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United States Patent [19]
Cheng

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[45] **Date of Patent:** **Oct. 8, 1996**

- [54] **DYNAMIC CHANNEL MANAGEMENT AND SIGNALLING METHOD AND APPARATUS**
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- [21] Appl. No.: **276,534**
- [22] Filed: **Jul. 18, 1994**
- [51] Int. Cl.⁶ **H04H 1/04**
- [52] U.S. Cl. **370/73; 348/12; 370/85.7; 370/85.8; 455/4.2; 455/5.1**
- [58] **Field of Search** **348/6, 9, 12, 13; 455/3.1, 4.2, 5.1, 6.1, 34.1; 379/71, 73, 76, 80, 85.3, 85.7, 85.8, 95.1, 95.2**

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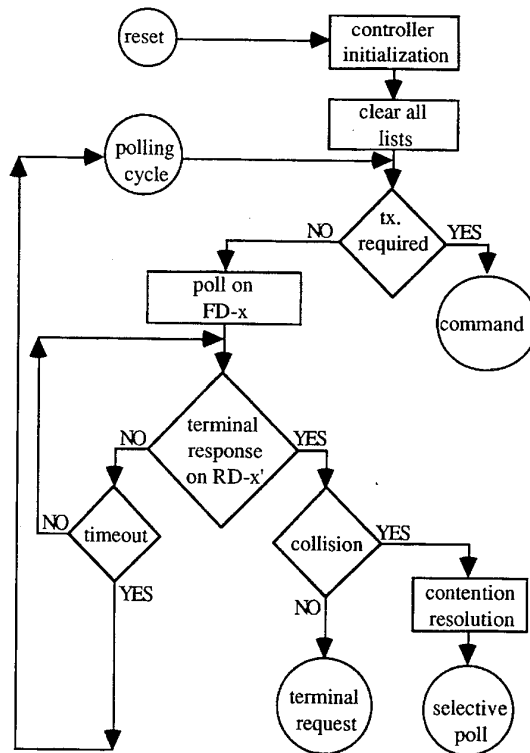
Primary Examiner—Benedict V. Safourek

[57] **ABSTRACT**

There is provided a dynamic and adaptable method and apparatus to support two-way multi-media communication

services on a multiple access communication system, which comprises a central controller, a shared transmission media and a plurality of remote terminals dispersed throughout the network. The central controller comprises switch and control apparatus and a pool of transmitters and receivers. The communication channels between the central controller and remote terminals are arranged for signalling data and traffic bearer channels in the forward and reverse directions. The number of signalling data channels is adjusted to satisfy the traffic requirements and for redundancy purposes. The forward and reverse signalling data channels are coupled in different mappings to support terminal grouping. Multiple access of the remote terminals for the upstream traffic are mitigated by separating remote terminals in groups via the channel allocation and the terminal assignment process. Communication between the central controller and the remote terminals follows a multiple access scheme controlled by the central controller via polling procedure on each of the forward signalling data channels independently. In case of collision, the central controller engages the remote terminals in a selective polling process to resolve the contention. The overlapping polling method of the controlled access scheme increases the utilization of the signalling channel and reduces the time required to gain access to the shared transmission media. By dynamically adjusting the load on signalling data channels, the signalling process is greatly improved for efficiency and redundancy against anomalies with the added benefit of improved flexibility and extensibility. The system is especially useful in a two-way CATV network.

