

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
28 June 2007 (28.06.2007)

PCT

(10) International Publication Number
WO 2007/072231 A3

(51) International Patent Classification:

A24B 15/28 (2006.01) A24D 3/16 (2006.01)

(21) International Application Number:

PCT/IB2006/004140

(22) International Filing Date:

20 December 2006 (20.12.2006)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/751,668 20 December 2005 (20.12.2005) US

(71) Applicant (for all designated States except US): **PHILIP MORRIS PRODUCTS S.A.** [CH/CH]; Quai Jeanrenaud 3, CH-2000 Neuchatel (CH).

(72) Inventors: **LUAN, Zhaohua**; 6011 Sedgefield Terrace, Midlothian, VA 23112 (US). **FOURNIER, Jay, A.**; 11771 Wexwood Drive, Richmond, VA 23236 (US).

(74) Agent: **MILLBURN, Julie, Elizabeth**; Reddie & Grose, 16 Theobalds Road, London WC1X 8PL (GB).

(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, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, 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, SV, SY, 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, 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).

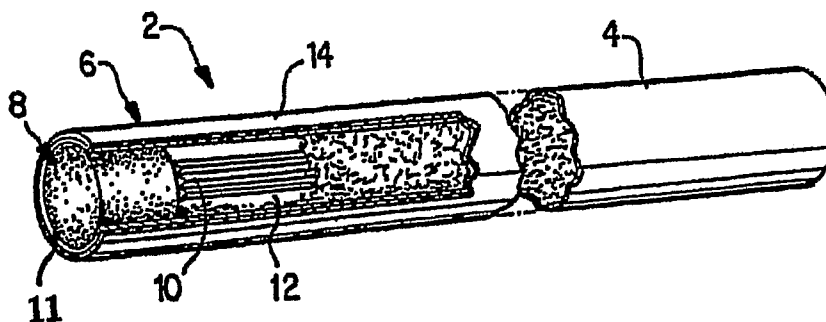
Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- the filing date of the international application is within two months from the date of expiration of the priority period

(88) Date of publication of the international search report:
22 November 2007

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: METAL-CONTAINING NANOWIRES PREPARED USING MESOPOROUS MOLECULAR SIEVES AS TEMPLATES, AND THEIR USE IN SMOKING ARTICLES



(57) Abstract: Cut filler compositions, smoking articles such as cigarettes 2, methods for making cigarettes and methods for treating cigarette smoke are provided, which involve the use of metal-containing nanowires. The metal-containing nanowires are capable of removing at least one constituent from tobacco smoke, preferably in a selective manner. The metal-containing nanowires may comprise any suitable metal, metal oxide or mixtures thereof. For example, the metal-containing nanowires comprise at least one transition or lanthanide metal or metal oxide thereof. Exemplary metals or metal oxides thereof include, but are not limited to, iron, copper, zinc, titanium, vanadium, palladium, cobalt, molybdenum and manganese. The metal-containing nanowires may be produced by (i) loading at least one metal-containing composition into a mesoporous molecular sieve substrate via repeated incipient-wetness impregnation followed by stepwise calcination to form said nanowires; and (ii) isolating the nanowires by extracting the mesoporous molecular sieve substrate, e.g., with aqueous NaOH.

WO 2007/072231 A3