



US005375068A

United States Patent [19]

[11] Patent Number: **5,375,068**

Palmer et al.

[45] Date of Patent: **Dec. 20, 1994**

[54] **VIDEO TELECONFERENCING FOR NETWORKED WORKSTATIONS**

[75] Inventors: **Ricky S. Palmer; Larry G. Palmer,** both of Nashua, N.H.

[73] Assignee: **Digital Equipment Corporation,** Maynard, Mass.

[21] Appl. No.: **893,074**

[22] Filed: **Jun. 3, 1992**

[51] Int. Cl.⁵ **G06K 15/00**

[52] U.S. Cl. **364/514; 370/62**

[58] Field of Search **364/514; 379/96, 94, 379/202; 370/60, 62; 395/152**

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,584,142	6/1971	Schoeffler	178/6.8
4,387,271	6/1983	Artom	179/2 DP
4,516,156	5/1985	Fabris et al.	358/85
4,525,779	6/1985	Davids et al.	364/200
4,574,374	3/1986	Scordo	370/62
4,645,872	2/1987	Pressman et al.	379/54
4,650,929	3/1987	Boerger et al.	358/86
4,653,090	3/1987	Hayden	379/204
4,679,191	7/1987	Nelsoy et al.	370/84
4,686,698	8/1987	Tompkins et al.	379/53
4,710,917	12/1987	Tompkins et al.	370/62
4,734,765	3/1988	Okada et al.	358/102
4,748,618	5/1988	Brown et al.	370/94
4,827,339	5/1989	Wada et al.	358/136
4,847,829	7/1989	Tompkins et al.	370/62
4,849,811	7/1989	Kleinerman	358/133
4,882,743	11/1989	Mahmoud	379/53
4,888,795	12/1989	Ando et al.	379/53
4,893,326	1/1990	Duran et al.	379/53
4,897,866	1/1990	Majmudar et al.	379/94
4,905,231	2/1990	Leung et al.	370/94.1
4,918,718	4/1990	Emmons et al.	379/53

(List continued on next page.)

workstation. The master process of a local workstation causes execution of a slave process on a remote workstation for receiving video teleconference data from the local workstation. An audio data transmitter for sends

an audio data stream to the remote workstation such that the audio data can be reconstructed into a continuous audio signal. A video transmitter sends video data so that each frame of video data to be sent is inserted into the audio data stream without affecting the continuity of the reconstructed audio signal at the remote workstation.

46 Claims, 28 Drawing Sheets

OTHER PUBLICATIONS

Palmer and Palmer, "Desktop Meeting", LAN Magazine, 6(11):111-121 (Nov. 1991).

D. Comer, "Internetworking with TCP/IP, vol. I: Principles, Protocols, and Architecture", 2nd Edition, pp. 1-8, 337-346, 505 (Prentice Hall: Engelwood Cliffs, N.J. 1991).

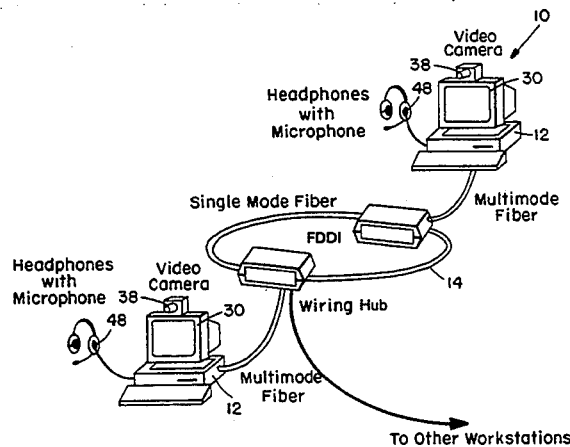
Primary Examiner—Emanuel T. Voeltz

Assistant Examiner—Thomas Peeso

Attorney, Agent, or Firm—Hamilton, Brook, Smith & Reynolds

[57] **ABSTRACT**

A video teleconferencing method and apparatus for computer workstations connected by a digital data network includes a transmission source portion for a local workstation to send audio and video teleconference data across the network to one or more remote workstations, and, a receiver for the local workstation to receive audio and video teleconference data back from the remote workstations. The local workstation sends teleconference data to each of the remote workstations over a variable bandwidth digital data connection, and each of the remote workstations returns teleconference data back to the local workstation over another variable bandwidth digital data connection. The transmission source portion includes a master software process executing on the local workstation, and the receiver includes a slave software process executing the remote



