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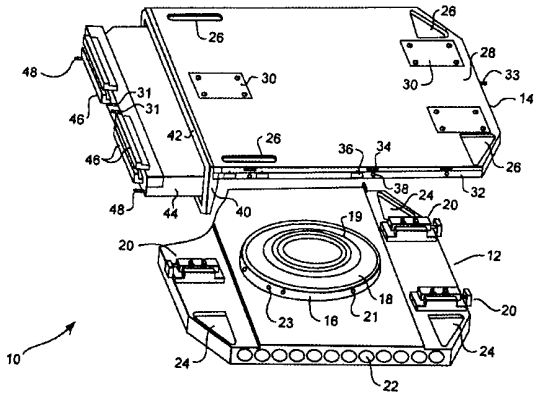
— *with international search report*

[Continued on next page]

(54) Title: WAFER-LEVEL BURN-IN AND TEST CARTRIDGE AND METHODS



(57) Abstract: A cartridge (10) includes a chuck plate (12) for receiving a wafer (74) and a probe plate (14) for establishing electrical contact with the wafer. In use, a mechanical connecting device (90) locks the chuck plate and the probe plate fixed relative to one another to maintain alignment of the wafer and the probe plate. Preferably, electrical contact with the wafer is established using a probe card (50) that is movably mounted to the probe plate by means of a plurality of leaf springs (52). The mechanical connecting device is preferably a kinematic coupling including a male connector (94) and first and second opposed jaws (122, 124). Each of the jaws is pivotable from a retracted position in which the male connector can be inserted between the jaws and an engaging position in which the jaws prevent withdrawal of the male connector from between the jaws. The male connector is movable between an extended and a retracted position, and is biased towards the retracted position. This provides a positive clamping force that pulls the chuck and probe plates together when the mechanical connecting device is engaged. To leaf a wafer into the cartridge, the wafer is placed on the chuck plate, the probe plate is aligned with the wafer, and the chuck plate and the probe plate are locked together. The cartridge can then be removed from the alignment device and placed in a burn-in or test chamber that does not itself require means for aligning the wafer or for providing a probe actuation force.

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18 April 2002

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.

INTF ˜NATIONAL SEARCH REPORT

Internat. .l Application No
PCT/US 00/19391

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G01R31/316 G01R31/28 G01R1/04

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 G01R 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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropnate, of the relevant passages	Relevant to claim No.
X	JP 08 005666 A (MATSUSHITA ELECTRIC IND CO LTD) 12 January 1996 (1996-01-12) the whole document -& JP 10 189670 A (MATSUSHITA ELECTRIC IND CO LTD) 21 July 1998 (1998-07-21) the whole document	1-14, 21-30, 38,39, 41-46, 48-62, 64-74, 76-86, 88-90, 93-98
P,X	-& US 5 945 834 A (HATADA KENZOU ET AL) 31 August 1999 (1999-08-31)	1-14, 21-30, 38,39, 41-46, 48-62, 64-74,

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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

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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

"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
15 June 2001	27. 06. 01

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	Hijazi, A

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Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
		76-86, 88-90, 93-98
	column 17, line 14 -column 18, line 52; figures 1,2,12 column 19, line 17 - line 44; figure 4 column 22, line 48 -column 24, line 22; figures 13,14 column 28, line 62 -column 29, line 55; figure 18	
X	EP 0 283 219 A (HEWLETT PACKARD CO) 21 September 1988 (1988-09-21) column 3, line 32 -column 6, line 10; figures 1-4	29-32, 37,40
X	US 4 818 933 A (KERSCHNER RONALD K ET AL) 4 April 1989 (1989-04-04) column 9, line 23 -column 10, line 2; figure 7	47
X	US 5 808 474 A (HIVELY JAMES W ET AL) 15 September 1998 (1998-09-15) abstract; figure 1	47
X	US 5 621 313 A (TSUTA KIYOAKI) 15 April 1997 (1997-04-15) column 3, line 60 -column 4, line 27; figure 1	91,92
X	US 5 777 485 A (AKAIKE SHINJI ET AL) 7 July 1998 (1998-07-07) column 13, line 27 - line 48; figures 18,19	91

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 00/19391

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.:
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. ☐ 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:

see additional sheet

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

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-20,23-26,29-37,40-44,46,48,54-56,63,68 partially, 75 partially,79,80,87

   Compliant mounting of a probe card to a probe plate in a burn-in or test cartridge by using leaf springs

2. Claims: 21,22,27,28,38,39,45,57,59-62,64, and 69-74,76, 81-86,88,98 all partially

   Device and method to press the probe card against the wafer in a burn-in or test cartridge allowing the use of either an increased or decreased air pressure

3. Claims: 47,49-53,67,58,65,66,67,77,78,89,90,93-97

   Locking means for a probe plate and a chuck plate in burn-in or test cartridge allowing lateral movement between the two plates before the locking

4. Claims: 91,92

   Method for simultaneously placing and aligning of a wafer on a chuck plate by capturing an image of the wafer and determining from the image an aligned position for the wafer.

INTE NATIONAL SEARCH REPORT

Information on patent family members

Internat. ..l Application No
PCT/US 00/19391

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