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Kieffer

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(54) **OPTIMIZED DELIVERY OF WEB APPLICATION CODE**

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(73) Assignee: **AOL Inc.**, Dulles, VA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 978 days.

This patent is subject to a terminal disclaimer.

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Related U.S. Application Data

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(60) Provisional application No. 60/180,378, filed on Feb. 4, 2000.

(51) **Int. Cl.**
G06F 9/44 (2006.01)

(52) **U.S. Cl.** **719/331**; 709/203; 709/219

(58) **Field of Classification Search** 719/331, 719/332; 709/203, 219

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,572,643	A	11/1996	Judson	395/793
5,835,914	A	11/1998	Brim	707/206
5,956,709	A *	9/1999	Xue	1/1
5,995,975	A	11/1999	Malcolm	707/103
6,012,068	A	1/2000	Boezeman et al.	707/104.1
6,026,437	A	2/2000	Muschett et al.	
6,141,793	A	10/2000	Bryant et al.	
6,151,599	A	11/2000	Shrader et al.	707/9
6,223,224	B1	4/2001	Bodin	709/236
6,230,157	B1	5/2001	Malcolm et al.	707/100
6,282,548	B1	8/2001	Burner et al.	707/104
6,289,333	B1	9/2001	Jawahar et al.	707/2
6,327,608	B1	12/2001	Dillingham	709/203
6,336,137	B1	1/2002	Lee et al.	709/219
6,340,977	B1 *	1/2002	Lui et al.	715/709
6,353,839	B1	3/2002	King et al.	707/513
6,353,923	B1	3/2002	Bogle et al.	717/4
6,360,236	B1	3/2002	Khan et al.	707/526

(Continued)

OTHER PUBLICATIONS

International Preliminary Examination Report for PCT Application Ser. No. PCT/US01/02962.

(Continued)

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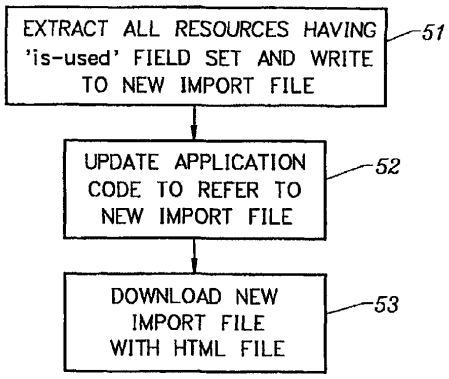
(57) **ABSTRACT**

Systems and methods are provided for optimizing application code for deployment to a client over a data link to minimize download time by supplying only the application code with a particular object that is required by the object. In a web application that includes multiple pages, the HTML and JAVASCRIPT may be scanned to identify code resources called by a particular web page. When all called resources are identified, they may be extracted and concatenated into a single resource file. When the page is downloaded to the client, the import file may be included with the page. The import file may be cached so that it need only be downloaded once, rather than being downloaded every time the page is requested. The disclosed systems and methods are suitable for use with other interpreted scripting languages.

27 Claims, 3 Drawing Sheets



U.S. PATENT DOCUMENTS

6,362,836	B1	3/2002	Shaw et al.	345/744
6,370,573	B1	4/2002	Bowman-Amuah	709/223
6,393,472	B1 *	5/2002	Anerousis et al.	709/223
6,427,149	B1	7/2002	Rodriguez et al.	707/10
6,615,253	B1	9/2003	Bowman-Amuah	709/219
6,687,737	B2	2/2004	Landsman et al.	709/203
6,744,447	B2	6/2004	Estrada et al.	
6,748,418	B1 *	6/2004	Yoshida et al.	709/204
6,880,123	B1	4/2005	Landsman et al.	715/500.1
6,952,279	B1 *	10/2005	Iida	358/1.15
6,961,750	B1 *	11/2005	Burd et al.	709/203
6,961,905	B1	11/2005	Cover et al.	
6,990,653	B1 *	1/2006	Burd et al.	717/108
7,130,885	B2 *	10/2006	Chandra et al.	709/206
7,231,644	B2 *	6/2007	Kieffer	719/331
7,493,554	B2 *	2/2009	Paila et al.	715/234

OTHER PUBLICATIONS

International Search Report for PCT Application Ser. No. PCT/US01/02962.

