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[Continued on next page]

(54) Title: METHODS AND APPARATUS FOR OPTIMIZATION OF INSPECTION SPEED BY GENERATION OF STAGE SPEED PROFILE AND SELECTION OF CARE AREAS FOR AUTOMATED WAFER INSPECTION

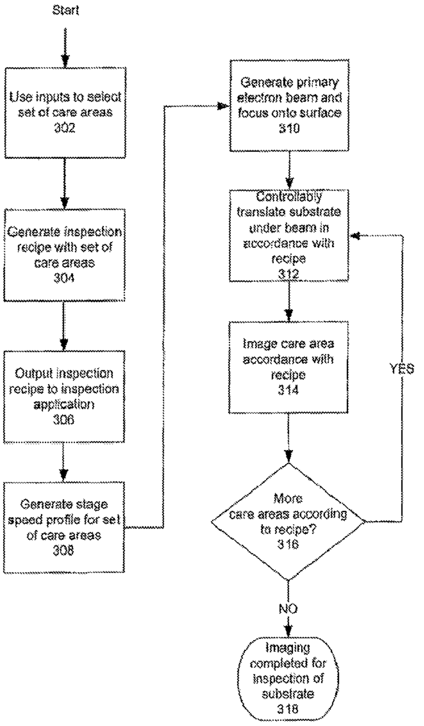

FIG. 3 300

(57) Abstract: Disclosed are apparatus and methods for the generation of a stage speed profile and/or the selection of care areas for automated wafer inspection. The stage speed profile generated corresponds to a fastest speed the inspection machine is able to inspect provided a set of care areas. The set of care areas selected correspond to specific regions on the wafer which are to be imaged in detail by the inspection machine. The apparatus and methods herein may also calculate speed of inspection and coverage (and possibly other characteristics of the inspection) for a quantity of cases, and select the best trade-off of coverage versus inspection time using a cost function. Other aspects, features, and embodiments of the invention are also disclosed.

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
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eKOMPASS(KIPO internal) & Keywords: inspection,beam,scan,speed,optimization,area,profile

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	US 2003-0063792 A1 (TAKASHI HIROI et al.) 03 April 2003 See abstract; figure 7; paragraphs [0030]-[0031]	1 2-18
Y X A	JP 2009-042055 A (TOSHIBA CORP) 26 February 2009 See abstract; figures 2-5; paragraphs [0023]-[0043]	1 9 2-8,10-18
A	US 2010-0211202 A1 (CHOU CHIEN-HUNG et al.) 19 August 2010 See figure 2; paragraphs [0030]-[0032]	1-18
A	US 2005-0033528 A1 (TOTH GABOR D. et al.) 10 February 2005 See figure 3; paragraphs [0042]-[0043], [0048]-[0049]	1-18

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003-0063792 A1	03.04.2003	JP 03-493312 B2	14.11.2003
		JP 04-006119 B2	14.11.2007
		JP 04-035242 B2	16.01.2008
		JP 04-041630 B2	30.01.2008
		JP 04-206192 B2	07.01.2009
		JP 04-677701 B2	10.02.2011
		JP 2000-161932 A	16.06.2000
		JP 2000-161948 A	16.06.2000
		JP 2000-162143 A	16.06.2000
		JP 2000-164661 A	16.06.2000
		JP 2000-193594 A	14.07.2000
		JP 2000-228430 A	15.08.2000
		JP 2002-148027 A	22.05.2002
		JP 2003-106829 A	09.04.2003
		JP 2005-181347 A	07.07.2005
		JP 2007-281500 A	25.10.2007
		JP 3493312 B2	03.02.2004
		JP 4677701 B2	27.04.2011
		US 2001-0011706 A1	09.08.2001
		US 2001-0015805 A1	23.08.2001
		US 2001-0019411 A1	06.09.2001
		US 2001-0021019 A1	13.09.2001
		US 2001-0021020 A1	13.09.2001
		US 2002-0054703 A1	09.05.2002
		US 2002-0057831 A1	16.05.2002
		US 2002-0105648 A1	08.08.2002
		US 2002-0109088 A1	15.08.2002
		US 2002-0113967 A1	22.08.2002
		US 2003-0058444 A1	27.03.2003
		US 2003-0062487 A1	03.04.2003
		US 2007-0131877 A9	14.06.2007
		US 2007-0269101 A1	22.11.2007
		US 2008-0056559 A1	06.03.2008
		US 2008-0063257 A1	13.03.2008
		US 2010-0246933 A9	30.09.2010
		US 6388747 B2	14.05.2002
		US 6421122 B2	16.07.2002
		US 6476913 B1	05.11.2002
		US 6480279 B2	12.11.2002
		US 6493082 B2	10.12.2002
		US 6504609 B2	07.01.2003
		US 6567168 B2	20.05.2003
		US 6759655 B2	06.07.2004
		US 6903821 B2	07.06.2005
		US 6919564 B2	19.07.2005
		US 7049587 B2	23.05.2006
		US 7133550 B2	07.11.2006
		US 7266235 B2	04.09.2007
		US 7457453 B2	25.11.2008

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/US2012/028347

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 7894658 B2	22.02.2011
		US 7957579 B2	07.06.2011
JP 2009-042055 A	26.02.2009	US 2009-0046280 A1	19.02.2009
		US 7742162 B2	22.06.2010
US 2010-0211202 A1	19.08.2010	TW 201030875 A	16.08.2010
US 2005-0033528 A1	10.02.2005	JP 04-722038 B2	15.04.2011
		JP 2006-525523 A	09.11.2006
		JP 4722038 B2	13.07.2011
		US 6952653 B2	04.10.2005
		WO 2004-097903 A2	11.11.2004
		WO 2004-097903 A3	11.11.2004