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(54) **MULTI-NETWORK EXCHANGE SYSTEM FOR TELEPHONY APPLICATIONS**

(75) Inventors: **Faramarz Vaziri**, Port Ewen, NY (US);
Herbert R. Graefe, Patterson, NY (US);
Xin Wang, New Paltz, NY (US);
Andrew Pletch, Gardiner, NY (US);
Jeffrey H. Paige, Wallkill, NY (US)

(73) Assignee: **eMerj, Inc.**, Edgewater, NJ (US)

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H04L 12/56   (2006.01)
(52) **U.S. Cl.** **370/401**; 370/353; 370/466; 370/230
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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,278,707	B1	10/1998	MacMillan et al.
5,991,292	A *	11/1999	Focsaneanu et al. 370/352
6,134,235	A	10/2000	Goldman et al.
6,141,341	A	10/2000	Jones et al.
6,141,345	A	10/2000	Goeddel et al.
6,304,565	B1	10/2001	Ramamurthy
6,339,593	B1 *	1/2002	Kikinis 370/352
6,347,085	B2	2/2002	Kelly
6,353,660	B1	3/2002	Burger et al.

(Continued)

OTHER PUBLICATIONS

"A Flexible, Module-Based Soc-Approach for Low-Power VOIPApplications" Fugger, et al., 15th Annual IEEE International ASIC/SOC Conference, 2002, pp. 256-260, Sep. 2002.

(Continued)

Primary Examiner—Kwang B Yao
Assistant Examiner—Nguyen Ngo
(74) *Attorney, Agent, or Firm*—Billy J. Knowles; BK Patents, Inc.

(57) **ABSTRACT**

A multi-network exchange system has a first type network (PSTN) and a second type network (Internet) and a multi-network exchange bridge in communication with the first and second type networks for the transfer of electronic information signals (telephone calls) between the first and second type networks. The multi-network exchange bridge apparatus facilitates transfer of electronic information signals to a portable access device or a gateway portal in communication with a node of one of second type networks from the first network. The multi-network exchange bridge has at least one multi-network instantiation device that enables the portable access device to function as a remote extension of the multi-network exchange bridge. A fixed address translation device provides conversion of a first address fixedly describing a node of the first type network to a second address or third address virtually describing nodes of the second type network.

76 Claims, 27 Drawing Sheets
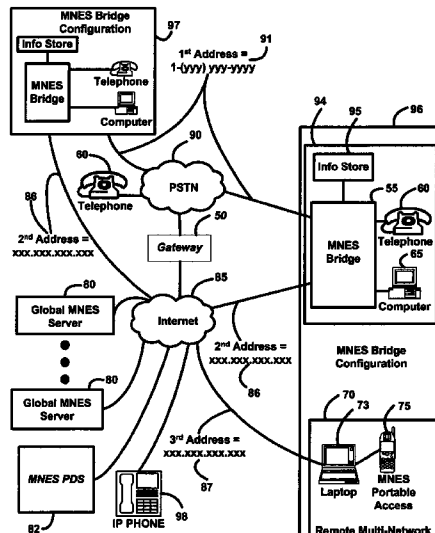
U.S. PATENT DOCUMENTS

6,377,570	B1	4/2002	Vaziri et al.	
6,404,764	B1	6/2002	Jones et al.	
6,411,704	B1	6/2002	Pelletier et al.	
6,446,127	B1	9/2002	Schuster et al.	
6,560,457	B1	5/2003	Silver et al.	
6,628,617	B1	9/2003	Karol et al.	
6,650,901	B1	11/2003	Schuster et al.	
6,665,293	B2	12/2003	Thornton et al.	
6,714,536	B1	3/2004	Dowling	
6,735,621	B1	5/2004	Yoakum et al.	
6,741,695	B1	5/2004	McConnell et al.	
6,744,759	B1	6/2004	Sidhu et al.	
7,092,379	B1 *	8/2006	Singh et al.	370/352
7,099,301	B1 *	8/2006	Sheu	370/352
2002/0107923	A1	8/2002	Chu et al.	
2002/0118671	A1	8/2002	Staples et al.	
2003/0039238	A1 *	2/2003	Ollis et al.	370/352
2003/0210663	A1 *	11/2003	Everson et al.	370/329
2004/0068648	A1 *	4/2004	Lewis et al.	713/153
2004/0174864	A1	9/2004	Klaghofer	
2004/0190498	A1	9/2004	Kallio et al.	
2005/0068938	A1 *	3/2005	Wang et al.	370/352