Logic Web: Enhancing the Web with Logic Programming; Andrew Davison, and Seng Wai Loke; Dec. 23, 1996.

SurveyWiz and FactorWiz: JavaScript web pages that make HTML forms for research on the Internet; M.H. Birnbaum; Behavior research Methods, Instruments, & Computers; May 2000.

Decrypting JavaScript; K. Chambers; Application Development Advisor; Jul.-Aug. 2000.

Creating a multiple-choice self-marketingengine on the internet; T.W. Ng; International Journal of Engineering Education; 2000.

A dynamic select component for JavaScript; S. Johnson; Dr. Dobb's Journal; Jan. 2000.

Generalized event handling in JavaScript; A. Hildyard; WEB Techniques; Feb. 1999.

Building object-oriented web pages with SilverStream; M. Pfeifer; WEB Techniques; Feb. 1999.

Adding style and behaviour to Web pages with a dash of Spice; D. Raggett; Computer Networks and ISDN Systems; Apr. 1998.

Architecture, design, and development of an HTML/JavaScript Web-based group support system; N.C. Romano, Jr.; J.F. Nunamaker, Jr.; R.O. Briggs; and D.R.Vogel; Journal of the American Society for Information Science; May 15, 1998.

Orthogonal extensions to the WWW user interface using client-side technologies; A. Fox, S.D. Gribble, Y. Chawathe, A.S. Polite, A. Huang, B. Ling and E.A. Brewer; Proceedings of the ACM Symposium on User Interface Software and Technology. 10th Annual Symposium; Oct. 14-17, 1997.

Responsive interaction for a large Web application: the Meteor Shower architecture in the WebWriter II editor; A.Crespo, Bay-Wei Chang, and E.A. Bier; Computer Networks and ISDN Systems; Sep. 1997.

Animation with layers in DHTML. Innovative examples from noted designers; J.S. Hamlin; WEB Techniques; Dec. 1997.

Jump starting your site with Dynamic HTML. Active content without page updates; R. Dobson; WEB Techniques; Dec. 1997.

Using JavaScript to write JavaScript; N.R. Radovanovic; WEB Techniques; Sep. 1997.

Using JavaScript to create interactive Web pages; T. Tessier; Dr. Dobb's Journal; Mar. 1996.

Optimization of Printer Font Download Using Font Character Download on Demand, IBM 1989.

Kong et al; Mitigating Server-Side Congestion in the Internet Through Pseudoserving; 1999 IEEE; pp. 530-544.

Accessing Multiple Mirror Sites in Parallel: Using Tornado Codes to Speed Up Downloads; 1999 IEEE, pp. 275-283.

LISP—a Language for Internet Scripting and Programming: Timothy J. Hickey, Peter Norvig, and Kenneth R. Anderson, (1998).

Responsive interaction for a large Web application: the Meteor,Shower architecture in the WebWriter II editor; A.Crespo, Bay-Wei Chang, and E.A. Bier; Computer Networks and ISDN Systems; Sep. 1997.

Snow Net: An Agent-Based Internet Tourist Information Service; A. Erni, and M.C. Norrie; Institute for Information Systems Swiss Federal Institute of Technology (ETH), (1997).

The Java Language Specification, Chapter 12, 1st Ed., (1996).