20 Claims, 16 Drawing Sheets



Petitioner ARRIS Group, Inc.'s



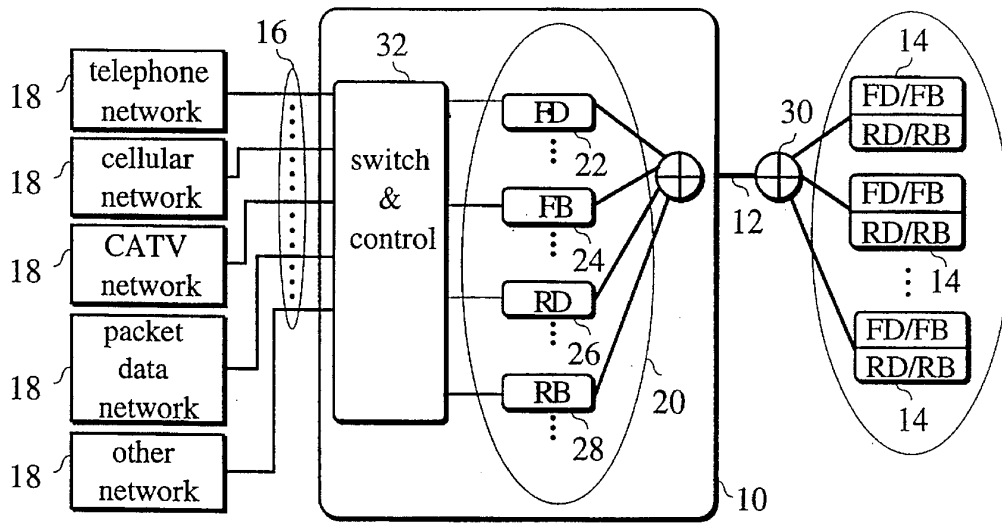


Figure 1

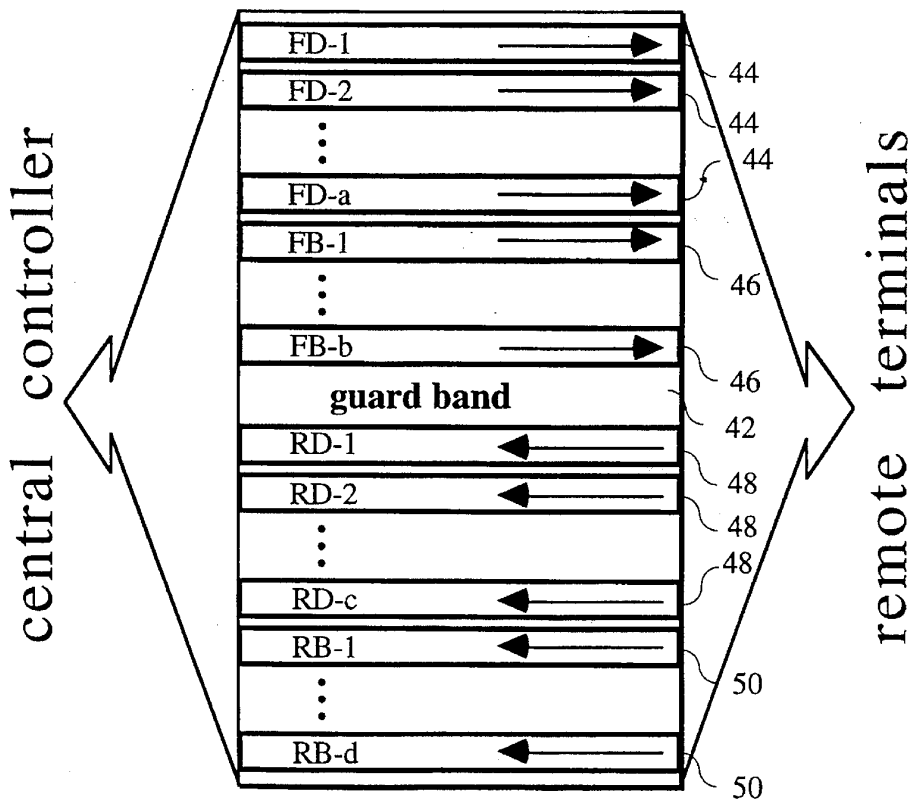


Figure 2

