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Silverman

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(54) **TDM OVER IP (IP CIRCUIT EMULATION SERVICE)**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 711 days.

(21) Appl. No.: **09/626,335**

(22) Filed: **Jul. 26, 2000**

(51) **Int. Cl.**⁷ **H04L 12/66**

(52) **U.S. Cl.** **370/466; 370/395.1; 370/395.2**

(58) **Field of Search** **370/466, 395.1, 370/401, 474, 352, 353, 395.52, 395.5**

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,548,646	A	8/1996	Aziz et al.
5,623,605	A *	4/1997	Keshav et al.
5,715,250	A	2/1998	Watanabe
5,903,559	A	5/1999	Acharya
5,936,936	A	8/1999	Alexander, Jr. et al.
5,936,965	A	8/1999	Doshi et al.

5,946,313	A	8/1999	Allan et al.
6,459,708	B1	10/2002	Cox et al.
6,519,261	B1 *	2/2003	Brueckheimer et al. 370/395.52
6,574,224	B1 *	6/2003	Brueckheimer et al. . . 370/395.6
6,603,850	B1 *	8/2003	Stahl et al. 379/221.02

* cited by examiner

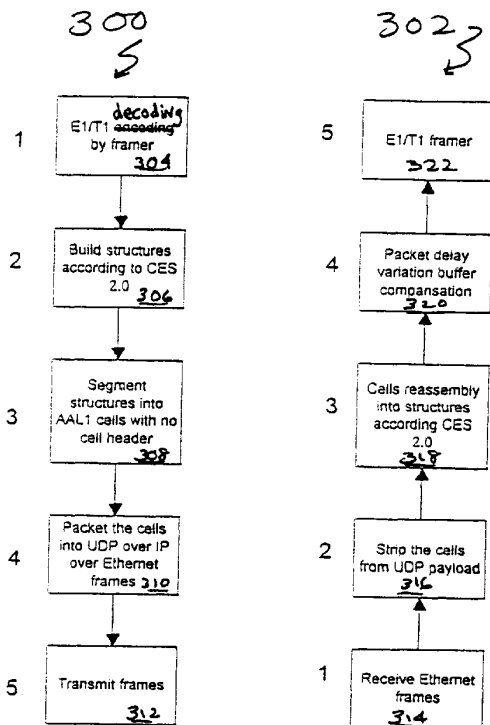
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(57) **ABSTRACT**

A method and system for processing one or more TDMs for communication over IP networks, such as the Internet, includes encapsulating ATM cells (packets) using AAL1 cells within UDP over IP frames to provide synchronous bit streams into fixed size cells. This allows for an IP header to be added to the packets, with such packets forwarded to its destination host across the IP network. The destination regenerates the clock, decrypts/strips the IP header and delivers a synchronous bit stream. Furthermore, an adaptive clock is provided for clock transfer across the network. The adaptive clock regenerates the far end T1/E1 receive clock out of the incoming arrival frame rate. Frames arriving from the IP network are stored in a buffer and taken out for TDM stream assembly.

