(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
4 March 2004 (04.03.2004)

PCT

(10) International Publication Number
WO 2004/019403 A3

(51) International Patent Classification[7]: H01L 21/762

(21) International Application Number:
PCT/IB2003/004029

(22) International Filing Date: 26 August 2003 (26.08.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
02/10588 26 August 2002 (26.08.2002) FR
60/431,930 9 December 2002 (09.12.2002) US

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(81) Designated States *(national)*: CN, JP, KR, SG, US.

(84) Designated States *(regional)*: European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).

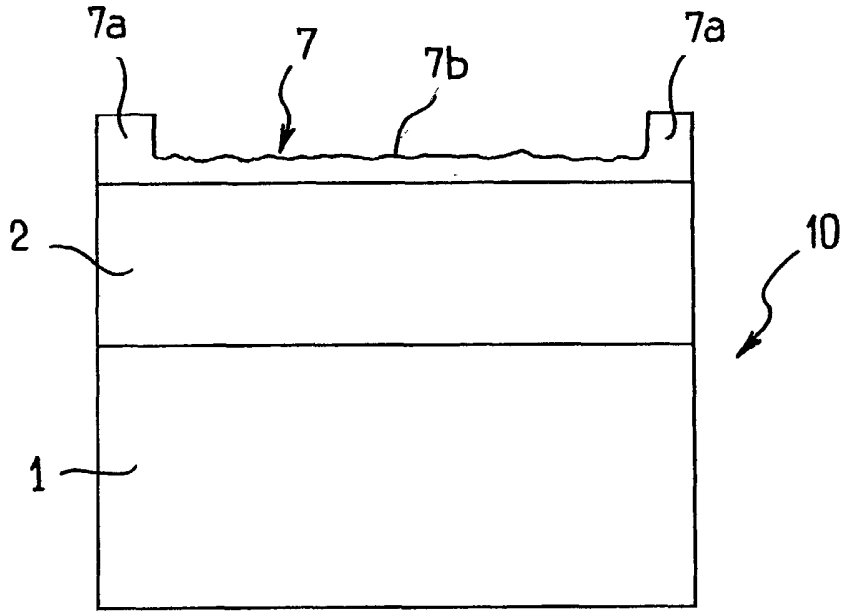
Declaration under Rule 4.17:
— *of inventorship (Rule 4.17(iv)) for US only*

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:
12 August 2004

[Continued on next page]

(54) Title: MECHANICAL RECYCLING OF A WAFER COMPRISING A BUFFER LAYER, AFTER HAVING TAKEN A LAYER THEREFROM



(57) Abstract: Method of recycling a donor wafer (10) after taking off at least one useful layer, the donor wafer (10) comprising successively a substrate (1), a buffer structure (I) and, before taking-off, a useful layer. The method comprsises employing mechanical means to remove part of the donor wafer (10) on the side where the taking-off took place, such that, after removal of substance, there remains at least part of the buffer structure (I) capable of being reused as at least part of a buffer structure (I) during a subsequent taking-off of a useful layer. The present document also relates to: a) methods of taking off a thin layer from a donor wafer (10) which can be recycled according to the invention; b) donor wafers (10) which can be recycled according to the invention.

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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/IB 03/04029

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01L21/762

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)
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)
PAJ, EPO-Internal, WPI Data, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/072130 A1 (FITZGERALD EUGENE A ET AL) 13 June 2002 (2002-06-13) the whole document	1-5, 8-10, 24-26, 28-33
X	EP 0 955 671 A (SHINETSU HANDOTAI KK) 10 November 1999 (1999-11-10) the whole document	1-7,10, 24-26, 28-31,33
X	EP 1 039 513 A (CANON KK) 27 September 2000 (2000-09-27) the whole document	1-5,8, 10, 24-30, 32,33

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

[X] Patent family members are listed in 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 document 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

"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.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 June 2004	22/06/2004

Name and mailing address of the ISA	Authorized officer
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	Szarowski, A

Form PCT/ISA/210 (second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 03/04029

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/11930 A (HENLEY FRANCOIS J ;BRYAN MICHAEL A (US); EN WILLIAM G (US); SILICO) 15 February 2001 (2001-02-15) page 15	1-3,6-8, 10, 24-26, 28-30, 32,33
X	EP 0 926 709 A (CANON KK) 30 June 1999 (1999-06-30) the whole document	1-3,6-8, 10, 24-30, 32,33
X	US 6 326 279 B1 (SATO NOBUHIKO ET AL) 4 December 2001 (2001-12-04) the whole document	1-3,6-8, 10,24, 25, 27-30, 32,33
E	WO 2004/006311 A (OSTERNAUD BENEDICTE ;AULNETTE CECILE (FR); GHYSELEN BRUNO (FR); S) 15 January 2004 (2004-01-15) the whole document	1-5, 8-10, 24-33

INTERNATIONAL SEARCH REPORT

...ational application No.
PCT/IB 03/04029

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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.: 11-23
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:

see FURTHER INFORMATION sheet PCT/ISA/210

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 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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 11-23

The present application fails to comply with the requirements of Rule 6.4 PCT as multiple dependent claims serve as basis for other multiple claims. In fact, the claims present so many options, possible permutations and conditions that the present application fails to comply with the clarity and conciseness requirements of Article 6 PCT (see also Rule 6.1(a) PCT) to such an extent that a meaningful search is impossible.

In view of the wording of the claims presently on file, which render it difficult, if not impossible, to determine the matter for which protection is sought, the present application fails to comply with the clarity and conciseness requirements of Article 6 PCT (see also Rule 6.1(a) PCT) to such an extent that a meaningful search is impossible.

Consequently, the search has been carried out for those parts of the application which do appear to be clear (and concise), namely claims 1-10 and claims 24-33 as long as they refer to claims 1-10.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/IB 03/04029

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