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[Continued on next page]

(54) Title: TUNNELING-JUNCTION SOLAR CELL WITH COPPER GRID FOR CONCENTRATED PHOTOVOLTAIC APPLICATION

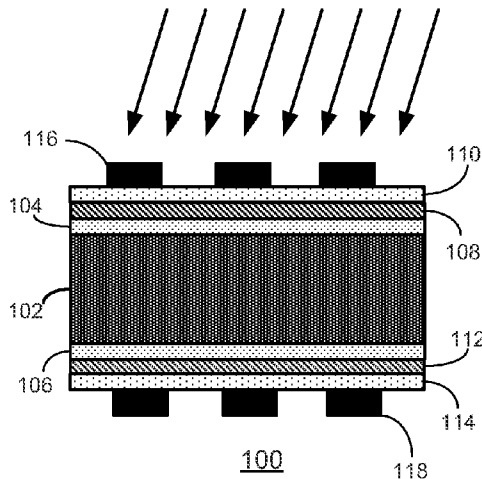
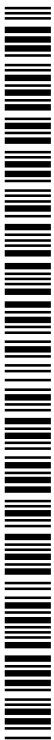


FIG. 1

(57) Abstract: One embodiment of the present invention provides a photovoltaic module. The photovoltaic module includes an optical concentrator and a tunneling-junction solar cell. The tunneling-junction solar cell includes a base layer, a quantum-tunneling-barrier (QTB) layer situated above the base layer, an emitter layer, a front-side electrode, and a back-side electrode.



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A. CLASSIFICATION OF SUBJECT MATTER**H01L 31/06(2006.01)i, H01L 31/042(2006.01)i, H01L 31/052(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 31/06; H01L 31/055; H01L 29/82; H01L 31/0236; H01L 31/18; H01L 31/0352

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: solar cell, grid, electrode, contact, quantum tunneling barrier, and the similar terms.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A A	WO 2011-005447 A2 (INTERNATIONAL BUSINESS MACHINES CORP.) 13 January 2011 See paragraphs [0004]-[0005], [0018], [0020], [0035], [0047]-[0049], and claim 23.	1-5, 7-10, 12-13, 15-21 6, 11, 14, 22
A	WO 2011-008881 A2 (SPECTRAWATT, INC.) 20 January 2011 See paragraphs [0024], [0030], [0042], [0043], [0088], [0097].	1-22
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A	WO 2009-150654 A2 (YISSUM RESEARCH DEVELOPMENT COMPANY et al.) 17 December 2009 See page 2, line 10 - page 22, line 10.	1-22

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

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"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

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