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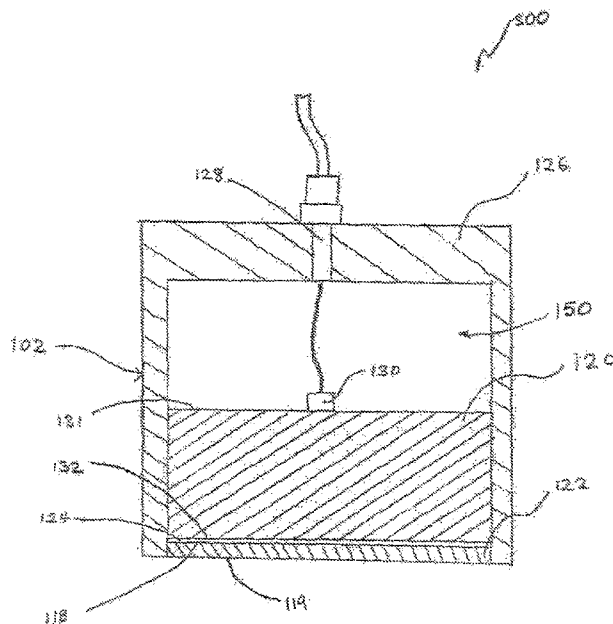
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(54) Title: SYSTEM, APPARATUS AND METHODS FOR PROCESSING SUBSTRATES USING ACOUSTIC ENERGY



(57) Abstract: A wafer cleaning system having a crystal or ceramic transducer assembly. The transducer assembly is adapted to convert electrical energy into sonic energy. The crystal or ceramic has a first conductive surface, The transducer assembly also has a transmitter made of an inert non-reactive plastic that transmits the sonic energy generated by the crystal or ceramic. The transmitter has a surface bonded directly to the conductive surface of the crystal or ceramic.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(8): B08B 3/12 (2007.01)

USPC: 134/1

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)

USPC: 134/1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

USPC: 134/109; 134/184; 134/89; search terms below

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PubWEST(PGPB,USPT,EPAB,JPAB); Google Scholar

Semiconductor, transducer, transmitter, liquid, acoustic energy, quartz, fluoropolymer, PTFE, PFA, crystal, ceramic, etched, bond, electrical energy,

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ----- Y	US 6,679,272 B2 (BRAN et al.) 20 January 2004 (20.01.2004), col. 2, ln 31-45; col. 3, ln 15; col. 3, ln 17-22; col. 3, ln 28-55; col. 3, ln 63-65; col. 4, ln 7-16; col. 5, ln 4-48; col. 5, ln 50-60; col. 6, ln 15-35; col. 6, ln 49-55; col. 8, ln 40-57.	39, 42-58 ----- 24, 27, 30, 40-41, 59-63
Y	US 5,355,048 A (ESTES) 11 October 1994 (11.10.1994), col. 2, ln 27-50; col. 3, ln 9-35; col. 4, ln 26-31; col. 4, ln 57-65; col. 5, ln 53-58; col. 6, ln 5-10; col. 6, ln 35-48; col. 6, ln 62 - col. 7, ln 1; col. 7, ln 6-8; col. 9, ln 22-26; col. 9, ln 58; col. 10, ln 56-61; col. 11, ln 8-10; col. 11, ln 34-40; col. 12, ln 34-38; col. 22, ln 19-27; ln 63-68; Fig. 8.	1-38, 40-41, 59-63
Y	US 6,210,510 B1 (KERN et al.) 03 April 2001 (03.04.2001), col. 2, ln 9-12; col. 3, ln 6-21; col. 3, ln 59-61; col. 4, ln 21-26.	1-38
Y	US 4,354,132 A (BORBURGH et al.) 12 October 1982 (12.10.1982), col. 2, ln 6-8.	4
Y	US 5,510,406 A (MATSUO et al.) 23 April 1996 (23.04.1996), col. 1, ln 24-27; col. 1, ln 56-61; col. 3, ln 36-44; col. 6, ln 18-28.	6-9, 19, 35-37
Y	US 5,608,267 A (MAHULIKAR et al.) 04 March 1997 (04.03.1997), col. 7, ln 6-16.	14
Y	US 4,924,890 A (GILES et al.) 15 May 1990 (15.05.1990), col. 3, ln 19-24.	27, 31-32, 62, 63

Further documents are listed in the continuation of Box C.

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"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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"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	

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