

(51) International Patent Classification:
H04W 36/14 (2009.01) *H04W 36/36* (2009.01)(21) International Application Number:
PCT/US2009/036707(22) International Filing Date:
10 March 2009 (10.03.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/040,617 28 March 2008 (28.03.2008) US
12/349,399 6 January 2009 (06.01.2009) US(71) Applicant (for all designated States except US): **QUALCOMM INCORPORATED** [US/US]; Attn: International IP Administration, 5775 Morehouse Drive, San Diego, CA 92121-1714 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **SAMPATH, Hemanth** [IN/US]; 5775 Morehouse Drive, San Diego, CA 92121-1714 (US). **LIN, Jeremy, H.** [US/US]; 5775 Morehouse Drive, San Diego, CA 92121-1714 (US). **OTTE, Kurt** [US/US]; 5775 Morehouse Drive, San Diego, CA 92121-1714 (US). **PRAKASH, Rajat** [IN/US]; 5775 Morehouse Drive, San Diego, CA 92121-1714 (US).(74) Agent: **MOSKOWITZ, Larry, J.**; Attn: International IP Administration, 5775 Morehouse Drive, San Diego, CA 92121-1714 (US).

(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, JP, 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.

(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, MK, 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).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

[Continued on next page]

(54) Title: REFERENCE SIGNAL MANAGEMENT IN MOBILE SYSTEMS

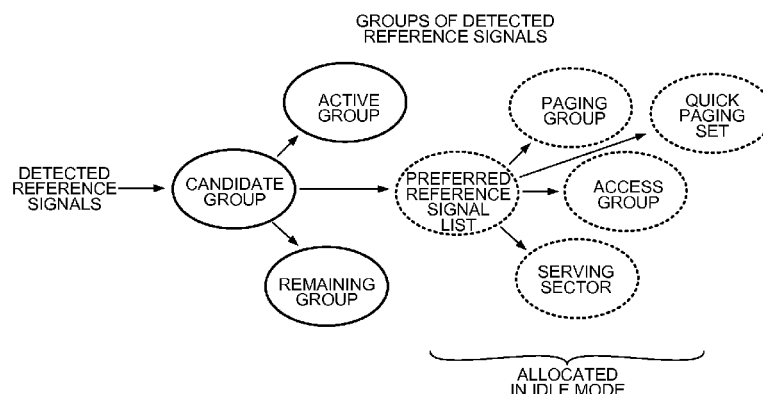


FIG. 5

(57) **Abstract:** A reference signal management (RSM) program executing on a mobile device detects multiple reference signals, allocates those reference signals into groups, and performs reference signal management functions using information conveyed in the reference signals. The RSM program detects both broadband and narrowband reference signals and maintains updated groups of reference signals that are transmitted from access points with independent configurations or different radio technologies. Battery power of the mobile device is efficiently used to manage reference signals in heterogeneous network environments by preventing unnecessary handoffs, overhead downloads, access probes and new registrations. Reference signals are managed from both synchronous and asynchronous sectors and in idle mode as well as in connected state mode. The RSM program performs functions such as managing handoffs between access points, managing an idle mode of the mobile device, managing an active group of the detected reference signals, and collecting overhead parameters for the mobile device.



Published:

— with international search report (Art. 21(3))

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))