41 Claims, 4 Drawing Sheets



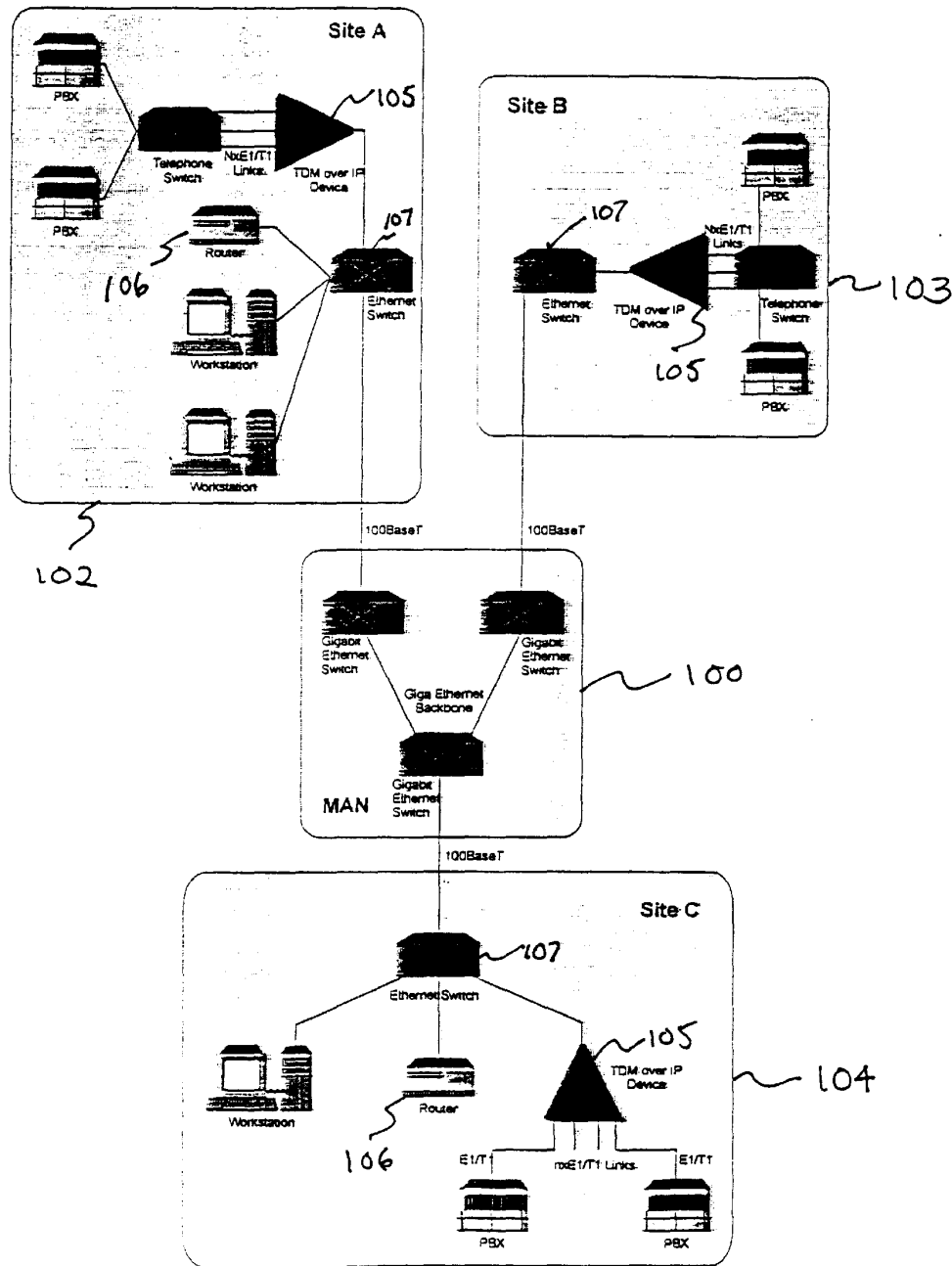


Figure 1

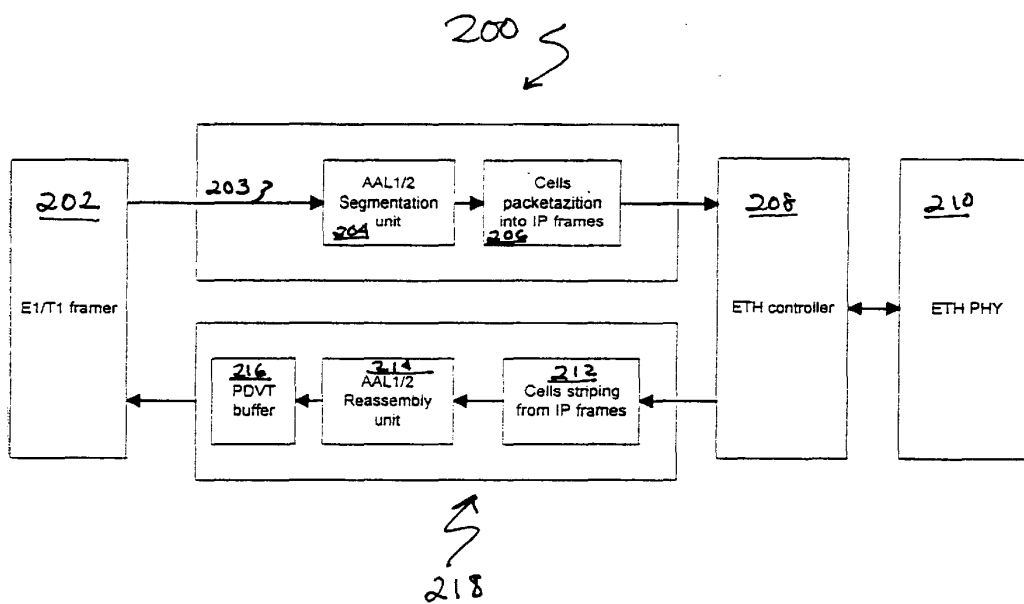


Figure 2

