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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
20 February 2003 (20.02.2003)

PCT

(10) International Publication Number
WO 03/015392 A3

(51) International Patent Classification[7]: H04N 7/173, 7/16

(21) International Application Number: PCT/US02/24138

(22) International Filing Date: 31 July 2002 (31.07.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/923,038 6 August 2001 (06.08.2001) US

(71) Applicant: TIME WARNER CABLE [US/US]; 290 Harbor Drive, Stamford, CT 06902 (US).

(72) Inventor: BROOKS, Paul, D.; 9215 S. Mountain Brush Ct., Highlands Ranch, CO 80130 (US).

(74) Agent: YIP, Alex, L.; Kaye Scholer LLP, 425 Park Avenue, New York, NY 10022 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

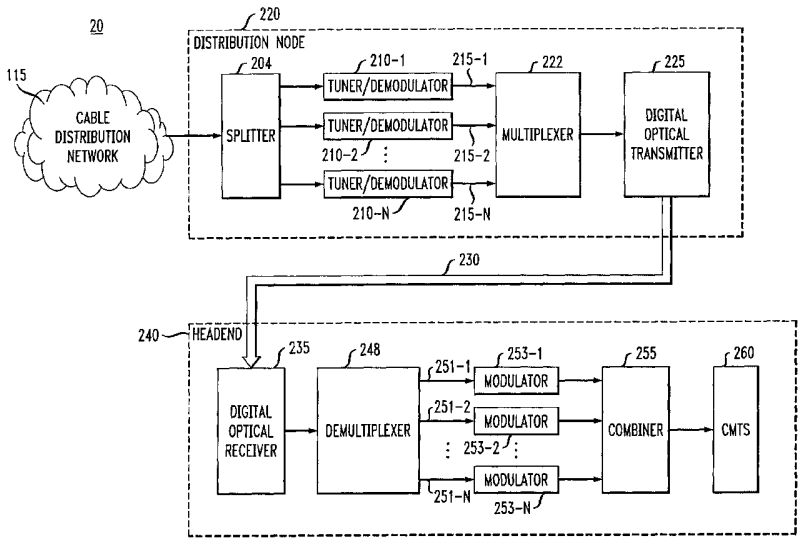
(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— with international search report

(88) Date of publication of the international search report:
22 May 2003

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: TECHNIQUE FOR REVERSE TRANSPORT OF DATA IN A HYBRID FIBER COAX CABLE SYSTEM




(57) Abstract: In a hybrid fiber coax (HFC) cable system (20), data is communicated upstream from user terminals (100) to a headend (240) of the system (20) to realize various interactive services. The user terminals (100) generate analog modulated signals representing the user data, which populate different channels in a reverse passband of the system. In accordance with the invention, the analog modulated signals are transformed to the corresponding digital baseband signals containing the data. The resulting digital baseband signals are optically transmitted to the headend (240), thereby efficiently utilizing the limited capacity of the fiber optical portion of the HFC cable system (20).

WO 03/015392 A3

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/24138

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : H04N 7/173, 7/16
US CL : 725/91,103,111,114,116,118,119,121,129,138

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 725/91,103,111,114,116,118,119,121,129,138

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)
East: Headend, HFC, Coax, Fiber, multiplex, demultiplex, combiner, optical, transmitter, reciever

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | US 5,581,555 A (DUBBERLY et al) 03 December 1996 (03.12.1996), Figures 1, 5, 6, and 11; Column 1, Lines 32-36; Column 6, Lines 43-44; Column 9, Lines 8-14; Column 11, Lines 23-32; Column 13, Lines 16-39; Column 15, Lines 63-67; Column 16, Lines 1-23; Column 21, Lines 50-67; Column 22, Lines 1-4 | 1-32 |

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"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)

"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

"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

"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

"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

"&" document member of the same patent family

Date of the actual completion of the international search
26 December 2002 (26.12.2002)

Date of mailing of the international search report
03 MAR 2003

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231
Facsimile No. (703)305-3230

Authorized officer
Andrew Faile

Telephone No. (703) 308-9048

Form PCT/ISA/210 (second sheet) (July 1998)