AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court **Western District of Texas - Waco Division** on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
6:22-cv-00176	2/18/2022	Western District of Texas - Waco Division

PLAINTIFF	DEFENDANT
Advanced Transactions, LLC	Belk, Inc. and Belk eCommerce, LLC

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	7,065,555	6/20/2006	Advanced Transactions, LLC
2	7,386,594	6/10/2008	Advanced Transactions, LLC
3	7,693,950	4/6/2010	Advanced Transactions, LLC
4	7,979,057	7/12/2011	Advanced Transactions, LLC
5	8,150,736	4/3/2012	Advanced Transactions, LLC

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT
10/11/2022 - Stipulation of Dismissal with Prejudice #37

CLERK	(BY) DEPUTY CLERK	DATE
Phillip J. Devlin	Suzanne Miles	10/20/2022

Copy 1—Upon initiation of action, mail this copy to Director **Copy 3—Upon termination of action, mail this copy to Director**
Copy 2—Upon filing document adding patent(s), mail this copy to Director **Copy 4—Case file copy**

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1	8,175,519	5/8/2012	Advanced Transactions, LLC
2	9,747,608	8/29/2017	Advanced Transactions, LLC
3	10,783,529	9/22/2020	Advanced Transactions, LLC
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DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
6:22-cv-00926	9/8/2022	Western District of Texas - Waco Division

PLAINTIFF	DEFENDANT
Advanced Transactions, LLC	Regis Corporation, Supercuts, Inc., and Supercuts Corporate Shops, Inc. dba, Supercuts, Cost Cutters, Roosters, and Smartstyle

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
6:22-cv-00563	June 1, 2022	Western District of Texas - Waco Division

PLAINTIFF	DEFENDANT
Advanced Transactions, LLC	Fiesta Mart LLC, Bodega Latina Corporation dba El Super, Smart & Final Stores LLC, Chedraui USA, Inc., Grupo Comercial Chedraui, S.A.B. de C.V., and Smart & Final Holdings, Inc.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	7,065,555	June 20, 2006	Advanced Transactions, LLC
2	7,386,594	June 10, 2008	Advanced Transactions, LLC
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT
09/02/2022 Doc #21 NOTICE of Voluntary Dismissal

CLERK	(BY) DEPUTY CLERK	DATE
PHILIP J. DEVLIN		09/02/2022

Copy 1—Upon initiation of action, mail this copy to Director **Copy 3—Upon termination of action, mail this copy to Director**
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AO 120 (Rev. 08/10)

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☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
6:22-cv-00563	June 1, 2022	Western District of Texas - Waco Division

PLAINTIFF	DEFENDANT
Advanced Transactions, LLC	Fiesta Mart LLC, Bodega Latina Corporation dba El Super, Smart & Final Stores LLC, Chedraui USA, Inc., Grupo Comercial Chedraui, S.A.B. de C.V., and Smart & Final Holdings, Inc.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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09/02/2022 Doc #21 NOTICE of Voluntary Dismissal

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☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
6:22-cv-00775	7/12/2022	Western District of Texas - Waco Division

PLAINTIFF	DEFENDANT
Advanced Transactions, LLC	Advance Auto Parts, Inc. and E-Advance, LLC

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	7,065,555	6/20/2006	Advanced Transactions, LLC
2	7,386,594	6/10/2008	Advanced Transactions, LLC
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PTO/SB/80 (01-06)
Approved for use through 12/31/2008. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

[X] Practitioners associated with the Customer Number: 26111

OR

[ ] Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

[X] The address associated with Customer Number: 26111

OR

[ ] Firm or Individual Name

Address					
City		State		Zip	
Country		Telephone		Email	

Assignee Name and Address:

Archeron Limited LLC
2711 Centerville Road, Suite 400
Wilmington, DE 19808

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	7/26/2007
Name	Bryan Burpee	Telephone	
Title	Authorized Person for Archeron Limited LLC		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt	
EFS ID:	10175748
Application Number:	11452431
International Application Number:	
Confirmation Number:	2713
Title of Invention:	SYSTEM AND METHOD RELATED TO GENERATING AN EMAIL CAMPAIGN
First Named Inventor/Applicant Name:	Michael G. Foulger
Customer Number:	26111
Filer:	Christopher Philip Wrist/Anastassia Reznik
Filer Authorized By:	Christopher Philip Wrist
Attorney Docket Number:	2222.9480002
Receipt Date:	26-MAY-2011
Filing Date:	14-JUN-2006
Time Stamp:	17:22:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		2222_9480002_poa.pdf	422950 77f1874b00fd5292ab523d4c8d923234848 52140	yes	4

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Assignee showing of ownership per 37 CFR 3.73(b).	2	3
	Power of Attorney	4	4
Warnings:			
Information:			
	Total Files Size (in bytes):	422950	

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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Sterne Kessler Goldstein Fox
ATTORNEYS AT LAW

May 26, 2011

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Confirmation No.: 2713
Art Unit: 2155
Mail Stop Post Issue

Re: U.S. Utility Patent
U.S. Patent No. 7,386,594; Issued: June 10, 2008
For: **System and Method Related to Generating and Tracking an Email Campaign**
Inventors: Foulger *et al.*
Our Ref: 2222.9480002

Sir:

Transmitted herewith for appropriate action is the following document:

1. Statement under 37 C.F.R. 3.73(b); and

2. Power of Attorney.

The above-listed document is filed electronically through EFS-Web.

In the event that extensions of time are necessary to prevent abandonment of this patent application, then such extensions of time are hereby petitioned.

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Christopher Philip Wrist
Attorney for Patentees
Registration No. 32,078

CPW/aer
Enclosures

1329154_1.DOC

American Airlines, Ex. 1008, p.16
American Airlines v. Advanced Transactions
IPR2023-01370

PTO/SB/96 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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STATEMENT UNDER 37 CFR 3.73(b)

Atty. Docket No. 2222.9480002

Applicant/Patent Owner: Foulger et al.

Application No./Patent No.: 7,386,594 Filed/Issue Date: June 10, 2008

Titled: System and Method Related to Generating and Tracking an Email Campaign

Archeron Limited LLC , a Limited Liability Company
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. [X] the assignee of the entire right, title, and interest in;

2. [ ] an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or

3. [ ] the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. [ ] An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy therefore is attached.

OR

B. [X] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: FOULGER et al. To: ICPLANET CORPORATION
The document was recorded in the United States Patent and Trademark Office at
Reel 019752, Frame 0433, or for which a copy thereof is attached.

2. From: FOULGER et al. To: ICPLANET CORPORATION
The document was recorded in the United States Patent and Trademark Office at
Reel 026214, Frame 0343, or for which a copy thereof is attached.

3. From: ICPLANET CORPORATION To: ICP ACQUISITION CORPORATION
The document was recorded in the United States Patent and Trademark Office at
Reel 025741, Frame 0646, or for which a copy thereof is attached.

[ ] Additional documents in the chain of title are listed on a supplemental sheet(s).

[X] As required by ~~37 CFR~~ 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature — May 26, 2011 (Date)

Christopher Philip Wrist, Reg. No. 32,078 (Printed or Typed Name) — Attorney for Patentees (Title)

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Supplemental Sheet to Chain of Title, Item B of the Statement Under 37 CFR 3.73(b) (PTO/SB/96)

Applicant/Owner: Foulger et al.

Application No./Patent No.: 7,386,594

Application Date/Issue Date: June 10, 2008

Title: System and Method Related to Generating and Tracking an Email Campaign

Name of Assignee: **Archeron Limited LLC** Type of Assignee: Limited Liability Company

Supplemental Sheet to Part B: Continuation of the chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

4. From: ICP ACQUISITION CORPORATION To: ICPLANET CORPORATION
   The document was recorded in the United States Patent and Trademark Office at
   Reel 026211, Frame 0632, or for which a copy thereof is attached.

5. From: ICPLANET CORPORATION To: KFORCE INC.
   The document was recorded in the United States Patent and Trademark Office at
   Reel 019002, Frame 0645, or for which a copy thereof is attached.

6. From: KFORCE INC. To: ARCHERON LIMITED LLC
   The document was recorded in the United States Patent and Trademark Office at
   Reel 019550, Frame 0768, or for which a copy thereof is attached.

7. From: _____ To: _____
   The document was recorded in the United States Patent and Trademark Office at
   Reel _____, Frame _____, or for which a copy thereof is attached.

8. From: _____ To: _____
   The document was recorded in the United States Patent and Trademark Office at
   Reel _____, Frame _____, or for which a copy thereof is attached.

9. From: _____ To: _____
   The document was recorded in the United States Patent and Trademark Office at
   Reel _____, Frame _____, or for which a copy thereof is attached.

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/452,431	06/10/2008	7386594	2222.9480002	2713

26111 7590 05/21/2008

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Michael G. Foulger, Novato, CA;
Thomas R. Chipperfield, Petaluma, CA;
Jeremy S. Cooper, Petaluma, CA;
Andrew C. Storms, Petaluma, CA;

American Airlines, Ex. 1008, p.19
American Airlines v. Advanced Transactions
IPR2023-01370

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26111 7590 01/30/2008

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/452,431	06/14/2006	Michael G. Foulger	2018.0040002	2713

TITLE OF INVENTION: SYSTEM AND METHOD RELATED TO GENERATING AN EMAIL CAMPAIGN

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1440	$300	$0	$1740	04/30/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
BAROT, BHARAT	2155	709-206000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 Sterne Kessler Goldstein & Fox
2 PLLC
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: ARCHERON LIMITED LLC
(B) RESIDENCE: (CITY and STATE OR COUNTRY): WILMINGTON, DELAWARE, USA

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☒ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 19-0036 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature Timothy A. Doyle Date April 30, 2008
Typed or printed name Timothy A. Doyle Registration No. 51,262

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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American Airlines, Ex. 1008, p.20
American Airlines v. Advanced Transactions
IPR2023-01370

Electronic Patent Application Fee Transmittal

Application Number:	11452431
Filing Date:	14-Jun-2006
Title of Invention:	SYSTEM AND METHOD RELATED TO GENERATING AN EMAIL CAMPAIGN
First Named Inventor/Applicant Name:	Michael G. Foulger
Filer:	Timothy Aloysius Doyle/Tracie Xhema
Attorney Docket Number:	2222.9480002
Filed as Large Entity	

Utility Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Publ. Fee- early, voluntary, or normal	1504	1	300	300
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	1501	1	1440	1440

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1740**

Electronic Acknowledgement Receipt

EFS ID:	3233542
Application Number:	11452431
International Application Number:	
Confirmation Number:	2713
Title of Invention:	SYSTEM AND METHOD RELATED TO GENERATING AN EMAIL CAMPAIGN
First Named Inventor/Applicant Name:	Michael G. Foulger
Customer Number:	26111
Filer:	Timothy Aloysius Doyle/Tracie Xhema
Filer Authorized By:	Timothy Aloysius Doyle
Attorney Docket Number:	2222.9480002
Receipt Date:	30-APR-2008
Filing Date:	14-JUN-2006
Time Stamp:	16:29:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1740
RAM confirmation Number	2103
Deposit Account	
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)

1		22229480002issuefee.pdf	131003 8de388a2811b1ff84ec7bb4434615429e2576dbf	yes	2

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Issue Fee Payment (PTO-85B)	2	2

Warnings:

Information:

2	Fee Worksheet (PTO-06)	fee-info.pdf	8334 e7f50b356ebed28053b1f56c488bc35aa3cb6a09	no	2

Warnings:

Information:

Total Files Size (in bytes):	139337

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New Applications Under 35 U.S.C. 111
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National Stage of an International Application under 35 U.S.C. 371
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New International Application Filed with the USPTO as a Receiving Office
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Sterne Kessler Goldstein Fox
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Christian A. Camarce+
Richard D. Coller III+
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Alyssa K. Sandrowitz+
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Stephanie L. Elmer
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Salvador M. Bezos
Yasser Mourtada

Of Counsel
Edward J. Kessler
Kenneth C. Bass III
Marvin C. Guthrie
Christopher P. Wrist

*Admitted only in Maryland
+Admitted only in Virginia
•Practice Limited to Federal Agencies

April 30, 2008

WRITER'S DIRECT NUMBER:
(202) 772-8774
INTERNET ADDRESS:
TDOYLE@SKGF.COM

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Mail Stop Issue Fee

Re: Allowed U.S. Utility Patent Application
Appl. No. 11/452,431; Filed: June 14, 2006
For: **System and Method Related to Generating an Email Campaign**
Inventors: FOULGER *et al.*
Our Ref: 2222.9480002

Sir:

In response to the **Notice of Allowance and Fees Due** dated January 30, 2008, the following documents are transmitted for appropriate action by the U.S. Patent and Trademark Office:

1. Issue Fee Transmittal (Form PTOL-85);

2. Online Credit Card Payment Authorization for $1,740.00 to cover: $1,440.00 - Issue Fee; and $300.00 - Publication Fee.

The above-listed documents are filed electronically through EFS-Web. Fee payment is provided through online credit card payment. The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Timothy A. Doyle
Attorney for Applicants
Registration No. 51,262

TAD/tjx
Enclosures

814969_1.doc

American Airlines, Ex. 1008, p.25
American Airlines v. Advanced Transactions
IPR2023-01370

10/30/2007

Equivalent of Form PTO/SB/08A (10-07)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449/PTO

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 4

Complete if Known	
Application Number	11/452,431
Filing Date	June 14, 2006
First Named Inventor	Michael G. Foulger
Art Unit	2155
Examiner Name	Bharat Barot
Attorney Docket Number	2222.9480002

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/BB/	US1	5,164,897	11-17-1992	Clark et al.	
	US2	5,265,033	11-23-1993	Vajk et al.	
	US3	5,583,995	12-10-1996	Gardner et al.	
	US4	5,870,552	02-09-1999	Dozier et al.	
	US5	5,933,811	08-03-1999	Angles et al.	
	US6	5,999,912	12-07-1999	Wodarz et al.	
	US7	6,091,777	07-18-2000	Guetz et al.	
	US8	6,094,507	07-25-2000	Monden	
	US9	6,101,485	08-08-2000	Fortenberry et al.	
	US10	6,170,~~871~~ B1 011	02-02-2001	Macleod Beck et al.	
	US11	6,188,~~306~~ B1 398	02-13-2001	~~Collins et al.~~ COLLINS-RECTOR, ET AL.	
	US12	6,222,825 B1	04-24-2001	Mangin et al.	
	US13	6,233,520 B1	05-15-2001	Ito et al.	
	US14	6,263,020 B1	07-17-2001	Gardos et al.	
	US15	6,275,575 B1	08-14-2001	Wu	
	US16	6,282,540 B1	08-28-2001	Goldensher et al.	
	US17	6,321,265 B1	11-20-2001	Najork et al.	
	US18	6,346,980 B1	02-12-2002	Tani et al.	
	US19	6,351,755 B1	02-26-2002	Najork et al.	
/BB/	US20	6,360,254 B1	03-19-2002	Linden et al.	

