

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
13 February 2003 (13.02.2003)

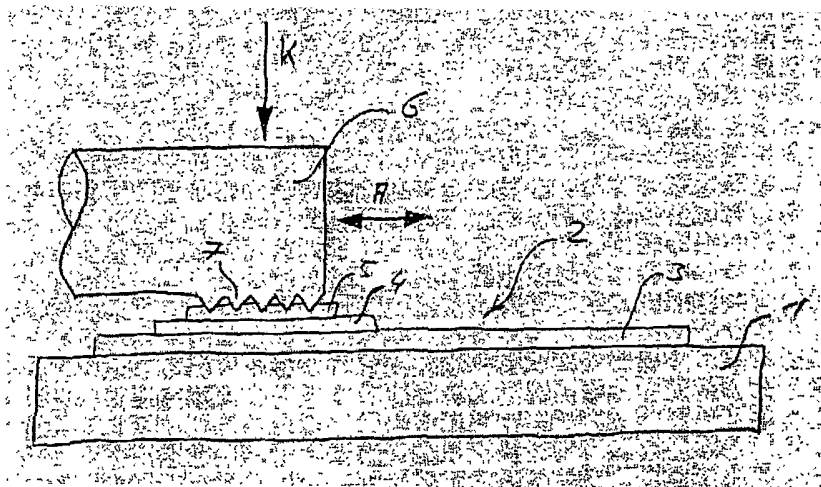
PCT

(10) International Publication Number
WO 2003/012883 A3

- (51) International Patent Classification⁷: **H01L 31/18**, 31/02
- (74) Agent: ZEESTRATEN, Albertus, Wilhelmus, Joannes; Shell International B.V., Intellectual Property Services, P.O. Box 384, NL-2501 CJ The Hague (NL).
- (21) International Application Number: PCT/EP2002/008638
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (22) International Filing Date: 2 August 2002 (02.08.2002)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 101 37 778.9 2 August 2001 (02.08.2001) DE
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (71) Applicant (*for all designated States except US*): SHELL SOLAR GMBH [DE/DE]; Otto Hahn Ring 6, 81739 München (DE).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): KARG, Franz [DE/DE]; Bad Kissingen Strasse 42, 81671 München (DE). SCHNEIDER, Heinz-Ingo [DE/DE]; Rossinistrasse 13, 85598 Baldham (DE). VOGT, Helmut [DE/DE]; Knorrstrasse 83b, 80807 München (DE).
- Published:
— with international search report
- (88) Date of publication of the international search report: 12 February 2004

[Continued on next page]

(54) Title: METHOD FOR CONTACTING THIN-FILM ELECTRODES



(57) Abstract: With thin-film components, in particular thin-film solar modules, conductive layers (4) are contacted with a metal strip (5) by ultrasonic welding according to the invention. For that purpose, a sonotrode (6) is set onto the metal strip (5) laid upon the conductive layer (4) with a contact force. Subsequently, the sonotrode (6) is oscillated and the conductive layer (4) is bonded with the metal strip (5).



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 02/08638

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01L31/18 H01L31/02

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)

IPC 7 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)

PAJ, EPO-Internal, INSPEC, 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 4 975 133 A (GOCHERMANN HANS) 4 December 1990 (1990-12-04) cited in the application	1-15
Y	claims 1,14; figure 2 ---	16,17
X	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 04, 31 August 2000 (2000-08-31) & JP 2000 004034 A (YAZAKI CORP), 7 January 2000 (2000-01-07)	1-15
Y	abstract ---	16,17
X	US 5 580 509 A (VAN DEN BERG ROBERT ET AL) 3 December 1996 (1996-12-03)	1-15
Y	column 3, line 47 -column 4, line 60; claim 4; figures ---	16,17
	--- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in 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

16 May 2003

Date of mailing of the international search report

26/05/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Wolff, G

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 02/08638

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 336 648 A (PSCHUNDER WILLI ET AL) 29 June 1982 (1982-06-29)	1-15
Y	column 3, line 6 -column 4, line 17; claim 2	16,17
A	US 3 620 847 A (WISE JOSEPH F) 16 November 1971 (1971-11-16) cited in the application column 2, line 16-69	1-17
Y	US 5 525 172 A (CADIOU JAMES) 11 June 1996 (1996-06-11) claim 1	16,17
Y	US 4 473 432 A (LEADER HAROLD ET AL) 25 September 1984 (1984-09-25) figures 10-12	16,17
A	US 5 626 276 A (LO JIANN-CHANG ET AL) 6 May 1997 (1997-05-06) column 10, line 56-65	1-17

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 02/08638

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4975133	A	04-12-1990	DE 3147255 A1 FR 2517232 A1	23-06-1983 03-06-1983
JP 2000004034	A	07-01-2000	NONE	
US 5580509	A	03-12-1996	DE 4340402 A1 FR 2713018 A1 IT MI942348 A1	01-06-1995 02-06-1995 26-05-1995
US 4336648	A	29-06-1982	DE 2944185 A1 FR 2469004 A1 GB 2062351 A , B JP 56093377 A	07-05-1981 08-05-1981 20-05-1981 28-07-1981
US 3620847	A	16-11-1971	NONE	
US 5525172	A	11-06-1996	DE 68926959 D1 DE 68926959 T2 EP 0404777 A1	19-09-1996 06-02-1997 02-01-1991
US 4473432	A	25-09-1984	NONE	
US 5626276	A	06-05-1997	NONE	