

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
30 March 2006 (30.03.2006)

PCT

(10) International Publication Number
WO 2006/033312 A1

(51) International Patent Classification:

H01L 51/50 (2006.01)

(21) International Application Number:

PCT/JP2005/017236

(22) International Filing Date:

13 September 2005 (13.09.2005)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2004-276034 22 September 2004 (22.09.2004) JP

(71) Applicant (for all designated States except US): **Toshiba Matsushita Display Technology Co., Ltd.** [JP/JP]; 1-8, Konan 4-chome, Minato-ku, Tokyo, 1080075 (JP).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **OKUTANI, Satoshi** [JP/JP].

(74) Agents: **SUZUYE, Takehiko** et al.; c/o **SUZUYE & SUZUYE**, 7-2, Kasumigaseki 3-chome, Chiyoda-ku, Tokyo, 1000013 (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, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, 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.

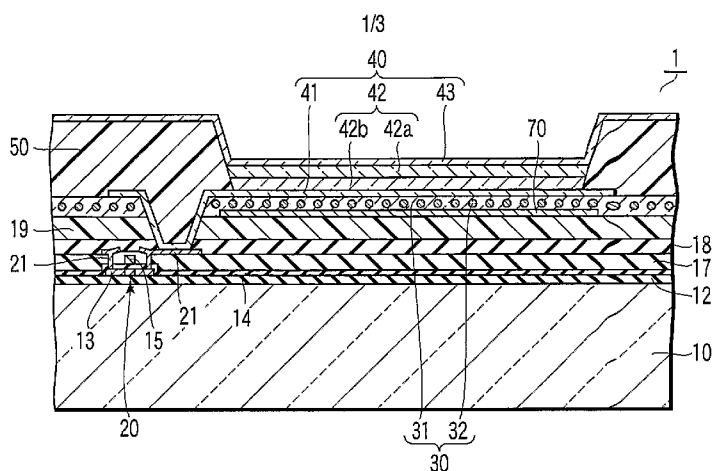
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT,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



$$\beta \sum_{M=1}^m \frac{(1-\beta)^{M-1}}{\exp\{\alpha(2M-1)x\}} > 0.1. \quad (3)$$

(57) Abstract: An organic EL display (1) includes an organic EL element (40) which includes first and second electrodes (41, 43) and an active layer (42) interposed therebetween and including an emitting layer (42a), and an outcoupling layer (30) facing the first electrode (41). The organic EL element (40) forms a waveguide layer which includes the first electrode (41) and the active layer (43) and in which light components from the emitting layer (42a) propagate in an in-plane direction while causing multiple-beam interference. A distance between the outcoupling layer and the waveguide layer is shorter than a wavelength of light from the organic EL element. A guide length x , a number of reflection m , an absorption coefficient α , and an outcoupling efficiency β satisfy a relationship represented by an inequality: inequality (3).

WO 2006/033312 A1