AE 3-14-08

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] Number[4] Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
/BB/	FP1	EP0989501 A2	09-22-1999	Yoshida et al.		
	FP2	JP08221479 A	08-30-1996	Ito		
	FP3	PCT/US97/19719 A2	10-30-1997	Lenz		
	FP4	PCT/US97/22151	06-25-1998	Sherer		
	FP5	WO 00/20975	04-13-2000	Shaw et al.		
	FP6	WO 01/13069 A1	02-22-2001	Collier et al.		
	FP7	WO 01/65426 A1	09-07-2001	Knorr		
	FP8	WO 97/07467	02-27-1997	Phelan		
/BB/	FP9	WO 98/20434	05-14-1998	Vayu Web Inc		

Examiner Signature	/Bharat Barot/	Date Considered	12/28/2007

Doc # 739368

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Equivalent of Form PTO/SB/08A (10-07)
Approved for use through 10/31/2007. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 4

Complete if Known	
Application Number	11/452,431
Filing Date	June 14, 2006
First Named Inventor	Michael G. Foulger
Art Unit	2155
Examiner Name	Bharat Barot
Attorney Docket Number	2222.9480002

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/BB/	US21	6,377,936 B1	04-23-2002	Henrick et al.	
	US22	6,397,219 B2	05-28-2002	Mills	
	US23	6,401,075 B1	06-04-2002	Mason et al.	
	US24	6,449,635 B1	09-10-2002	Tilden Jr. et al.	
	US25	6,462,676 B1	07-13-2003	Koizumi	
	US26	6,466,940 B1	10-15-2002	Mills	
	US27	6,523,021 B1	02-18-2003	Monberg et al	
	US28	6,539,080 B1	05-25-2003	Bruce et al.	
	US29	6,549,950 B2	04-15-2003	Lytle et al.	
	US30	6,560,243 B1	05-06-2003	Mogul	
	US31	6,578,~~002~~ B1 022	~~06-10-203~~	Foulger et al. 06-10-2003	
	US32	6,587,832 B1	07-01-2003	Beck et al.	
	US33	6,594,666 B1	08-15-2003	Biswas et al.	
	US34	6,618,747 B1	09-09-2003	Flynn et al.	
	US35	6,657,558 B2	12-02-2003	Horita et al.	
	US36	6,662,194 B1	12-09-2003	Joao	
	US37	6,668,281 B1	12-23-2003	Ayyadurai	
	US38	6,681,255 B1	01-20-2004	Cooper et al.	
	US39	6,694,353 B2	02-17-2004	Sommerer	
/BB/	US40	6,721,784 B1	04-13-2004	Leonard et al.	

AE 3-14-08

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] Number[4] Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	FP10					
	FP11					
	FP12					
	FP13					
	FP14					
	FP15					
	FP16					
	FP17					
	FP18					

Examiner Signature	/Bharat Barot/	Date Considered	12/28/2007

Doc # 739368

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

26111 7590 01/30/2008

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER	
BAROT, BHARAT	
ART UNIT	PAPER NUMBER
2155	

DATE MAILED: 01/30/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/452,431	06/14/2006	Michael G. Foulger	2018.0040002	2713

TITLE OF INVENTION: SYSTEM AND METHOD RELATED TO GENERATING AN EMAIL CAMPAIGN

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1440	$300	$0	$1740	04/30/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

American Airlines, Ex. 1008, p.28
American Airlines v. Advanced Transactions
IPR2023-01370

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26111 7590 01/30/2008

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/452,431	06/14/2006	Michael G. Foulger	2018.0040002	2713

TITLE OF INVENTION: SYSTEM AND METHOD RELATED TO GENERATING AN EMAIL CAMPAIGN

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1440	$300	$0	$1740	04/30/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
BAROT, BHARAT	2155	709-206000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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American Airlines, Ex. 1008, p.29
American Airlines v. Advanced Transactions
IPR2023-01370

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/452,431	06/14/2006	Michael G. Foulger	2018.0040002	2713

26111 7590 01/30/2008

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1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER	
BAROT, BHARAT	
ART UNIT	PAPER NUMBER
2155	

DATE MAILED: 01/30/2008

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

American Airlines, Ex. 1008, p.30
American Airlines v. Advanced Transactions
IPR2023-01370

Notice of Allowability	Application No.	Applicant(s)	
	11/452,431	FOULGER ET AL.	
	Examiner	Art Unit	
	Bharat N. Barot	2155	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendment and terminal disclaimer filed on 11/16/2007*.

2. ☒ The allowed claim(s) is/are *20-34 re-numbered as 1-15*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 10/30/2007
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Bharat Barot

BHARAT BAROT
PRIMARY EXAMINER

(571) 272-3979

American Airlines, Ex. 1008, p.31
American Airlines v. Advanced Transactions
IPR2023-01370

REASONS FOR ALLOWANCE

1. The following is an Examiner's Statement of Reasons for Allowance: Claims 20-34 are allowable over the prior art of record.

The examiner has found that the prior art of record does not disclose or teach or suggest or render obvious a system and method for generating an email campaign template from an email target database having a plurality of email targets, the email campaign template comprises a message template (text message) and a configuration file having data related to each of the plurality of email targets; generating a custom email corresponding to each of the plurality of email targets, the custom email is formed from the email campaign template; and sending the custom email to each of the plurality of email targets at set forth in the independent claims 20 and 29.

2. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

CONTACT INFORMATION

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Bharat Barot** whose Telephone Number is **(571) 272-3979**. The examiner can normally be reached on Monday-Friday from 7:00 AM to 3:30 PM. Most facsimile-transmitted patent application related correspondence is required to be sent to the Central FAX Number **(571) 273-8300**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Saleh Najjar**, can be reached at **(571) 272-4006**.

Bharat Barot.

BHARAT BAROT
PRIMARY EXAMINER

Patent Examiner Bharat Barot

Art Unit 2155

December 28, 2007

10/30/2007

Equivalent of Form PTO/SB/08A (10-07)
Approved for use through 10/31/2007. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449/PTO

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(Use as many sheets as necessary)

Sheet 1 of 4

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Examiner Name	Bharat Barot
Attorney Docket Number	2222.9480002

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/BB/	US1	5,164,897	11-17-1992	Clark et al.	
	US2	5,265,033	11-23-1993	Vajk et al.	
	US3	5,583,995	12-10-1996	Gardner et al.	
	US4	5,870,552	02-09-1999	Dozier et al.	
	US5	5,933,811	08-03-1999	Angles et al.	
	US6	5,999,912	12-07-1999	Wodarz et al.	
	US7	6,091,777	07-18-2000	Guetz et al.	
	US8	6,094,507	07-25-2000	Monden	
	US9	6,101,485	08-08-2000	Fortenberry et al.	
	US10	6,170,071 B1	02-02-2001	Macleod Beck et al.	
	US11	6,188,396 B1	02-13-2001	Collins et al.	
	US12	6,222,825 B1	04-24-2001	Mangin et al.	
	US13	6,233,520 B1	05-15-2001	Ito et al.	
	US14	6,263,020 B1	07-17-2001	Gardos et al.	
	US15	6,275,575 B1	08-14-2001	Wu	
	US16	6,282,540 B1	08-28-2001	Goldensher et al.	
	US17	6,321,265 B1	11-20-2001	Najork et al.	
	US18	6,346,980 B1	02-12-2002	Tani et al.	
	US19	6,351,755 B1	02-26-2002	Najork et al.	
/BB/	US20	6,360,254 B1	03-19-2002	Linden et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] Number[4] Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
/BB/	FP1	EP0989501 A2	09-22-1999	Yoshida et al.		
	FP2	JP08221479 A	08-30-1996	Ito		
	FP3	PCT/US97/19719 A2	10-30-1997	Lenz		
	FP4	PCT/US97/22151	06-25-1998	Sherer		
	FP5	WO 00/20975	04-13-2000	Shaw et al.		
	FP6	WO 01/13069 A1	02-22-2001	Collier et al.		
	FP7	WO 01/65426 A1	09-07-2001	Knorr		
	FP8	WO 97/07467	02-27-1997	Phelan		
/BB/	FP9	WO 98/20434	05-14-1998	Vayu Web Inc		

Examiner Signature	/Bharat Barot/	Date Considered	12/28/2007

Doc # 739368

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(Use as many sheets as necessary)

Sheet 2 of 4

Complete if Known	
Application Number	11/452,431
Filing Date	June 14, 2006
First Named Inventor	Michael G. Foulger
Art Unit	2155
Examiner Name	Bharat Barot
Attorney Docket Number	2222.9480002

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/BB/	US21	6,377,936 B1	04-23-2002	Henrick et al.	
	US22	6,397,219 B2	05-28-2002	Mills	
	US23	6,401,075 B1	06-04-2002	Mason et al.	
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	FP10					
	FP11					
	FP12					
	FP13					
	FP14					
	FP15					
	FP16					
	FP17					
	FP18					

Examiner Signature	/Bharat Barot/	Date Considered	12/28/2007

Doc # 739368

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Sheet 3 of 4

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First Named Inventor	Michael G. Foulger
Art Unit	2155
Examiner Name	Bharat Barot
Attorney Docket Number	2222.9480002

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/BB/	US41	6,751,606 B1	06-15-2004	Fries et al.	
	US42	6,791,943 B1	09-14-2004	Reynolds	
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	FP19					
	FP20					
	FP21					
	FP22					
	FP23					
	FP24					
	FP25					
	FP26					
	FP27					

Examiner Signature	/Bharat Barot/	Date Considered	12/28/2007

Doc # 739368

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Sheet 4 of 4

Complete if Known	
Application Number	11/452,431
Filing Date	June 14, 2006
First Named Inventor	Michael G. Foulger
Art Unit	2155
Examiner Name	Bharat Barot
Attorney Docket Number	2222.9480002

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/BB/	US61	2002/0156779 A1	10-24-2002	Elliott et al.	
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	US79				
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	FP28					
	FP29					
	FP30					
	FP31					
	FP32					
	FP33					
	FP34					
	FP35					
	FP36					

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Sheet 1 of 3

Complete if Known	
Application Number	11/452,431
Filing Date	June 14, 2006
First Named Inventor	Michael G. Foulger
Art Unit	2155
Examiner Name	Bharat Barot
Attorney Docket Number	2222.9480002

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T[2]
/BB/	NPL1	"What is MD5 and Why Do I Care?" by Lance Spitzner [redacted] enteract.com/~/spitz/md5.html downloaded 3/20/2000	
	NPL2	The MD5 Message Digest Algorithm by R.Rivest MIT Laboratory for Computer Science and RSA Data Security, Inc. April 1992	
	NPL3	Applied Cryptography Protocols, Algorithms, and Source Code Inc. Schier, Bruce 1996.	
	NPL4	Google Launches Full Suite of Fully Automated, Highly Customizable Websearch Services Based on Company's Award-Winning Search Technology Business Wire, p.0420 4/4/2000	
	NPL5	RSS Feeds From CNET News.com/CNET News.com "[redacted]news.com/2009-1090-980549.html?tag=ne.404 (downloaded 5/15/2006- 3 pgs)	
	NPL6	[redacted].weather.com/services/oap.html?from=servicesindex downloaded 5/18/2006	
	NPL7	Gauch, S. and Smith, John. " Query Reformulation Strategies for an Intelligent Search Intermediary" Proceedings of the AI Systems in Government Conference, IEEE Computer Society ISBN No. 0-8186-1934-1 pp. 65-71 (March 27-31, 1989)	
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	NPL9	Jin-gang Kim et al., "Intelligent Information Recommend System on the Internet, 1999, IEEE	
/BB/	NPL10	Branscum, Deborah "Sites to Help Professional Workers Who Like to Go it Alone", New York Times, 10/14/1999, [retrieved 06/23/2005 from Proquest Direct, pp.1-3.	

Examiner Signature	/Bharat Barot/	Date Considered	12/28/2007

Doc # 739380

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Substitute for form 1449/PTO				*Complete if Known*	
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/BB/	NPL11	Houston, Lori, "IC Planet: Running Perl in the Engine", ~~www~~oreilly.com 04/10/2000 [retrieved 05/23/2005 from Google.com p.1-2]	
	NPL12	Clark, Don "E-Business Starting Gate" Wall Street Journal 04/24/2000 [retrieved 06/23/2005 from Proquest Direct p. 1-3]	
	NPL13	IBM Technical Disclosure Bulletin, NN8905154, May 1989 2 pgs	
	NPL14	Copy of International Search report for Application Number PCT/US01 12648 Nov. 21, 2001, 6 pgs	
	NPL15	Copy of International Search Report from Application No. PCT/US01/13141, 7 pages, mailed Oct. 27th, 2003.	
	NPL16	Sanad et al. Mobile cellular/GPS/satellite antennas with both single -band and dual-band, Antennas and Propagation Society International Symposium, Jul. 16-20, 2000. cited by examiner .	
	NPL17	Nagy et al. Geographic Data Processing. ACM Computing Surveys. 1979, p. 139-181. cited by examiner .	
	NPL18	Copy of International Search report for Application Number PCT/US01 12510 April 18, 2001, 6 pgs mailed Sept 5, 2002.	
	NPL19	Ju, J and Wang Y., "Scheduling PVM Tasks," XP000627434, Operating Systems Review (SIGOPS), ACM Headquarter, New York, NY, vol. 30, no. 3, July 1, 1996, pps. 22-31.	
/BB/	NPL20	"Mental Ray Specification," XP002195542, <~~http://www~~.id8media.com/3s_products/mental_ray2.htm>,[internet], retrieved on April 8, 2002.	

