



- (51) International Patent Classification:
G01J 3/02 (2006.01) G01J 3/44 (2006.01)
G01J 3/28 (2006.01) G01N 21/65 (2006.01)
- (21) International Application Number:
PCT/US2011/043986
- (22) International Filing Date:
14 July 2011 (14.07.2011)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
61/366,414 21 July 2010 (21.07.2010) US
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- (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, CL, 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, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, 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, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: TEMPERATURE-ADJUSTED SPECTROMETER

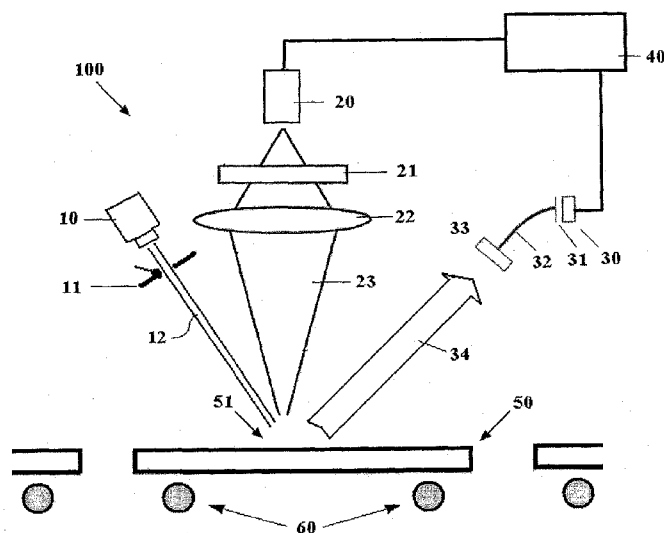


FIG.2

(57) Abstract: A temperature-adjusted spectrometer includes a light source, a temperature sensor and a spectral analyzer. The light source is configured to direct light along a light path through a first lens toward a substrate position in the process chamber; the spectral analyzer is configured to receive light scattered from a material sample in sample area on a substrate located at the substrate position in the process chamber; and the temperature measurement device is configured to measure the temperature of a material sample on a substrate located at the substrate position in the process chamber. Further, the spectrum is corrected by means the measured temperature by a calibration module to provide a temperature-adjusted spectrum.

WO 2012/012258 A3



Published:

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

15 March 2012

- *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/US2011/043986

A. CLASSIFICATION OF SUBJECT MATTER
 INV. G01J3/02 G01J3/28 G01J3/44 G01N21/65
 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)
 G01J G01N

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 5 002 631 A (GIAPIS KONSTANTINOS P [US] ET AL) 26 March 1991 (1991-03-26) column 3, line 4 - line 8 column 4, line 11 - line 58 -----	1-20, 22-26, 29-31, 36-41, 43,47-52
X	RO 122 614 B1 (UNIV TEFAN CEL MARE DIN SUCEAV [RO]) 30 September 2009 (2009-09-30) page 2, line 43 - page 3, line 7 -----	1,20

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

11 October 2011

Date of mailing of the international search report

23/01/2012

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/043986

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.:
1-20, 22-26, 29-31, 36-41, 43, 47-52

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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2011/043986

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5002631	A	26-03-1991	EP 0445981 A2 11-09-1991
			JP 2948930 B2 13-09-1999
			JP 4218914 A 10-08-1992
			US 5002631 A 26-03-1991

RO 122614	B1	30-09-2009	NONE

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-20, 22-26, 29-31, 36-41, 43, 47-52

A spectrometer having a spectral analyzer and a temperature sensor, wherein a lens directs light radiated from the sample toward the temperature sensor.

2. claims: 21, 27, 28, 32-34, 42

A spectrometer having a spectral analyzer and a temperature sensor, wherein a calibration table is used in order to adjust the spectrum by means of the measured temperature.

3. claim: 35

A photovoltaic device having a substrate and an absorber material.

4. claims: 44-46

A spectrometer for use in a process chamber having a spectral analyzer and a temperature sensor, wherein further specific optical analysis apparatuses are provided.
