

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
30 May 2003 (30.05.2003)

PCT

(10) International Publication Number
WO 03/044528 A2

(51) International Patent Classification⁷: **G01N 33/53**

(21) International Application Number: PCT/US02/24850

(22) International Filing Date: 6 August 2002 (06.08.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/944,816 31 August 2001 (31.08.2001) US

(71) Applicant (for all designated States except US): **BATTELLE MEMORIAL INSTITUTE** [US/US]; P.O. Box 999, Richland, WA 99352 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **GRATE, Jay, W.** [US/US]; P.O. Box 4147, West Richland, WA 99353 (US). **BRUCKNER-LEA, Cynthia, J.** [US/US]; 144 Mountain View Lane, Richland, WA 99352 (US). **HOLMAN, David, A.** [US/US]; 11036 Linden Leaf Drive, Las Vegas, NV 89144 (US).

(74) Agents: **COY, Greg, B.** et al.; Woodward, Emhardt, Naughton, Moriarty & Mcnett, Bank One Center/Tower, Suite 3700, 111 Monument Circle, Indianapolis, IN 46204 (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, EC, 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, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

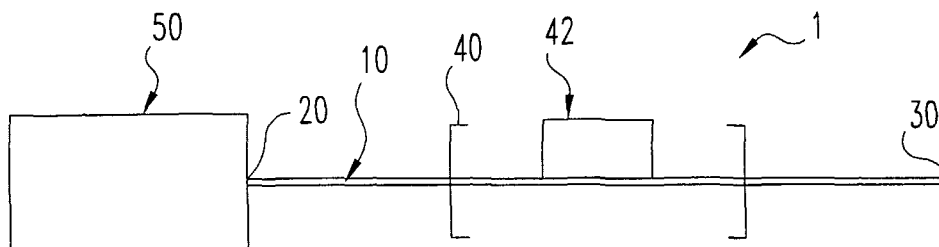
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, 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

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.

(54) Title: FLOW-CONTROLLED MAGNETIC PARTICLE MANIPULATION



(57) Abstract: Inventive methods and apparatus (1, 2) are useful for collecting magnetic materials in one or more magnetic fields and resuspending the particles into a dispersion medium, and optionally repeating collection/resuspension one or more times in the same or different medium, by controlling the direction and rate of fluid flow through a fluid flow path (10). The methods provide for contacting derivatized particles with test samples and reagents, removal of excess reagent, washing of magnetic material, and resuspension for analysis, among other uses. The methods are applicable to a wide variety of chemical and biological materials that are susceptible to magnetic labeling, including, for example, cells, viruses, oligonucleotides, proteins, hormones, receptor-ligand complexes, environmental contaminants and the like.



WO 03/044528 A2