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/BB/	NPL21	Taylor, A., "Press Release - Avid Announces New Release of softimage^3d 3.8sp2," XP002195543, <http://www.softimage.com/community/xsi/discuss/Archives/3dgames.archive.9907/msg0000.htm>, [internet], retrieved on April 8, 2002.	
/BB/	NPL22	Ganesh, Sathy, Google Groups, "Re: Group Scheduling Software for PC's and mac's", 9-22-1994, Newsgroups: bit.listserv.novell.	
/BB/	NPL23	Foulger, Michael G., et al. Application No. 09/551,746 filed 04-18-2000 entitled "Method, System, and Computer Program Product for Propagating Remotely Configurable Posters of Host Site Content"	
	NPL24		
	NPL25		
	NPL26		
	NPL27		
	NPL28		
	NPL29		
	NPL30		

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Issue Classification	Application/Control No. 11/452,431	Applicant(s)/Patent under Reexamination FOULGER ET AL.
	Examiner Bharat N. Barot	Art Unit 2155

ISSUE CLASSIFICATION

ORIGINAL		INTERNATIONAL CLASSIFICATION								
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED			
709	206	G	06	F	15	/16				/
						/				/
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CROSS REFERENCES				
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)			
709	201	203		

(Assistant Examiner) (Date)

R. Johnson 1-29-08
(Legal Instruments Examiner) (Date)

Bharat Barot
BHARAT BAROT
PRIMARY EXAMINER
(Primary Examiner) 12/28/07 (Date)

Total Claims Allowed: 15

O.G. Print Claim(s)	O.G. Print Fig.
10	3A

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
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	6		36		66		96		126		156		186
	7		37		67		97		127		157		187
	8		38		68		98		128		158		188
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	10		40		70		100		130		160		190
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2	21		51		81		111		141		171		201
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4	23		53		83		113		143		173		203
5	24		54		84		114		144		174		204
6	25		55		85		115		145		175		205
7	26		56		86		116		146		176		206
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Search Notes	Application/Control No.	Applicant(s)/Patent under Reexamination
	11/452,431	FOULGER ET AL.
	Examiner	Art Unit
	Bharat N. Barot	2155

SEARCHED			
Class	Subclass	Date	Examiner
709	201-203 206-207 223-225	5/8/2007	
Update	Search	12/28/2007	BB

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner
709	**201, 203**	**12/28/2007**	**BB**
709	206	/	/

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
WEST Search	5/8/2007	BB
WEST Search	12/28/2007	BB

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Index of Claims

Application/Control No.	Applicant(s)/Patent under Reexamination
11/452,431	FOULGER ET AL.
Examiner	**Art Unit**
Bharat N. Barot	2155

√	Rejected	–	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

Claim Final	Claim Original	Date 5/8/07	Date 12/28/07
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Set Name side by side	Query	Hit Count	Set Name result set
DB=PGPB; PLUR=YES; OP=ADJ			
L28	L27 and L26	37	L28
L27	L15 or L16 or L17 or L18	221	L27
L26	L25 or L24 or L23	7538	L26
L25	709/206.ccls.	3151	L25
L24	709/203.ccls.	3759	L24
L23	709/201.ccls.	836	L23
L22	L21 or L20 or L19	8	L22
L21	L15 and L18	4	L21
L20	L15 and L17	4	L20
L19	L15 and L16	4	L19
L18	custom email or custom e-mail	67	L18
L17	generat$ with configur$ with file with email	38	L17
L16	email with target with database	60	L16
L15	generat$ with email with template	70	L15
DB=USPT; PLUR=YES; OP=ADJ			
L14	L12 and L7	2	L14
L13	L12 and L1	3	L13
L12	custom email or custom e-mail	23	L12
L11	L9 and L7	1	L11
L10	L9 and L1	2	L10
L9	generat$ with configur$ with file with email	7	L9
L8	L7 and L1	1	L8
L7	email with target with database	16	L7
L6	L1 same campaign	3	L6
L5	L1 same configur$	3	L5
L4	L2 and L1	2	L4
L3	L2 same L1	1	L3
L2	target with database	4743	L2
L1	generat$ with email with template	17	L1

END OF SEARCH HISTORY

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
	11/452,431	FOULGER ET AL.	
		Barot	2155

Document Code - DISQ	Internal Document – DO NOT MAIL

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 11-16-07	**This patent is subject to a Terminal Disclaimer**	

Approved/Disapproved by: Angie

U.S. Patent and Trademark Office

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Confirmation No. 2713
Foulger *et al.*	Art Unit: 2155
Appl. No. 11/452,431	Examiner: Bharat Barot
Filed: June 14, 2006	Atty. Docket: 2222.9480002 (*formerly 2018.0040002*)
For: **System and Method Related to Generating an Email Campaign**	

Reply Under 37 C.F.R. § 1.111

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

In reply to the final Office Action dated May 18, 2007 (PTO Prosecution File Wrapper Paper No. 20070508), Applicants submit the following Remarks.

Status of the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks and Arguments begin on page 7 of this paper.

It is not believed that extensions of time or fees for net addition of claims are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor (including fees for net addition of claims) are hereby authorized to be charged to our Deposit Account No. 19-0036.

Status of the Claims

The listing of claims will replace all prior versions and listings of claims in the application.

1-19. (Canceled)

20. (Previously Presented) A method for conducting an email campaign, comprising the steps of:

(1) receiving an email target database;

(2) generating an email campaign template related to at least one email target in the received email target database, wherein step (2) comprises:

(a) generating a message template, and

(b) generating a configuration file to contain data related to each of the at least one email target, wherein the data is insertable in the generated message template; and

(3) sending to each of the at least one email target a corresponding custom email, wherein the custom email is formed from the email campaign template.

21. (Previously Presented) The method of claim 20, wherein step (1) comprises the step of:

(a) generating the email target database.

22. (Previously Presented) The method of claim 21, wherein step (a) comprises the steps of:

(i) collecting at least one raw document;

(ii) parsing said collected at least one document;

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(iii) categorizing said parsed at least one document into at least one category;

(iv) inserting said at least one document into a database; and

(v) removing documents from the database corresponding to duplicate email addresses.

23. (Previously Presented) The method of claim 20, wherein step (1) comprises the step of:

(a) requesting an email target database according to a structured query language statement.

24. (Previously Presented) The method of claim 20, wherein step (1) comprises the step of:

(a) receiving an email target database from a database vendor.

25. (Previously Presented) The method of claim 20, wherein step (b) comprises the steps of:

(i) generating a custom uniform resource locator address for each of the at least one email target; and

(ii) inserting the generated custom uniform resource locator address for each of the at least one email target into the configuration file.

26. (Previously Presented) The method of claim 25, wherein step (i) comprises the steps of:

(A) generating a hash from a campaign ID, a message template version ID, a user reference ID, and a private key, for each of the at least one email target; and

(B) appending a first portion of the generated hash for each of the at least one email target to a host web address to form the custom uniform resource locator address for each of the at least one email target.

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27. (Previously Presented) The method of claim 26, wherein the host web address is equal to:

hostname/module?token

where hostname is replaced with an email campaign host Internet address,

module is replaced with an identifier for software located at the email campaign host directed to processing the custom uniform resource locator address for each email target after it is selected, and

token is replaced with any alphanumeric identifier for unique information related to the customized uniform resource locator address for each of the at least one email target.

28. (Previously Presented) The method of claim 20, wherein step (3) comprises the step of:

(a) forming the custom email for each of the at least one email target from the generated text message template and the generated configuration file.

29. (Previously Presented) A system to generate an email campaign, comprising:

an email campaign generator that generates an email campaign template from an email target database, wherein said email target database comprises a plurality of email targets; and

an email campaign engine that generates a custom email corresponding to each of said plurality of email targets, wherein said custom email is formed from said email campaign template, wherein said email campaign engine sends said custom email to each of said plurality of email targets;

wherein said email campaign template comprises

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a text message, and

a configuration file that includes data from said email target database corresponding to each of said plurality of email targets.

30. (Previously Presented) The system of claim 29, wherein said email campaign engine makes a copy of said text message to generate said custom email.

31. (Previously Presented) The system of claim 30, wherein said email campaign engine replaces at least one custom tag in said text message copy with a corresponding portion of said configuration file data.

32. (Previously Presented) The system of claim 29, wherein said email campaign generator comprises a custom uniform resource locator generator that creates a custom uniform resource locator address for each of said plurality of email targets, wherein said configuration file includes said custom uniform resource locator address in said data.

33. (Previously Presented) The system of claim 32, wherein said custom uniform resource locator generator generates a hash from a campaign ID, a message template version ID, a user reference ID, and a private key, for each of said plurality of email targets, and appends at least a portion of the generated hash to a host web address to form said custom uniform resource locator address for each of said plurality of email targets.

34. (Previously Presented) The system of claim 33, wherein said host web address is equal to:

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hostname/module?token

where hostname is replaced with an email campaign host Internet address,

module is replaced with an identifier for software located at the email campaign host directed to processing said custom uniform resource locator address for an email target after it is selected, and

token is replaced with any alphanumeric identifier for unique information related to said custom uniform resource locator address for said email target.

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Remarks

Reconsideration of this Application is respectfully requested.

Claims 20-34 are pending in the application, with claims 20 and 29 being the independent claims. Claims 1-19 were previously canceled. No new matter has been added.

Based on the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding rejections and that they be withdrawn.

Double Patenting Rejection

On page 2 of the Office Action, claims 20-34 were rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over claims 1-9 and 12-17 of U.S. Patent No. 7,065,555. Applicants believe that the Examiner mistakenly refers to U.S. Patent No. 7,043,525 in his arguments. Thus, Applicants have included herewith a terminal disclaimer with respect to U.S. Patent No. 7,065,555 in compliance with 37 C.F.R. § 1.321(c) to obviate the double patenting rejection.

Applicants therefore respectfully request that the double patenting rejection be reconsidered and withdrawn and that claims 20-34 be passed to allowance.

Information Disclosure Statement

Applicants acknowledge with appreciation the Examiner's consideration of the documents listed on the Forms PTO-1449 that accompanied the Information Disclosure Statement filed June 14, 2006.

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Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Reply is respectfully requested.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Timothy A. Doyle

Timothy A. Doyle
Attorney for Applicants
Registration No. 51,262

Date: 16 NOV 07

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Washington, D.C. 20005-3934
(202) 371-2600

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PTO/SB/26 (10-07)
Approved for use through 10/31/2007. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	Docket Number (Optional) 2222.9480002

In re Application of: FOULGER et al.

Application No.: 11/452,431

Filed: June 14, 2006

For: System and Method Related to Generating an Email Campaign

The owner*, Acheron Limited LLC, of 100% percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term **prior patent** No. 7,065,555 as the term of said prior patent is defined in 35 U.S.C. 154 and 173, and as the term of said **prior patent** is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 and 173 of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 28,458

Signature — 11-16-2007 Date

Glenn J. Perry
Typed or printed name

(202) 371-2600
Telephone Number

☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Confirmation No. 2713
Foulger *et. al.*	Art Unit: 2155
Application No. 11/452,431	Examiner: Bharat Barot
Filed: June 14, 2006	Atty. Docket: 2222.9480002
For: **System and Method Related to Generating an Email Campaign**	

Request for Change of Attorney Docket Number Pleading

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Applicants respectfully request that the attorney docket number for the above-captioned application be changed from "2018.0040002" to -- 2222.9480002 --. Kindly use this attorney docket number in any future correspondence addressed to the undersigned.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Timothy A. Doyle

Timothy A. Doyle
Attorney for Applicants
Registration No. 51,262

Date: 16 NOV 07

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749103_1.DOC

Electronic Patent Application Fee Transmittal

Application Number:	11452431
Filing Date:	14-Jun-2006
Title of Invention:	System and method related to generating an email campaign
First Named Inventor/Applicant Name:	Michael G. Foulger
Filer:	Timothy Aloysius Doyle
Attorney Docket Number:	2018.0040002
Filed as Large Entity	

Utility Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Statutory disclaimer	1814	1	130	130
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 3 months with $0 paid	1253	1	1050	1050
Miscellaneous:				
		Total in USD ($)		**1180**

Electronic Acknowledgement Receipt

EFS ID:	2479290
Application Number:	11452431
International Application Number:	
Confirmation Number:	2713
Title of Invention:	System and method related to generating an email campaign
First Named Inventor/Applicant Name:	Michael G. Foulger
Customer Number:	26111
Filer:	Timothy Aloysius Doyle/Bridget Christian
Filer Authorized By:	Timothy Aloysius Doyle
Attorney Docket Number:	2018.0040002
Receipt Date:	16-NOV-2007
Filing Date:	14-JUN-2006
Time Stamp:	17:12:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1180
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)

1	Miscellaneous Incoming Letter	22229480002_transmittal.pdf	55887 a8b11abcdfdc591f1528625a5a4e6bc9cc7ba783	no	2
Warnings:					
Information:					
2	Extension of Time	22229480002_EOT.pdf	54253 79ed9f8a49477bae6de85c0b5397c34d816b1cd3	no	1
Warnings:					
Information:					
3		22989480002_reply.pdf	235186 9c078e9a3111e19a60c125534bb5ccafb0d9e07a	yes	8

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment - After Non-Final Rejection	1	1
Claims	2	6
Applicant Arguments/Remarks Made in an Amendment	7	8

Warnings:					
Information:					
4	Terminal Disclaimer Filed	22229480002_terminaldisclaimer.pdf	64370 28010c170bd9011a0343ec9676b17cfd3c133b2f	no	1
Warnings:					
Information:					
5	Change of Address	22229480002_changeattydkt.pdf	23168 179bce3bb91e812776c6c36da0ab8629af3c0d9d	no	1
Warnings:					
Information:					
6	Fee Worksheet (PTO-06)	fee-info.pdf	8309 8eaaa85d4883266b044e135e45f822603a57a930	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	441173	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Sterne Kessler Goldstein Fox
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+ Admitted only in Virginia
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November 16, 2007

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INTERNET ADDRESS:
TDOYLE@SKGF.COM

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Art Unit 2155

Re: U.S. Utility Patent Application
Application No. 11/452,431; Filed: June 14, 2006
For: **System and Method Related to Generating an Email Campaign**
Inventors: Foulger *et al.*
Our Ref: 2222.9480002

Sir:

Transmitted herewith for appropriate action are the following documents:

1. Online Credit Card Payment Authorization in the amount of **$1,180.00** to cover:
   $ 1,050.00 - Petition for Extension of Time Fee; and
   $ 130.00 - Terminal Disclaimer Fee.

