

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
21 December 2006 (21.12.2006)

PCT

(10) International Publication Number
WO 2006/134952 A1

(51) International Patent Classification:

G11B 5/66 (2006.01) *G11B 5/851* (2006.01)
G11B 5/65 (2006.01) *H01F 10/12* (2006.01)
G11B 5/667 (2006.01) *H01F 10/16* (2006.01)
G11B 5/738 (2006.01) *H01F 41/18* (2006.01)

(21) International Application Number:

PCT/JP2006/311890

(22) International Filing Date: 7 June 2006 (07.06.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

2005-172201 13 June 2005 (13.06.2005) JP
60/693,090 23 June 2005 (23.06.2005) US

(71) Applicant (for all designated States except US): **SHOWA DENKO K.K.** [JP/JP]; 13-9, Shibadaimon 1-chome, Minato-ku, Tokyo 105-8518 (JP).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **OKA, Masahiro** [JP/JP]; c/o Showa Denko HD K.K., 5-1 Yawata Kaigan Dori, Ichihara-shi, Chiba 290-0067 (JP).

(74) Agents: **SHIGA, Masatake** et al.; 2-3-1 Yaesu, Chuo-ku, Tokyo 104-8453 (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, 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.

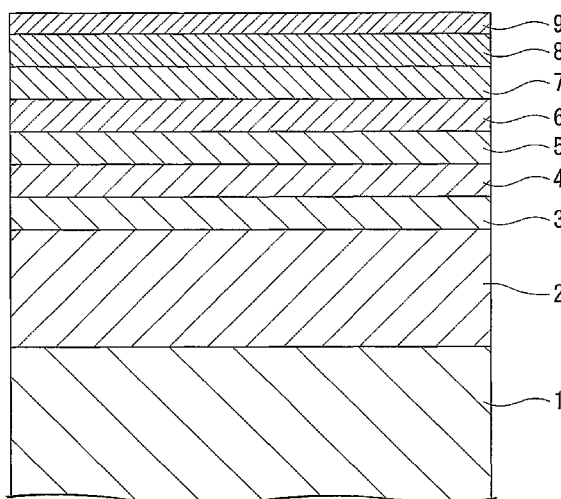
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, 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

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: PERPENDICULAR MAGNETIC RECORDING MEDIUM, PRODUCTION PROCESS THEREOF, AND MAGNETIC RECORDING AND REPRODUCING APPARATUS



(57) Abstract: The invention provides a perpendicular magnetic recording medium for use in a hard disk drive or a similar apparatus, a method for producing the perpendicular magnetic recording medium, and a magnetic recording and reproducing apparatus. The recording medium has excellent recording and reproducing characteristics and includes at least a non-magnetic substrate, an alignment control layer a perpendicular magnetic layer in which easy-magnetization axes are oriented in a direction virtually normal to a substrate, and a protective layer. The perpendicular magnetic layer containing Co as a predominant component, is formed of at least a first perpendicular magnetic layer formed predominantly from a material containing at least Cr, Pt, and a metal oxide or a semiconductor oxide, a second perpendicular magnetic layer formed predominantly from a CoCr alloy, and a third perpendicular magnetic layer formed predominantly from a CoCrPtB-based alloy.

WO 2006/134952 A1