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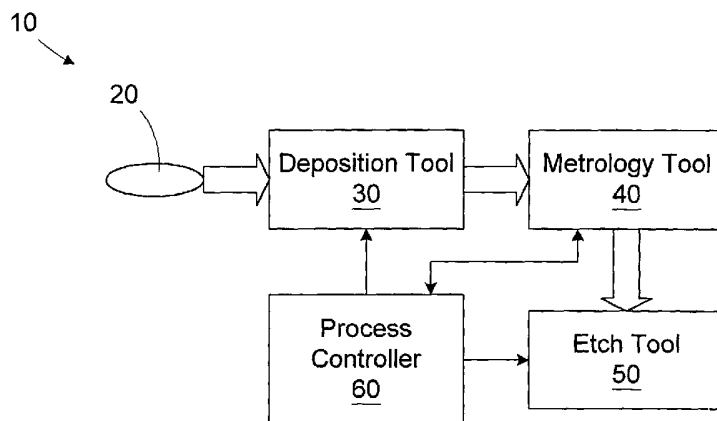
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(54) Title: METHOD AND APPARATUS FOR MODELING THICKNESS PROFILES AND CONTROLLING SUBSEQUENT ETCH PROCESS



(57) Abstract: A processing line (10) includes a deposition tool (30), a metrology tool (40), an etch tool (50), and a process controller (60). The deposition tool (30) is adapted to form a process layer on a plurality of wafers. The metrology tool (40) is adapted to measure the thickness of the process layer for a sample of the wafers. The etch tool (50) is adapted to etch the process layer in accordance with an operating recipe. The process controller (60) is adapted to store a thickness profile model of the deposition tool (30), generate predicted process layer thicknesses for the wafers not measured by the metrology tool (40) based on the process layer thickness measurements of the wafers in the sample and the thickness profile model, and modify the operating recipe of the etch tool (50) based on the predicted process layer thicknesses. A method for controlling wafer uniformity includes storing a thickness profile model of a deposition tool (30); depositing a process layer on a plurality of wafers in the deposition tool (30); measuring the thickness of the process layer for a sample of the wafers; generating predicted process layer thicknesses for the wafers not measured based on the process layer thickness measurements and the thickness profile model; and etching the process layer in an etch tool (50) in accordance with an operating recipe, the operating recipe being based on the predicted process layer thicknesses.



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## INTERNATIONAL SEARCH REPORT

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7 H01L21/66												
According to International Patent Classification (IPC) or to both national classification and IPC												
<b>B. FIELDS SEARCHED</b>												
Minimum documentation searched (classification system followed by classification symbols) IPC 7 H01L												
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, PAJ, IBM-TDB, INSPEC												
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>												
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.										
Y	US 4 571 685 A (KAMOSHIDA MOTOTAKA) 18 February 1986 (1986-02-18) the whole document ---	1,6										
Y	US 5 966 312 A (CHEN VINCENT MING CHUN) 12 October 1999 (1999-10-12) the whole document ---	1,6										
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<input type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.												
° Special categories of cited documents : <table border="0"> <tr> <td>*A* document defining the general state of the art which is not considered to be of particular relevance</td> <td>*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</td> </tr> <tr> <td>*E* earlier document but published on or after the international filing date</td> <td>*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</td> </tr> <tr> <td>*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)</td> <td>*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.</td> </tr> <tr> <td>*O* document referring to an oral disclosure, use, exhibition or other means</td> <td>*&amp;* document member of the same patent family</td> </tr> <tr> <td>*P* document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table>			*A* document defining the general state of the art which is not considered to be of particular relevance	*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	*E* earlier document but published on or after the international filing date	*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	*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)	*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.	*O* document referring to an oral disclosure, use, exhibition or other means	*&* document member of the same patent family	*P* document published prior to the international filing date but later than the priority date claimed	
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Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer <b>Prohaska, G</b>										

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Information on patent family members

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