2. Petition for Extension of Time Fee (PTO/SB/22);

3. Reply Under 37 C.F.R. § 1.111;

4. Terminal Disclaimer (PTO/SB/26); and

5. Request for Change of Attorney Docket Number Pleading.

The above-listed documents are filed electronically through EFS-Web.

In the event that extensions of time are necessary to prevent abandonment of this patent application, then such extensions of time are hereby petitioned.

American Airlines, Ex. 1008, p.61
American Airlines v. Advanced Transactions
IPR2023-01370

Fee payment is provided through online credit card payment. The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Timothy A. Doyle

Timothy A. Doyle
Attorney for Applicants
Registration No. 51,262

TAD/brc
Enclosures

749257_1.DOC

American Airlines, Ex. 1008, p.62
American Airlines v. Advanced Transactions
IPR2023-01370

PTO/SB/22 (10-07)
Approved for use through 10/31/2007. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARMENT OF COMMERCE
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) **FY 2008** *(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)*	Docket Number (Optional) 2222.9480002
Application Number 11/452,431	Filed June 14, 2006
For System and Method Related to Generating an Email Campaign	
Art Unit 2155	Examiner Bharat Barot

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	
☐	One month (37 CFR 1.17(a)(1))	$120	$60	$
☐	Two months (37 CFR 1.17(a)(2))	$460	$230	$
☒	Three months (37 CFR 1.17(a)(3))	$1050	$525	$ 1,050.00
☐	Four months (37 CFR 1.17(a)(4))	$1640	$820	$
☐	Five months (37 CFR 1.17(a)(5))	$2230	$1115	$

☐ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check in the amount of the fee is enclosed.

☒ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 19-0036. I have enclosed a duplicate copy of this sheet.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).

☐ attorney or agent of record. Registration Number _____

☒ attorney or agent under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 51,262

Timothy A. Doyle — Signature

16 NOV 07 — Date

Timothy A. Doyle — Typed or printed name

(202) 371-2600 — Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☒ Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2. 749260.1_DOC

PTO/SB/06 (07-06)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11/452,431	Filing Date 06/14/2006	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
	11/16/2007	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	* 15	Minus	** 20	= 0	X $ =		OR	X $50=	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $ =		OR	X $210=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	**0**

		(Column 1)		(Column 2)	(Column 3)					
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
Fennell A. Pearlie

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Confirmation No. 2713
Foulger *et al.*	Art Unit: 2155
Appl. No. 11/452,431	Examiner: Bharat Barot
Filed: June 14, 2006	Atty. Docket: 2222.9480002
For: **System and Method Related to Generating an Email Campaign**	

Supplemental Information Disclosure Statement

Mail Stop Amendment

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Listed on accompanying IDS Forms are documents that may be considered material to the examination of this application, in compliance with the duty of disclosure requirements of 37 C.F.R. §§ 1.56, 1.97 and 1.98.

Where the publication date of a listed document does not provide a month of publication, the year of publication of the listed document is sufficiently earlier than the effective U.S. filing date and any foreign priority date so that the month of publication is not in issue. Applicants have listed publication dates on the attached IDS Forms based on information presently available to the undersigned. However, the listed publication dates should not be construed as an admission that the information was actually published on the date indicated.

Applicants reserve the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may not be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This statement should not be construed as a representation that a search has been made, or that information more material to the examination of the present patent application does not exist. The Examiner is specifically requested not to rely solely on the material submitted herewith.

Applicants have checked the appropriate boxes below.

☐ 1. Statement under 37 C.F.R. 1.704(d). Each item of information contained in this Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart application and this communication was not received by any individual designated in 37 C.F.R. § 1.56(c) more than thirty days prior to the filing of this information disclosure statement.

☐ 2. Filing under 37 C.F.R. § 1.97(b). This Information Disclosure Statement is being filed within three months of the date of filing of a national application other than a continued prosecution application (CPA), OR within three months of the date of entry of the national stage as set forth in 37 C.F.R. § 1.491 in an international application, OR before the mailing date of a first Office Action on the merits OR before the mailing of a first Office Action after the filing of a request for continued examination under 37 C.F.R. § 1.114. No statement or fee is required.

☒ 3. Filing under 37 C.F.R. § 1.97(c). This Information Disclosure Statement is being filed more than three months after the U.S. filing date AND after the mailing date of the first Office Action on the merits, but before the mailing date of a Final Rejection, or Notice of Allowance, or an action that otherwise closes prosecution in the application.

American Airlines, Ex. 1008, p.66
American Airlines v. Advanced Transactions
IPR2023-01370

☐ a. Statement under 37 C.F.R. § 1.97(e)(1). I hereby state that each item of information contained in this Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(1).

☐ b. Statement under 37 C.F.R. § 1.97(e)(2). I hereby state that no item of information in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(2).

☒ c. The required fee is provided through online credit card payment authorization in the amount of $180.00 in payment of the fee under 37 C.F.R. § 1.17(p).

☐ 4. Filing under 37 C.F.R. § 1.97(d) This Information Disclosure Statement is being filed more than three months after the U.S. filing date and after the mailing date of a Final Rejection or Notice of Allowance, but before payment of the Issue Fee. The required fee is provided through online credit card payment authorization in the amount of $_____ in payment of the fee under 37 C.F.R. § 1.17(p); in addition:

American Airlines, Ex. 1008, p.67
American Airlines v. Advanced Transactions
IPR2023-01370

☐ a. Statement under 37 C.F.R. § 1.97(e)(1). I hereby state that each item of information contained in this Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(1).

☐ b. Statement under 37 C.F.R. § 1.97(e)(2). I hereby state that no item of information in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.97(e)(2).

☐ 5. The document(s) was/were cited in a search report by a foreign patent office in a counterpart foreign application. Submission of an English language version of the search report that indicates the degree of relevance found by the foreign office is provided in satisfaction of the requirement for a concise explanation of relevance. 1138 OG 37, 38.

☒ 6. A concise explanation of the relevance of the non-English language document FP2 (JP 08221479 A), which appears to describe a factory work scheduler, as indicated by its English language abstract, is enclosed as the cover page of the document and appears below in accordance with 37 C.F.R. § 1.98(a)(3).

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American Airlines v. Advanced Transactions
IPR2023-01370

☒ 7. Copies of documents NPL1-NPL23; FP1-FP9; are submitted. However, in accordance with 37 C.F.R. § 1.98(a)(2), no copies of U.S. patents and patent application publications cited on the attached IDS Forms are submitted.

☐ 8. Copies of the documents were cited by or submitted to the Office in an IDS that complies with 37 C.F.R. § 1.98(a)-(c) in Application No._____, filed _____, which is relied upon for an earlier filing date under 35 U.S.C. § 120. Thus, copies of these documents are not attached. 37 C.F.R. § 1.98(d).

☒ 9. It is expected that the examiner will review the prosecution and cited art in the parent application no(s). 09/841,186 filed April 25, 2001 (now U.S. Pat. No. 7,065,555) in accordance with MPEP 2001.06(b), and indicate in the next communication from the office that the art cited in the earlier prosecution history has been reviewed in connection with the present application.

It is respectfully requested that the Examiner initial and return a copy of the enclosed IDS Forms, and indicate in the official file wrapper of this patent application that the documents have been considered.

American Airlines, Ex. 1008, p.69
American Airlines v. Advanced Transactions
IPR2023-01370

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Timothy A. Doyle

Timothy A. Doyle
Attorney for Applicants
Registration No. 51,262

Date: 29 OCT 07

1100 New York Avenue, N.W.
Washington, D.C. 20005-3934
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Doc # 739394

American Airlines, Ex. 1008, p.70
American Airlines v. Advanced Transactions
IPR2023-01370

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Substitute for form 1449/PTO	*Complete if Known*	
SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(Use as many sheets as necessary)*	Application Number	11/452,431
	Filing Date	June 14, 2006
	First Named Inventor	Michael G. Foulger
	Art Unit	2155
	Examiner Name	Bharat Barot
Sheet 1 of 4	Attorney Docket Number	2222.9480002

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	US1	5,164,897	11-17-1992	Clark et al.	
	US2	5,265,033	11-23-1993	Vajk et al.	
	US3	5,583,995	12-10-1996	Gardner et al.	
	US4	5,870,552	02-09-1999	Dozier et al.	
	US5	5,933,811	08-03-1999	Angles et al.	
	US6	5,999,912	12-07-1999	Wodarz et al.	
	US7	6,091,777	07-18-2000	Guetz et al.	
	US8	6,094,507	07-25-2000	Monden	
	US9	6,101,485	08-08-2000	Fortenberry et al.	
	US10	6,170,071 B1	02-02-2001	Macleod Beck et al.	
	US11	6,188,396 B1	02-13-2001	Collins et al.	
	US12	6,222,825 B1	04-24-2001	Mangin et al.	
	US13	6,233,520 B1	05-15-2001	Ito et al.	
	US14	6,263,020 B1	07-17-2001	Gardos et al.	
	US15	6,275,575 B1	08-14-2001	Wu	
	US16	6,282,540 B1	08-28-2001	Goldensher et al.	
	US17	6,321,265 B1	11-20-2001	Najork et al.	
	US18	6,346,980 B1	02-12-2002	Tani et al.	
	US19	6,351,755 B1	02-26-2002	Najork et al.	
	US20	6,360,254 B1	03-19-2002	Linden et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] Number[4] Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	FP1	EP0989501 A2	09-22-1999	Yoshida et al.		
	FP2	JP08221479 A	08-30-1996	Ito		
	FP3	PCT/US97/19719 A2	10-30-1997	Lenz		
	FP4	PCT/US97/22151	06-25-1998	Sherer		
	FP5	WO 00/20975	04-13-2000	Shaw et al.		
	FP6	WO 01/13069 A1	02-22-2001	Collier et al.		
	FP7	WO 01/65426 A1	09-07-2001	Knorr		
	FP8	WO 97/07467	02-27-1997	Phelan		
	FP9	WO 98/20434	05-14-1998	Vayu Web Inc		

Examiner Signature		Date Considered	

Doc # 739368

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 4

Complete if Known	
Application Number	11/452,431
Filing Date	June 14, 2006
First Named Inventor	Michael G. Foulger
Art Unit	2155
Examiner Name	Bharat Barot
Attorney Docket Number	2222.9480002

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	US21	6,377,936 B1	04-23-2002	Henrick et al.	
	US22	6,397,219 B2	05-28-2002	Mills	
	US23	6,401,075 B1	06-04-2002	Mason et al.	
	US24	6,449,635 B1	09-10-2002	Tilden Jr. et al.	
	US25	6,462,676 B1	07-13-2003	Koizumi	
	US26	6,466,940 B1	10-15-2002	Mills	
	US27	6,523,021 B1	02-18-2003	Monberg et al	
	US28	6,539,080 B1	05-25-2003	Bruce et al.	
	US29	6,549,950 B2	04-15-2003	Lytle et al.	
	US30	6,560,243 B1	05-06-2003	Mogul	
	US31	6,578,002 B1	06-10-203	Foulger et al.	
	US32	6,587,832 B1	07-01-2003	Beck et al.	
	US33	6,594,666 B1	08-15-2003	Biswas et al.	
	US34	6,618,747 B1	09-09-2003	Flynn et al.	
	US35	6,657,558 B2	12-02-2003	Horita et al.	
	US36	6,662,194 B1	12-09-2003	Joao	
	US37	6,668,281 B1	12-23-2003	Ayyadurai	
	US38	6,681,255 B1	01-20-2004	Cooper et al.	
	US39	6,694,353 B2	02-17-2004	Sommerer	
	US40	6,721,784 B1	04-13-2004	Leonard et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] Number[4] Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	FP10					
	FP11					
	FP12					
	FP13					
	FP14					
	FP15					
	FP16					
	FP17					
	FP18					

Examiner Signature		Date Considered	

Doc # 739368

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Substitute for form 1449/PTO

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 3 of 4

Complete if Known	
Application Number	11/452,431
Filing Date	June 14, 2006
First Named Inventor	Michael G. Foulger
Art Unit	2155
Examiner Name	Bharat Barot
Attorney Docket Number	2222.9480002

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number / Number-Kind Code[2] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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	FP19					
	FP20					
	FP21					
	FP22					
	FP23					
	FP24					
	FP25					
	FP26					
	FP27					

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SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 4 of 4

Complete if Known	
Application Number	11/452,431
Filing Date	June 14, 2006
First Named Inventor	Michael G. Foulger
Art Unit	2155
Examiner Name	Bharat Barot
Attorney Docket Number	2222.9480002

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	FP28					
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				Filing Date	June 14, 2006
				First Named Inventor	Michael G. Foulger
				Art Unit	2155
				Examiner Name	Bharat Barot
Sheet	1	of	3	*Attorney Docket Number*	2222.9480002

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	NPL9	Jin-gang Kim et al., "Intelligent Information Recommend System on the Internet, 1999, IEEE	
	NPL10	Branscum, Deborah "Sites to Help Professional Workers Who Like to Go it Alone", New York Times, 10/14/1999, [retrieved 06/23/2005 from Proquest Direct, pp.1-3.	

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Sheet 3 of 3

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	NPL21	Taylor, A., "Press Release - Avid Announces New Release of softimage^3d 3.8sp2," XP002195543, <http://www.softimage.com/community/xsi/discuss/Archives/3dgames.archive.9907/msg0000.htm>, [internet], retrieved on April 8, 2002.	
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	NPL24		
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	NPL26		
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(54) Method and apparatus for collaboration support

(57) A server offers a centralized service with respect to a dialog between a plurality of browsers and a Web server, thereby changing the content of service offered to the browsers without changing the server. To accomplish this, in a domain name server 130, a plurality of virtual host names and their common IP address are managed. When a Web browser 100 sends a request by specifying this virtual host name, a server having the common IP address is rendered to offer the centralized service. For a request that does not require any service, this request is transferred to actual Web servers 151 to 157 corresponding to the virtual host name.

