(12) **United States Patent**
LaPier et al.

(10) **Patent No.:** **US 6,333,931 B1**
(45) **Date of Patent:** *Dec. 25, 2001

(54) **METHOD AND APPARATUS FOR INTERCONNECTING A CIRCUIT-SWITCHED TELEPHONY NETWORK AND A PACKET-SWITCHED DATA NETWORK, AND APPLICATIONS THEREOF**

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(*) Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/221,912**

(22) Filed: **Dec. 28, 1998**

(51) **Int. Cl.^{7}** **H04Q 11/00**
(52) **U.S. Cl.** **370/385**; 370/410; 370/352
(58) **Field of Search** 370/352–563, 370/385, 466, 467, 410, 522; 379/88.17, 202, 201.01–201.05, 201.11, 201.12, 202.01, 203.01; 348/14

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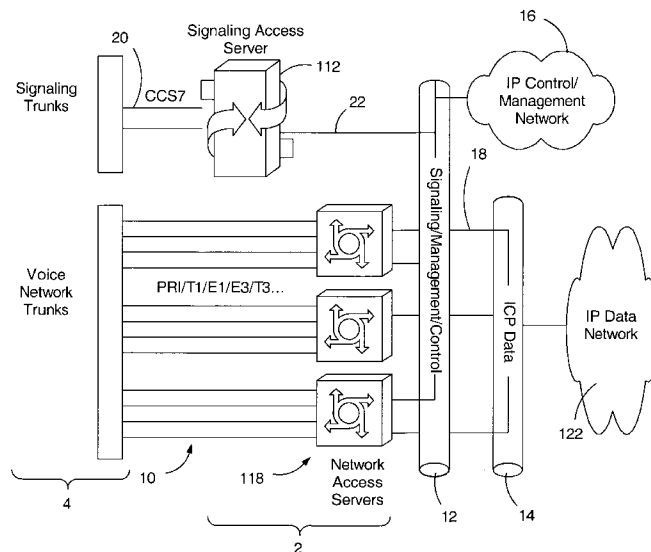* cited by examiner