U.S. PATENT DOCUMENTS

4,924,311	5/1990	Ohki et al.	358/138	5,042,006	8/1991	Flohrer	364/900
4,932,047	6/1990	Emmons et al.	379/53	5,042,062	8/1991	Lee et al.	379/54
4,935,953	6/1990	Appel et al.	379/53	5,046,079	9/1991	Hashimoto	379/53
4,942,540	7/1990	Black et al.	364/514	5,046,080	9/1991	Lee et al.	379/53
4,943,994	7/1990	Ohtsuka et al.	379/53	5,056,136	10/1991	Smith	389/10
4,953,159	8/1990	Hayden et al.	370/62	5,062,136	10/1991	Gattis et al.	380/18
4,953,196	8/1990	Ishikawa et al.	379/53	5,072,442	12/1991	Todd	370/62
4,962,521	10/1990	Komatsu et al.	379/53	5,079,627	1/1992	Filo	358/85
4,965,819	10/1990	Kannes	379/53	5,099,510	3/1992	Blinken, Jr. et al.	379/202
4,995,071	2/1991	Weber et al.	379/53	5,103,444	4/1992	Leung et al.	370/60
5,003,532	3/1991	Ashida et al.	370/62	5,111,409	5/1992	Gaspar et al.	395/152
5,034,916	7/1991	Ordish	364/900	5,113,431	5/1992	Horn	379/94
				5,195,086	3/1993	Baumgartner et al.	379/202
				5,200,989	4/1993	Milone	379/96

