(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
23 April 2009 (23.04.2009)

PCT

(10) International Publication Number
WO 2009/052206 A1

(51) International Patent Classification:
H04N 7/26 (2006.01) *H04N 7/30* (2006.01)

(21) International Application Number:
PCT/US2008/080034

(22) International Filing Date: 15 October 2008 (15.10.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/979,919	15 October 2007 (15.10.2007)	US
60/980,214	16 October 2007 (16.10.2007)	US
12/250,784	14 October 2008 (14.10.2008)	US

(71) Applicant *(for all designated States except US)*: **QUALCOMM Incorporated** [US/US]; Attn: International IP Administration, 5775 Morehouse Drive, San Diego, California 92121 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **KARCZEWICZ, Marta** [PL/US]; 5775 Morehouse Drive, San Diego, California 92121 (US). **PANCHAL, Rahul** [IN/US]; 5775 Morehouse Drive, San Diego, California 92121 (US). **YE, Yan** [CN/US]; 5775 Morehouse Drive, San Diego, California 92121 (US).

(74) Agent: **EVANS, Matthew, J.**; Attn: International IP Administration, 5775 Morehouse Drive, San Diego, Califonia 92121 (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,

[Continued on next page]

(54) Title: IMPROVED ENHANCEMENT LAYER CODING FOR SCALABLE VIDEO CODING

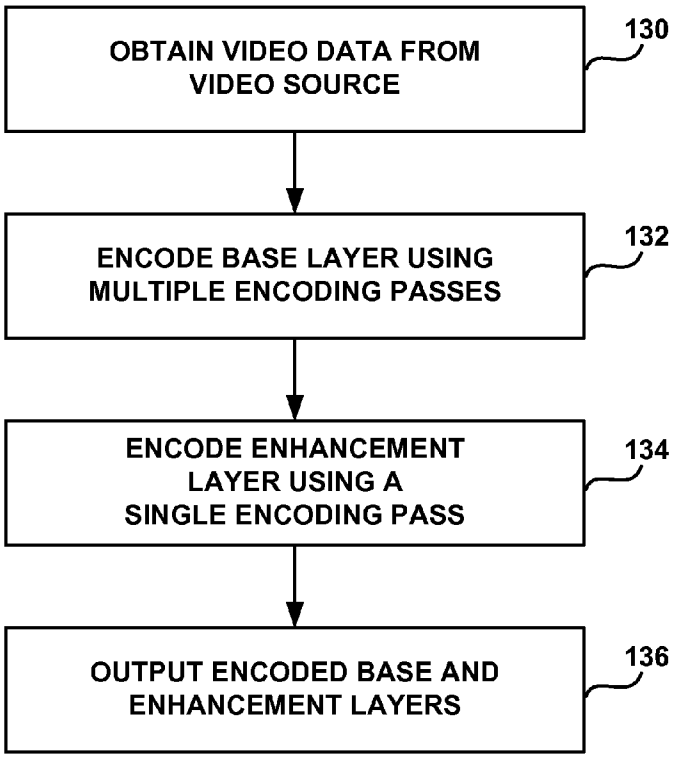


FIG. 9

(57) Abstract: This disclosure describes scalable video coding techniques. In particular, the techniques may be used to encode refinements of a video block for enhancement layer bit streams in a single coding pass, thereby reducing coding complexity, coding delay and memory requirements. In some instances, the techniques encode each nonzero coefficient of a coefficient vector of the enhancement layer without knowledge of any subsequent coefficients. Coding the enhancement layer in a single pass may eliminate the need to perform a first pass to analyze the coefficient vector and a second pass for coding the coefficient vector based on the analysis.

WO 2009/052206 A1

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).

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))*

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*