



[54] MULTIMEDIA CONTROL SYSTEM AND METHOD FOR CONTROLLING MULTIMEDIA PROGRAM PRESENTATION

[75] Inventors: Hal Hjalmar Ottesen; Gordon J. Smith; George Willard VanLeeuwen, all of Rochester, Minn.

[73] Assignee: International Business Machines Corporation, Armonk, N.Y.

[21] Appl. No.: 473,315

[22] Filed: Jun. 7, 1995

[51] Int. Cl.⁶ H04N 7/14

[52] U.S. Cl. 395/500; 348/7

[58] Field of Search 395/500; 455/4.2; 364/514 A; 348/7

[56] References Cited

U.S. PATENT DOCUMENTS

4,142,209	2/1979	Hedlund et al.	386/95
4,420,828	12/1983	Yoshida et al.	369/47
4,475,132	10/1984	Rodesch	386/92
4,761,694	8/1988	Shudo et al.	386/95
4,797,752	1/1989	Giddings	386/125
4,916,682	4/1990	Tomoda et al.	369/32
4,949,187	8/1990	Cohen	386/69
4,972,190	11/1990	Primeau et al.	341/155
5,113,439	5/1992	Hashimoto	380/7
5,191,410	3/1993	McCalley et al.	358/86
5,197,051	3/1993	Tomoda et al.	369/14
5,208,665	5/1993	McCalley et al.	348/12
5,257,111	10/1993	Kakuyama	386/125
5,260,800	11/1993	Sturm et al.	386/2
5,291,343	3/1994	Goto	386/96
5,341,474	8/1994	Gelman et al.	395/200

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

0 265 167 8/1989 European Pat. Off. G11B 27/00

OTHER PUBLICATIONS

Taylor, Herb et al., *The Magic Video-on-Demand Server and Real-Time Simulation System*, IEEE, 1995, pp. 40-51.

Lougher, Phillip et al., *The Impact of Digital Audio and Video on High-Speed Storage*, IEEE, 1994, pp. 84-89.

Sincoskie, W. D., *System architecture for a large scale video on demand service*, Computer Networks and ISDN Systems 22, 1991, 155-162.

IBM Technical Disclosure Bulletin, *Multimedia Extensions to Tutorial Manager for Officevision*, vol. 33, No. 2, Jul. 1990, p. 440.

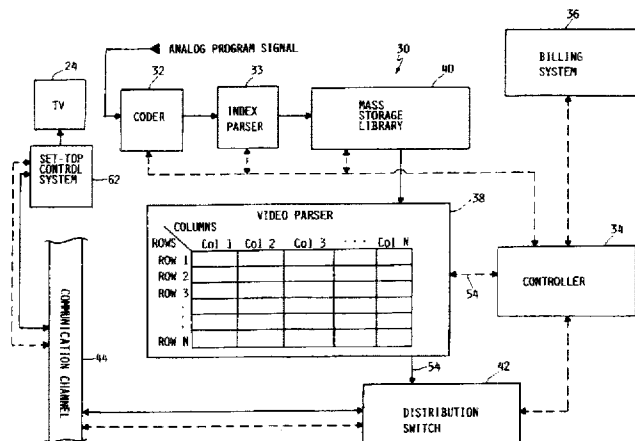
(List continued on next page.)

Primary Examiner—Gary Chin
 Assistant Examiner—Matthew Loppnow
 Attorney, Agent, or Firm—Mark A. Hollingsworth

[57] ABSTRACT

An apparatus and method for effectuating local reception and processing of source program signals representative of a compressed digital multimedia program received from a remote multimedia server are disclosed. The multimedia server transmits a selected multimedia program as a custom ordered series of discrete program segments to a local set-top control system, which buffers and decompresses the compressed program segments for presentation on a local display monitor. A local set-top control system preferably includes a direct access storage device adapted to buffer a predetermined number of compressed program segments received from a multimedia server, some of which may be non-sequentially ordered and others of which may be sequentially ordered. A novel formatting methodology provides for the sequential presentation of the program segments asynchronously distributed on one or more data storage disks disposed in the direct access storage device. A user-definable presentation control window for performing local VCR-type presentation control functions for the portion of a multimedia program buffered in the direct access storage device is also provided through the novel formatting methodology. The novel formatting methodology also provides concurrent presentation and buffering of program segments received from the multimedia server for on-demand viewing of a selected multimedia program.