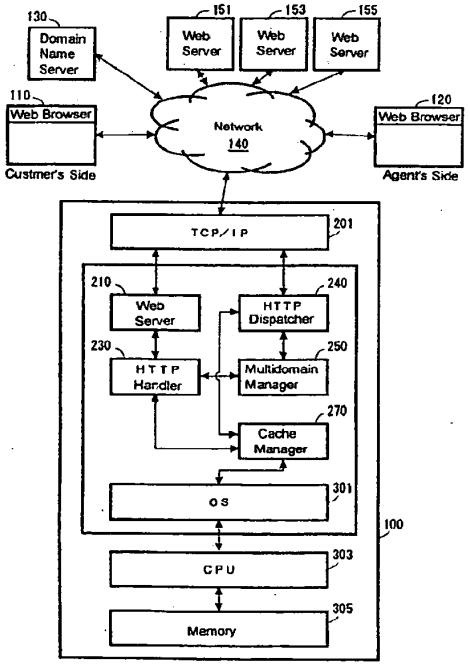


FIG. 1

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EP 0 989 501 A2

Description

[0001] This invention relates to supporting collaboration, for example between information terminals connected to a server via a network in a centralized manner.

[0002] The Internet comprises multiple interconnected computer networks so that any computer on a given network can communicate with one or more computers on any other given network. A gateway computer is a computer that interconnects two networks and passes data from one network to the other(s).

[0003] All the computers on the Internet communicate through certain communication protocols, i.e., Internet Protocol (IP). Most applications use Transmission Control Protocol (TCP) along with the Internet Protocol. Therefore, the Internet is also referred to as a TCP/IP Network. Any computer connected to the Internet is identified by a unique Internet address.

[0004] The Internet uses a well known packet switching technique to route information. On the Internet, the data is transferred through packets (also called IP packets) with an address. Some common Internet applications include Electronic Mail, FTP, Telnet and Network news among others. Internet communication protocols and applications are well known.

[0005] The World Wide Web (i.e., WWW or Web) is an information service system that is based on the Internet. The WWW uses Hypertext and client/server technology.

[0006] Hypertext is a method of organizing and presenting information such that any data object in a hypertext file can have links to other hypertext files or data objects. For example, while viewing a hypertext page, a user can select a word that has links. This may bring the user to another hypertext file that contains more text and pictures explaining this word (the new file may also have more links to other hypertext files and so forth).

[0007] Currently, the hypertext file is organized using a Hyper Text Markup Language (HTML). A hypertext data object can be almost any information media such as text, image, sound, movie or even a piece of an executable computer program. Any hypertext file on the Web is uniquely identified by its Universal Resource Locator (URL).

[0008] The Web client or a client (commonly a computer executing a program called a browser) is essentially a hypertext reader that communicates with a Web server through certain data transfer protocols, such as a Hyper Text Transfer Protocol (HTTP). The client can request a hypertext file with its URL and displays the file on a Graphical User Interface (GUI). This display is called a Web page. The client can also pass certain data back to the server and can invoke Common Gateway Interface (CGI) programs on the server computer to conduct certain tasks. Known popular browsers are Netscape Navigator® (trademark of Netscape Communications Corp.) and "Internet Explorer" (trademark of Microsoft Corp.).

[0009] Using the worldwide connections of the Internet, the WWW allows a user, being anywhere on the Internet, to post any hypertext file on the WWW and fetch any hypertext file from all over the world as conveniently as using a local hard disk. This gives the user a tremendous power to acquire information and also turns the Internet into a hypermedia global database, i.e., the information superhighway.

[0010] The Internet and the WWW have been growing explosively over the past few years. Businesses have also seen the great potential of using the Internet and WWW as the new generation of world-wide communication infrastructure to approach a massive consumer market.

[0011] Given such Internet technology, there has been proposed a collaboration technique for allowing a plurality of users to simultaneously conduct a collaboration (browsing, moving and/or modifying) of an HTML page, as disclosed in Japanese Patent Publication 10-124461. Fig. 9 is a diagram showing an example where such a collaboration using an HTML page is applied to an interactive banking system. With this technique, while a customer is viewing a page, a bank agent is enabled to refer to the same page and manipulate it.

[0012] However, since there exist certain HTML pages (e.g., stock information pages, other pages including movies and the like) the contents of which vary from time to time, it has been required to synchronize such HTML data that is acquired by a plurality of members participating in a collaboration session. To this end, it has been required to introduce a collaboration server for handling an HTML request sent from one member of the participants in such a way that content of its response is cached and then distributed to another member of the participants. However, since such a collaboration server is capable of supporting only one domain (Web server) alone, great investment costs have been required to introduce such a collaboration technique.

[0013] On the other hand, it has been desired to change the content of a response, which is associated with a request sent from a browser to a Web server, without applying any changes to the Web server's side.

[0014] Accordingly, the present invention provides an information processing server for supporting a collaboration session between a customer browser and an agent browser, comprising:

(a) means for determining whether or not unique identifier information is contained in a first HTTP request from a browser and, if not, for generating such unique identifier information to be granted to said browser;

(b) means for generating an HTTP response containing said unique identifier information and for sending said HTTP response to said browser; and

(c) a destination Web server management system for transferring a second HTTP request to another Web server corresponding to a host name con-

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American Airlines, Ex. 1008, p.79
American Airlines v. Advanced Transactions
IPR2023-01370

tained in said second HTTP request sent from said browser.

[0015] In a preferred embodiment the server further comprises an agent management table for managing the unique identifier information for a customer browser and the unique identifier information for an agent browser having a collaboration relation with said customer browser.

[0016] It is also preferred that the server further comprises means for determining whether or not said second HTTP request contains information specifying an application, wherein if the request does contain such information the relevant application is executed, and if not, the request is passed to the destination Web server management system.

[0017] In the preferred embodiment the destination Web server management system further comprises means for determining the communication method to be used in transferring said request to said another Web server.

[0018] The invention also provides a method for supporting at a server a collaboration session between a customer browser and an agent browser, comprising:

(a) determining whether or not unique identifier information is contained in a first HTTP request to the server from a browser and, if not, for generating such unique identifier information to be granted to said browser;
(b) means for generating an HTTP response containing said unique identifier information and for sending said HTTP response from the server to said browser; and
(c) transferring a second HTTP request to another Web server corresponding to a host name contained in said second HTTP request sent from said browser.

[0019] The above method step will benefit from the same preferred features as described above in relation to the apparatus of the invention, and will typically be implemented by executing appropriate computer program code. Such computer code is often supplied on a computer storage medium, and is also covered by the present invention.

[0020] The approach described herein provides a system that is capable of supporting or controlling information terminals in a centralized manner at a lower cost (in terms of a reduced number of resources required for supporting information terminals), yet is not dependent on which particular platforms of information terminals are to be supported or controlled thereby. Further, the content of service offered or provided to information terminals can be controlled without applying any changes to a server that responds to requests from the information terminals.

[0021] In one preferred embodiment, a plurality of virtual host names and their common IP address are managed in a domain name server. When a Web browser sends a request by specifying this virtual host name, a server having the common IP address is rendered to offer centralized service. For a request that does not require any service, this request is transferred to an actual Web server corresponding to the virtual host name. In this way, there is provided a server for offering centralized service with respect to a dialog between a plurality of browsers and a Web server, thereby to change if necessary the content of service offered to the browsers without changing the server.

[0022] According to another aspect of this invention, there is provided an information processing method to be carried out in a system including a collaboration server for supporting a collaboration between a customer browser and an agent browser, comprising the steps of:

(a) generating, at said collaboration server, a first UAI to be granted to a first agent browser in response to a first HTTP request from the said first agent browser;
(b) sending a first HTTP response containing said first UAI to said first agent browser;
(c) storing said first UAI into an agent management table:
(d) generating, at said collaboration server, a second UAI to be granted to a first customer browser in response to a second HTTP request from the said first customer browser;
(e) sending a second HTTP response containing said second UAI to said first customer browser;
(f) storing said second UAI into said agent management table in association with said first UAI;
(g) receiving a third HTTP request sent from said first customer browser, the said third HTTP request containing first host specifying information;
(h) transferring said third HTTP request to a first Web server corresponding to said first host specifying information;
(i) generating, at said collaboration server, a third UAI to be granted to a second agent browser in response to a fourth HTTP request from the said second agent browser;
(j) sending a third HTTP response containing said third UAI to said second agent browser;
(k) storing said third UAI into said agent management table;
(l) generating, at said collaboration server, a fourth UAI to be granted to a second customer browser in response to a fifth HTTP request from the said second customer browser;
(m) sending a fourth HTTP response containing said fourth UAI to said second customer browser;
(n) storing said fourth UAI into said agent management table in association with said third UAI;
(o) receiving a sixth HTTP request sent from said second customer browser, the said sixth HTTP re-

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quest containing second host specifying information; and
(p) transferring said sixth HTTP request to a second Web server corresponding to said second host specifying information.

[0023] According to another aspect of this invention, there is provided an information processing method to be carried out in a system including a server for receiving a request from an information terminal and for providing service corresponding to the request, comprising the steps of:

(a) receiving, at a first server, a first request from a first information terminal;
(b) executing, at said first server, a first application to grant first information terminal identifying information to said first information terminal;
(c) receiving a second request from said first information terminal, the said second request containing first host specifying information;
(d) transferring said second request to a second server corresponding to said first host specifying information;
(e) receiving, at said first server, a third request from a second information terminal;
(f) executing, at said first server, said first application to grant second information terminal identifying information to said second information terminal;
(g) receiving a fourth request from said second information terminal, the said fourth request containing second host specifying information; and
(h) transferring said fourth request to a third server corresponding to said second host specifying information.

Note here that, in the claims of the present specification, the expression "information terminal identifying information" represents a concept covering information, such as UAI to be described below in connection with an embodiment, which is required for specifying an information terminal or software loaded thereto.

[0024] According to another aspect of this invention, there is provided an information processing method to be carried out in a system including a server for receiving a request from an information terminal and for providing service corresponding to the request, comprising the steps of:

(a) sending, from the information terminal, a request containing first host specifying information and application specifying information to a first server corresponding to the said first host specifying information;
(b) checking, at said first server, whether or not said request contains the application specifying information;
(c) if it is determined that said request contains the application specifying information, then executing an application corresponding to the application specifying information; and
(d) if it is determined that said request does not contain the application specifying information, then transferring said request to a second server corresponding to said first host specifying information.

[0025] (Note here that the expression "application specifying information" represents a concept covering information, such as a URL or information of a local directory which is required for specifying an application to be executed).

[0026] According to another aspect of this invention, there is provided an information processing method to be carried out in a system including a server for receiving a request from an information terminal and for providing service corresponding to the request, comprising the steps of:

(a) sending, from the information terminal, a request containing first host specifying information to a first server corresponding to the said first host specifying information;
(b) checking whether or not communication method specifying information corresponding to said first host specifying information contained in said request is stored at said first server; and
(c) if the communication method specifying information corresponding to said first host specifying information contained in said request is stored at said first server, then transferring said request to a second server corresponding to said first host specifying information in a manner based on said communication method specifying information.

[0027] According to another aspect of this invention, there is provided an information processing apparatus for supporting a collaboration between a customer browser and an agent browser, comprising:

(a) a UAI generator for determining whether or not UAI information is contained in a first HTTP request from a browser and, if not, for generating a UAI to be granted to the said browser;
(b) an application for generating an HTTP response containing said UAI and for sending the said HTTP response to said browser;
(c) an agent management table for managing said UAI and another UAI that has a collaboration relation with said UAI; and
(d) a destination Web servers' management table being referred to for transferring a second HTTP request to another Web server corresponding to a host name contained in said second HTTP request sent from said browser.

[0028] According to another aspect of this invention,

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there is provided an information processing apparatus for receiving a request from an information terminal and for generating a response corresponding to the request, comprising:

(a) an information terminal identifying information generator, being responsive to a request from the information terminal, for generating information terminal identifying information; and
(b) a destination Web servers' management table being referred to for transferring said request to another Web server corresponding to host specifying information contained in said request sent from said information terminal.

[0029] According to another aspect of this invention, there is provided a storage medium for storing an information processing program to be executed in a system including a server for receiving a request from an information terminal and for providing service corresponding to the request, the program comprising:

(a) program code for directing a first server to receive a first request from a first information terminal;
(b) program code for directing said first server to execute a first application to grant first information terminal identifying information to said first information terminal;
(c) program code for directing said first server to receive a second request from said first information terminal, the said second request containing first host specifying information;
(d) program code for directing said first server to transfer said request to a second server corresponding to said first host specifying information;
(e) program code for directing said first server to receive a third request from a second information terminal;
(f) program code for directing said first server to execute said first application to grant second information terminal identifying information to said second information terminal;
(g) program code for directing said first server to receive a fourth request from said second information terminal, the said fourth request containing second host specifying information;
and
(h) program code for directing said first server to transfer said request to a third server corresponding to said second host specifying information.

[0030] A preferred embodiment of the invention will now be described in detail by way of example only with reference to the following drawings:

Fig. 1 is a conceptual diagram of a communications network with Web clients and servers;
Fig. 2 is a block diagram showing an embodiment of a hardware configuration of a collaboration server (information terminal supporting server) or an information terminal;
Fig. 3 is a block diagram of processing elements in the collaboration server in a preferred embodiment of the invention;
Fig. 4 is a conceptual diagram of an agent management table in the server of Fig. 3;
Fig. 5 is a conceptual diagram of a destination Web servers' management table in the server of Fig. 3;
Fig. 6 is a conceptual diagram of an HTTP response header in a preferred embodiment of the invention;
Fig. 7 is a conceptual diagram of an HTTP request header in a preferred embodiment of the invention;
Fig. 8 is a conceptual diagram of a cache management table in the server of Fig. 3; and
Fig. 9 is a conceptual diagram illustrating a conventional collaboration technique.

[0031] Fig. 1 is a conceptual diagram of a computer system in a preferred embodiment of this invention. In an information terminal 110, a Web browser such as Netscape Navigator and/or Internet Explorer is installed. The information terminal 110 is able to access Web servers 151 to 155 via a network 140 for acquiring a variety of information. In a preferred embodiment, an information terminal supporting server 100 is provided as a "collaboration server". This collaboration server 100 associates the information terminal 110 on a customer's side with an information terminal 120 on an agent's side, and controls both of the associated information terminals such that the same data is sent to their browsers respectively.

