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(54) Title: REVERSE HETEROJUNCTIONS FOR SOLAR CELLS

(57) Abstract: In a solar cell having one or more subcells, at least one subcell is provided with a reverse heterojunction, the reverse heterojunction being formed with an emitter and an adjacent base, wherein the emitter has a band gap that is at least 10 meV lower than that of the adjacent base in order to reduce sheet resistance of the emitter and/or increase the subcell current with minimal effect on the open-circuit voltage. Because of the increase in current, the decrease in emitter sheet resistance, and relatively unchanged open-circuit voltage of the subcell, the efficiency of a solar cell employing one or more subcells with reverse heterojunctions is enhanced.

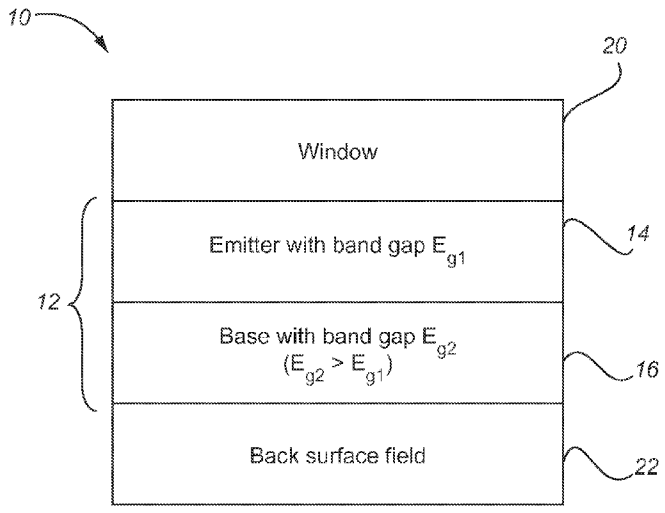


Figure 1

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— *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))*

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
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ADD.

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

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 practicable, search terms used)

EPO-Internal, 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	US 2012/031478 A1 (BOISVERT JOSEPH CHARLES [US] ET AL) 9 February 2012 (2012-02-09) abstract; figures 1,2,4; table 1 paragraphs [0002], [0007], [0008], [0015] - [0026], [0034], [0035], [0038], [0044]	1-8

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
25 February 2014	04/03/2014

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Sagol, Bülent Erol

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Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATTON M O ET AL: "Development of a high efficiency metamorphic triple-junction 2.1 eV/1.6 eV/1.2 eV AlGaInP/InGaAsP/InGaAs space solar cell", CONFERENCE RECORD OF THE IEEE PHOTOVOLTAIC SPECIALISTS CONFERENCE 2002 INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC. US; [IEEE PHOTOVOLTAIC SPECIALISTS CONFERENCE], CONFERENCE RECORD OF THE 29TH IEEE PHOTOVOLTAIC SPECIALISTS CONFERENCE - 200, vol. CONF. 29, 19 May 2002 (2002-05-19), pages 1027-1030, XP010666455, DOI: 10.1109/PVSC.2002.1190780 ISBN: 978-0-7803-7471-3 abstract; figure 3	1-3,6,8

X,P	ARTHUR B CORNFELD ET AL: "Evolution of a 2.05 eV AlGaInP top sub-cell for 5 and 6J-IMM applications", PHOTOVOLTAIC SPECIALISTS CONFERENCE (PVSC), 2012 38TH IEEE, IEEE, 3 June 2012 (2012-06-03), pages 2788-2791, XP032258388, DOI: 10.1109/PVSC.2012.6318171 ISBN: 978-1-4673-0064-3 the whole document	1-8

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2012031478 A1	09-02-2012	CA 2804222 A1	16-02-2012
		EP 2603934 A2	19-06-2013
		JP 2013533645 A	22-08-2013
		US 2012031478 A1	09-02-2012
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