23 Claims, 30 Drawing Sheets



U.S. PATENT DOCUMENTS

5,357,276	10/1994	Banker et al.	348/7
5,369,533	11/1994	Ottesen et al.	360/51
5,410,676	4/1995	Huang et al.	395/500
5,414,455	5/1995	Hooper et al.	348/7
5,434,678	7/1995	Abecassis	358/342
5,442,455	8/1995	Hioki et al.	358/342
5,517,250	5/1996	Hoogenboom et al.	348/467
5,517,652	5/1996	Miyamoto et al.	395/800
5,528,281	6/1996	Grady et al.	348/7
5,535,137	7/1996	Rossmere et al.	364/514 A
5,555,441	9/1996	Haddad	455/4.2
5,557,538	9/1996	Retter et al.	364/514 A
5,557,541	9/1996	Schulhof et al.	364/514 R

OTHER PUBLICATIONS

IBM Technical Disclosure Bulletin, Interactive Computer/Video Server, vol. 34, No. 3, Aug. 1991, pp. 67-68.

IBM Technical Disclosure Bulletin, Automatic Multiple Source Selection in a Video Conference, vol. 34, No. 7A, Dec. 1991, pp. 385-386.

IBM Technical Disclosure Bulletin, Multimedia Bitmap Video Imaging in an OS/2 Window, vol. 34, No. 7A, Dec. 1991, pp. 402-403.

IBM Technical Disclosure Bulletin, Multimedia Network System, vol. 35, No. 4B, Sep. 1992, pp. 118-119.

IBM Technical Disclosure Bulletin, Spiral Direct Access Storage Device Format for Non-Stop Multimedia Data Transfers, vol. 37, No. 8, Aug. 1994, pp. 7-8.

Electronic Engineering Times, Rich Boyd-Merritt, Video-On-Demand Battle Brewing, Oct. 4, 1993, pp. 113-114.

Electronic Engineering Times, Rich Boyd-Merritt, Redesign Disk Drives Go To The Movies, Jan. 17, 1994, pp. 37, 39-40, 53.