B. Hardware Configuration

[0032] With reference to Fig. 2, there is schematically shown a hardware configuration for implementing the collaboration server 100. The collaboration server 100 includes a central processing unit (CPU) 1 and a memory 4. CPU 1 and memory 4 are connected to a hard disk drive 13 as an auxiliary storage device via a bus 2. A floppy disk drive 20 (or another storage medium drive such as an MO drive 28 or CD-ROM drives 26, 29) is connected to bus 2 via a floppy disk controller 19 (or another controller such as an IDE controller 25 or a SCSI controller 27).

[0033] A floppy disk (or other storage medium such as an MO disk or a CD-ROM) inserted into the floppy disk drive 20 (or appropriate other storage medium drive such as the MO drive or CD-ROM drive), the hard disk drive 13 and/or a ROM 14 are capable of storing a computer program code for practicing the method described herein. At the time of execution, this computer program code is loaded into the memory 4 such that it cooperates with an operating system to provide instructions to the CPU or the like. This computer program code may be compressed or divided into a plurality of segments for

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storing across a plurality of media.

[0034] Also, the collaboration server 100 may be provided with user interface hardware, including a pointing device 7 (such as a mouse, a joystick or the like) and a keyboard 6 for inputting, as well as a display 12 for presenting visual data to a user. In addition, a touch panel may be used as an input means. Also, a printer and a modem may be connected via a parallel port 16 and a serial port 15 respectively. The present server 100 may be connected to a network via the serial port 15 and the modem or a communication adapter 18 (Ethernet or token ring card) for communicating with other computers and the like.

[0035] A speaker 43 receives audio signals that are D/A (digital/analog) converted by an audio controller 21 via an amplifier 22, and outputs the audio signals as sounds. Also, the audio controller 21 may perform an A/D (analog/digital) conversion of audio information received from a microphone 24, thereby to capture the external audio information into the system.

[0036] Thus, it will be readily understood from the foregoing that the collaboration server 100 may be implemented for example by a conventional personal computer (PC), a workstation, a notebook PC, a palm top PC, a communication terminal having communication functions including a network computer or the like, and any combinations thereof. The information terminal 110 may be implemented by the hardware configuration as shown in Fig. 2 in the same manner as the collaboration server 100. However, since the information terminal 110 requires only limited functions for entering information acquisition requests and originating the same, it will be readily understood by those skilled in the art that the information terminal 110 may also be implemented by a variety of household electric appliances such as TV sets incorporating computers, a game machine having communication functions, an information terminal having communication functions including a telephone, a FAX machine, a mobile telephone, a PHS (personal handyphone system), an electronic memorandum book or the like, and any combinations thereof.

[0037] It will be appreciated that the skilled person will be aware of many variations with regard to the hardware configuration shown in Figure 2, which is exemplary only, and includes many items which are only optional in relation to the present invention, such as audio controller 21, amplifier 22, speaker 23, microphone 24, keyboard 6, mouse 7, keyboard/mouse controller 5, CRT 12, display device 11, VRAM 9 and VGA 8, storage medium controllers 19, 25, 27, and the like. Furthermore, the functions of the collaboration server 100 may be implemented by combining a plurality of machines and distributing implemented functions among these machines.

[0038] It will be appreciated that the collaboration server and information server may run any suitable operating system, such as "Windows95" (trademark of Microsoft Corp.), "AIX" (trademark of IBM Corp.) or the like; one possibility is to use a real-time or embedded OS, such as "OS/Open" (trademark of IBM Corp.).

C. System Configuration

[0039] Fig. 3 is a functional block diagram, which shows a system configuration of a collaboration system including the collaboration server 100 in a preferred embodiment.

[0040] The collaboration system in a preferred embodiment includes the information terminals 110, 120, a domain name server 130, the collaboration server 100, as well as Web servers 151, 153 and 157.

[0041] In a preferred embodiment, the information terminals 110, 120 are provided with Web browsers. Each of the Web browsers specifies a URL and sends a request toward a given Web server. It also receives responses sent from the Web servers 210, 151 to 155 and displays them on a display screen.

[0042] The domain name server 130 manages an association (correspondence) table of host names in a domain and IP addresses. Each of the Web servers 151 to 155 responds to a request sent by one of the Web browsers for sending an HTML content of the specified URL back to the Web browser's side.

[0043] The collaboration server 100 in a preferred embodiment is provided with the Web server 210, an HTTP handler 230, an HTTP request dispatcher 240, a multi-domain manager 250, a cache manager 270 and a session manager 290.

[0044] The Web server on the collaboration server's side (collaboration Web server) 210 responds to a request sent by a Web browser for sending an HTML file of the specified URL back to the said Web browser. It also has an API for passing the received request to the HTTP handler 230. In this collaboration Web server 210, an application 211 is installed. This application 211 indicates checking of authority to access this collaboration Web server 210, generation of a UAI (see below), allocation of an agent and the like. A UAI generator 213 responds to an indication of the application 211 for allocating a UAI that is uniquely identifiable by the Web browser on the customer's side. An agent assignment 215 uses an agent management table 220 to manage status of the information terminal on the agent's side, and to manage information of the Web browser on the customer's side that participates in a collaboration.

[0045] The HTTP handler 230 accepts an HTTP request received by the collaboration Web server 210 to determine whether a local process or an acquisition process of a Web server (the acquisition process requires to delegate its processing to the cache manager 270) is to be carried out. If it is determined that processing of the request is delegated to the cache manager 270, the request is passed to the HTTP request dispatcher 240. Otherwise, the request is returned to the collaboration Web server 210. Also, the HTTP handler 230 sends an HTML content, which is returned via the

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cache manager 270, back to the Web browsers 110, 120 by way of the Web server 210.

[0046] The HTTP request dispatcher 240 responds to the HTTP request from the Web browser 110 for determining whether or not its corresponding HTML content resides in a cache 275 within the cache manager 270. If not, the HTTP request dispatcher 240 sends the HTTP request to the actual Web servers 151, 153, 155 and receives the HTML content therefrom. The received HTML content is stored into the cache 275 under the control of cache manager 270 and, at the same time, the HTML content is returned to the HTTP handler 230 by way of the cache manager 270. On the other hand, if the HTML content resides in the cache 275 within the cache manager 270, the HTTP request dispatcher 240 indicates to send its corresponding data back to the Web browsers 110, 120.

[0047] The multidomain manager 250 manages relations between virtual Web servers that are owned by the collaboration Web server 210 and the actual Web servers 151, 153, 155. Also, the multidomain manager 250 manages methods for establishing HTTP sessions with respect to the actual Web servers 151, 153, 155.

[0048] The cache manager 270 is used for caching an HTML content (HTTP response), which corresponds to an HTTP request sent from a Web browser 110, 120. Also, in a situation where the two Web browsers are being shared, the cache manager 270 responds to HTTP requests sent by both of the Web browsers for controlling to send the same HTML content back to them. The session manager 290 establishes sessions on the agent's side and the customer's side, and allocates session IDs.

[0049] (It will be appreciated that the functional blocks shown in Fig. 3 are logical functional blocks as implemented by combined hardware and software, rather than individual hardware components).

D. Setting/Registration Procedure of System

D-1. Setting of Domain Name Server

[0050] For each of the Web servers 151 to 155 that are serviced by the collaboration server 100, a different host name will be defined respectively. Note, however, that an IP address of the collaboration server 100 is to be set up/registered as the respective IP address. For example, as shown in Fig. 3, assuming that the actual Web servers (their host names are: www. a. com (151); www. b. com (153); www. c. com (155); www. d. com (157)) are to be serviced by the collaboration server 100 (its host name is: www. isp. com; and its IP address is: 9. 100. 100. 100), the same IP address (9. 100. 100. 100) as that of the host name (www. isp. com) will be commonly set up with respect to host names (wwwc. a. isp. com; wwwc. b. isp. com; wwwc. c. isp. com; wwwc. d. isp. com) respectively.

D-2. Setting of Web Server

[0051] For each of said host names (wwwc. a. isp. com; wwwc. b. isp. com; wwwc. c. isp. com; wwwc. d. isp. com), a virtual Web server will be created respectively. While, viewing from the Web browsers, they appear to be independent Web servers respectively, they are actually a single Web server.

[0052] The information terminal 120 on the agent's side uses its Web browser to send a request for a specific URL to the Web server (wwwc. a. isp. com) on the collaboration server 100, thereby activating an application A to perform the following functions. Thus a unique UAI generated by the UAI generator 213 is set into an HTTP response header as a Cookie. Also, by notifying the agent assignment 215 of its own UAI, it is registered at the agent management table 220 and enters into a customer wait state.

[0053] Fig. 6 shows an example of an HTTP response header 330 to be sent by the application A at this point of time. As shown, the HTTP response header 330 contains a "set-cookie" command 331 for registering the UAI at the Web browser on the customer's side. Thereafter, as shown in Fig. 7, an HTTP request header 320 will contain a "Cookie" command 321 for acquiring UAI information that enables one to uniquely identify the Web browser on the customer's side.

[0054] The application 211 on the Web server 210 is specified at a local directory 263 within a destination Web servers' management table 260 (Fig. 5). When this application 211 responds to an HTTP request without a Cookie called "IBMCF UAI" for creating an HTTP response, it generates a unique ID (UAI), uses the "Set-cookie:" response header to set the previously generated UAI into the key called "IBMCF UAI" as a Cookie, and sends the HTTP response back to the Web browser.

[0055] Thereafter, an HTTP request to be sent from this Web browser to the Web server (wwwc. a. isp. com) will contain this UAI or ID at HTTP Cookies in its HTTP request header. With this ID, the collaboration server 100 will be able to identify each Web browser on the Internet.

[0056] Fig. 4 is a conceptual diagram of the agent management table 220 in a preferred embodiment. As shown, in a first column 221, UAIs of those agents logged-on the system are registered. In a second column 223, status (B: busy; F: free; and the like) of such agents are registered, whilst in a third column 225, UAIs of their accompanying collaborators (Web browsers on the customer's side) are registered.

D-3. Setting of Collaboration Server

[0057] In the destination Web servers' management table 260, the following items are set up.

1. Associations between the virtual Web servers and the actual Web servers 151 to 157;

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2. Settings of the local directory 263 entries corresponding to the virtual Web servers; and
3. Settings of methods for establishing HTTP sessions with respect to the actual Web servers 151 to 157(non-secure and secure port numbers, as well as cipher information)

[0058] Fig. 5 is a conceptual diagram of the destination Web servers' management table 260 in a preferred embodiment. As shown, the destination Web servers' management table 260 manages a variety of information in its columns, which are labeled as collaboration server's host name 261, Web server's host name 262, local directory 263, non-secure port number 264, secure port number 265 and cipher information 267 respectively.

[0059] A collaboration server's host name 261 entry and a Web server's host name 262 entry contain such information for specifying a virtual Web server and an actual Web server respectively. A local directory 263 entry contains such information for accessing information of a virtual Web server. Controlling this local directory 263 by means of the destination Web servers' management table 260, it becomes possible to provide an application for offering common service to a plurality of Web servers, without changing the Web servers' side. In a preferred embodiment, it is possible to execute such an application, which is unique to a collaboration (allocation of a UAI, log-in control of an agent and the like), and which is specified at a local directory 263 entry within this destination Web servers' management table 260. In a preferred embodiment, by requesting a specific URL (e.g., http://wwwc. a. isp. com/servlet/appl/), it is possible to activate the specified application.

[0060] A non-secure port number 264 entry and a secure port number 265 entry contain information for specifying those port numbers for use in non-secure and secure communications respectively. A cipher information 267 entry contains information for specifying a communication procedure to be carried out by using a secure port number.

E. Operational Procedures

[0061] By using the Web browser of the information terminal 110 on the customer's side to send a request for another URL (e.g., http://wwwc. a. isp. com/servlet/applB/), which is different from the aforesaid specific URL requested by an agent, to the Web server (wwwc. a. isp. com) on the collaboration server 100, an application B will be activated. Similar to the aforesaid operation of the agent's side, this application B will set a unique UAI generated by the UAI generator 213 into an HTTP response header as a Cookie.

[0062] Fig. 6 is a conceptual diagram showing an example of an HTTP response header 330 in a preferred embodiment. As shown, the HTTP response header 330 contains a "set cookie" command 331 for registering a UAI at the Web browser on the customer's side. Thereafter, as shown in Fig. 7, an HTTP request header 320 will contain a "Cookie" command 321 for acquiring UAI information that enables one to uniquely identify the Web browser on the customer's side.

[0063] More particularly, when the application 211 on the Web server 210 responds to an HTTP request without a Cookie called "IBMCF UAI" for creating an HTTP response, it generates a unique ID (UAI), uses a "Set-cookie:" response header to set the previously generated UAI into the key called "IBMCF UAI" as a Cookie, and sends it back to the Web browser.

[0064] Thereafter, an HTTP request sent from this Web browser to the Web server (wwwc. a. isp. com) will contain this UAI or ID at HTTP Cookies in its HTTP request header. With this ID, the collaboration server 100 will be able to identify each Web browser on the Internet. If an agent is requested, an application C for requesting such an agent will be activated by the Web server on the collaboration server 100. The application C sends a request for assignment of an agent to the agent assignment 215.

[0065] The agent assignment 215 retrieves the agent management table 220 to find an agent that is in a customer wait state, passes its UAI and the customer's UAI to the session manager 290, thereby requesting to generate a new session. Then, the session manager 290 uses the passed agent's UAI and customer's UAI to generate a session ID and thus informs the cache manager 270 that the Web browsers with the two UAIs are entering into a collaboration session using the generated session ID.

[0066] The cache manager 270 starts to share a cache 275 section associated with the agent's UAI and another cache 275 section associated with the customer's UAI. With this process, the agent is able to share the cache section owned by the customer.

[0067] Fig. 8 is a conceptual diagram of a cache management table 280 in a preferred embodiment. As shown, the cache management table 280 manages a variety of information in its columns, which are labeled as UAI 281, session ID 282, cache table pointer 283, URL 284, cache record pointer 285 and cache record 286 respectively.

[0068] A UAI 281 entry contains a UAI of a Web browser on the customer's side. A session ID 282 entry contains information of a session ID that has been allocated by the session manager 290. A cache table pointer 283 entry manages pointer information for accessing a request group that has been sent in this session.

