

(43) International Publication Date
12 November 2009 (12.11.2009)

PCT

(10) International Publication Number
WO 2009/136251 A3(51) International Patent Classification:
H01L 31/18 (2006.01)(21) International Application Number:
PCT/IB2009/005476(22) International Filing Date:
4 May 2009 (04.05.2009)

(25) Filing Language: Italian

(26) Publication Language: English

(30) Priority Data:
TO2008A000332 5 May 2008 (05.05.2008) IT(71) Applicant (for all designated States except US):
SOLTECHNA S.R.L. [IT/IT]; Corso Francia, 3/bis, I-Mondovì (IT).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **CARCANGIU, Giacomo** [IT/IT]; Via Ciusa, 1, I-08030 Sadali (IT).(74) Agent: **JORIO, Paolo**; c/o Studio Torta S.r.l., Via Viotti, 9, I-10121 Torino (IT).

(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, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (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, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: METHOD AND SYSTEM FOR ELECTRICALLY CONNECTING PHOTOVOLTAIC CELLS TOGETHER

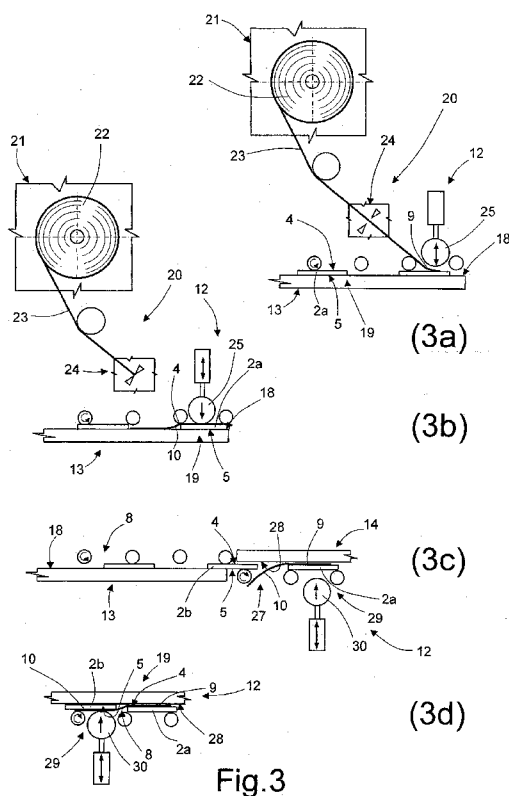


Fig. 3

(57) Abstract: A method and a system (12) for electrically connecting photovoltaic cells (2) together, whereby, in an orderly succession of photovoltaic cells set with equi-oriented polarities and fed along a path (15) of electrical connection, a first photovoltaic cell (2a) is electrically connected to a second adjacent photovoltaic cell (2b) by soldering a first stretch (9) of an elongated electrical connection element (8) to a first extensive surface (4) of the first photovoltaic cell (2a), allowing a second stretch (10) of the elongated element (8) to project in cantilever fashion along the connection path (15), setting the second photovoltaic cell (2b) on top of the second stretch (10) of the elongated element (8), and soldering the second stretch (10) to a second extensive surface (5) of the second photovoltaic cell (2b), which has a polarity different from that of the first extensive surface (4).

**Published:****(88) Date of publication of the international search report:**

22 April 2010

- *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))*

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2009/005476

A. CLASSIFICATION OF SUBJECT MATTER

INV. H01L31/18

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 practical, 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 4 430 519 A (YOUNG WALTER M [US]) 7 February 1984 (1984-02-07) column 2, line 48 - column 4, line 68; figures 4,7,8A-8D,9A,9B,11	1-4,9-13
A	DE 10 2006 034492 A1 (TEAMTECHNIK MASCHINEN UND ANLA [DE]; SOLAR FACTORY GMBH [DE]) 31 January 2008 (2008-01-31) the whole document	1-13
A	JP 2000 022188 A (NPC CORP) 21 January 2000 (2000-01-21) abstract; figure all	1-13

☐ 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 document 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 another 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

1 December 2009

Date of mailing of the international search report

08/03/2010

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Melodia, Andrea

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2009/005476

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-13

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-13

A method for connecting photovoltaic cells electrically together according to claim 1, further characterised by the way the superposition of the second photovoltaic cell on the second stretch of the connection element is made.
A system for connecting photovoltaic cells electrically together according to claim 13.

2. claims: 1, 7-8, 13-16

A method for connecting photovoltaic cells electrically together according to claim 1, further characterized in that feeding of said photovoltaic cells along said path comprises the operations of feeding the photovoltaic cells in contact with a first resting surface and subsequently in contact with a second surface of contrast so that they are set on opposite sides of said path and at a distance apart from one another in a transverse direction; at least the electrical connection of said first stretch of said elongated element to said first extensive surface being made by bringing said first photovoltaic cell into contact with said first contrast surface, and the superposition of said second photovoltaic cell to said second stretch of said elongated element being made after said first photovoltaic cell has disengaged said first surface of contrast.

A system for connecting photovoltaic cells electrically together according to claim 13, further characterized in that said feed means comprise a first contrast surface and a second contrast surface of said photovoltaic cells; said contrast surfaces being set on opposite lateral sides of said path and extending parallel to one another.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2009/005476

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4430519	A	07-02-1984	AU 1412983 A	01-12-1983
			EP 0095843 A2	07-12-1983
			JP 58219779 A	21-12-1983
DE 102006034492	A1	31-01-2008	NONE	
JP 2000022188	A	21-01-2000	JP 4240587 B2	18-03-2009