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 13/413,521 6 March 2012 (06.03.2012) US</p> <p>(71) Applicant <i>(for all designated States except US):</i> KLA-TENCOR CORPORATION [US/US]; Legal Department, One Technology Drive, Milpitas, CA 95035 (US).</p> <p>(72) Inventors; and
 (75) Inventors/Applicants <i>(for US only):</i> WOLTERS, Christian [US/US]; 5073 Shady Avenue, San Jose, CA 95129 (US). REICH, Juergen [DE/US]; 2221 Wren Way, Campbell, CA 95008 (US).</p> | <p>(74) Agent: MCANDREWS, Kevin; KLA-Tencor Corp., Legal Department, One Technology Drive, Milpitas, CA 95035 (US).</p> <p>(81) Designated States <i>(unless otherwise indicated, for every kind of national protection available):</i> 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, QA, RO, RS, RU, RW, 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).</p> <p>(84) Designated States <i>(unless otherwise indicated, for every kind of regional protection available):</i> ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, 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,</p> |
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[Continued on next page]

(54) Title: SURFACE SCANNING INSPECTION SYSTEM WITH INDEPENDENTLY ADJUSTABLE SCAN PITCH

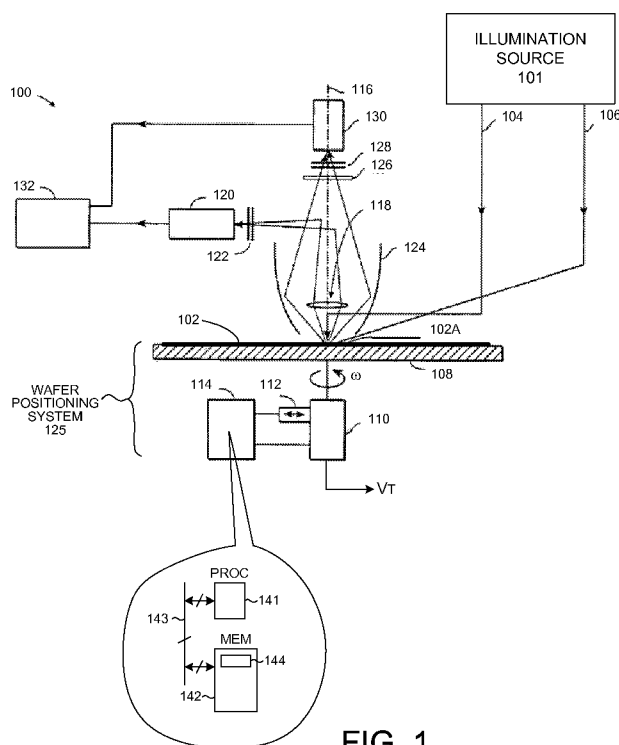


FIG. 1

(57) Abstract: A surface scanning wafer inspection system with independently adjustable scan pitch and associated methods of operation are presented. The scan pitch may be adjusted independently from an illumination area on the surface of a wafer. In some embodiments, scan pitch is adjusted while the illumination area remains constant. For example, defect sensitivity is adjusted by adjusting the rate of translation of a wafer relative to the rate of rotation of the wafer without additional optical adjustments. In some examples, the scan pitch is adjusted to achieve a desired defect sensitivity over an entire wafer. In other examples, the scan pitch is adjusted during wafer inspection to optimize defect sensitivity and throughput. In other examples, the scan pitch is adjusted to maximize defect sensitivity within the damage limit of a wafer under inspection.



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A. CLASSIFICATION OF SUBJECT MATTER***H01L 21/66(2006.01)i***

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 21/66; G01N 13/10; H01J 37/20; G01N 21/88; G06K 9/00; G21K 5/10

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: wafer, inspection, illumination, position, scan, pitch, motion

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2000-260376 A (JEOL LTD et al.) 22 September 2000 See paragraphs[0007], [0051]-[0052] claim 1 fig. 10	1-23
A	US 2009-0224180 A1 (AIGNER ROBERT) 10 September 2009 See paragraphs[0025]-[0027] claim 34 fig. 1a	1-23
A	US 2004-0076322 A1 (AVISHAY GUETTA) 22 April 2004 See paragraph[0013] claim 1 fig. 1	1-23



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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"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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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2000-260376 A	22.09.2000	JP 3652912 B2	25.05.2005
US 2009-0224180 A1	10.09.2009	DE 112006003970 T5	30.07.2009
		KR 10-1106815 B1	19.01.2012
		WO 2008-011903 A1	31.01.2008
US 2004-0076322 A1	22.04.2004	US 7286697 B2	23.10.2007