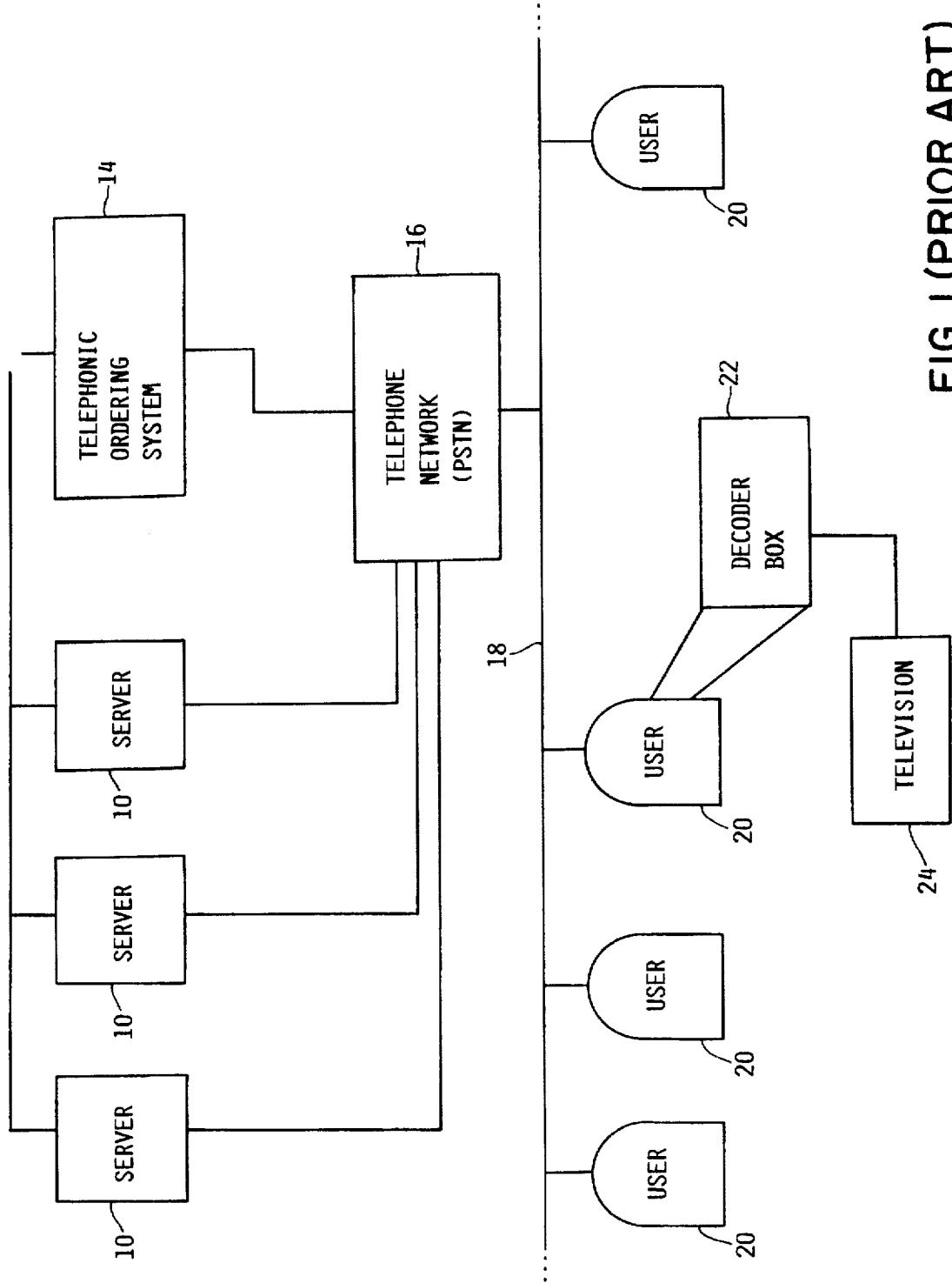


FIG. 1 (PRIOR ART)

