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Published:

— *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))*

[Continued on next page]

(54) Title: DETERMINATION OF CD AND MD VARIATIONS FROM SCANNING MEASUREMENTS OF A SHEET OF MATERIAL

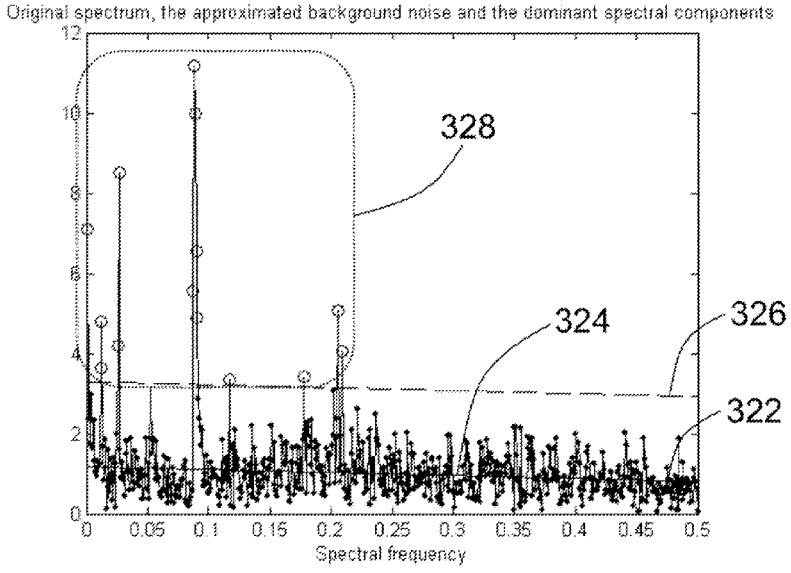


Fig. 21

(57) Abstract: The system of the present application determines cross-machine direction (CD) variations and/or machine direction (MD) variations within scan measurements of material being measured based on spectral components of power spectra of scan measurements taken using two or more scanning speeds. Dominant spectral components having the same spatial frequencies are used to identify CD variations and dominant spectral components having the same temporal frequencies are used to identify MD variations. Dominant spectral components can be extracted from a power spectrum of noisy measurements by sorting all spectral components of a power spectrum to form a first ordered power spectrum. Background noise of the ordered power spectrum is represented by a first polynomial with a first threshold being set with respect to the first polynomial. Spectral components of the ordered power that exceed the first threshold are removed from the ordered power spectrum to form a noise power spectrum. The noise power spectrum in the power spectrum is represented by a second polynomial and a second threshold is set with respect to the second polynomial. Spectral components of the power spectrum that exceed the second threshold are identified as dominant spectral components of the power spectrum.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
INV. D21G9/00 G01N21/89 G01N33/34
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)
D21G G01N G01F G06F

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 practicable, 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.
A	EP 1 665 981 A1 (GEN ELECTRIC [US]) 7 June 2006 (2006-06-07) paragraph [0018] - paragraph [0020] paragraph [0033] - paragraph [0041] -----	1,9
A	US 4 910 688 A (AMINI JUNIS [CA]) 20 March 1990 (1990-03-20) column 1, line 6 - column 2, line 36 column 3, line 41 - column 30; figures 1, 3 column 6, line 46 - line 62 -----	1,9

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[X] Further documents are listed in the continuation of Box C.

[X] 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 application or patent 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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 October 2012	19/10/2012

Name and mailing address of the ISA/	Authorized officer
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Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	"Spectral density estimation", Wikipedia , 25 February 2008 (2008-02-25), XP002679604, Retrieved from the Internet: URL:http://web.archive.org/web/20080303134910/http://en.wikipedia.org/wiki/Spectral_density_estimation [retrieved on 2008-03-03] the whole document	1,9
A	EP 1 768 108 A1 (MATSUSHITA ELECTRIC IND CO LTD [JP]) 28 March 2007 (2007-03-28) paragraph [0017] - paragraph [0019] paragraph [0031] - paragraph [0035]	13,14
A	US 2011/082692 A1 (LIM HYUNG JOON [KR] ET AL) 7 April 2011 (2011-04-07) paragraph [0002] - paragraph [0016] paragraph [0051] - paragraph [0061]; figures 2, 3	13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/035385

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.:

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: 1-12

   claims relating to a process for determining CD and MD variations from scanning measurements made of a sheet of material

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2. claims: 13, 14

   claims relating to a process for extracting dominant spectral components from a power spectrum of noisy measurements

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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