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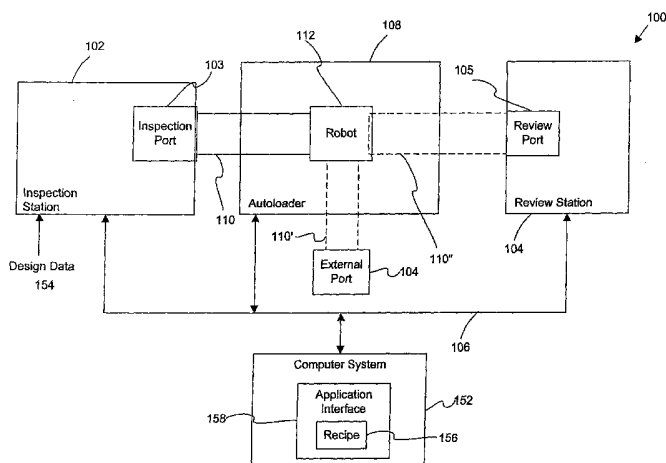
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[Continued on next page]

(54) Title: SINGLE TOOL DEFECT CLASSIFICATION SOLUTION



(57) Abstract: Methods and apparatus for efficiently analyzing defects in-line on a wafer by wafer basis are provided. In general terms, embodiments of the present invention provide a simple interface (158, 500) for setting up the entire inspection and defect analysis process in a single set up procedure. In one embodiment, an apparatus for analyzing defects on specimens (100) is disclosed. The apparatus includes an inspection station for inspecting a specimen for potential defects (102) and a review station for analyzing a sample of the potential defects to determine a classification of such potential defects (104). The apparatus further includes a computer system (152) having an application interface (158, 500) operable to allow a user to set up the inspection station and the review station during a same setup phase so as to allow the inspection station and the review station to then operate automatically to provide defect information for one or more specimens based on the user set up. Techniques for using such apparatus are also disclosed.



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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/US04/13642

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 19/00; G06K 9/00

US CL : 702/35, 83, 84; 382/149, 145; 700/110

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)

U.S. : 702/35, 83, 84; 382/149, 145; 700/110

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)
NPL, Online

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,324,298 B1 (O'Dell et al.) 27 November 2001 (27.11.2001), column 7, lines 47-67 and column 8, lines 1-52.	1, 2, 4, 9-13, 15-23
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Y	Rehani et al., An Automated Recipe-Based Defect Analysis System for ASICs, SEMICON 1999, Pages 40-43	3, 5-8, 14

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

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"P" document published prior to the international filing date but later than the priority date claimed

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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

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/13642

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim 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. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

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 fee, this Authority did not invite payment of any additional fee.
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.

No protest accompanied the payment of additional search fees.