[0069] A URL 284 entry contains URL information that has been included in an HTML request. A cache record pointer 285 entry contains address information of stored HTML content. A cache record 286 entry contains information of the HTML content.

[0070] When a Web browser on the customer's side issues an HTTP request (GET HTTP://wwwc. a. isp. com/index.html) toward the Web server (wwwc. a. isp.

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com), the Web browser confirms an IP address (9. 100. 100. 100) of the destination Web server (wwwc. a. isp. com) through the domain name server 130. Then, the Web browser issues the HTTP request (GET HTTP:// wwwc. a. isp. com/index.html) to the Web server (its IP address is: 9. 100. 100. 100) on the collaboration server 100.

[0071] The collaboration Web server 210 transfers the received HTTP request to the HTTP handler 230. This is done by an API of the Web server 210. At the HTTP handler 230, it is determined whether or not there exists a UAI in "HTTP Cookies" of the HTTP request header. If there is no such UAI, its processing is delegated to the collaboration Web server 210.

[0072] On the other hand, if there exists such a UAI, the HTTP handler 230 refers to a local directory 261 entry of the destination Web servers' management table 260, and determines whether its processing is delegated to the Web server 210 or the HTTP request is transferred to an actual Web server (www. a. com) 151. By way of example, if the present HTTP request is "GET HTTP://wwwc. a. isp. com/index.html", its processing will be delegated to the collaboration Web server 210.

[0073] In case of transferring the HTTP request to the actual Web server (www. a. com) 151, the HTTP handler 230 checks at the outset whether or not there exists a corresponding HTML file in the cache 275 within the collaboration server 100. If so, its content will be sent back to the Web server. In a preferred embodiment, this determination is made based on whether or not there exists a URL object. On the other hand, if there is no such corresponding HTML file, the HTTP handler 230 refers to the destination Web servers' management table 260 and, sends the HTTP request to the actual Web server (www. a. com) 151. Thereafter, it stores an HTTP response received from the actual Web server (www. a. com) 151 into the cache 275 and, at the same time, it sends the HTTP response back to the Web server 210.

[0074] The collaboration Web server 210 sends the HTTP response so received back to the Web browser as it is. Carrying out said processing for each of the Web servers that are defined by the destination Web servers' management table 260, it becomes possible to support a plurality of domains.

[0075] It will be appreciated that although the invention has been described above with respect to using Web browsers over the Internet, it is also applicable to collaboration servers on communication systems that use a protocol other than the Internet protocol.

Claims

1. An information processing server for supporting a collaboration session between a customer browser and an agent browser, comprising:

   (a) means for determining whether or not unique identifier information is contained in a first HTTP request from a browser and, if not, for generating such unique identifier information to be granted to said browser;

   (b) means for generating an HTTP response containing said unique identifier information and for sending said HTTP response to said browser; and

   (c) a destination Web server management system for transferring a second HTTP request to another Web server corresponding to a host name contained in said second HTTP request sent from said browser.

2. The server of claim 1, further comprising an agent management table for managing the unique identifier information for a customer browser and the unique identifier information for an agent browser having a collaboration relation with said customer browser.

3. The server of claim 1 or 2, further comprising means for determining whether or not said second HTTP request contains information specifying an application, wherein if the request does contain such information the relevant application is executed, and if not, the request is passed to the destination Web server management system.

4. The server of any preceding claim, wherein the destination Web server management system further comprises means for determining the communication method to be used in transferring said request to said another Web server.

5. A method for supporting at a server a collaboration session between a customer browser and an agent browser, comprising:

   (a) determining whether or not unique identifier information is contained in a first HTTP request to the server from a browser and, if not, for generating such unique identifier information to be granted to said browser;

   (b) means for generating an HTTP response containing said unique identifier information and for sending said HTTP response from the server to said browser; and

   (c) transferring a second HTTP request to another Web server corresponding to a host name contained in said second HTTP request sent from said browser.

6. The method of claim 5, further comprising the step of maintaining an agent management table at the server for managing the unique identifier information for a customer browser and the unique identifier information for an agent browser having a collabo-

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ration relation with said customer browser.

7. The method server of claim 5 or 6, further comprising the steps of:

determining whether or not said second HTTP request contains information specifying an application; and
responsive to the request containing such information, executing the specified application; otherwise, passing the request for transfer to another Web server.

8. The method of any of claims 5 to 7, further comprising the step of determining the communication method to be used in transferring said request to said another Web server.

9. Computer program code which when executed performs the method steps of any of claims 5 to 8.

10. A computer storage medium containing the computer program code of claim 9.

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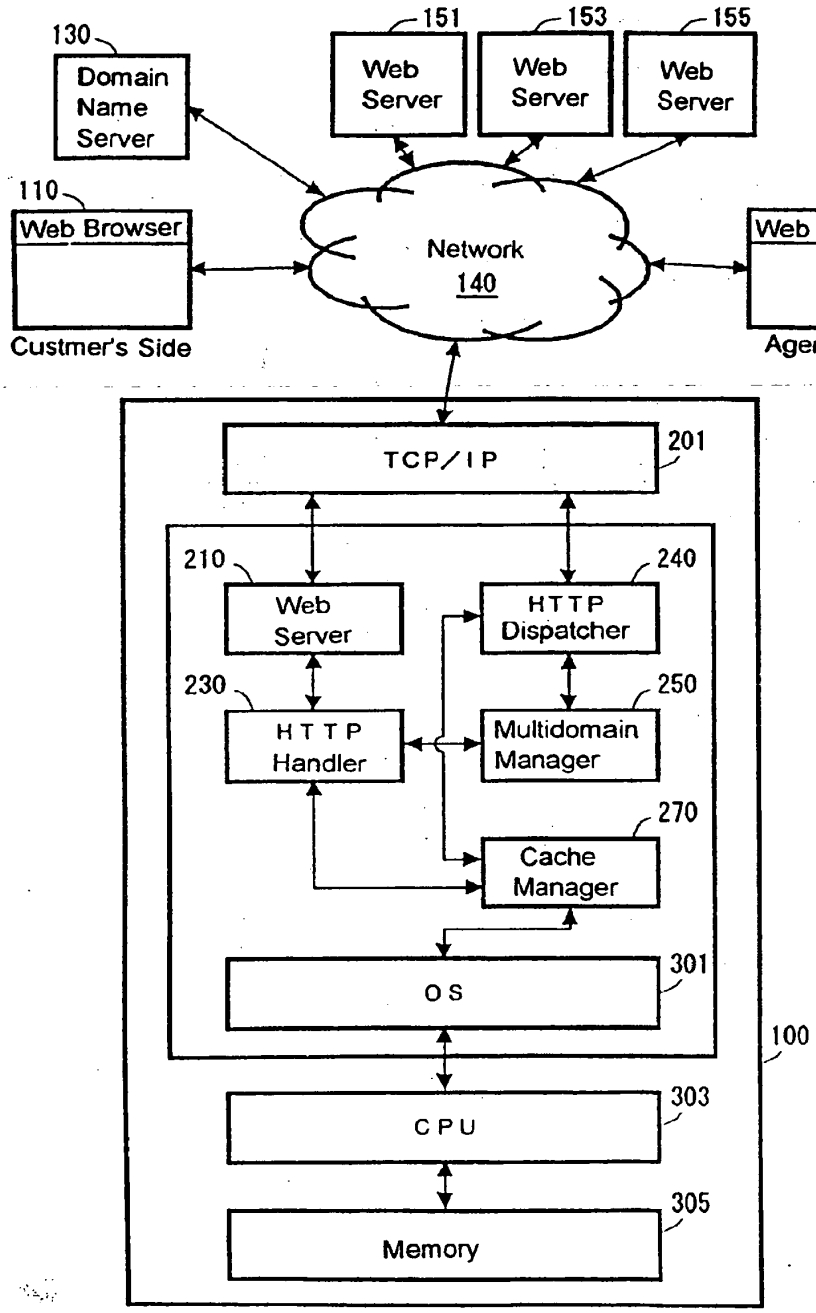


FIG. 1

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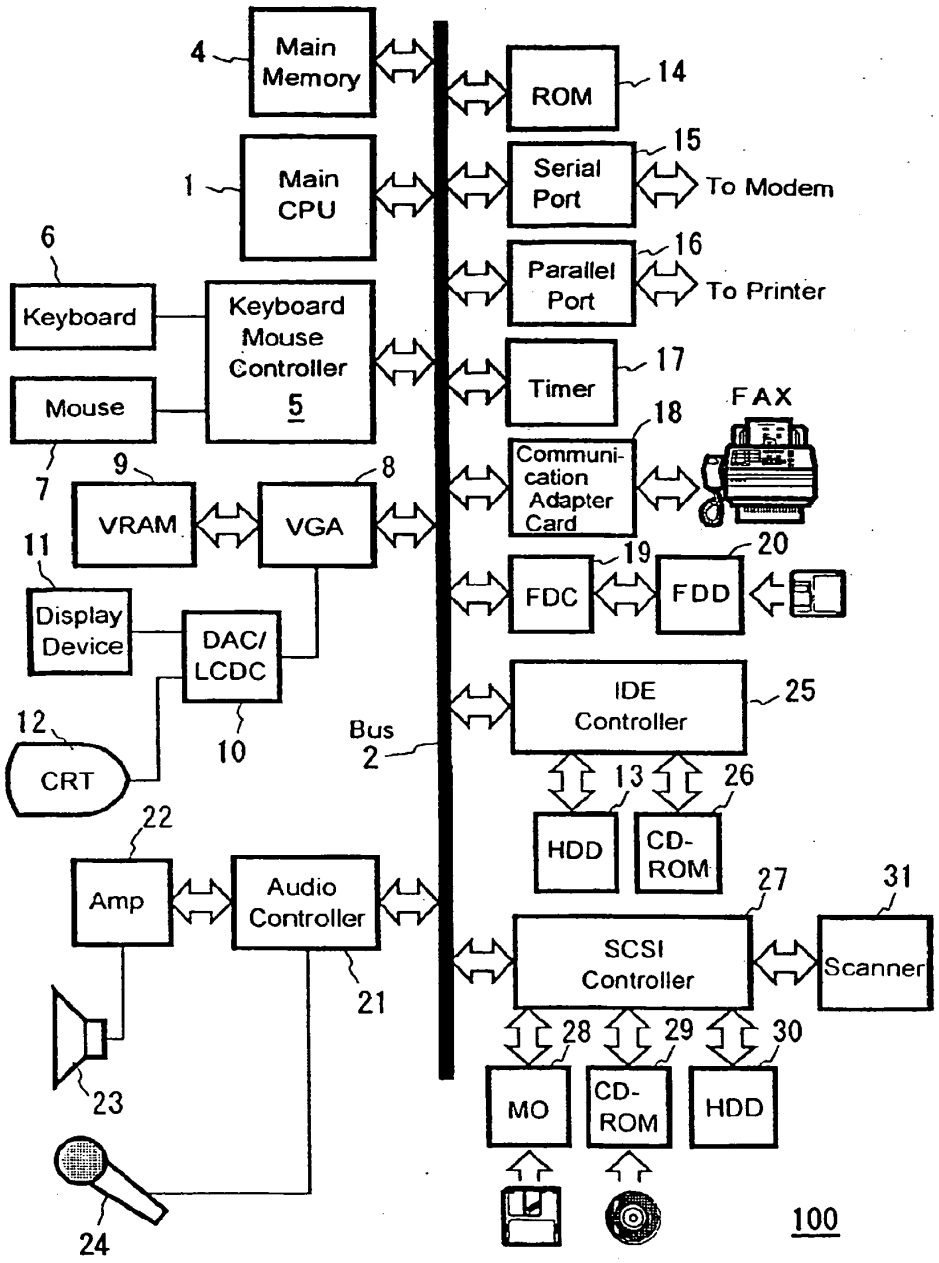


FIG. 2

ISDOCID: <EP___0989501A2_I_>

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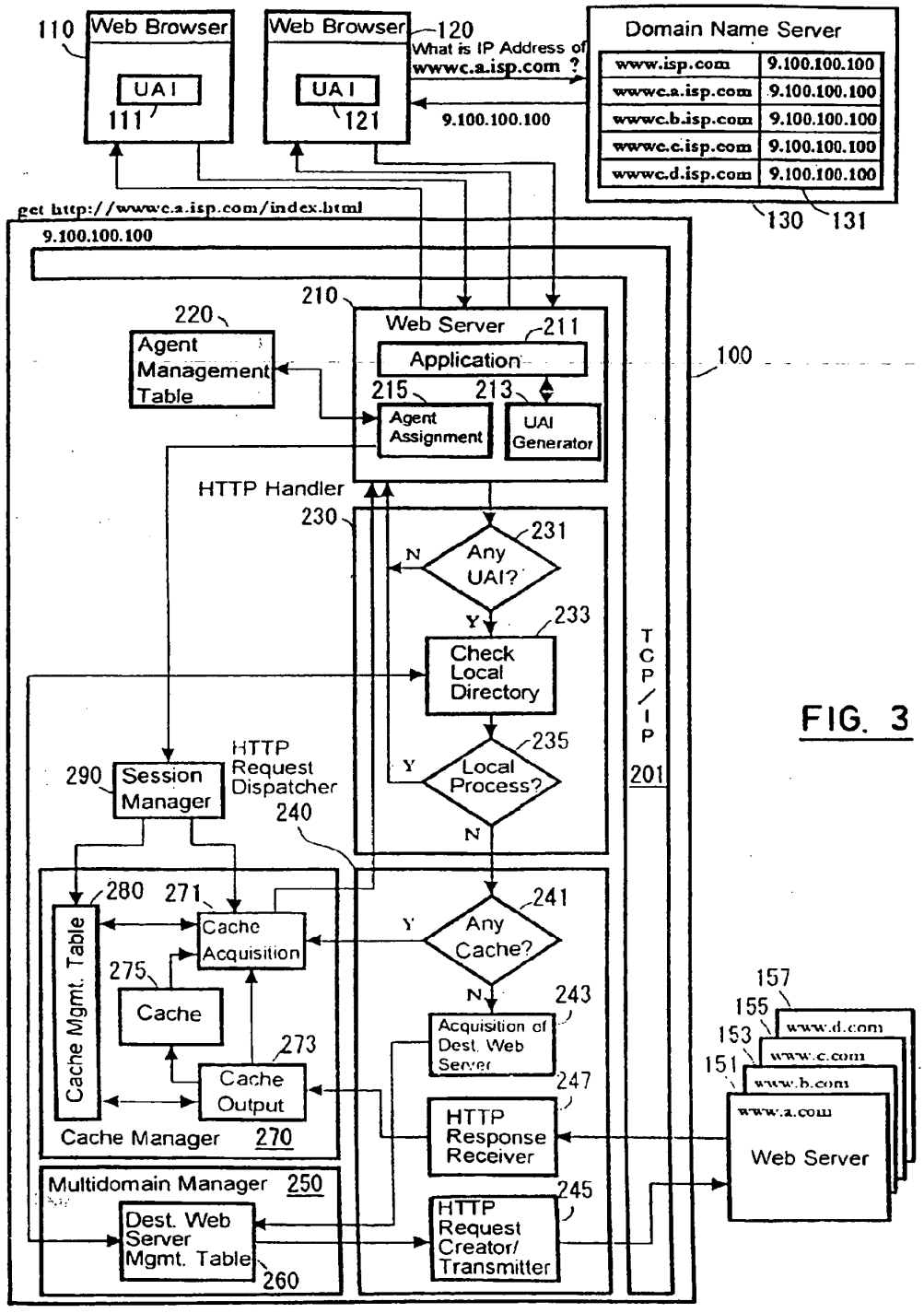


