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(54) **ADVANCED INTELLIGENT NETWORK GATEWAY**

(75) **Inventors:** Timothy Darland; Robert F. Dickerman, both of Cedar Rapids; Christopher P. Tofanelli, Marion, all of IA (US)

(73) **Assignee:** MCI Communications Corporation, Washington, DC (US)

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(56) **References Cited**

U.S. PATENT DOCUMENTS

4,232,199 11/1980 Boatwright et al. 179/18 B
 4,577,061 3/1986 Katzeff et al. 179/2 AM

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

WO 91/16779 10/1991 (WO) H04M/1/66
 WO/91/16779 10/1991 (WO) .

OTHER PUBLICATIONS

"Gazing into the SPC network future reveals vista of new features," Gordon and Hodges, Telephony Magazine, Mar. 21, 1983.

"Signaling System 7 Rescues antiquated billing system," Jonelit, Telephony Magazine, Dec. 2, 1991.

"Smart Credit Cards: the answer to cashless shopping," Weinstein, IEEE Spectrum, Feb. 1984.

"Excel Switching", electronic brochure, www.xl.com/prod.htm.

"VCO Open Programmable Switches," electronic brochure, www.summa4.com/products/wpswitch.htm.

(List continued on next page.)

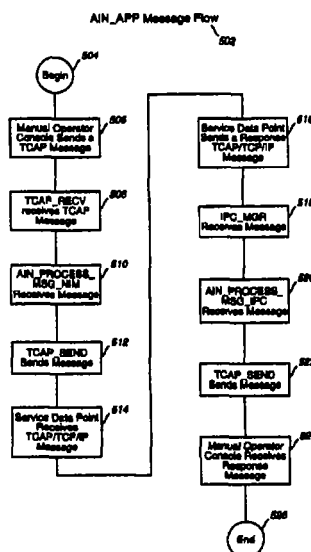
Primary Examiner—Chau Nguyen

Assistant Examiner—Chiho Andrew Lee

(57) **ABSTRACT**

An advanced intelligent network gateway that allows communication between telecommunications network component that use different protocols. In one embodiment, the advanced intelligent network gateway is used to communicate between a manual operator console that are processing a customer's telephone call and a service data point which is a database containing information needed to process the customer's telephone call. However, the advanced intelligent network gateway may also be used to receive and transmit messages between other telecommunications components. In addition, methods for protocol conversion are described. One method for protocol conversion is for the conversion of a transaction capabilities application part message from a user datagram protocol/internet protocol implementation to a transmission control protocol/internet protocol implementation or vice versa. Methods for receiving and transmitting transaction capabilities application part messages are also described.

20 Claims, 13 Drawing Sheets



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U.S. PATENT DOCUMENTS

4,611,096	9/1986	Asmuth et al.	179/18 B
4,625,081	11/1986	Lotito et al.	379/88
4,685,127	8/1987	Miller et al.	379/221
4,706,275	11/1987	Kamil	379/144
4,782,519	11/1988	Patel et al.	379/221
4,791,640	12/1988	Sand	370/58
4,893,330	1/1990	Franco	379/91
5,068,891	11/1991	Marshall	379/91
5,195,086	3/1993	Baumgartner et al.	370/62
5,222,120	6/1993	McLeod et al.	379/88
5,452,350	9/1995	Reynolds et al.	379/220
5,555,244 *	9/1996	Gupta et al.	370/401
5,590,181	12/1996	Hogan et al.	379/114
5,640,446	6/1997	Everett et al.	379/119
5,732,213	3/1998	Gessel et al.	395/200.54
5,774,695	6/1998	Autrey et al.	395/500
5,793,771 *	8/1998	Darland et al.	370/467
5,987,118 *	11/1999	Dickerman et al.	379/365

OTHER PUBLICATIONS

"The Centrex Call Center Advantage," electronic brochure, www.nortel.com/pen/solutions/acd.html.

"Centrex Call Center Tailoring for your Business", electronic brochure, www.nortel.com/pen/solutions/tailoring.html.

"Centrex CTI", electronic brochure, www.nortel.com/pen/solutions/cti.html.

"Centrex Call Center Reporting Options," electronic brochure, www.nortel.com/pen/solutions/reporting.html.

Weinstein, S., "Smart credit cards: the answer to cashless shopping", *IEEE Spectrum*, Feb. 1984, pp. 43-49.

Joneleit, P. "Signaling System 7 rescues antiquated billing system", *Telephony*, Dec. 2, 1991, pp. 32, 34 and 36.

Gordon et al., "Gazing into the SPC network future reveals vista of new features", *Telephony*, Feb. 21, 1983, pp. 86-93.

"DMS-250 Long Distance Switch Product Information: Product Technical Overview", Northern Telecom, from <http://www.nortel.com/broadband/dms/250/250information.html>, Copyright 1996.

Briere, D., "The secret to success with virtual nets", *Network World*, vol. 9, No. 12, Mar. 23, 1992, pp. 1, 31 and 41-43.

* cited by examiner