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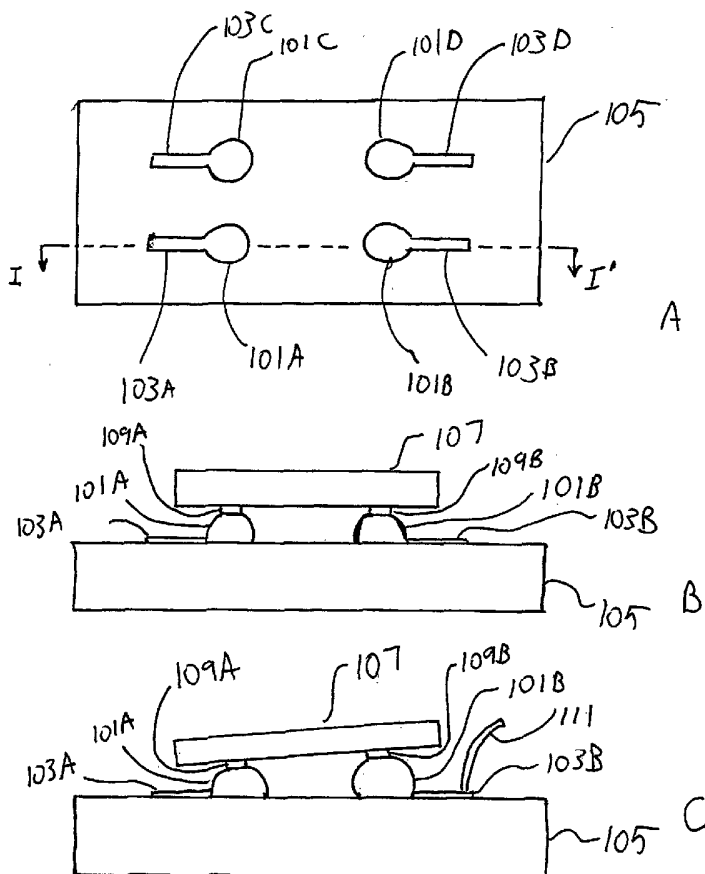
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[Continued on next page]

(54) Title: METHODS OF POSITIONING COMPONENTS USING LIQUID PRIME MOVERS AND RELATED STRUCTURES



(57) Abstract: A liquid prime mover can be used to position a component on a substrate. For example, a liquid material can be provided on the substrate adjacent the component such that the component has a first position relative to the substrate. A property of the liquid material can then be changed to move the component from the first position relative to the substrate to a second position relative to the substrate. Related structures are also discussed.



CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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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/US 01/47517

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B23K3/06 G01F23/292

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 B23K G01F

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 939 583 A (RESMA GMBH) 1 September 1999 (1999-09-01) column 6, paragraph 3 - column 8, paragraph 1; figures 1,2 ---	1-4, 12, 19, 25
Y	EP 0 595 343 A (SHOWA DENKO K.K.) 4 May 1994 (1994-05-04) claims 1,9 ---	1-4, 12, 19, 25
A	WO 98 53946 A (MYDATA AUTOMATION AB) 3 December 1998 (1998-12-03) claims 1,3,13; figures 1,2 ---	9, 10, 13
X	US 4 415 811 A (BECK ET AL) 15 November 1983 (1983-11-15) column 3, line 26 - line 47 ---	27
A	---	34-39
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☒ Further documents are listed in the continuation of box C.☒ 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

19 November 2002

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 01/47517

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 880 118 A (SIEMENS AG) 25 November 1998 (1998-11-25) abstract figure ----	27
X	FR 2 738 338 A (KAO HAN CHIN) 7 March 1997 (1997-03-07) claim 1 ----	27, 37
A	DE 197 13 785 A (VELHAGEN ET AL.) 8 October 1998 (1998-10-08) the whole document -----	27-42

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 01/47517

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: 1-26

Method of positioning a component on a substrate , in which one provides a liquid material on the substrate adjacent the component such that the component has a first position relative to the substrate, and one changes a property of the liquid material while in a liquid state to move the component

2. Claims: 27-42

Method of manipulating a light path between two optical components, in which one provides a liquid material on a wettable area of a substrate and one changes a height of a liquid bump between two different heights so that the light path is not interrupted at the second height of the liquid bump.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/47517

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