Christine** [US/US]; 79 Chesterfield Road, Northborough, MA 01532 (US).

(74) Agents: **ASHER, Robert, M.** et al.; Bromberg & Sunstein, LLP, 125 Summer Street, Boston, MA 02110 (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, 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, 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.

(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,

[Continued on next page]

(54) Title: REMOVABLE THERMAL CONTROL FOR RIBBON CRYSTAL PULLING FURNACES

(57) Abstract: A ribbon crystal pulling furnace has a base insulation and a liner insulation removably connected to the base insulation. At least a portion of the liner insulation forms an interior for containing a crucible.

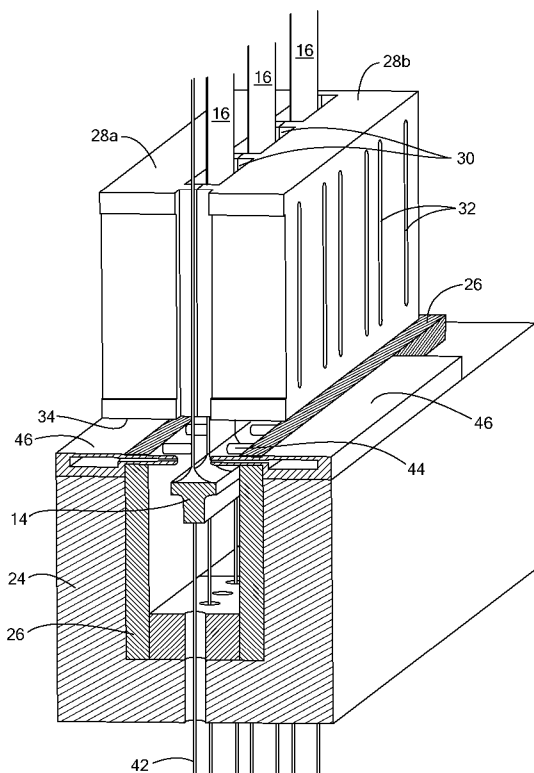


FIG. 3

WO 2008/154654 A1



FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL,  
NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG,  
CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— *with international search report*