

EXHIBIT C



US005991301A

United States Patent [19]
Christie

[11] **Patent Number:** **5,991,301**
[45] **Date of Patent:** ***Nov. 23, 1999**

[54] **BROADBAND TELECOMMUNICATIONS SYSTEM**

92307752 8/1992 European Pat. Off. .

(List continued on next page.)

[75] **Inventor:** **Joseph Michael Christie**, San Bruno, Calif.

OTHER PUBLICATIONS

[73] **Assignee:** **Sprint Communications Co. L.P.**, K.C., Mo.

Yoshikai, N., Et Al., "Report of the Meeting of SWP 13/1-4 (Draft Recommendation I.580)," ITU-T Telecommunication Standardization Sector, Study Group 13, pp. 1-51, (Mar. 7-18, 1994).

[*] **Notice:** This patent is subject to a terminal disclaimer.

N/A, "Final Draft Text for Broadband Capability Set 2 Signaling Requirements, Attachment "D" Special Drafting Meeting," ITU-T Telecommunications Standardization Sector, Study Group 11, p. 1-127, (Sep. 13-22, 1993).

[21] **Appl. No.:** **08/525,897**

Ohta, S., Et Al., "A Dynamically Controllable ATM Transport Network Based on the Virtual Path Concept," Communications for the Information Age, Globecom'88, Conference Record, p. 1272-1276, (Nov. 28-Dec. 1, 1988).

[22] **Filed:** **Sep. 8, 1995**

Fukazawa, M., Et Al., "Intelligent Network Call Model for Broadband ISDN," Fujitsu Laboratories, Ltd. (Japan), p. 30.6.1-30.6.5.

Related U.S. Application Data

[63] Continuation-in-part of application No. 08/238,605, May 5, 1994, abandoned.

[51] **Int. Cl.⁶** **H04L 12/56; H04L 12/28**

[52] **U.S. Cl.** **370/395; 370/410; 370/466**

[58] **Field of Search** **370/17, 24, 58.2, 370/68.1, 110.1, 60, 60.1, 94.1, 94.2, 79, 84, 85.13, 351, 352-360, 395, 396, 397, 398, 399, 465, 466, 467, 410, 389; 379/220, 229, 230**

Minzer, Steven, "A Signaling Protocol for Complex Multimedia Services," IEEE Journal on Selected Areas in Communications (ISSN 0733-8716), vol. 9, (No. 9), p. 1383-1394, (Dec. 1991).

(List continued on next page.)

[56] **References Cited**

U.S. PATENT DOCUMENTS

- 4,201,889 5/1980 Lawrence et al. .
- 4,310,727 1/1982 Lawser .
- 4,348,554 9/1982 Asmuth .
- 4,453,247 6/1984 Suzuki et al. .
- 4,554,659 11/1985 Blood et al. .

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

- 90312739 7/1991 European Pat. Off. .
- 91303312 10/1991 European Pat. Off. .
- 91311342 12/1991 European Pat. Off. .
- 91311342 7/1992 European Pat. Off. .

Primary Examiner—Ajit Patel

Attorney, Agent, or Firm—Harley R. Ball; Bruce C. McClelland

[57] **ABSTRACT**

The invention is a system for providing virtual connections through an ATM interworking multiplexer on a call-by-call basis. A signaling processor receives signaling for a call and selects the virtual connection for the call. The signaling processor generates new signaling that identifies the selection and transfers the new signaling to the ATM interworking multiplexer that accepted the access connection for the call. The multiplexer converts user information from the access connection into ATM cells for transmission over the virtual connection in accord with the new signaling.

47 Claims, 12 Drawing Sheets

