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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
3 May 2012 (03.05.2012)

PCT

(10) International Publication Number
WO 2012/058358 A1

(51) International Patent Classification:
H01L 31/02 (2006.01) *H01L 31/0224* (2006.01)

(21) International Application Number:
PCT/US2011/057963

(22) International Filing Date:
27 October 2011 (27.10.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/407,588 28 October 2010 (28.10.2010) US

(71) Applicant *(for all designated States except US)*: **FERRO CORPORATION** [US/US]; 6060 Parkland Boulevard, Mayfield Heights, OH 44124 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **YANG, Yi** [CN/US]; 17315 4S Ranch Parkway, San Diego, CA 92127 (US). **SHAIKH, Aziz, S.** [US/US]; 17790 Weaving Lane, San Diego, CA 92127 (US). **SRIDHARAN, Srinivasan** [US/US]; 14073 Pine Lakes Drive, Strongsville, OH 44136 (US).

(74) Agent: **CLARK, Kenneth, A.**; Rankin, Hill & Clark LLP, 23755 Lorain Road, Suite 200, North Olmsted, OH 44070 (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, 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).

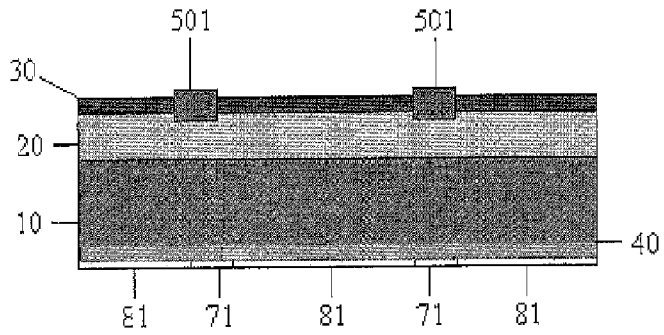
Published:

— *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))*

(54) **Title**: SOLAR CELL METALLIZATIONS CONTAINING METAL ADDITIVE

FIG. 1E



(57) **Abstract**: Paste compositions, methods of making a paste composition, and methods of making a solar cell contact are disclosed. The paste composition can contain silver, a glass frit, a metal additive and an organic vehicle system. The metal additive is at least one selected from the group consisting of yttrium, an organo- vanadium compound, organo-antimony compound, organo-phosphorus compound, and an organo-yttrium compound. The paste can be used for making a solar cell contact.

WO 2012/058358 A1