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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
19 October 2006 (19.10.2006)

PCT

(10) International Publication Number
WO 2006/109861 A1

(51) International Patent Classification:
F04B 49/10 (2006.01)

(21) International Application Number:
PCT/JP2006/307878

(22) International Filing Date: 7 April 2006 (07.04.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2005-112373 8 April 2005 (08.04.2005) JP

(71) Applicant *(for all designated States except US)*: **EBARA CORPORATION** [JP/JP]; 11-1, Haneda Asahi-cho, Ohta-ku, Tokyo, 1448510 (JP).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **SUGIURA, Tetsuro** [JP/JP]; c/o Ebara Corporation, 11-1, Haneda Asahi-cho, Ohta-ku, Tokyo, 1448510 (JP). **TANAKA, Keiji** [JP/JP]; c/o Ebara Corporation, 11-1, Haneda Asahi-cho, Ohta-ku, Tokyo, 1448510 (JP). **NAKAZAWA, Toshiharu** [JP/JP]; c/o Ebara Corporation, 11-1, Haneda Asahi-cho, Ohta-ku, Tokyo, 1448510 (JP). **KIDO, Koichi** [JP/JP]; c/o Ebara Corporation, 11-1, Haneda Asahi-cho, Ohta-ku, Tokyo, 1448510 (JP). **YAMAZAKI, Tomoyuki** [JP/JP]; c/o Ebara Densan Ltd., 11-1, Haneda Asahi-cho, Ohta-ku, Tokyo, 1448575 (JP).

(74) Agents: **SHAMOTO, Ichio** et al.; YUASA AND HARA, Section 206, New Ohtemachi Bldg., 2-1, Ohtemachi 2-chome, Chiyoda-ku, Tokyo 1000004 (JP).

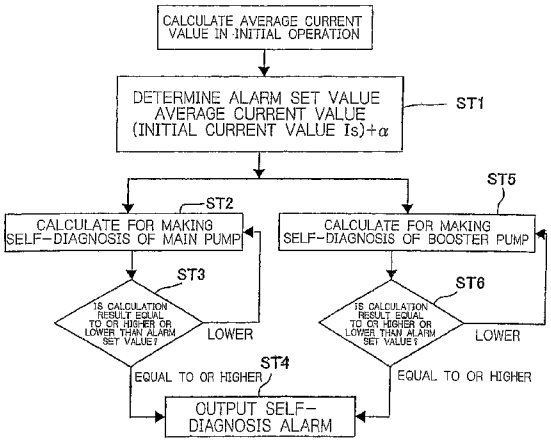
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

[Continued on next page]

(54) **Title:** VACUUM PUMP SELF-DIAGNOSIS METHOD, VACUUM PUMP SELF-DIAGNOSIS SYSTEM, AND VACUUM PUMP CENTRAL MONITORING SYSTEM



(57) **Abstract:** There are provided a vacuum pump self-diagnosis method, a vacuum pump self-diagnosis system, a vacuum pump central monitoring system capable of making self-diagnosis of a dry vacuum pump. A vacuum pump self-diagnosis method decides the occurrence of failure and generates an alarm when a predetermined alarm set value is exceeded by an integrated value or an average value of a current of a motor for rotating a rotor of said vacuum pump. In a vacuum pump self-diagnosis system for making self-diagnosis of a vacuum pump which comprises a casing and a rotor rotatably arranged in the casing for sucking and discharging a gas through rotations of the rotor, the rotor comprises a plurality of stages and a pressure sensor is provided between the rotor stages. A self-diagnosis unit is provided for calculating an integrated value or an average value of a current of a motor for rotating said rotor, and making self-diagnosis of the vacuum pump when the integrated value or average value exceeds a predetermined alarm set value. The self-diagnosis unit switches from one self-diagnosis calculation method to another or interrupts the self-diagnosis calculation based on a pressure value detected by said pressure sensor.

WO 2006/109861 A1

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.