

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
23 August 2007 (23.08.2007)

PCT

(10) International Publication Number  
**WO 2007/094751 A3**

(51) International Patent Classification:  
*H04N 7/16* (2006.01) *H04L 9/00* (2006.01)

(21) International Application Number:  
PCT/US2006/001673

(22) International Filing Date: 17 January 2006 (17.01.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
11/058,894 16 February 2005 (16.02.2005) US

(63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application:  
US 11/058,894 (CON)  
Filed on 16 February 2005 (16.02.2005)

(71) Applicant (for all designated States except US): **COMCAST CABLE HOLDINGS, LLC** [US/US]; 34th Floor, 1500 Market Street, Philadelphia, PA 19102-2148 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **FAHRNY, James, William** [US/US]; 1829 South Pueblo Boulevard, #335, Pueblo, CO 81005 (US).

(74) Agents: **MANSFIELD, Stephanie, M.** et al.; Brooks Kushman, 1000 Town Center, Twenty-Second Floor, Southfield, MI 48075 (US).

(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, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US (patent), UZ, VC, VN, YU, 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).

**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))
- of inventorship (Rule 4.17(iv))

**Published:**

- with international search report

(88) Date of publication of the international search report:  
7 May 2009

(54) Title: SYSTEM AND METHOD FOR A VARIABLE KEY LADDER

(57) Abstract: A method of generating encryption and decryption keys for a multiple tier, variable key ladder (VKL) hierarchy includes determining a device key based on network connection and configuration data contained in conditional access system firmware, decrypting and extracting a session or category key from an input media stream or an Entitlement Management Message using the device key, and configuring a key ladder in response to at least one Entitlement Control Message (ECM), wherein the key ladder comprises the device key and at least one of (i) a program key, (ii) the session or category key, and (iii) at least one control word.



WO 2007/094751 A3

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US06/01673

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC: <b>H04N 7/16( 2006.01);H04L 9/00( 2006.01)</b>  USPC: <b>380/201;713/176</b> According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) U.S. : 380/201; 713/176  Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) IBM TDB		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2004/0088558 (Candelore) 6 May, 2004 (6.5.2004), par. 88-94, 103-108, 136-140	1-21
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 19 June 2008 (19.06.2008)	Date of mailing of the international search report <b>08 JUL 2008</b>	
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer Emmanuel Moise Telephone No. (571)272-3795  DEBORAH A. THOMAS PARALEGAL SPECIALIST <i>[Signature]</i>	