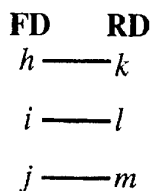


Figure 3a

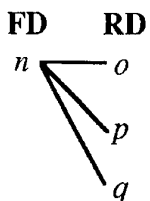


Figure 3b

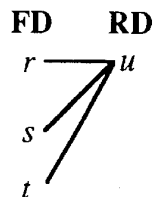


Figure 3c

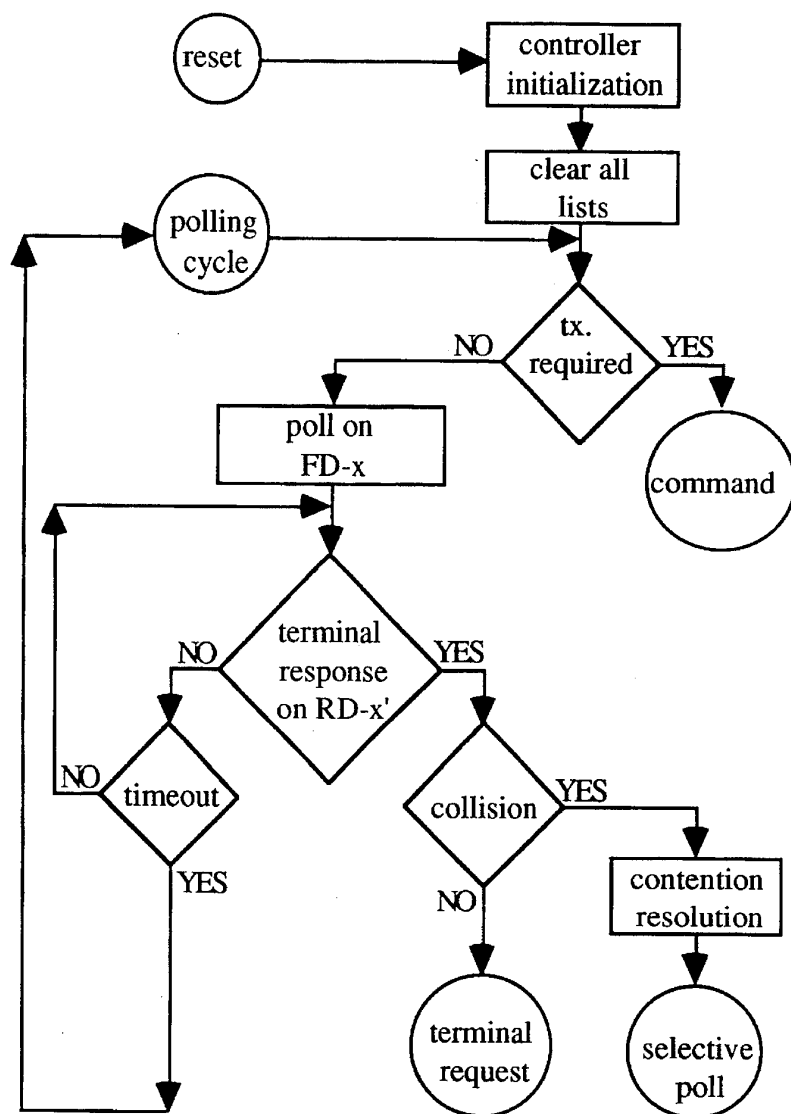


