

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : G06F 15/00	A1	(11) International Publication Number: WO 99/41675 (43) International Publication Date: 19 August 1999 (19.08.99)
--	-----------	---

(21) International Application Number: PCT/US98/03017

(22) International Filing Date: 12 February 1998 (12.02.98)

(71) Applicant (for all designated States except US): DIGITAL PAPER LLC [US/US]; Suite 100, 211 North Union Street, Alexandria, VA 22314 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): HORNBACKER, Cecil, V., III [US/US]; 2032 Cranberry Isles Way, Apopka, FL 32712 (US). CRONIN, John, C. [US/US]; Apartment 3, 1804 Greene Street, Philadelphia, PA 19130 (US).

(74) Agents: FEIN, Michael, B. et al.; Suite 3600, 1600 Market Street, Philadelphia, PA 19103 (US).

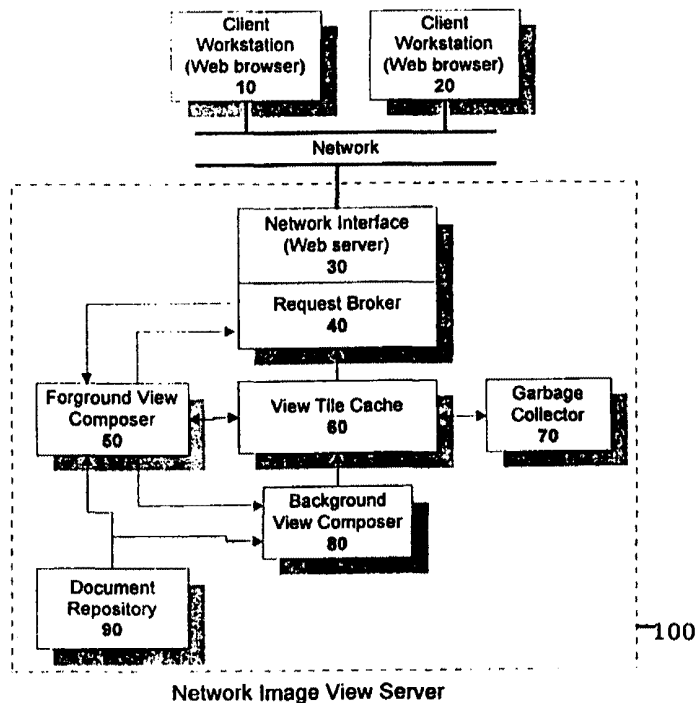
(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published*With international search report.*

(54) Title: NETWORK IMAGE VIEW SERVER USING EFFICIENT CLIENT-SERVER, TILING AND CACHING ARCHITECTURE

(57) Abstract

A computer network server using HTTP (Web) server software combined with foreground view composer software (50), background view composer software (80), view tile cache (60), view tile cache garbage collector (70) and image files (90) provides image view data to client workstations (20) using graphical web browsers. Problems with specialized client workstation image view software are eliminated by using the internet and industry standards based graphical web browsers for the client software. Network and system performance problems that previously existed when accessing large image files from a network file server are eliminated by tiling the image view so that computation and transmission of the view data can be done in an incremental fashion. The view tiles are cached on the client workstation to further reduce network traffic. View tiles are cached on the server to reduce the amount to view tile computation and to increase responsiveness of the image view server.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

**NETWORK IMAGE VIEW SERVER USING EFFICIENT CLIENT-SERVER,
TILING AND CACHING ARCHTECTURE**

5

BACKGROUND OF THE INVENTION

10 1. Field of the Invention

This invention relates to workstation viewing images of digital documents stored on a network server and in particular to viewing large digital document images using a client-server architecture.

2. Description of the Prior Art

15 Current methods for viewing digital document images for workstations in a networked environment use proprietary workstation application software to access a network image file server. To view an image, the application software transfers a copy of the whole image file from the image file server to the networked client workstation. This method has a number of limitations including: inefficient use of the network; high software purchase cost per workstation; high software administrative cost per workstation; high computational demands on the workstation; proprietary software available only for limited workstation types. Some other network image viewers may provide viewing using more optimized image transmission protocols but only with proprietary protocols and proprietary workstation software.

25 It is an object of the invention to provide a method of obtaining graphical images from a network server for viewing at a computer workstation which does not require proprietary workstation software.

It is another object to provide such a method which makes efficient use of the network and results in greater speed of image display in response to requests from the workstations.

30 It is another object to provide such a method which makes use of caching mechanisms resulting in a balanced load on the network file server and a faster response time to a single client when many clients are accessing the server simultaneously.

It is another object to minimize the computing resources required by a client

workstation.

A further object is to provide apparatus for storing graphical images, requesting portions of the stored graphical images from storage, and quickly and efficiently displaying the images on a workstation.

5 A still further object is to provide a computer program which facilitates requesting portions of graphical images stored on a network server and displaying those portions on a workstation.

SUMMARY OF THE INVENTION

10 These objects, and others which will become apparent from the following disclosure, are achieved by this invention which comprises in one aspect method of identifying and delivering a graphical image from a computer network file server comprising providing a network file server on which are stored digital document image files, said server adapted to receive requests from a Web browser in Uniform Resource Locator (URL) code, to identify
15 the image file and format selections being requested, to compose the requested view into a grid of view tiles, and to transmit HTML code for view tiles to the requesting Web browser.

Another aspect of the invention comprises apparatus comprising a computer network server adapted to store digital document image files, programmed to receive requests from a client Web browser in URL code, the URL specifying a view which identifies an image
20 file and format, to compose the requested view, and to transmit HTML code for the resultant view to the client Web browser to display.

A further aspect of the invention is the computer program recorded on magnetic or optical media for use on a network server comprising code which interprets HTTP requests from a workstation for a particular view of a digital document image file stored in memory,
25 retrieves the digital document image file, composes a grid of view tiles corresponding to the requested view of the image, computes HTML code for the grid of view tiles in a form which can be transmitted from the server to the workstation.

The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate an embodiment of the invention and together with the general
30 description, serve to explain the principles of the invention.

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.