



US006463509B1

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

(10) **Patent No.:** **US 6,463,509 B1**
(45) **Date of Patent:** **Oct. 8, 2002**

(54) **PRELOADING DATA IN A CACHE MEMORY ACCORDING TO USER-SPECIFIED PRELOAD CRITERIA**

(75) Inventors: **Deniz Teoman**, San Mateo; **John M. Neil**, San Francisco, both of CA (US)

(73) Assignee: **Motive Power, Inc.**, San Mateo, CA (US)

(*) Notice: 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.: **09/238,656**

(22) Filed: **Jan. 26, 1999**

(51) **Int. Cl.**⁷ **G06F 12/00**

(52) **U.S. Cl.** **711/137; 711/118; 711/141; 711/152; 711/113**

(58) **Field of Search** **711/118, 137, 711/138, 129, 113, 141, 152, 3, 125; 710/52; 713/400; 714/5**

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,609,665 A	9/1971	Kronies	
3,806,888 A	4/1974	Brickman et al.	
4,020,466 A	4/1977	Cordi et al.	
4,215,400 A	7/1980	Denko	
4,295,205 A	10/1981	Kunstadt	
4,342,079 A	7/1982	Stewart et al.	
4,435,775 A	3/1984	Brantingham et al.	
4,500,954 A *	2/1985	Duke et al.	711/138
4,637,024 A *	1/1987	Dixon et al.	714/819
5,128,810 A	7/1992	Halford	
5,131,089 A	7/1992	Cole	
5,146,576 A	9/1992	Beardsley	
5,218,689 A	6/1993	Hotle	
5,226,168 A	7/1993	Kobayashi et al.	
5,263,142 A	11/1993	Watkins et al.	
5,287,457 A	2/1994	Arimilli et al.	
5,291,584 A	3/1994	Challa et al.	

5,293,622 A	3/1994	Nicholson et al.	
5,359,713 A *	10/1994	Moran et al.	710/52
5,396,596 A	3/1995	Hashemi et al.	
5,420,998 A	5/1995	Horning	
5,437,018 A	7/1995	Kobayashi et al.	
5,448,719 A *	9/1995	Schultz et al.	714/5

(List continued on next page.)

OTHER PUBLICATIONS

International Search Report in connection with International Application No. PCT/US00/02156 (6 pages).

"The I/O System", Inside Windows NT Second Edition, Microsoft Press, David A. Solomon, pp. v-xiv, 325-393, 1998.

"Filter Drivers", Windows NT File System Internals A Developer's Guide, Rajeev Nagar, O'Rielly & Associates, Inc., pp. vii-x, 615-667, 1997.

