(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

162162

(43) International Publication Date
10 January 2002 (10.01.2002)

PCT

(10) International Publication Number
WO 02/02276 A2

(51) International Patent Classification[7]: B24B 37/04, 41/047, 47/10

(21) International Application Number: PCT/US01/41232

(22) International Filing Date: 29 June 2001 (29.06.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/215,666 1 July 2000 (01.07.2000) US

(71) Applicant *(for all designated States except US)*: **LAM RESEARCH CORPORATION** [US/US]; 4650 Cushing Parkway, Fremont, CA 94568 (US).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **HALLEY, David, G.** [US/US]; 2780 Covey Lane, Los Osos, CA 93402 (US).

(74) Agent: **PENILLA, Albert, S.**; Martine & Penilla, LLP, Suite 170, 710 Lakeway Drive, Sunnyvale, CA 94085 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

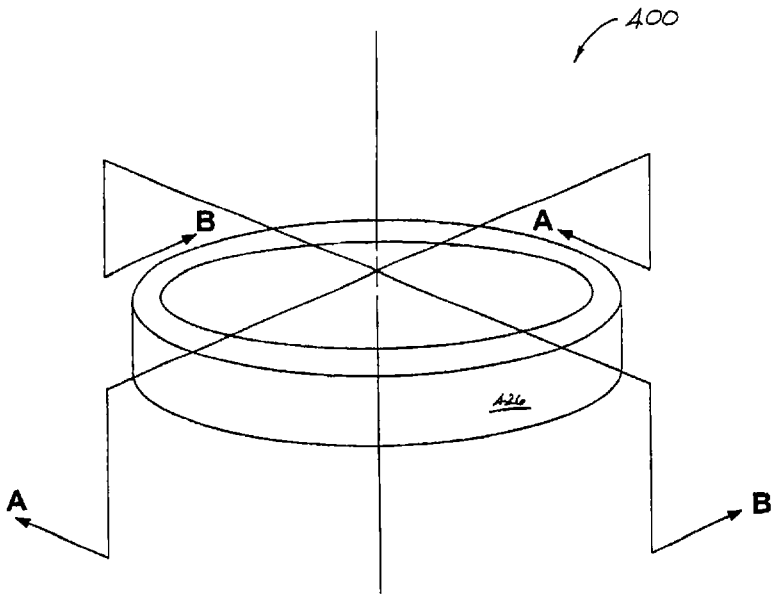
(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *without international search report and to be republished upon receipt of that report*

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.

G00002

(54) Title: PROJECTED GIMBAL POINT DRIVE



(57) Abstract: A projected gimbal point drive system is disclosed. The projected gimbal point drive system includes a spindle capable of apply a torque, and having a concave spherical surface formed on its lower portion. Further included is a wafer carrier disposed partially within the lower portion of the spindle. The wafer carrier has a convex spherical surface formed on a surface opposite the concave spherical surface of the spindle. In addition, a drive cup is included that is disposed between the spindle and the wafer carrier. The drive cup has a concave inner surface and a convex outer surface, and allows the wafer carrier to be tilted about a predefined gimbal point. In this manner, torque can be applied without affecting the gimbal action.

WO 02/02276 A2