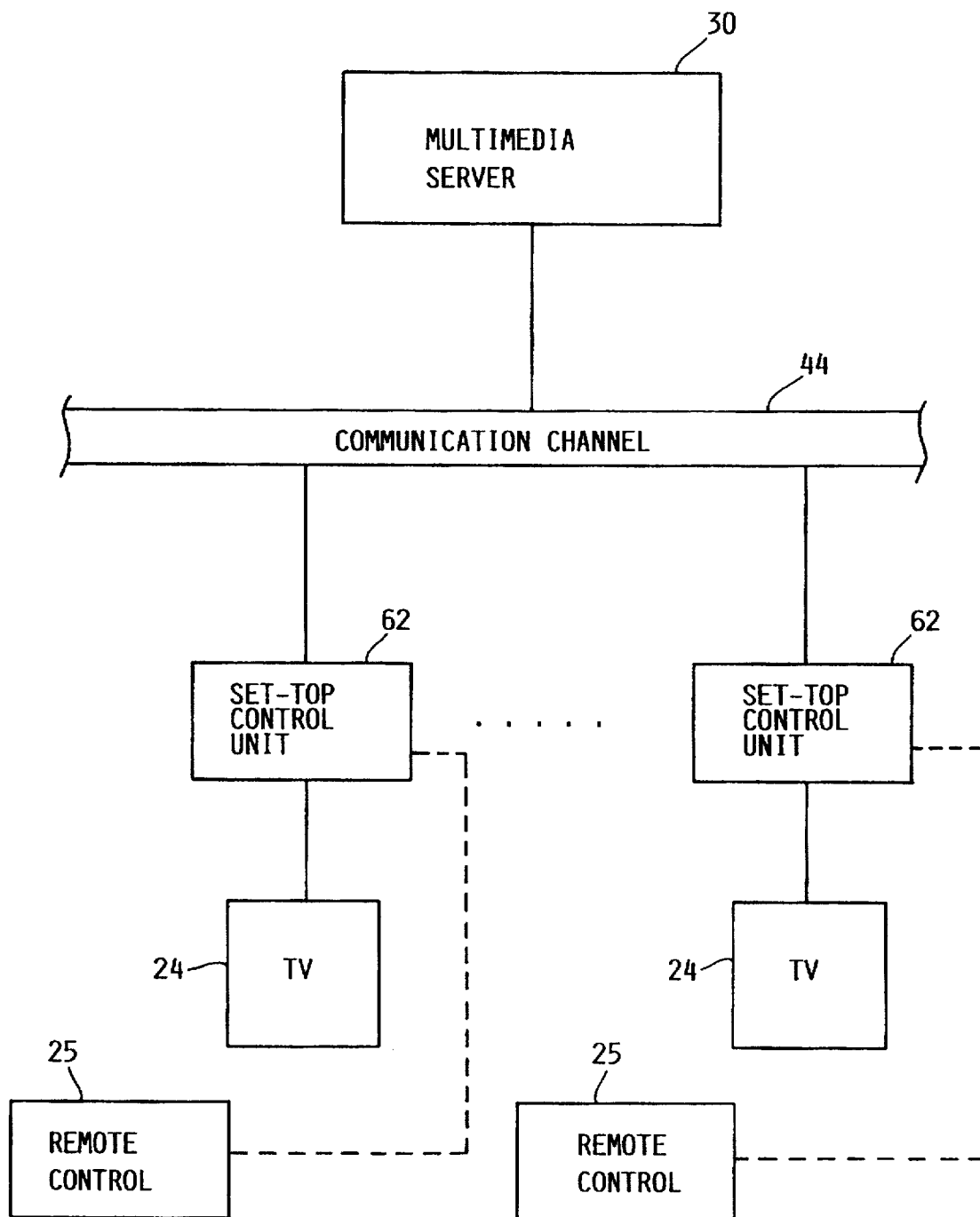


FIG. 2

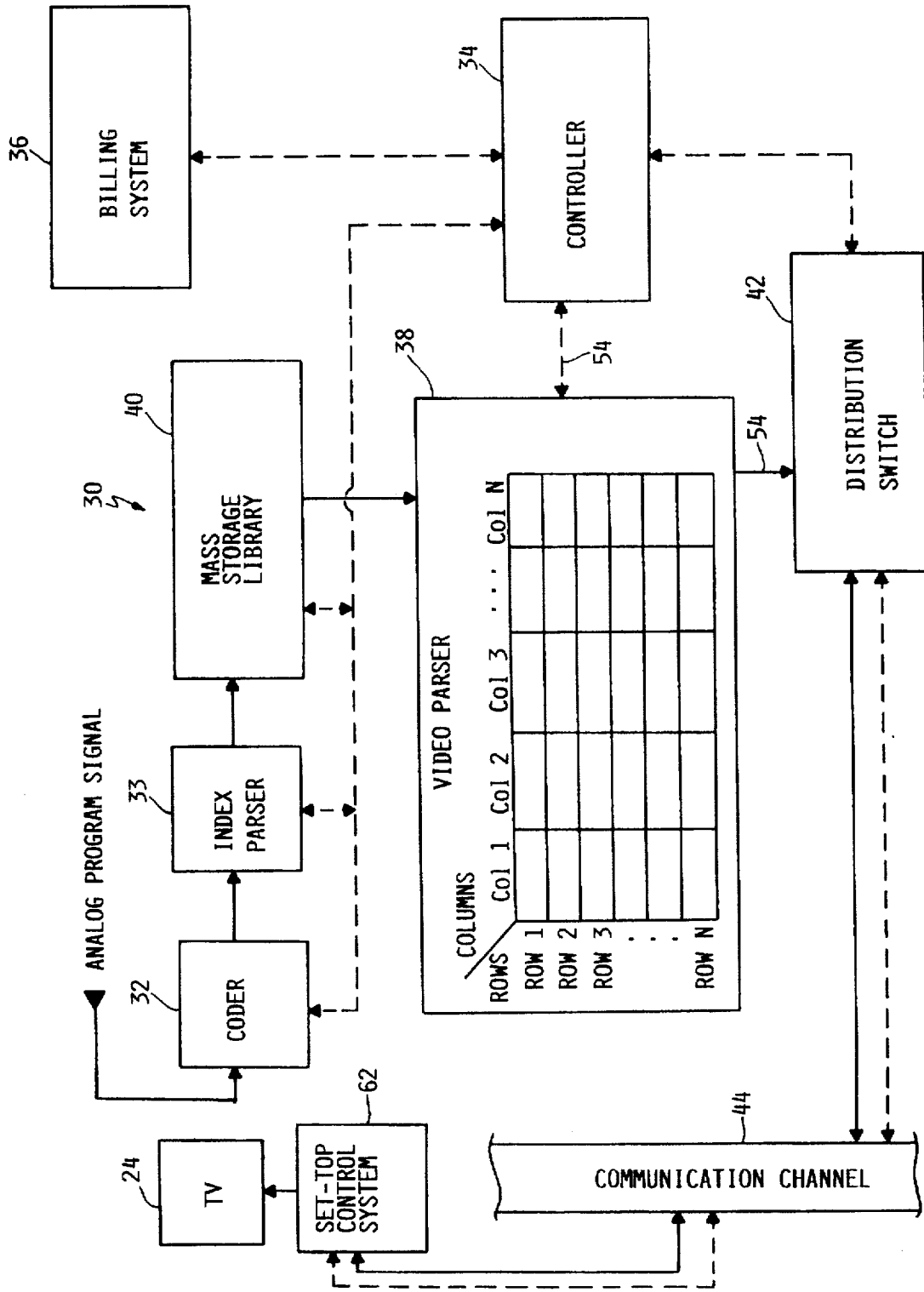


FIG. 3

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.