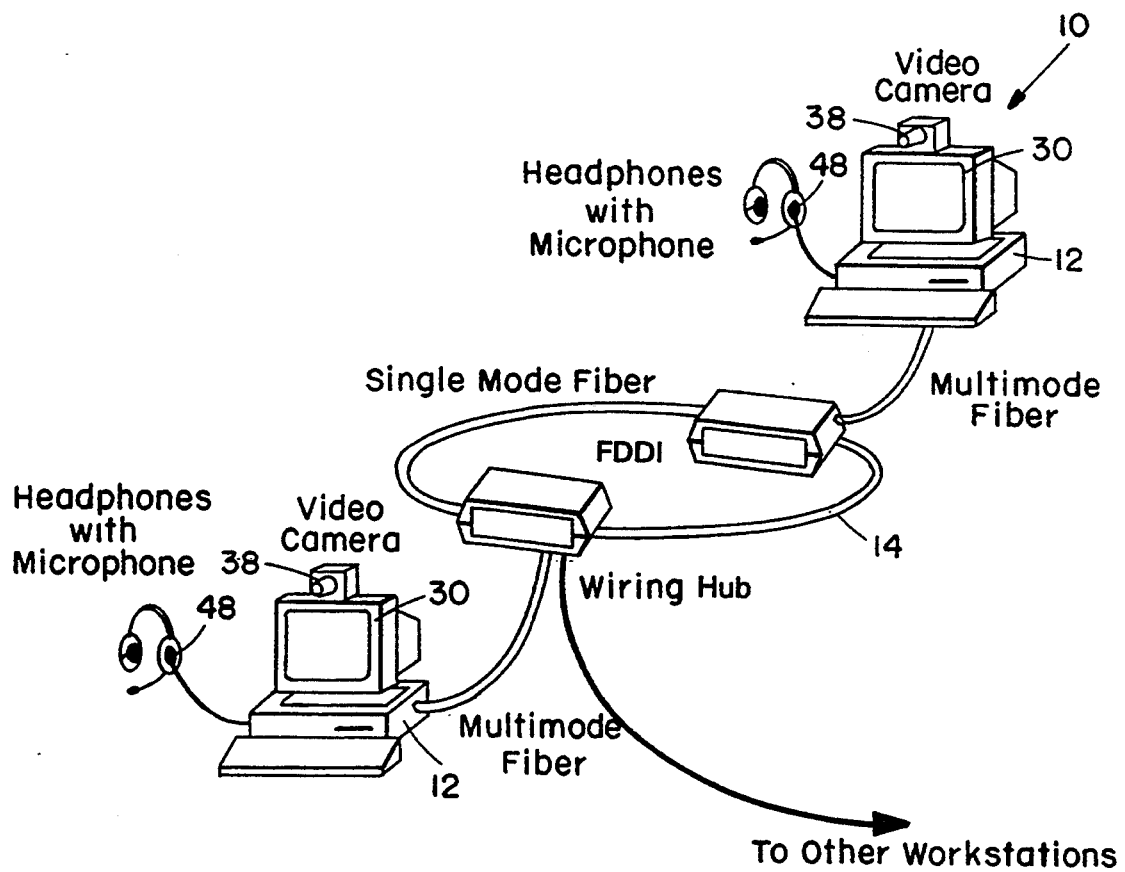


FIG. 1

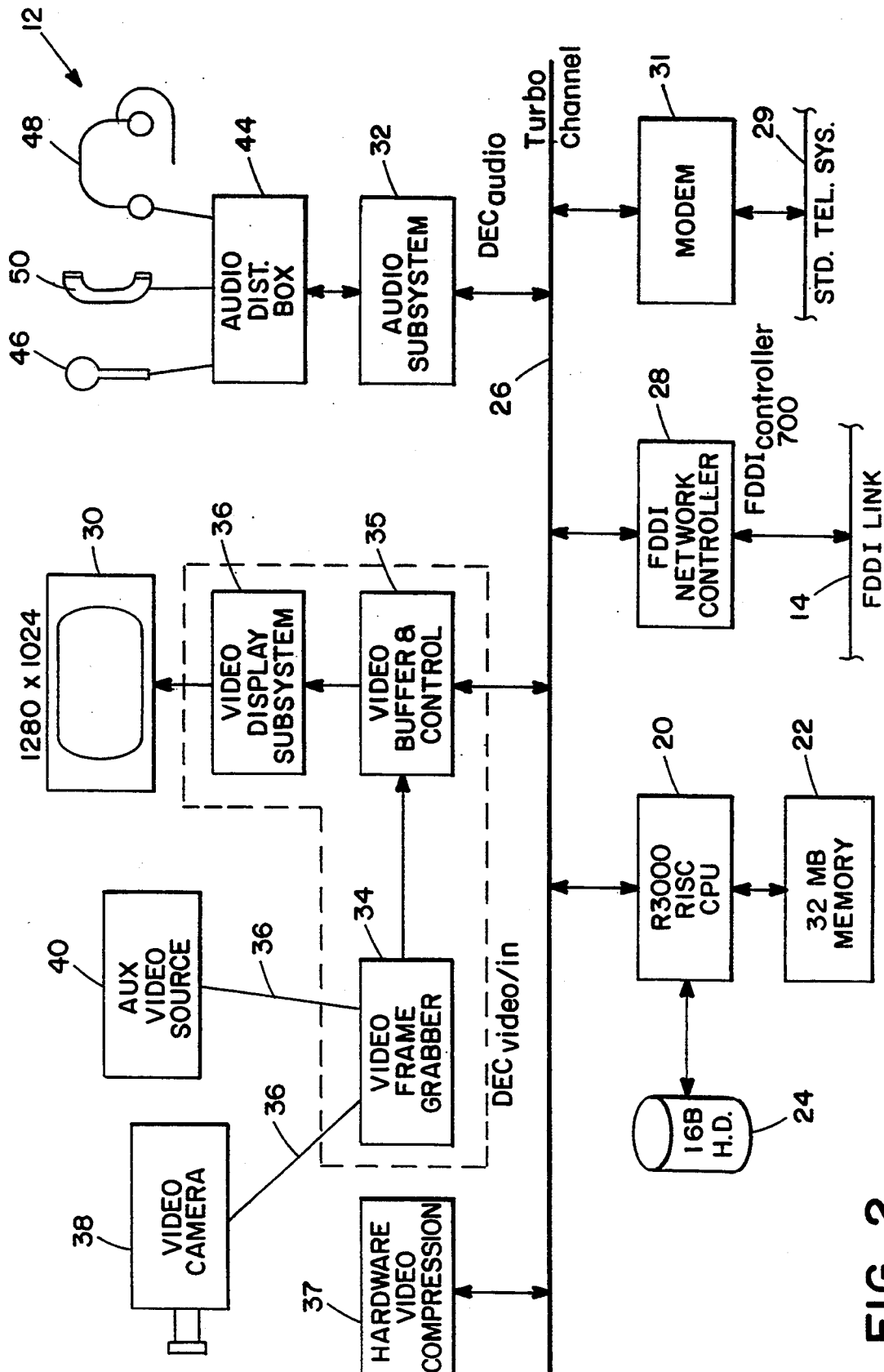


FIG. 2

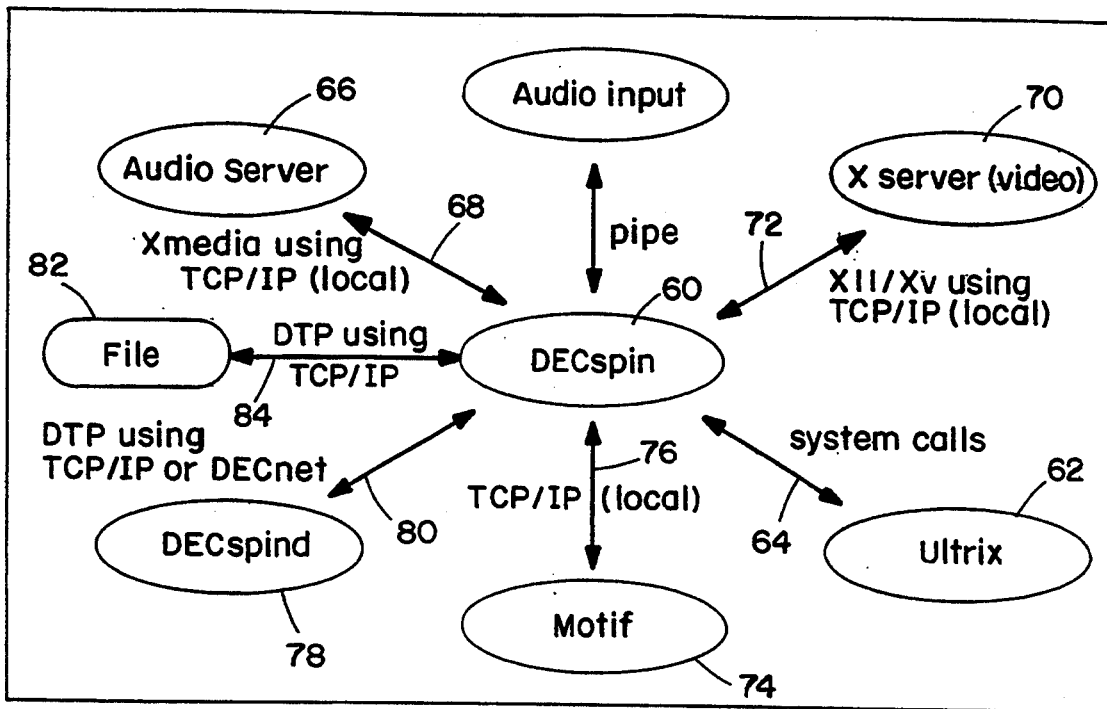


