

(51) International Patent Classification:
H04L 1/16 (2006.01)(21) International Application Number:
PCT/US2009/038370(22) International Filing Date:
26 March 2009 (26.03.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/039,724 26 March 2008 (26.03.2008) US
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(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.

[Continued on next page]

(54) Title: SCRAMBLING AND MODULATION TO CONSTRAIN THE CONSTELLATION SIZE OF ACK/NAK TRANSMISSION ON THE DATA CHANNEL

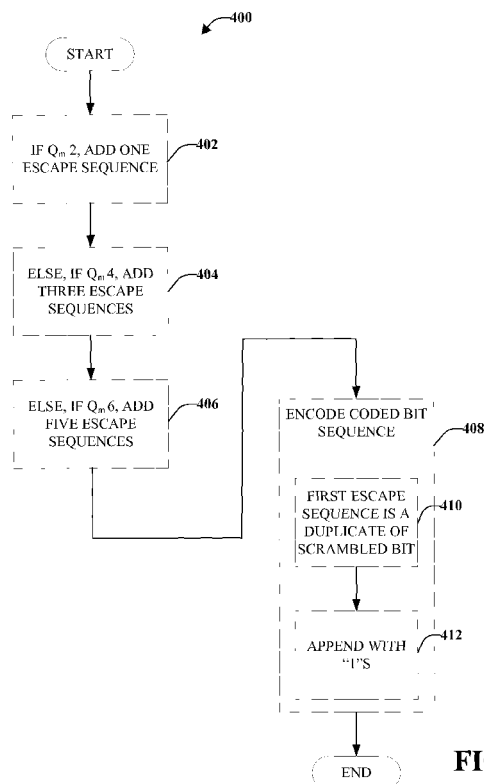


FIG. 4

(57) Abstract: Aspects describe maximizing a Euclidean distance for an ACK transmission as a function of the number of bits in a HARQ-ACK and a modulation order. Encoding includes placing escape sequences in the HARQ-ACK, wherein the number of escape sequences is based on the number of bits and the modulation order. Multiple encoded ACK blocks are combined to obtain a vector sequence that is multiplexed with the encoded data and interleaved, such as on a "time-first" manner. Scrambling is performed as a function of the size and the modulation order. For a 1-bit ACK, the scrambling is performed to achieve any two corners in any constellation for transmission for the ACK. For a 2-bit ACK, the scrambling is performed to achieve any four corners in any constellation for transmission for the ACK.



(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).

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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))*

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

(88) Date of publication of the international search report:

12 November 2009