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(57) **ABSTRACT**

A method and apparatus are disclosed for interconnecting a circuit-switched telephone network and a packet-switched data network for communication among them. A signaling trunk of a circuit-switched telephone network is coupled to a signaling access server that is also coupled to a signaling, management and control network. One or more voice trunks of the telephone network are coupled to one or more network access servers, which are also coupled to the control network to thereby receive instructions from the signaling access server. The network access servers are also coupled to a packet-switched data network, such as the global packet-switched network known as Internet. The signaling access server can receive call setup messages and other messages in standard telephone network protocol formats and convert them into call setup messages in a special protocol for communications between the signaling access server and the network access servers. The signaling access server can instruct the network access servers to establish a call, containing voiceband information such as modem-based data calls, from the voice trunks to the data network. Accordingly, the public switched telephone network and the Internet may be interconnected and may inter-communicate without modifying the protocols of either one.
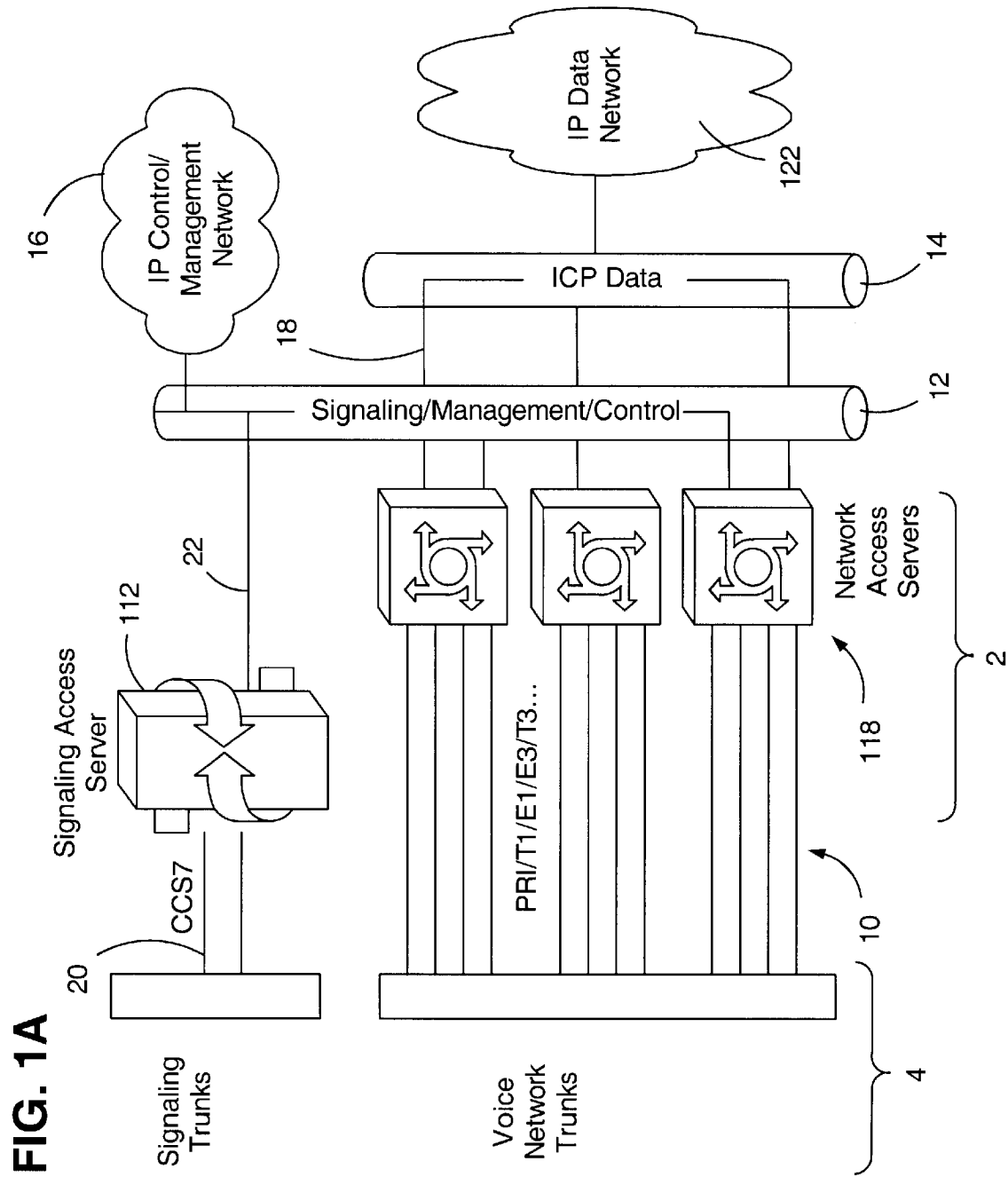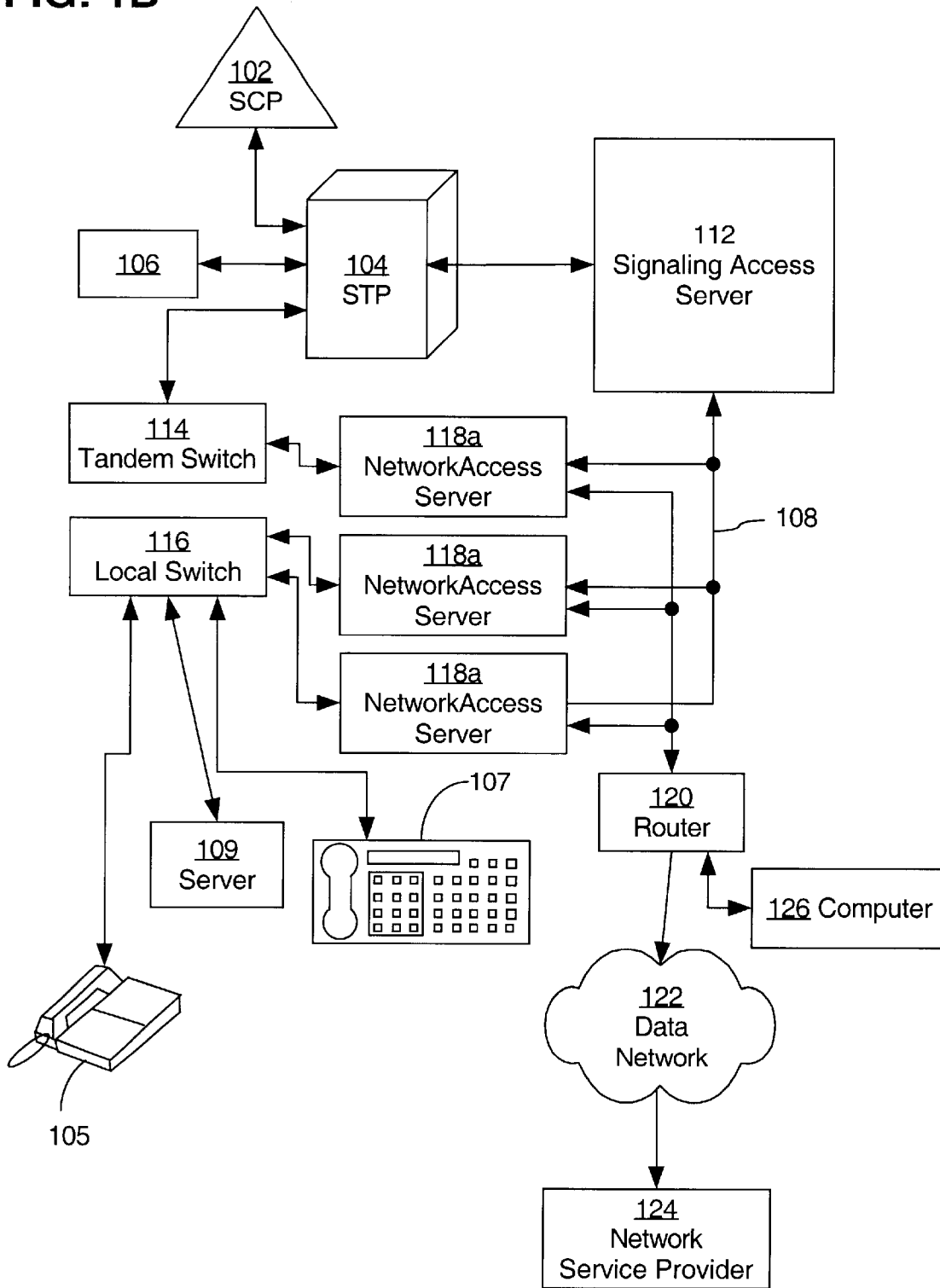
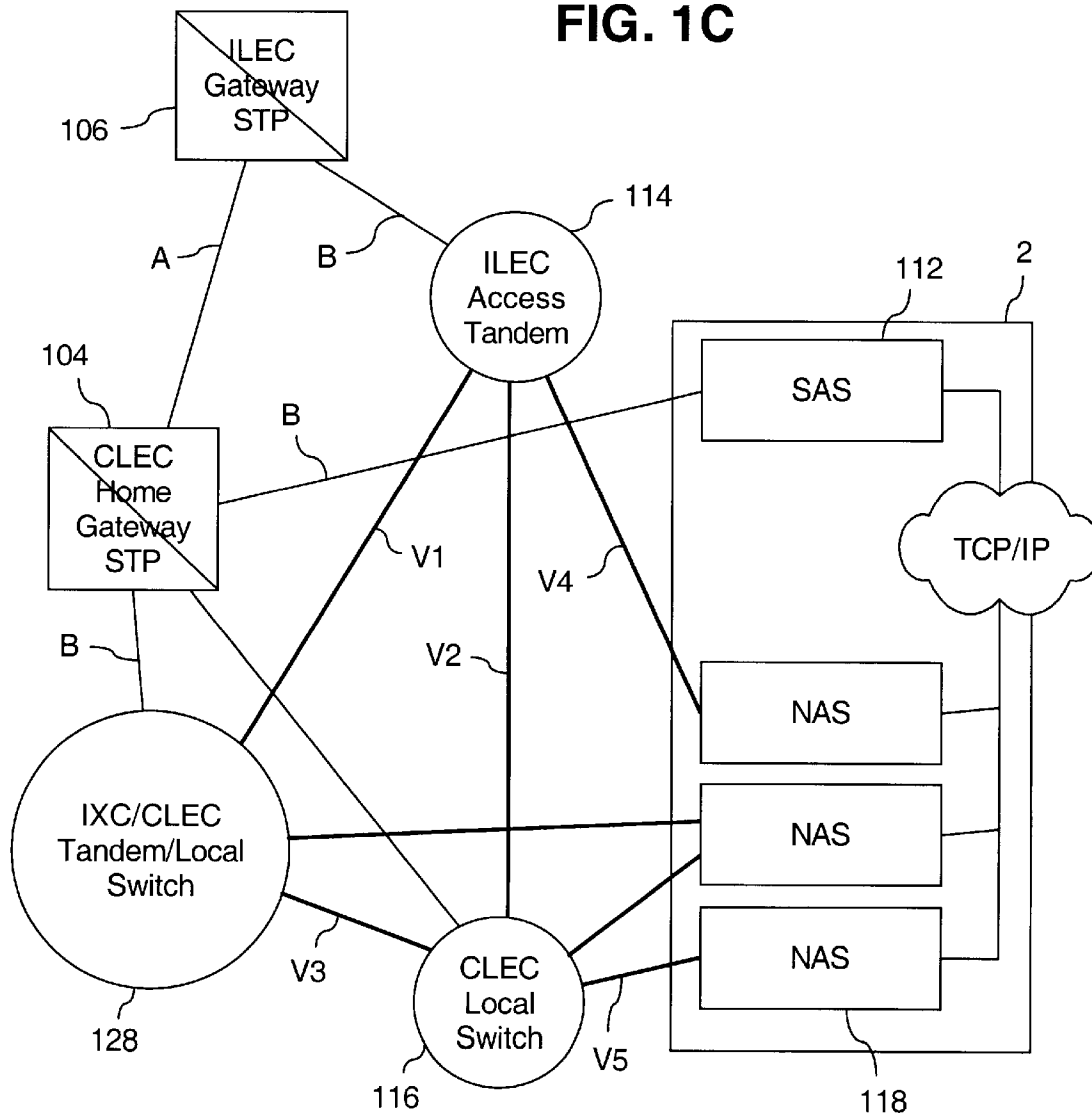**19 Claims, 23 Drawing Sheets**

