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[Continued on next page]

(54) **Title**: IMPROVED PHOTOVOLTAIC CELL ASSEMBLY

(57) **Abstract**: The present invention is premised upon an improved photovoltaic cell assembly that include at least plurality of photovoltaic cells with a photoactive portion with a top surface, a top collection structure on the top surface and an opposing conductive substrate layer on a side of the photoactive portion opposite the top surface. Also including a first conductive element with a first surface and wherein the first conductive element is bent at least once and wherein the first surface is in contact with the top collection structure and/or the top surface of a first photovoltaic ceil and the opposing conductive substrate layer of an adjacent second photovoltaic cell; further wherein at least a portion of the first surface is held in contact to the ceils by an adhesive.

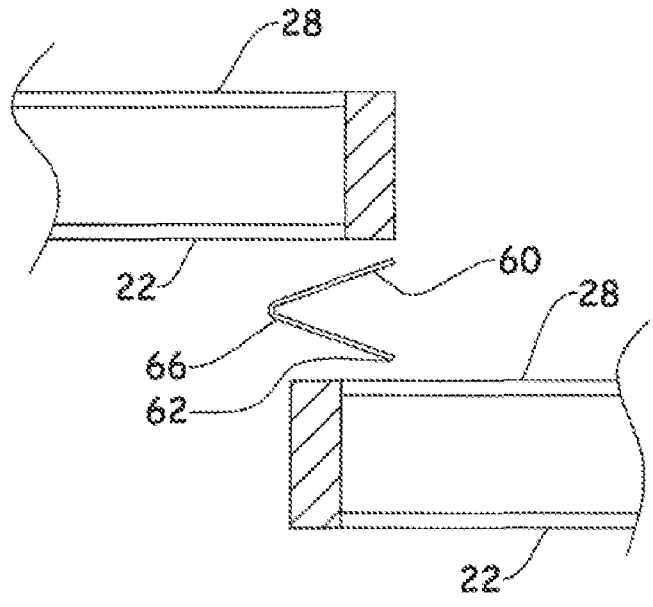


Fig. 3

WO 2012/033657 A3

TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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B. FIELDS SEARCHED

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H01L

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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	EP 1 868 250 A2 (MIASOLE [US]) 19 December 2007 (2007-12-19) abstract; figure 1 paragraph [0012] - paragraph [0014] paragraph [0037] -----	1,3-15
X	US 2005/257823 A1 (ZWANENBURG ROBERT [NL]) 24 November 2005 (2005-11-24) abstract; figures 1-11,14 paragraph [0001] - paragraph [0014] paragraph [0055] -----	1-15
X	US 3 553 030 A (LEBRUN JEAN) 5 January 1971 (1971-01-05) abstract; figures 1-10 -----	1,3-15
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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
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 391 235 A (INOUE YUJI [JP]) 21 February 1995 (1995-02-21) abstract; figures 25-27 -----	1,15
A	US 2010/218799 A1 (STEFANI FRANCO [IT]) 2 September 2010 (2010-09-02) abstract; figures 2-7 -----	1,15

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2011/049485

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1868250 A2	19-12-2007	AT 543219 T	15-02-2012
		EP 1868250 A2	19-12-2007
US 2005257823 A1	24-11-2005	EP 1598874 A1	23-11-2005
		US 2005257823 A1	24-11-2005
US 3553030 A	05-01-1971	BE 723804 A	13-05-1969
		DE 1807818 A1	26-06-1969
		ES 360195 A1	16-10-1970
		FR 1552078 A	03-01-1969
		GB 1246837 A	22-09-1971
		NL 6816001 A	19-05-1969
		SE 338378 B	06-09-1971
		US 3553030 A	05-01-1971
US 5391235 A	21-02-1995	NONE	
US 2010218799 A1	02-09-2010	AU 2007360045 A1	16-04-2009
		CN 101641800 A	03-02-2010
		EP 2195855 A1	16-06-2010
		US 2010218799 A1	02-09-2010
		WO 2009047815 A1	16-04-2009