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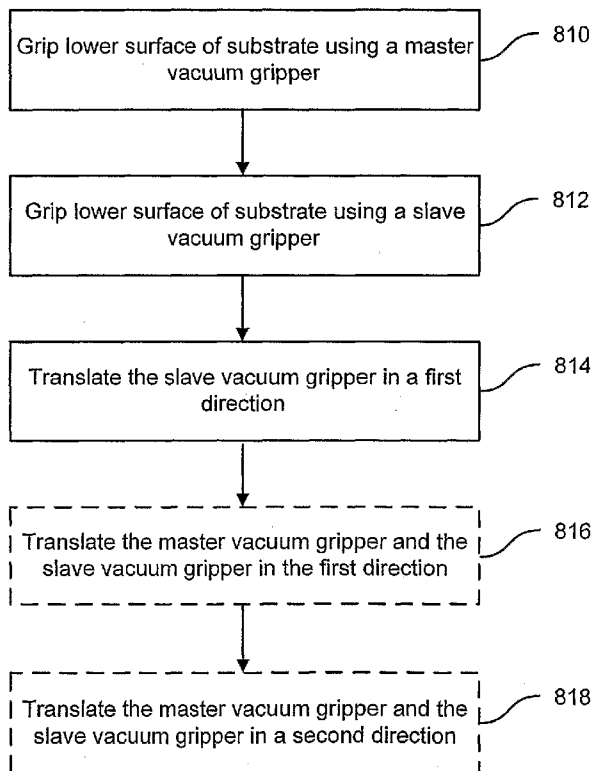
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[Continued on next page]

(54) Title: VACUUM GRIPPING SYSTEM FOR POSITIONING LARGE THIN SUBSTRATE ON A SUPPORT TABLE



(57) Abstract: A method of manipulating a substrate comprising gripping a lower surface of the substrate with a master vacuum gripper mounted on a first motorized stage. The master vacuum gripper is adapted to rotate about a Z-axis. The method also includes gripping the lower surface of the substrate with a slave vacuum gripper mounted on a second motorized stage. The slave vacuum gripper is also adapted to rotate about the Z-axis. The method further includes actuating the second motorized stage in a first direction, thereby causing the slave vacuum gripper to move laterally in both the first direction and a second direction and the master vacuum gripper to rotate about the Z-axis.

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B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) US: 294/64.1,907; 414/737,738; 451/289,388,412; 901/40		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched GOOGLE PATENT SEARCH and GOOGLE SCHOLAR SEARCH --- TERMS/PHRASE(S): glass, vacuum, gripper, chuck, suction, panel flat, shaft, pad, air, bearing, translate, contact, substrate, index, squaring, slave, master, thin, large, first, second		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) USPTO WEST [USPT, PGPB, JPAB, EPAB] ---- TERMS/PHRASE(S): glass, vacuum, gripper, chuck, suction, panel, flat, shaft, pad, air, bearing, translate, contact, substrate, position, orient, panel, flat, substrate, slave, master, index, squaring, grip, support, bars, table, move, x-y table, master, slave, cushion, y-axis, z-axis		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,P	US 7,077,019 B2 (Weiss, et al.) 18 July 2006 (18.07.2006)	1-16
A	US 6,736,408 B2 (Olgado, et al.) 18 May 2004 (18.05.2004)	17-30
A	JP 2000309423 A (Uchida, et al.) 07 November 2000 (07.11.2000)	17-30
<input type="checkbox"/> Further documents are listed in the continuation of Box C.		
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