FIG. 1A

FIG. 1B

102
SCP

106

104
STP

112
Signaling Access
Server

114
Tandem Switch

118a
NetworkAccess
Server

116
Local Switch

118a
NetworkAccess
Server

108

118a
NetworkAccess
Server

107

120
Router

109
Server

126 Computer

122
Data
Network

105

124
Network
Service Provider

FIG. 1C

FIG. 2A

DOCKET ALARM
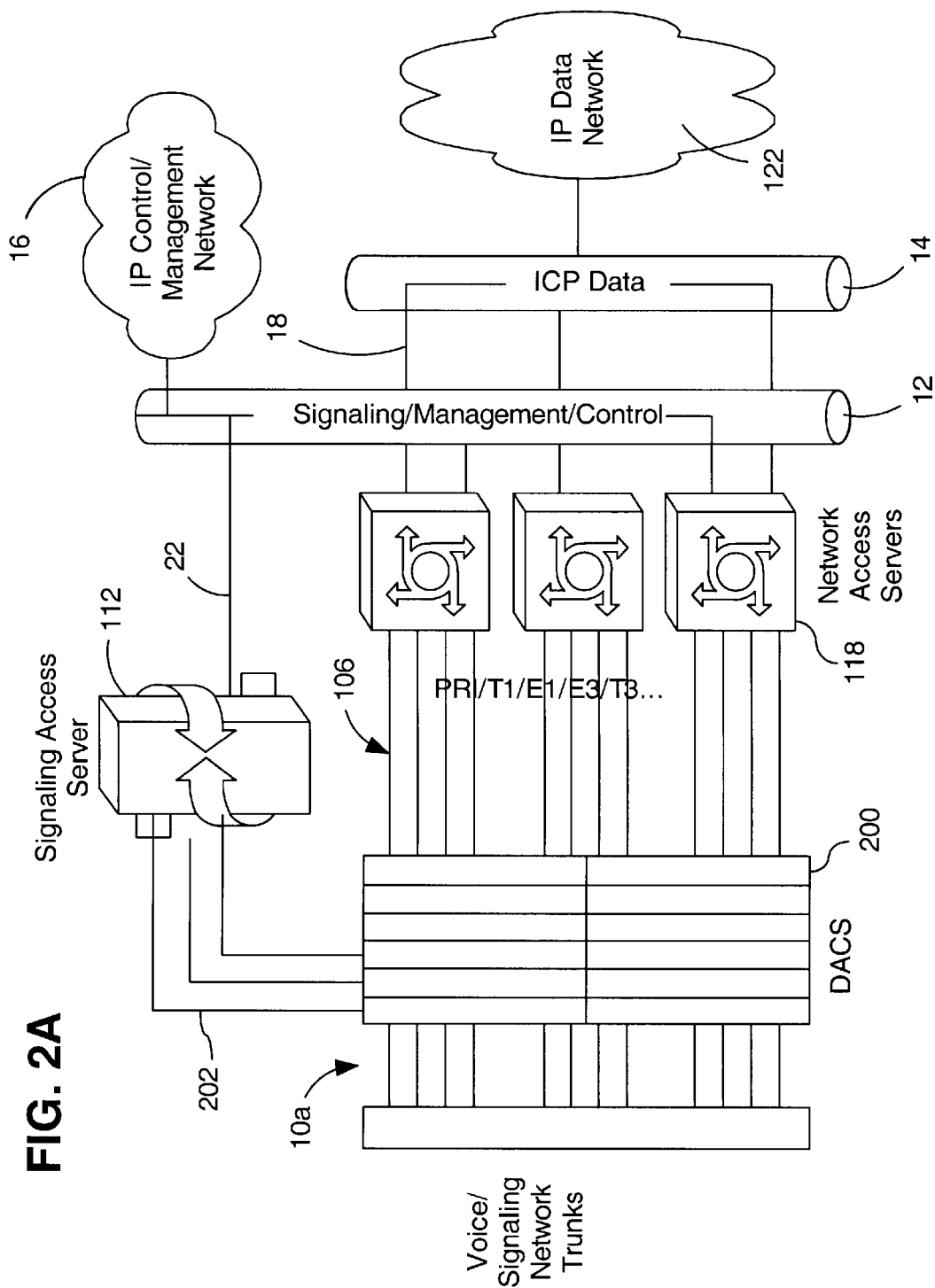
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