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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
20 December 2012 (20.12.2012)

WIPO | PCT

(10) International Publication Number
WO 2012/174432 A3

(51) International Patent Classification:
H01L 21/673 (2006.01) *B65D 85/86* (2006.01)
H01L 31/18 (2006.01) *B65D 85/38* (2006.01)

(21) International Application Number:
PCT/US2012/042749

(22) International Filing Date:
15 June 2012 (15.06.2012)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/497,372 15 June 2011 (15.06.2011) US

(71) Applicant *(for all designated States except US)*: **ENTEGRIS, INC.** [US/US]; 129 Concord Road, Billerica, MA 01821 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **SMITH, Mark, V.** [US/US]; 4110 Bobbie Kay Place, Colorado Springs, CO 80908 (US). **BURNS, John** [US/US]; 6046 Bow River Drive, Colorado Springs, CO 80919 (US).

(74) Agents: **CHRISTENSEN, Douglas, J.** et al.; Patterson Thuente Christensen Pedersen, P.A., 4800 IDS Center, 80 South Eight Street, Minneapolis, MN 55402-2100 (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, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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).

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:
23 May 2013

(54) Title: SOLAR CELL PROCESS CARRIER

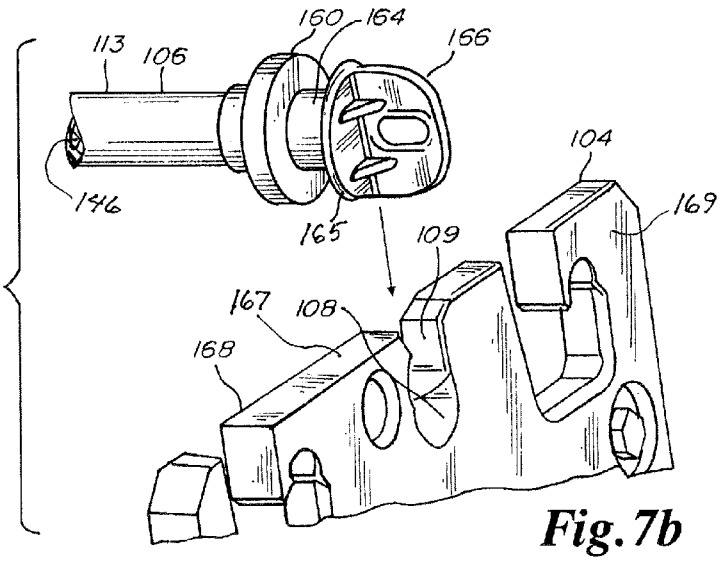


Fig. 7b

(57) Abstract: A process carrier for solar cells includes a plurality of supports configured as toothed rails extending between a pair of endwalls. Each cell support includes a plurality of teeth arranged in a row extending outwardly therefrom defining a solar cell receiving region with plurality of slots for containing cells. Toothed rails are connected to endwalls with connections having significant strength, high dimensional accuracy and that minimize potential leaks. Rigid structural support members of the rails, such as metal shafts, can be isolated from process fluids and can be totally encapsulated by chemical resistant polymers such as fluoropolymers by overmolding or other isolation means. End caps configured as fittings attach to receiving openings on the endwalls and an uppermost toothed rail can be inserted and removed and rotated to secure batches of cells in place for processing.

WO 2012/174432 A3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/042749

A. CLASSIFICATION OF SUBJECT MATTER

H01L 21/673(2006.01)i, H01L 31/18(2006.01)i, B65D 85/86(2006.01)i, B65D 85/38(2006.01)i

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)

H01L 21/673; H01L 21/68; B65D 85/48; B65D 85/38

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & keywords: carrier, substrate, toothed, shaft, secure, and fluoropolymer

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y A	KR 10-1032881 B1 (SANG-A FLONTEC CO., LTD.) 6 May 2011 See paragraphs [0024],[0026]-[0027],[0035] and figures 1,3-5.	8-10 1-7,11-26 27-35
Y	JP 07-273179 A (NIPPON VALQUA IND. LTD.) 20 October 1995 See paragraphs [0002],[0005],[0021] and figures 2-4.	1-7,11-26,32-34
X Y	KR 10-2010-0106132 A (EM-POWER CO., LTD.) 01 October 2010 See paragraphs [0019],[0021]-[0023],[0027]-[0030] and figures 1-3a,5,6a,8-10.	27-31,35 6-7,17,20-22,32-34
A	KR 10-1035552 B1 (SANG-A FLONTEC CO., LTD.) 23 May 2011 See abstract and figure 5.	1-35

☐ 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 application or patent 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 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
15 MARCH 2013 (15.03.2013)	**18 MARCH 2013 (18.03.2013)**

Name and mailing address of the ISA/KR

Facsimile No. 82-42-472-7140

Authorized officer

HWANG, Yun Koo

Telephone No. 82-42-481-5715

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/042749

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 10-1032881 B1	06.05.2011	None	
JP 07-273179 A	20.10.1995	None	
KR 10-2010-0106132 A	01.10.2010	None	
KR 10-1035552 B1	23.05.2011	WO 2012-128459 A2	27.09.2012