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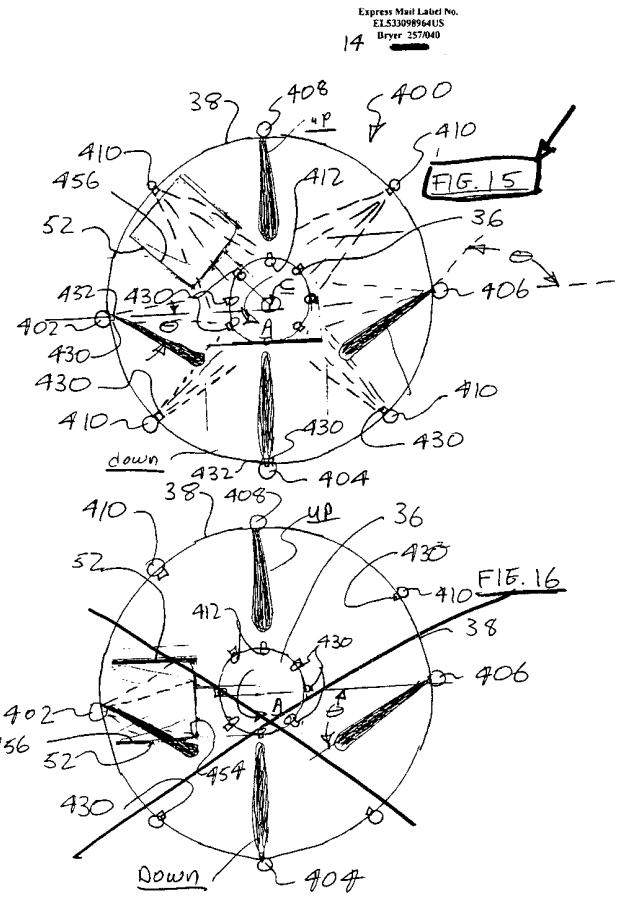
[Continued on next page]

(54) Title: SEMICONDUCTOR WAFER CONTAINER CLEANING APPARATUS



(57) Abstract: A cleaning system for cleaning boxes (52) or containers used to carry semiconductor wafers and other flat articles, has box holder assemblies (50)and a box door holder assembly (300) attached to a rotor (36) within an enclosure (38). Upper and lower hooks (96, 108, 314, 316) on the box holder and box door holder assemblies hold boxes (52) and doors (325) as the rotor spins. Liquid spray manifolds (406) have one or more spray nozzles (430) that spray at an angle toward or away from the direction of rotation of the rotor, or an angle up or down, rather than straight at the boxes in the box holder assemblies. Improved spray coverage and cleaning is achieved. Boxes and their doors, such as front opening unified pods (FOUP), are both efficiently cleaned and handled.

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INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :Please See Extra Sheet.
US CL :134/26,32,33,36,37,22.18,104.1,153,158,184
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)

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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 practicable, 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.
X ------ Y	US 5,224,503 A (THOMPSON ET AL.) 06 JULY 1993, see the abstract, Figs 7,9, and the document in general.	1,6,14-15, 20 --------- 10-13, 16-19
X	US 5,672, 212 A (MANOS) 30 SEPTEMBER 1997. See the document in general.	14,15,20

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	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 document 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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