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(71) Applicant: KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL–5621 BA Eindhoven (NL).

(71) Applicant *(for SE only)*: PHILIPS AB [SE/SE]; Kottbygatan 7, Kista, S–164 85 Stockholm (SE).

(72) Inventors: ROBERTS, Douglas, K.; Prof. Holstlaan, NL–5656 AA Eindhoven (NL). FACCA, Horacio; Prof. Holstlaan 6, NL–5656 AA Eindhoven (NL). CHANDLER, Gary, F., Jr.; Prof. Holstlaan 6, NL–5656 AA Eindhoven (NL).

(74) Agent: GROENENDAAL, Antonius, W., M.; Internationaal Octrooibureau B.V., P.O. Box 220, NL–5600 AE Eindhoven (NL).

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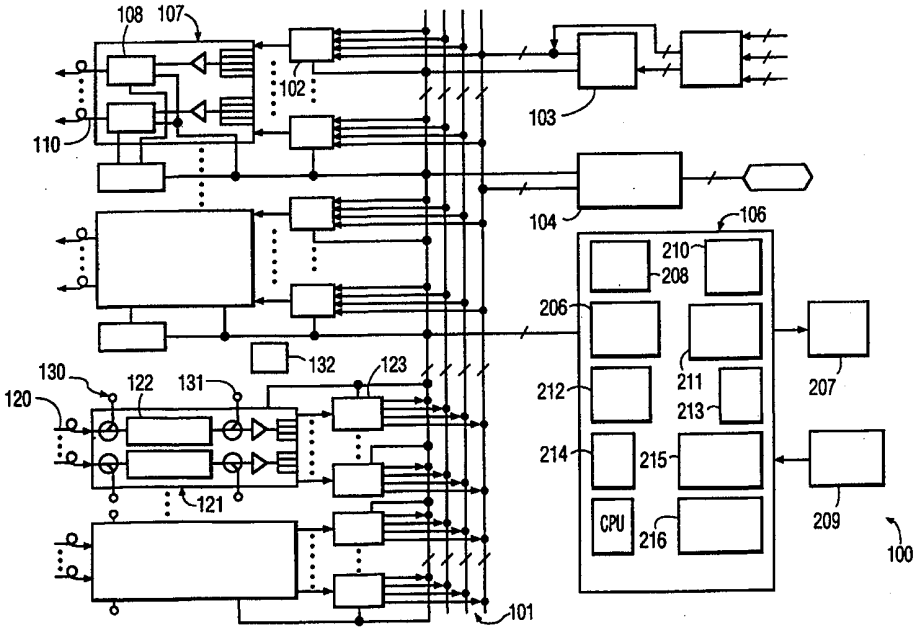
(57) Abstract

A CATV system includes a head–end with laser transmitters for providing television programs and data to a multitude of nodes through a forward optical network tree. The data includes telephone signals and computer communications signals. The nodes convert the optical signals into electrical signals and retransmit the television and data signals through a coaxial network tree to customer interface units (CIUs). Return data from the CIUs is transmitted back through the coaxial network to the nodes. The nodes include filters to separate the return data from the forward signal. Laser transmitters of the nodes transmit the return data to the head–end through a return optical network tree. The head–end converts the optical return signals into electrical signals and routs the return data to the telephone and computer gateways. The head–end includes a controller for controlling the other head–end equipment and for producing equipment control signal which are included in the forward signals to the nodes to control the equipment of the nodes. The nodes include respective controllers which identify the controls signals from the head–end and provide control signals to control the equipment of the node depending on the control signals from the head–end. The controllers of the nodes also identify status signals from the equipment of the nodes and transmit the status signals and a reference signal to the head–end controller for display on a display of the head–end controller. The reference signal allows monitoring that the return optical transmitter and network are operating correctly and allows the return signals from the nodes to be aligned. The status signals from the nodes include laser operation, laser bias current and laser power output for the laser transmitters of the nodes.



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB 98/02013

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04N 7/173
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)

IPC6: H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, EPODOC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5453868 A (HENRY A. BLAUVELT ET AL), 26 Sept 1995 (26.09.95), cited in the application --	1-21
A	US 5673265 A (DEV VRAT GUPTA ET AL), 30 Sept 1997 (30.09.97), abstract --	1-21
A	WO 9637062 A1 (WEST END SYSTEMS CORP), 21 November 1996 (21.11.96), abstract --	1-21
A	US 5642351 A (PAUL BARAN), 24 June 1997 (24.06.97), abstract --	1-21

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5635979 A (BRUCE KOSTRESKI ET AL), 3 June 1997 (03.06.97), abstract ---	1-21
A	US 5630204 A (DENNY L HYLTON ET AL), 13 May 1997 (13.05.97), abstract ---	1-21
A	US 5534912 A (BRUCE W. KOSTRESKI), 9 July 1996 (09.07.96), abstract ---	1-21
A	US 5421030 A (PAUL BARAN), 30 May 1995 (30.05.95), abstract ---	1-21
X	DE 3223338 A1 (EUROSIL GMBH), 5 January 1984 (05.01.84), see whole document --- --------	22

INTERNATIONAL SEARCH REPORT

Information on patent family members

03/05/99

International application No.
PCT/IB 98/02013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5453868 A	26/09/95	CA 2096795 A	23/11/93
		CN 1095487 A	23/11/94
		DE 69320101 D,T	10/12/98
		EP 0570984 A,B	24/11/93
		JP 6104843 A	15/04/94
		US 5430569 A	04/07/95
US 5673265 A	30/09/97	AU 692551 B	11/06/98
		AU 2511695 A	21/12/95
		CA 2190590 A	07/12/95
		CN 1151230 A	04/06/97
		EP 0760186 A	05/03/97
		IL 113768 D	00/00/00
		JP 10501383 T	03/02/98
		US 5555244 A	10/09/96
		US 5740176 A	14/04/98
		US 5799017 A	25/08/98
		US 5864542 A	26/01/99
		WO 9533309 A	07/12/95
WO 9637062 A1	21/11/96	AU 5681696 A	29/11/96
		CA 2221761 A	21/11/96
		EP 0872068 A	21/10/98
		GB 9510127 D	00/00/00
US 5642351 A	24/06/97	US 5870395 A	09/02/99
		AU 673415 B	07/11/96
		AU 5958994 A	15/08/94
		CA 2153174 A	21/07/94
		EP 0677233 A	18/10/95
		JP 8508855 T	17/09/96
		US 5425027 A	13/06/95
		WO 9416534 A	21/07/94
US 5635979 A	03/06/97	AU 2657995 A	21/12/95
		US 5666293 A	09/09/97
		US 5768539 A	16/06/98
		WO 9533338 A	07/12/95
US 5630204 A	13/05/97	US 5613190 A	18/03/97
		US 5613191 A	18/03/97
		US 5708961 A	13/01/98
		US 5793413 A	11/08/98
US 5534912 A	09/07/96	NONE	
US 5421030 A	30/05/95	AU 2782092 A	27/04/93
		EP 0604592 A	06/07/94
		JP 6510894 T	01/12/94
		WO 9306669 A	01/04/93
DE 3223338 A1	05/01/84	NONE	