OTHER PUBLICATIONS

"Supplementary Services in the H.323 IP Telephony Network", Korpi, et al., IEEE Communications Magazine, vol. 37, Jul. 1999, pp. 118-125.

"Windows Netmeeting Advanced Calling Feature", found www.microsoft.com/windows/NetMeeting, Oct. 2004.

"JFFS: The Journaling Flash File System", Woodhouse, Proc. of Ottawa Linux Symposium, 2001, found:http://sources.redhat.com/jffs2/jffs2-html/jffs2-html.html, Oct. 2004.

"SIP: Session Initiation Protocol", RFC2543, Handley, et al., The Internet Society, Mar. 1999, found: www.ietf.org/rfc/rfc2543.txt?number=2543, Oct. 2004.

"GZIP file format specification version 4.3", RFC1952, Deutsch, The Internet Society, May 1996, found: http://www.ietf.org/rfc/rfc1952.txt?number=1952, Oct. 2004.

"Dynamic Host Configuration Protocol", RFC1541, DROMS, The Internet Society, Oct. 1993, found: http://www.ietf.org/rfc/rfc1541.txt?number=1541, Oct. 2004.

"Domain Names—Concepts and Facilities", RFC1034, Mockapetris, The Internet Society, Nov. 1987, found: http://www.ietf.org/rfc/rfc1034.txt?number=1034, Oct. 2004.

"Simple Network Time Protocol (SNTP) Version 4 or IPv4, IPv6 and OSI", RFC2030, Mills, Oct. 1996, The Internet Society, found: http://www.ietf.org/rfc/rfc2030.txt?number=20.

"File Transfer Protocol (FTP)", RFC959, Postel, et al., The Internet Society, Oct. 1985, found: http://www.ietf.org/rfc/rfc0959.txt?number=959, Oct. 2004.

"RTP: A Transport Protocol for Real-Time Applications", RFC1889, Schulzrinne, et al., Audio-Video Transport Working Group, The Internet Society, Jan. 1996, found: http://www.ietf.org/rfc/rfc1889.txt?number=1889, Oct. 2004.

"SIP: Session Initiation Protocol", RFC 3261, Rosenberg, et al., The Internet Society, Jun. 2002, found: http://www.ietf.org/rfc/rfc3261.txt?number=3261, Oct. 2004.

"Multifrequency push-button signal reception", Specification: ITU-T Q.24, International Telecommunications Union, Nov. 1998.

"Dual rate speech coder for multimedia communications transmitting at 5.3 and 6.3 kbit/s", Specification ITU.T G.723.1, International Telecommunications Union, Nov. 1996.

"Pulse code modulation (PCM) of voice frequencies", ITU-T Recommendation G.711, International Telecommunications Union, Nov. 1988.