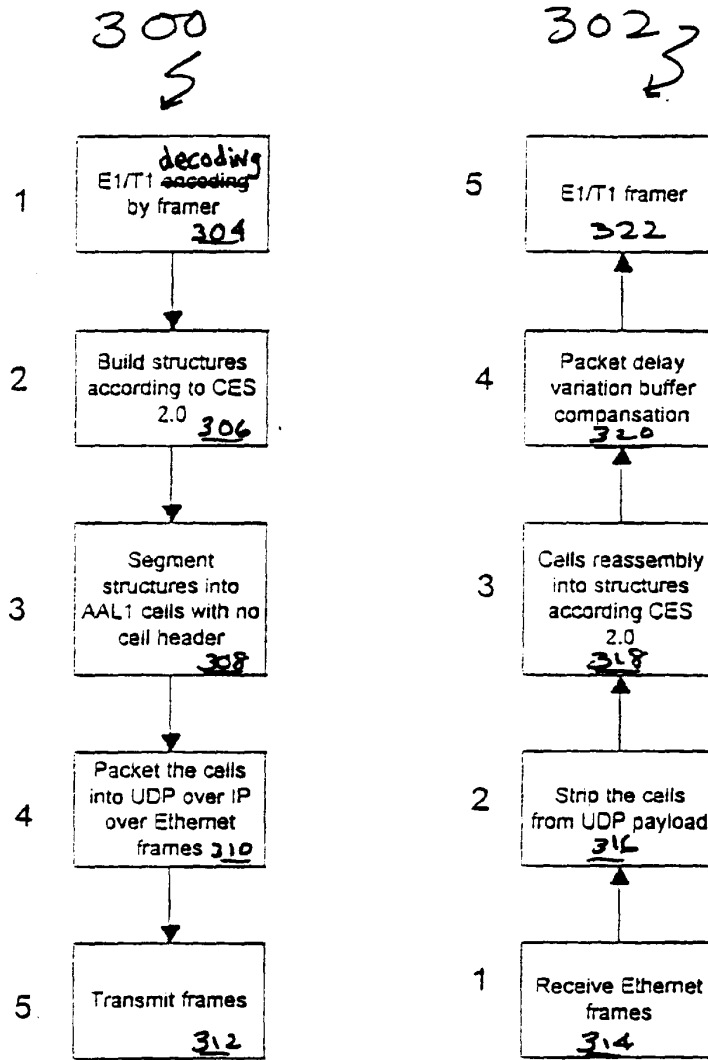


Figure 3

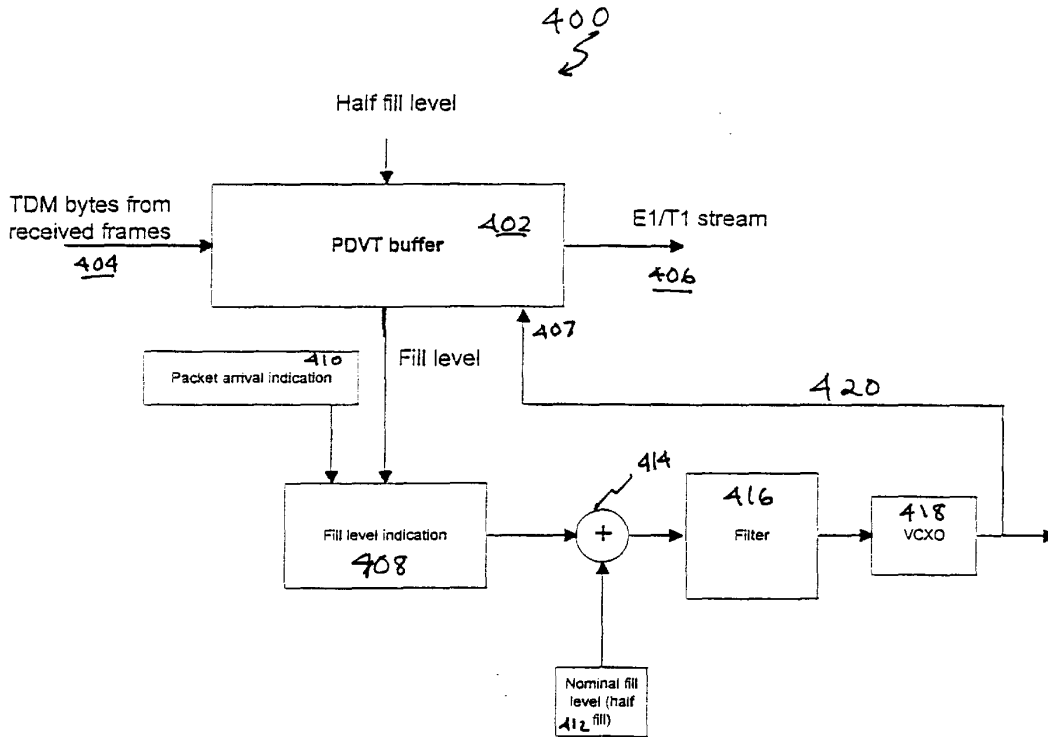


Figure 4

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