

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
11 June 2009 (11.06.2009)

PCT

(10) International Publication Number
WO 2009/072667 A1

- (51) International Patent Classification:
G03G 5/00 (2006.01) **G03G 21/00** (2006.01)
- (21) International Application Number:
PCT/JP2008/072466
- (22) International Filing Date:
4 December 2008 (04.12.2008)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
2007-315465 6 December 2007 (06.12.2007) JP
- (71) Applicant (for all designated States except US): **Ricoh Company, Ltd.** [JP/JP]; 3-6, Nakamagome 1-chome, Ohta-ku, Tokyo, 1438555 (JP).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **KAWASAKI, Yoshiaki** [JP/JP]; 3-3-13, Yobiko, Susono-shi, Shizuoka, 4101109 (JP). **SUGINO, Akihiro** [JP/JP]; 194-3, Ono, Numazu-shi, Shizuoka, 4100307 (JP). **HIROSE, Mitsuaki** [JP/JP]; Reopalace Esta 106, 886-1, Ozuwa, Numazu-shi,

Shizuoka, 4100873 (JP). **MURAMATSU, Susumu** [JP/JP]; 620-57, Isshiki, Fuji-shi, Shizuoka, 4170808 (JP). **KURIBAYASHI, Katsuo** [JP/JP]; c/o TRAY Engineering Co., Ltd. of 405-1, Ashitaka, Numazu-shi, Shizuoka, 4100001 (JP). **WAKABAYASHI, Shoichi** [JP/JP]; c/o TRAY Engineering Co., Ltd. of 405-1, Ashitaka, Numazu-shi, Shizuoka, 4100001 (JP).

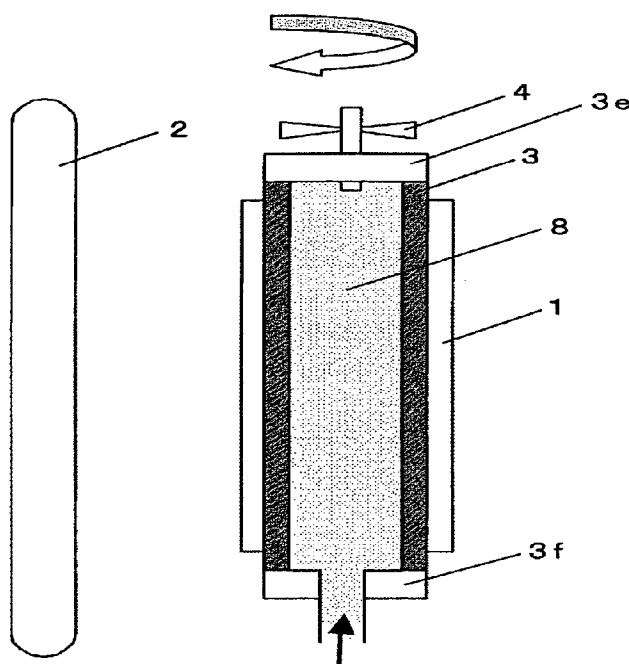
(74) Agent: **HIROTA, Koichi**; HIROTA, NAGARE & ASSOCIATES, 4th Floor, Shinjuku TR Bldg., 2-2-13, Yoyogi, Shibuya-ku, Tokyo 1510053 (JP).

(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, 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, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

[Continued on next page]

(54) Title: TEMPERATURE CONTROL UNIT FOR ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR SUBSTRATE

FIG. 1



(57) Abstract: There is provided a temperature control unit for an electrophotographic photoconductor substrate, containing a stretchable membrane member which is detachably disposed in a hollow space of the cylindrical substrate, wherein the membrane member is configured to sequentially stretch until reaching the deepest part of the hollow space of the cylindrical substrate as a result of an introduction of a refrigerant therein to closely contact with an entire inner wall of the cylindrical substrate, and to sequentially shrink to the original shape thereof as a result of a release of the refrigerant therefrom, so that the membrane member is detachably disposed in the hollow space, and wherein the membrane member is configured to make a heat transfer between a surface of the cylindrical substrate and the refrigerant via the membrane member closely contacted with the inner surface of the cylindrical substrate, to control a surface temperature of the cylindrical substrate.



(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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL,

NO, 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*