* cited by examiner

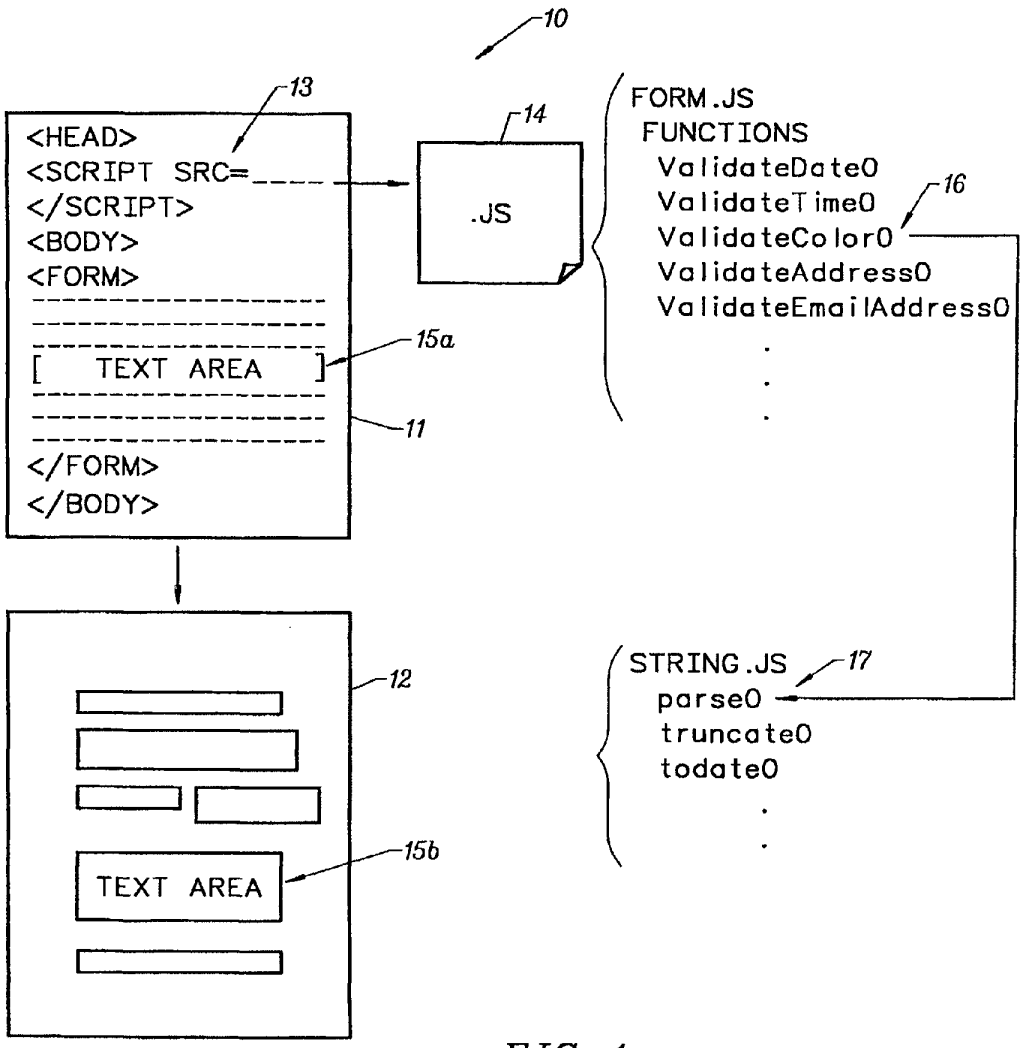


FIG. 1

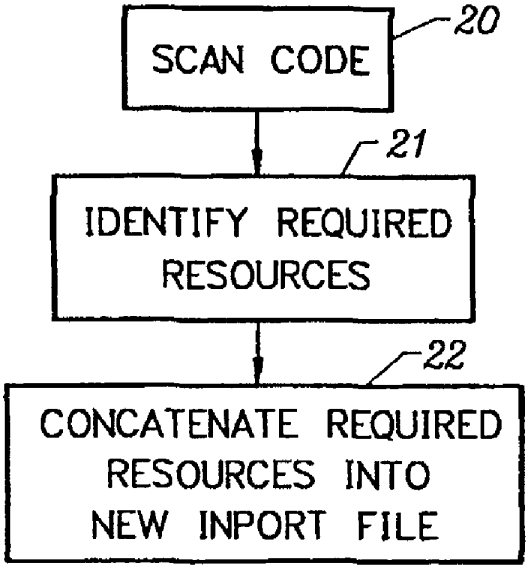


FIG. 2

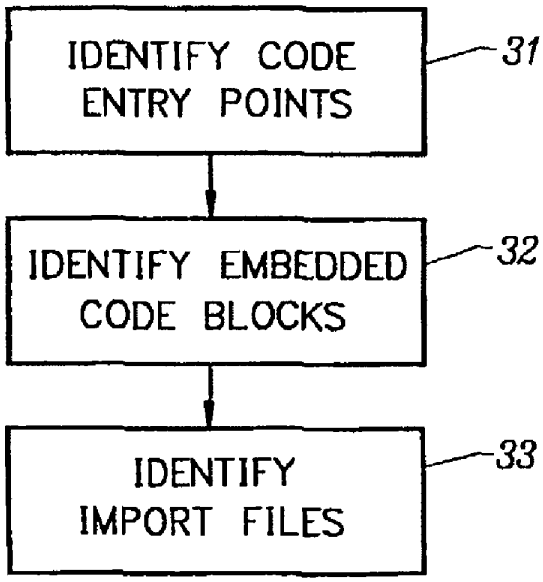