Primary Examiner—David Hudspeth

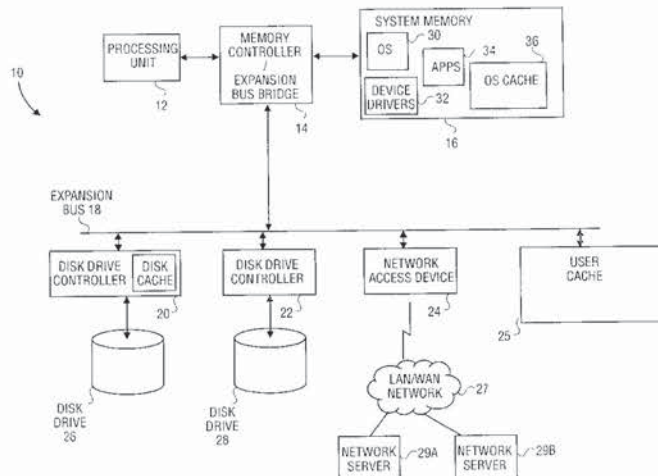
Assistant Examiner—Fred F. Tzeng

(74) *Attorney, Agent, or Firm*—Blakely, Sokoloff, Taylor & Zafman LLP

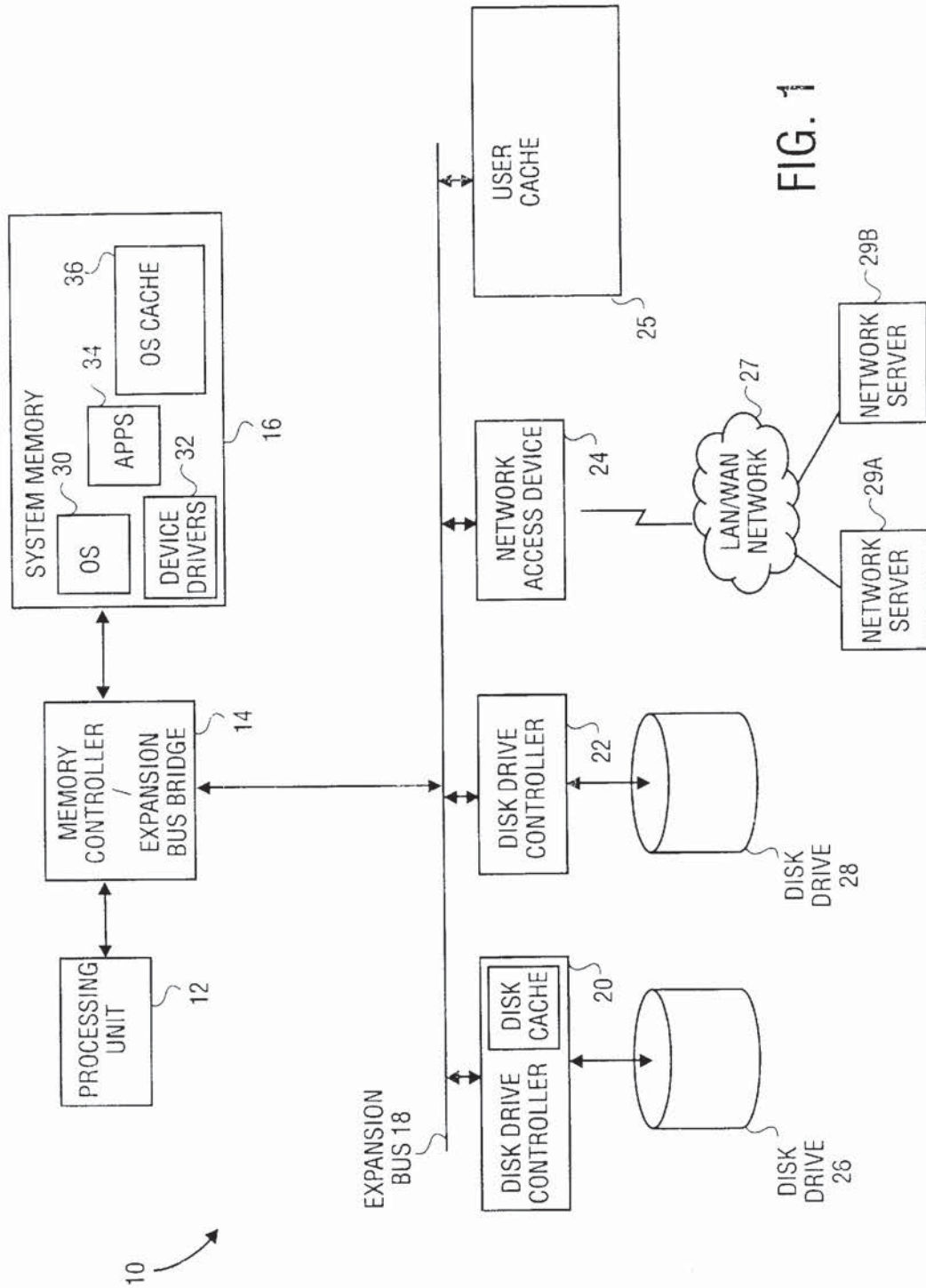
(57) **ABSTRACT**

An apparatus and method for caching data in a storage device of a computer system. A relatively high-speed, intermediate-volume storage device is operated as a user-configurable cache. Requests to access a mass storage device such as a disk or tape are intercepted by a device driver that compares the access request against a directory of the contents of the user-configurable cache. If the user-configurable cache contains the data sought to be accessed, the access request is carried out in the user-configurable cache instead of being forwarded to the device driver for the target mass storage device. Because the user-cache is implemented using memory having a dramatically shorter access time than most mechanical mass storage devices, the access request is fulfilled much more quickly than if the originally intended mass storage device was accessed. Data is pre-loaded and responsively cached in the user-configurable cache memory based on user preferences.