Practical VoIP Using Vocal, Dang, et. al., O'Reilly Associates, Inc., Sebastopol, CA 95472, Jul. 2002.
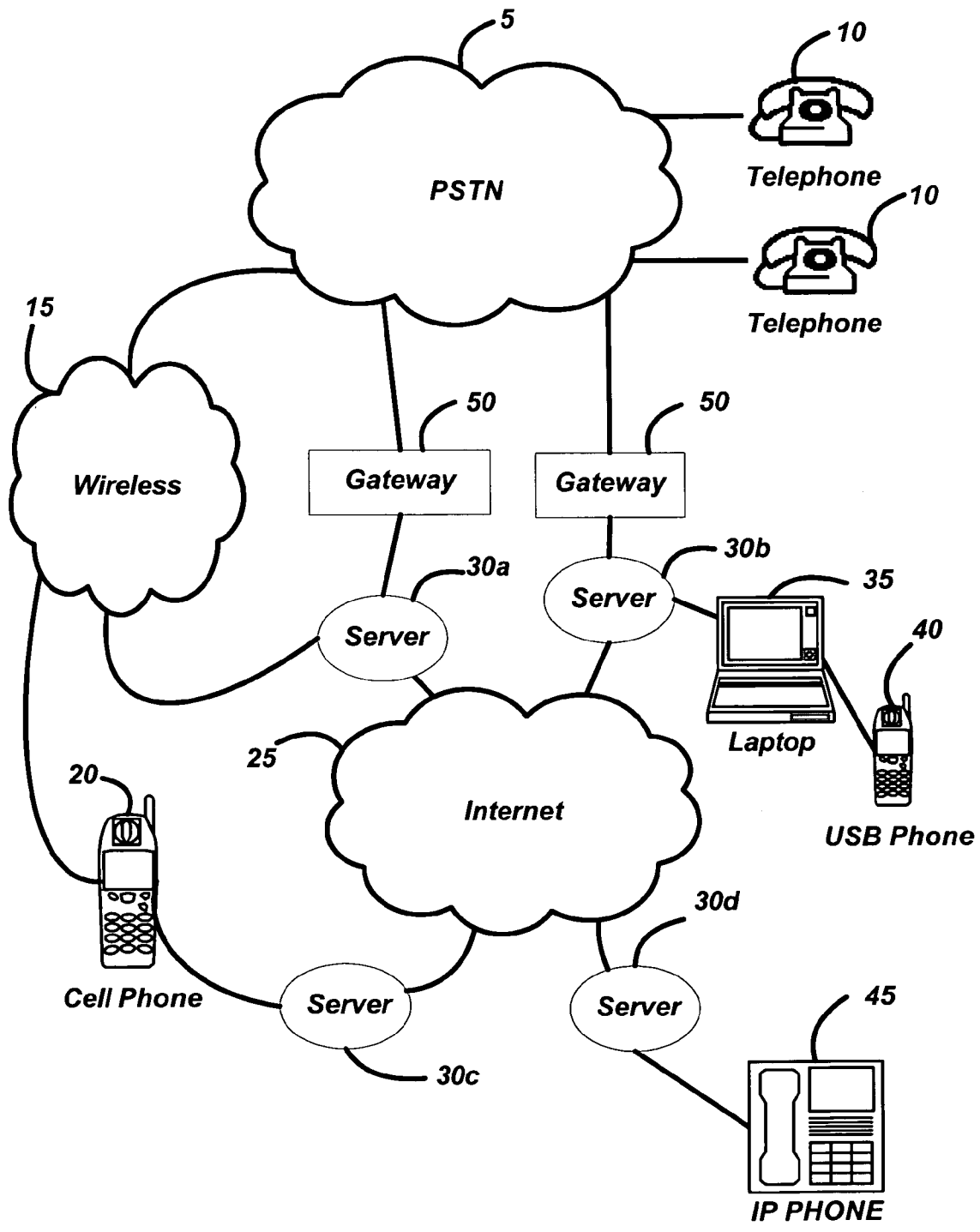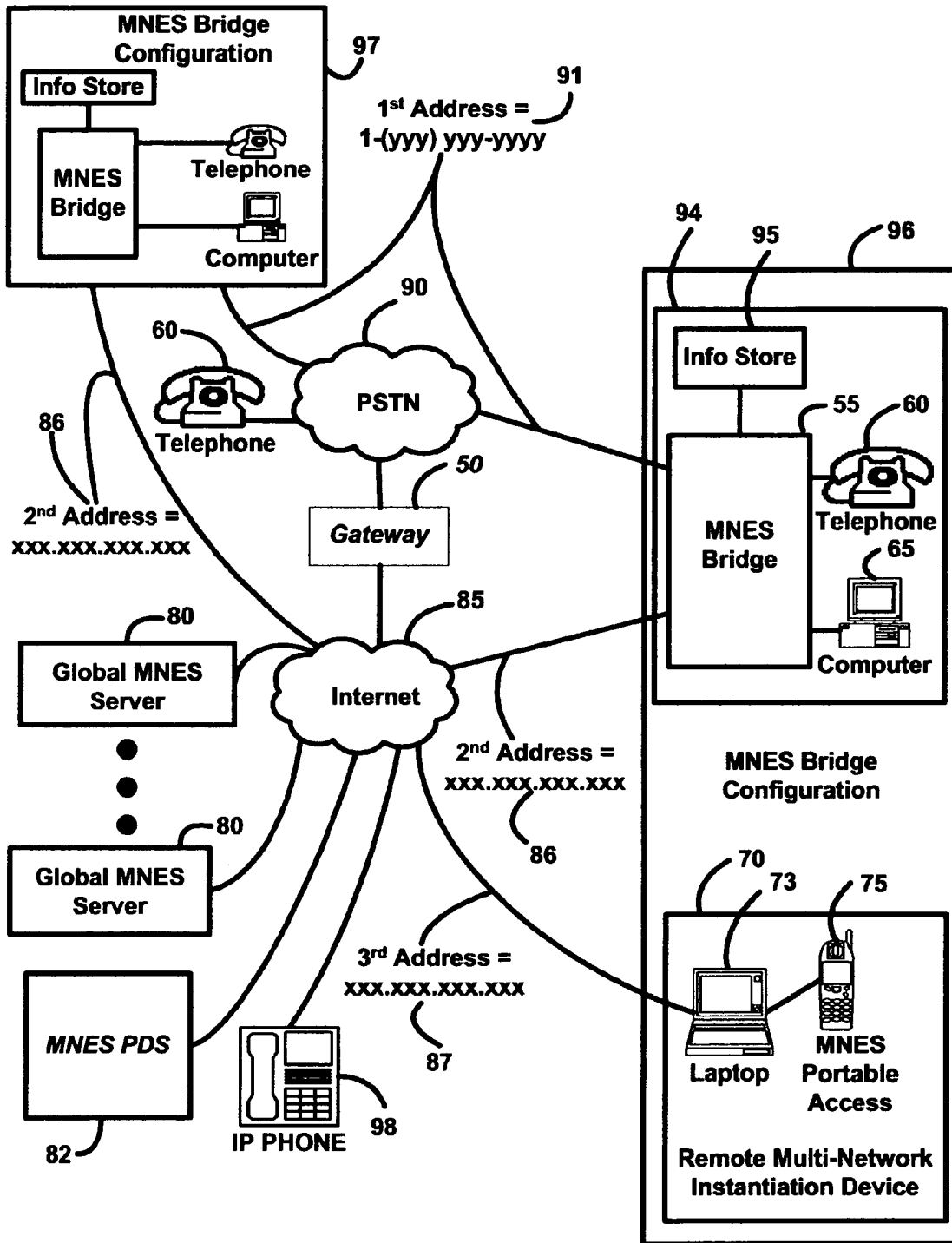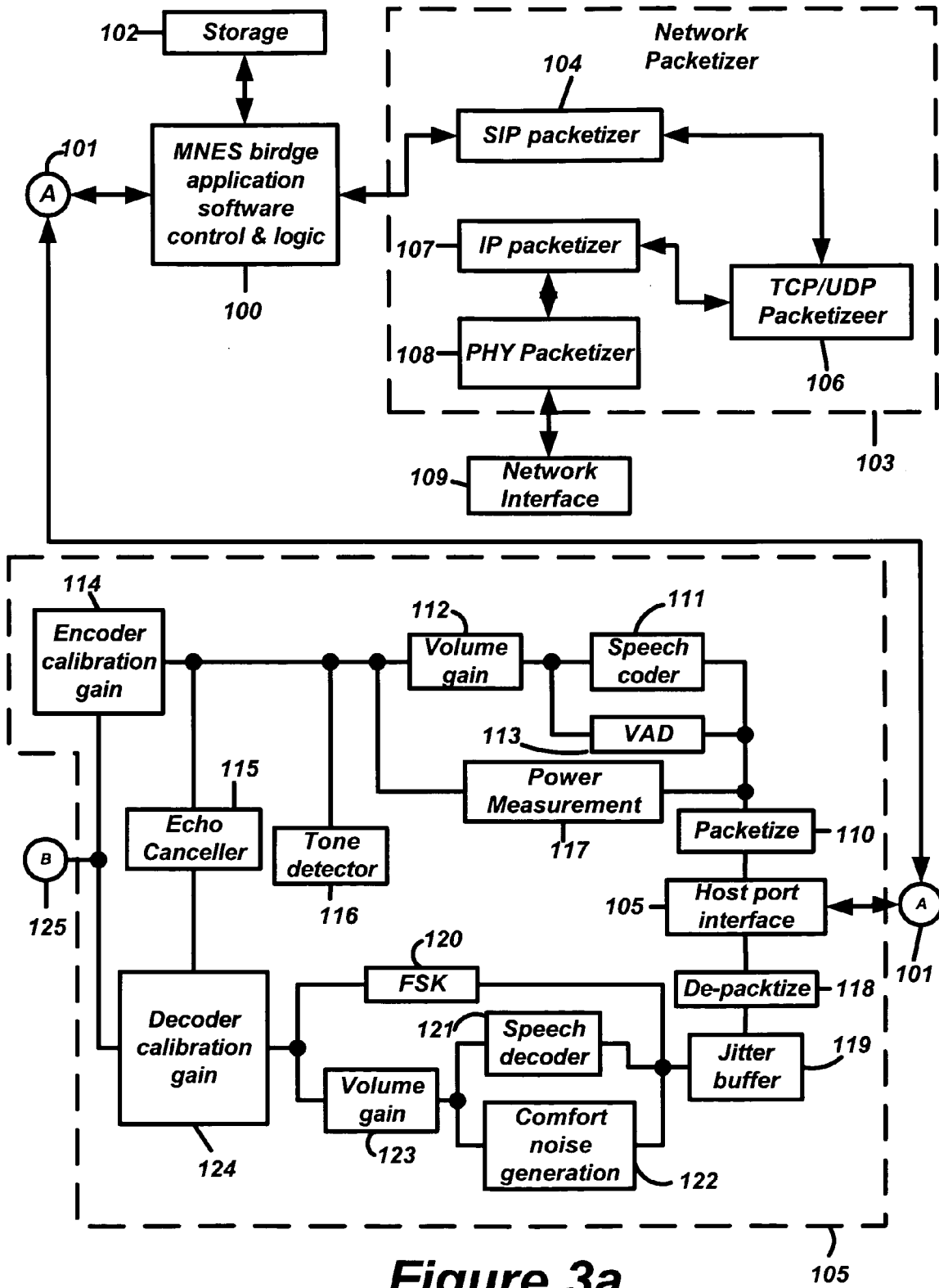
* cited by examiner

Figure 1

MNES Bridge Configuration 97

Info Store

MNES Bridge

Telephone

Computer

1st Address = 91
1-(yyy) yyy-yyyy

94   95   96

60

PSTN 90

Telephone

86

2nd Address =
xxx.xxx.xxx.xxx

50

Gateway

Info Store

55   60

MNES Bridge

Telephone

65

Computer

80

Global MNES Server

85

Internet

2nd Address =
xxx.xxx.xxx.xxx

86

MNES Bridge Configuration

80

Global MNES Server

3rd Address =
xxx.xxx.xxx.xxx

70   73   75

MNES PDS

87

Laptop

MNES Portable Access

98

IP PHONE

82

Remote Multi-Network Instantiation Device

Figure 2

Figure 3a

DOCKET ALARM

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