FIG. 3

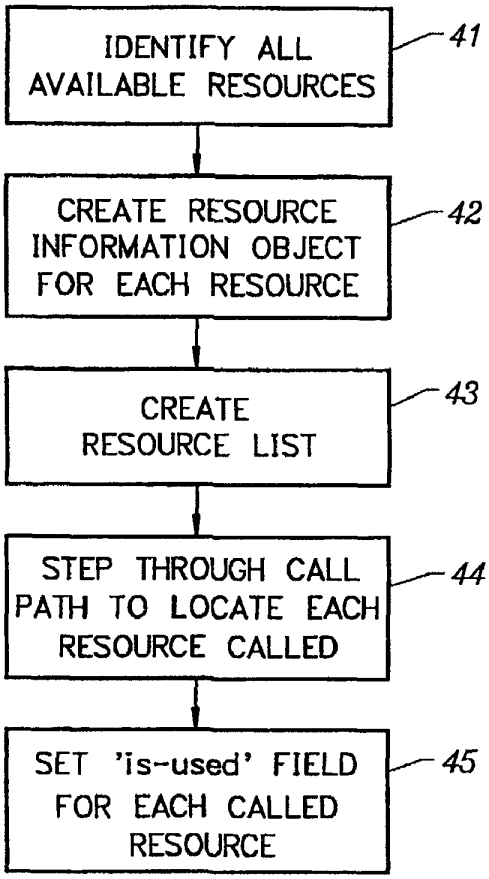


FIG. 4

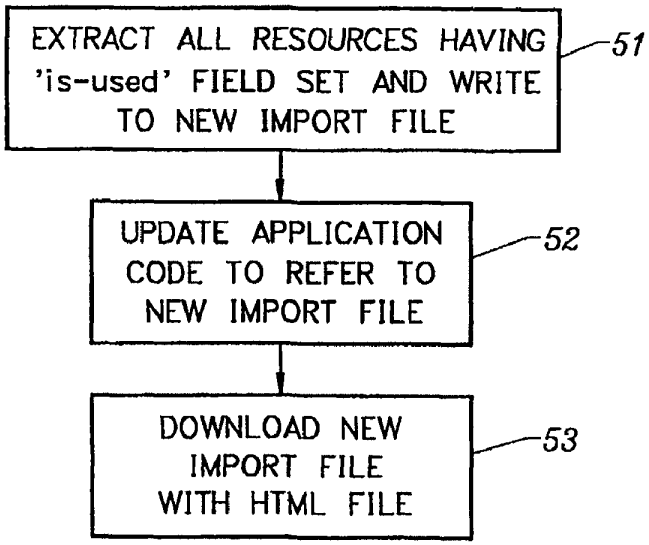


FIG. 5

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