26 Claims, 12 Drawing Sheets



U.S. PATENT DOCUMENTS				
5,459,850 A	10/1995	Clay et al.	5,692,190 A	11/1997 Williams
5,483,641 A	1/1996	Jones et al.	5,694,567 A	* 12/1997 Bourekas et al. 711/3
5,493,574 A	2/1996	McKinley	5,694,570 A	* 12/1997 Beardsley et al. 711/113
5,515,525 A	5/1996	Grynberg et al.	5,712,811 A	1/1998 Kim
5,519,853 A	* 5/1996	Moran et al. 713/400	5,732,267 A	3/1998 Smith
5,551,000 A	8/1996	Tan et al.	5,737,619 A	4/1998 Judson
5,555,402 A	9/1996	Tuma et al.	5,745,773 A	4/1998 Mizuta
5,594,885 A	1/1997	Lautzenheiser	5,778,418 A	7/1998 Auclair et al.
5,603,011 A	2/1997	Piazza	5,787,470 A	7/1998 DeSimone et al.
5,633,484 A	5/1997	Zancho et al.	5,802,566 A	* 9/1998 Hagersten 711/137
5,657,470 A	8/1997	Fisherman et al.	5,895,487 A	4/1999 Boyd et al.
5,673,394 A	9/1997	Fenwick et al.	5,913,224 A	* 6/1999 MacDonald 711/125
5,680,570 A	10/1997	Rantala et al.	6,003,115 A	* 12/1999 Spear et al. 711/137
5,680,573 A	* 10/1997	Rubin et al. 711/129		* cited by examiner