FIG. 3

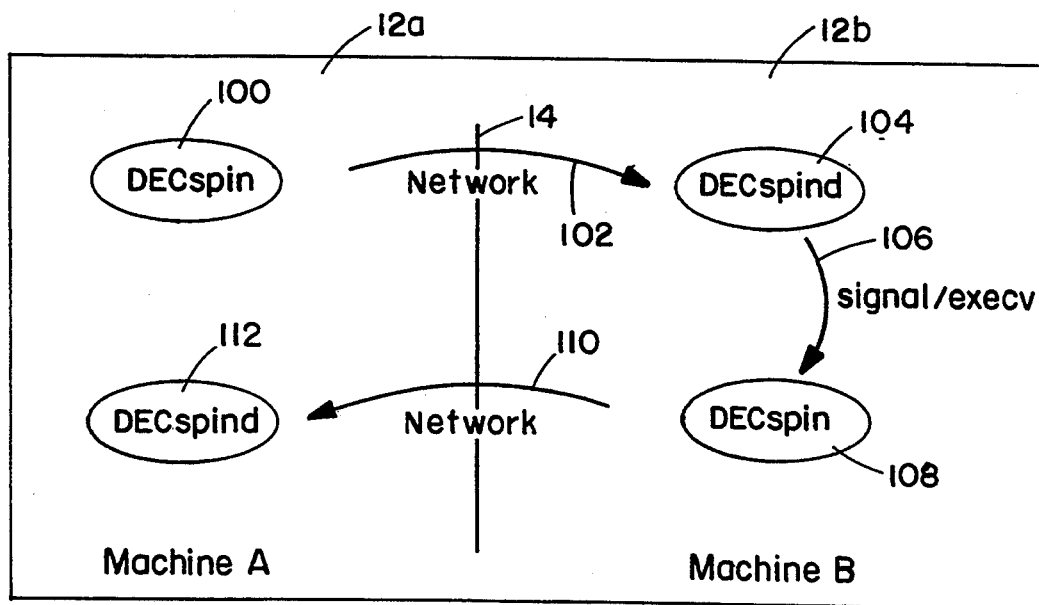


FIG. 4

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.