



(51) International Patent Classification:
H04L 1/00 (2006.01) *H04L 1/18* (2006.01)

(21) International Application Number:
PCT/IB2009/006918

(22) International Filing Date:
21 September 2009 (21.09.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/099,341 23 September 2008 (23.09.2008) US
61/101,288 30 September 2008 (30.09.2008) US
12/502,506 14 July 2009 (14.07.2009) US

(71) Applicant (for all designated States except US): **TELEFONAKTIEBOLAGET L M ERICSSON (PUBL)** [SE/SE]; S-164 83 Stockholm (SE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BERGMAN, Johan** [SE/SE]; Kungsholmsgatan 9, S-112 27 Stockholm (SE). **WANG, Yi-Pin, Eric** [US/US]; 44923 Trout Ct., Fremont, CA 94539 (US). **LARSSON, Erik** [SE/SE]; Vretgränd 6A, S-753 22 Uppsala (SE).

(74) Agents: **CAMERON, Michael, G.** et al.; Ericsson Inc., 6300 Legacy, MS EVR 1-C-11, Plano, TX 75024 (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, CL, 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, PE, 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, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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))

(54) Title: MULTIPLE CARRIER ACKNOWLEDGMENT SIGNALING

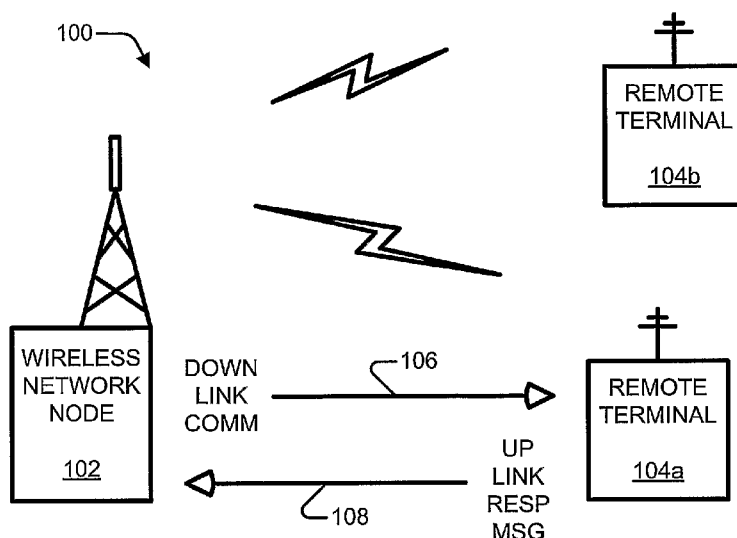


FIG. 1

(57) Abstract: Acknowledgment signaling in a multiple carrier environment is enabled with a multiple carrier codebook having code words that jointly encode acknowledgment for at least two carriers. For an example embodiment, there is a method in a remote terminal for acknowledgment uplink signaling in a multiple-carrier mode. First, a code word is determined that jointly encodes acknowledgment signaling for at least two carriers from a multiple carrier codebook that is stored in the remote terminal. The multiple carrier codebook includes eight code words that are defined to have a single carrier codebook as a sub-codebook of the multiple carrier codebook, each code word of the eight code words having a length of ten. The multiple carrier codebook achieves a minimum Hamming distance of four among the eight code words. Second, an uplink signaling message that includes the determined code word is transmitted from the remote terminal to a wireless network node.