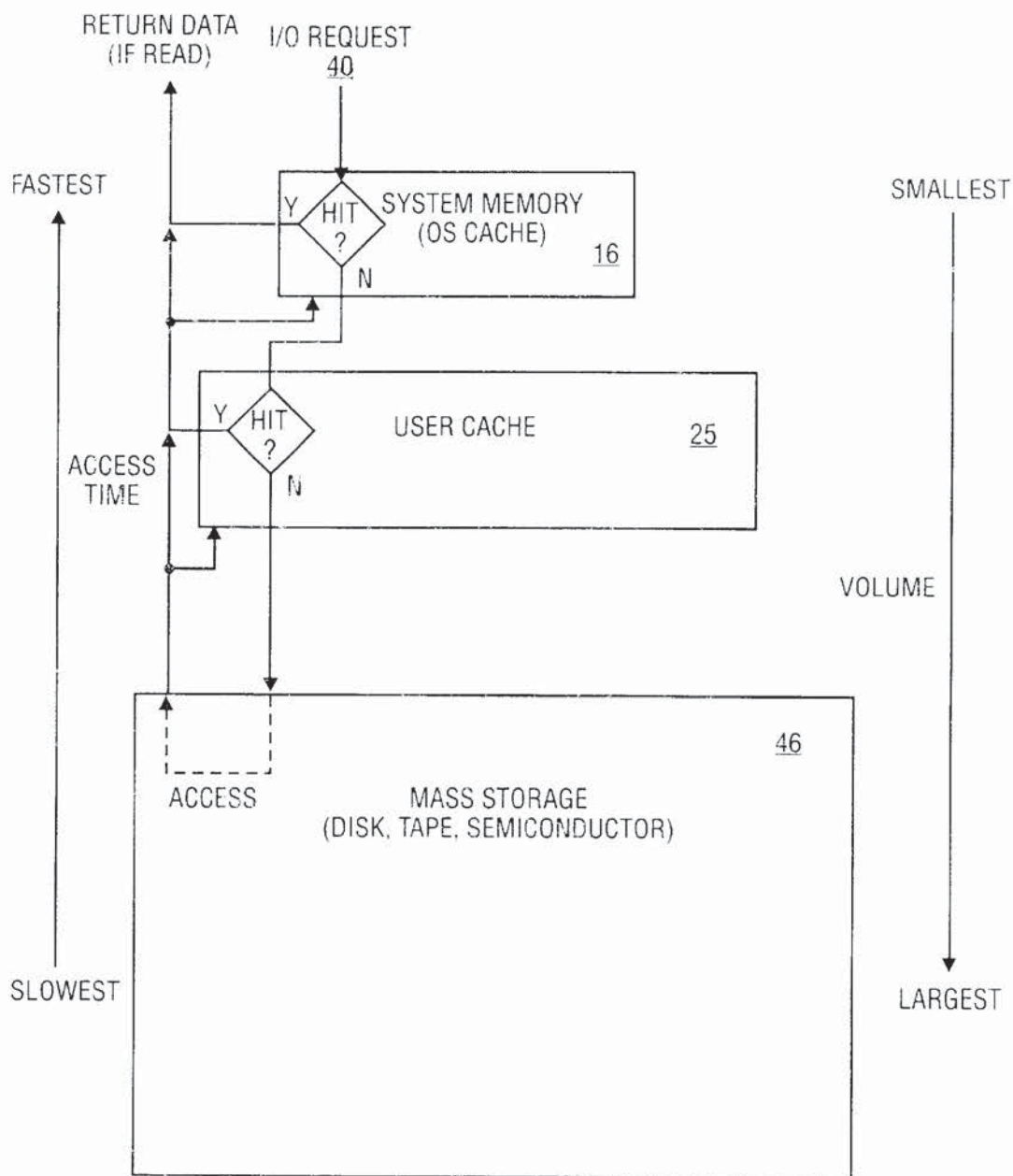


FIG. 2

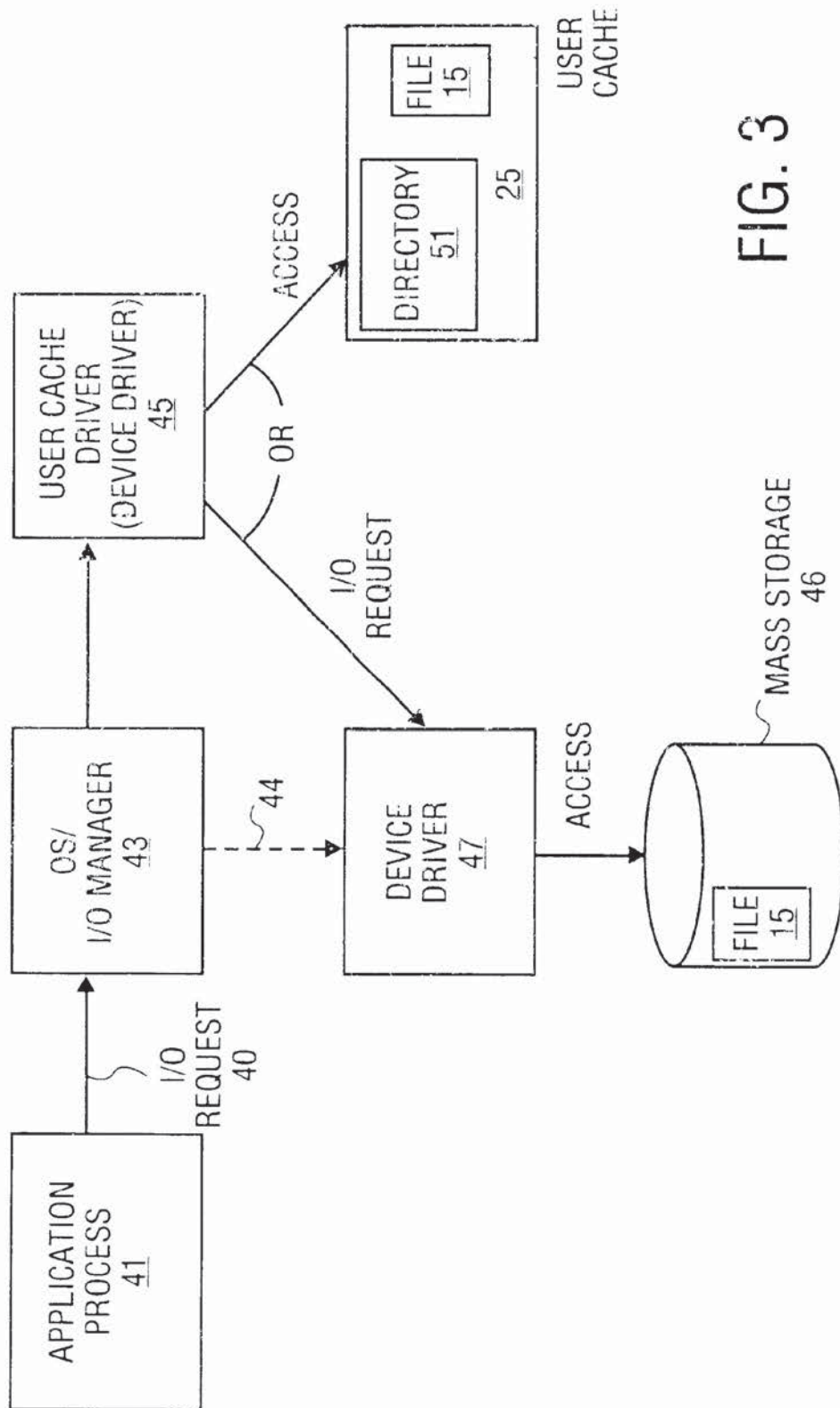


FIG. 3

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.