Figure 4

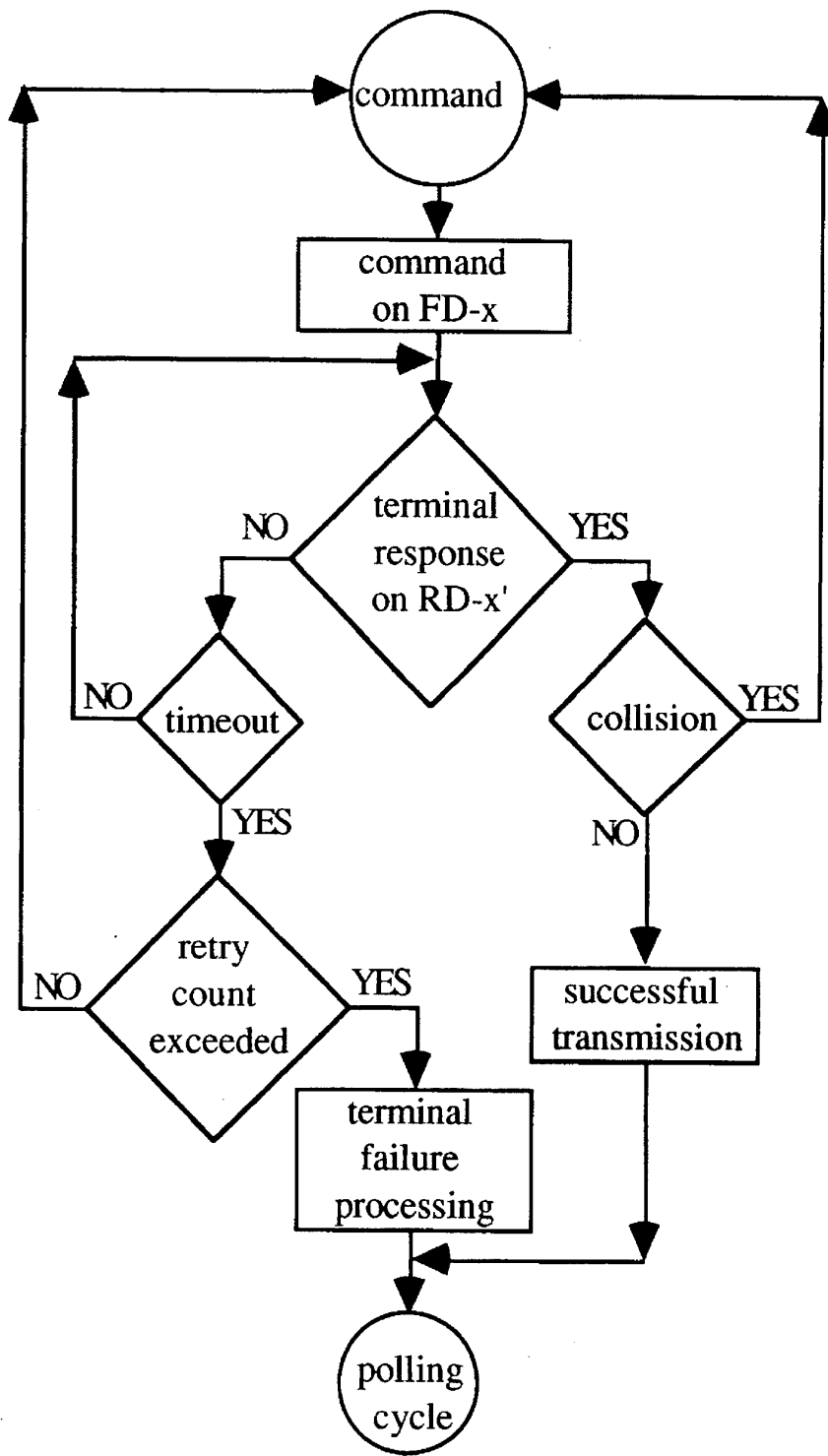


Figure 5

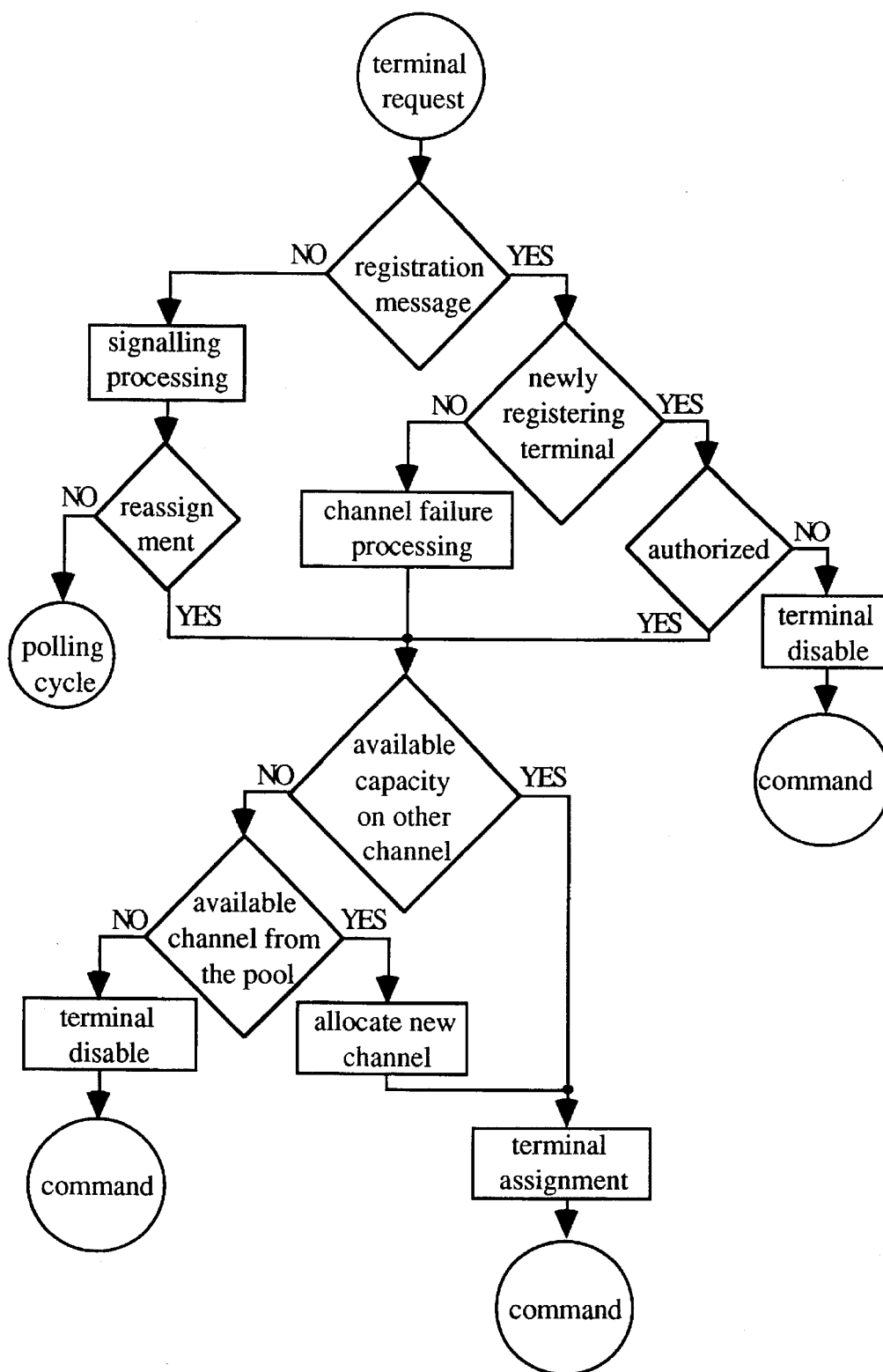


Figure 6

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