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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
24 November 2011 (24.11.2011)

PCT

(10) International Publication Number
WO 2011/146672 A2

(51) International Patent Classification: Not classified

(21) International Application Number:
PCT/US2011/037074

(22) International Filing Date:
19 May 2011 (19.05.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/346,461 19 May 2010 (19.05.2010) US

(71) Applicant *(for all designated States except US)*: **THOMAS WEST, INC.** [US/US]; 470 Mercury Drive, Sunnyvale, CA 94085 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **WEST, Thomas** [US/US]; 470 Mercury Drive, Sunnyvale, CA 94085 (US). **KIRTLEY, Steve** [US/US]; 470 Mercury Drive, Sunnyvale, CA 94085 (US). **RICHARDSON, Matt** [US/US]; 470 Mercury Drive, Sunnyvale, CA 94085 (US). **PONDER, Ken** [US/US]; 470 Mercury Drive, Sunnyvale, CA 94085 (US). **TOCCHINI, John** [US/US]; 470 Mercury Drive, Sunnyvale, CA 94085 (US). **NGUYEN, Long** [US/US]; 470 Mercury Drive, Sunnyvale, CA 94085 (US).

(74) Agent: **WILLIAMS, Larry**; Williams IPS, 3645 Montgomery Drive, Santa Rosa, CA 95405-5212 (US).

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

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

WO 2011/146672 A2

(54) **Title**: APPARATUSES AND METHODS FOR SCRUBBING SUBSTRATES

(57) **Abstract**: One aspect of the present invention includes an apparatus for scrubbing substrates such as a roller scrubber. According to one embodiment, the apparatus comprises a scrubbing medium having an axial bore and a mandrel having a section disposed through the axial bore of the scrubbing medium. The mandrel is configured so that it exerts an adjustable axial compression on the scrubbing medium. According to another embodiment, the apparatus comprises a roller scrubber. The roller scrubber comprises a scrubbing medium comprising a plurality of discrete disks having a center hole. The disks are disposed side by side so that the center holes form an axial bore in the scrubbing medium. The combined outer edges of the plurality of disks form a scrubbing surface of the roller scrubber.