FIG. 3

EPODOC: <EP___0989501A2_I_>

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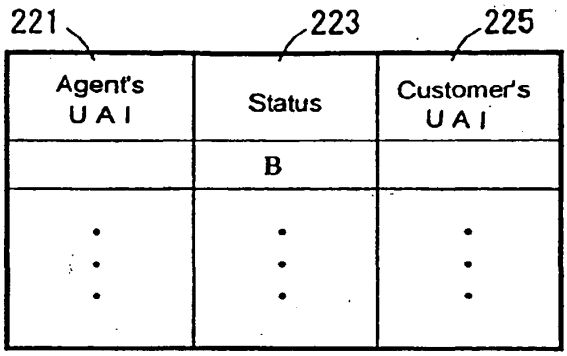


FIG. 4

261 Collaboration Server's Host Name	262 Web Server's Host Name	263 Local Directory	264 Secure Port No.	265 Non-Secure Port No.	267 Cipher Information
wwwc.a.isp.com	www.a.com	localdir	80	443	2,1,100
wwwc.b.isp.com	www.b.com	b-directory	80	443	2,1,100
wwwc.c.isp.com	www.c.com	c-dir	80	443	2,1,100
wwwc.d.isp.com	www.d.com	d-path	80	443	2,1,100

260

FIG. 5

SDOCID: <EP___0989501A2_I_>

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HTTP Response Header

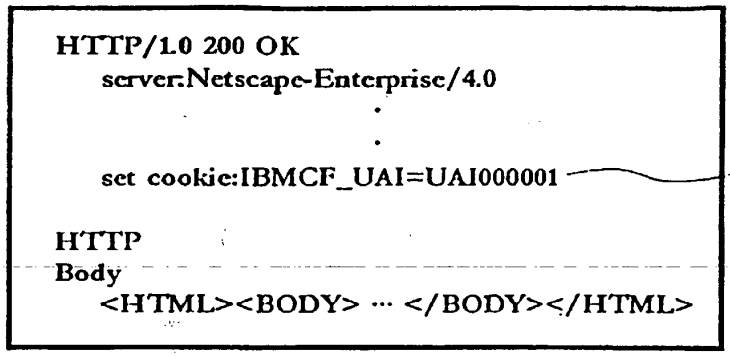


FIG. 6

HTTP Request Header

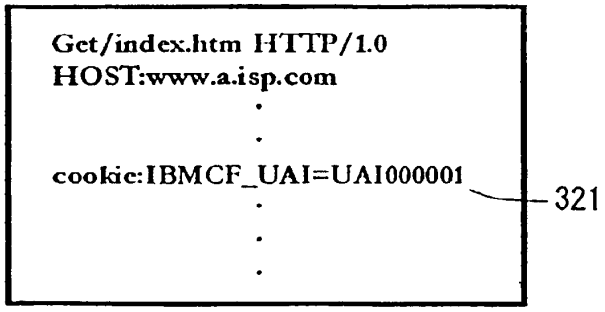


FIG. 7

ISDOCID: <EP___0989501A2_I_>

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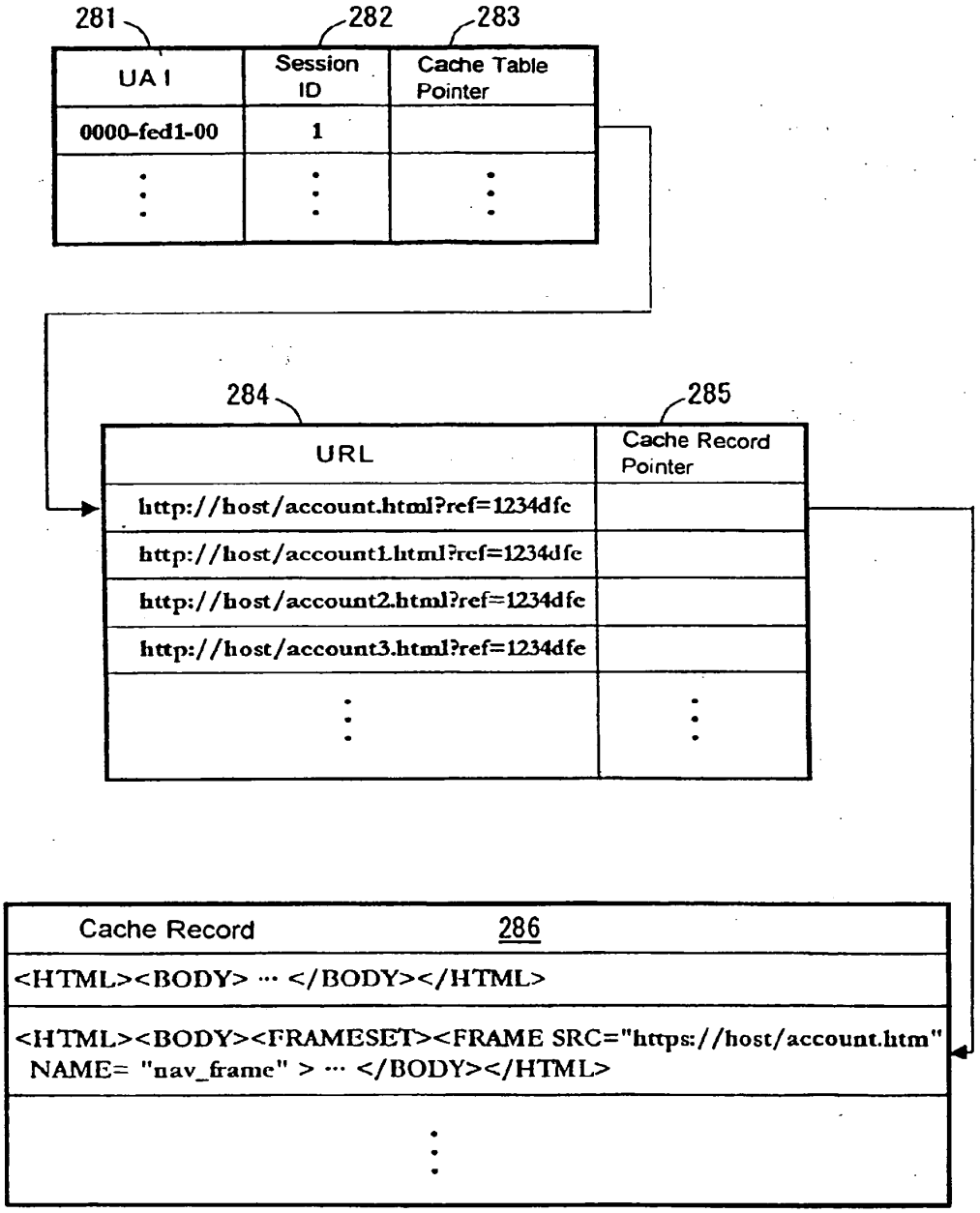


FIG. 8

SDOCID: <EP___0989501A2_I_>

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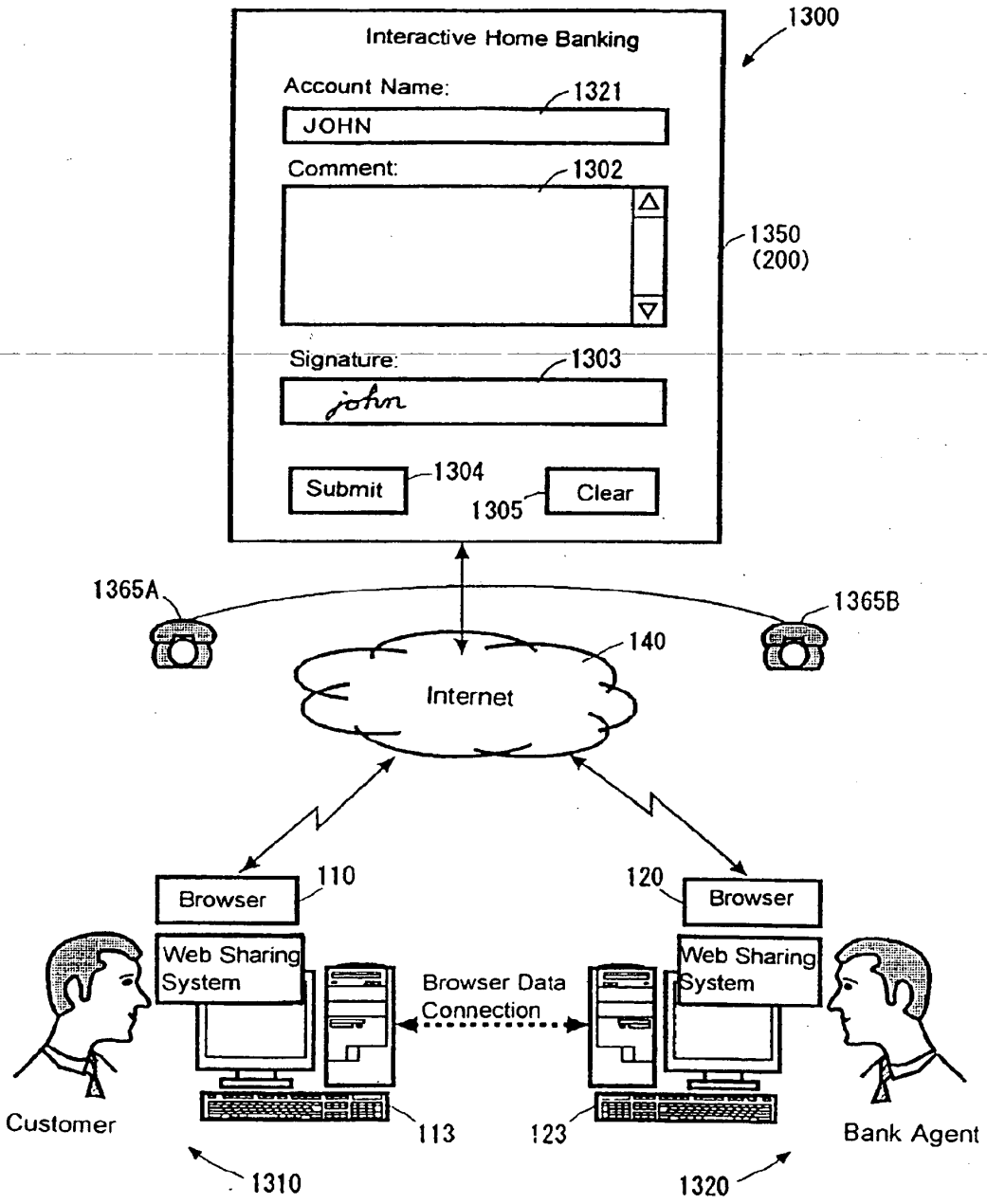


FIG. 9

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DERWENT-ACC-NO: 1996-447555

DERWENT-WEEK: 199645

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TITLE: Factory work scheduler - includes node definition appts. that arranges lead time into group and passes time for delivery to cut process flow end

PATENT-ASSIGNEE: NIPPONDENSO CO LTD[NPDE]

PRIORITY-DATA: 1995JP-0053268 (February 17, 1995)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 08221479 A	August 30, 1996	N/A	004	G06F 017/60

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
JP 08221479A	N/A	1995JP-0053268	February 17, 1995

INT-CL (IPC): G06F017/60

ABSTRACTED-PUB-NO: JP 08221479A

BASIC-ABSTRACT:

The scheduler (1) has a process management appts. (5) which manages an advancement of each product lot through a process using several separation couplings. A scheduling is performed by a lead time arrangement which is the sum of a margin time and a scheduling total processing time for each net installation. A **master schedule** is made

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and each product lot is assigned automatically to each **installation**. A scheduling data which begins for every installation is considered in computing and directing timing.

A process flow (a-g) in each product lot is cut off by each node. A node definition appts. (3) arranges the lead time into a group and passes time for delivery to a cut process flow end. The process flow cut off is considered as an independent product lot.

ADVANTAGE - Eliminates complicated logic using node definition unit. Reliably obtains time for delivery in each node to prevent delay.

CHOSEN-DRAWING: Dwg.1/3

TITLE-TERMS: FACTORY WORK NODE DEFINE APPARATUS ARRANGE LEAD TIME GROUP PASS TIME DELIVER CUT PROCESS FLOW END

DERWENT-CLASS: T01

EPI-CODES: T01-J07;

SECONDARY-ACC-NO:

Non-CPI Secondary Accession Numbers: N1996-377158

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特開平8－221479

(43)公開日　平成８年(1996)８月30日

(51)Int.Cl.[6]	識別記号	庁内整理番号	ＦＩ	技術表示箇所
Ｇ０６Ｆ　17/60			Ｇ０６Ｆ　15/21	Ｒ

審査請求　未請求　請求項の数１　ＦＤ　（全　４　頁）

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(22)出願日　平成７年(1995)２月17日

(71)出願人　000004260
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愛知県刈谷市昭和町１丁目１番地　日本電装株式会社内

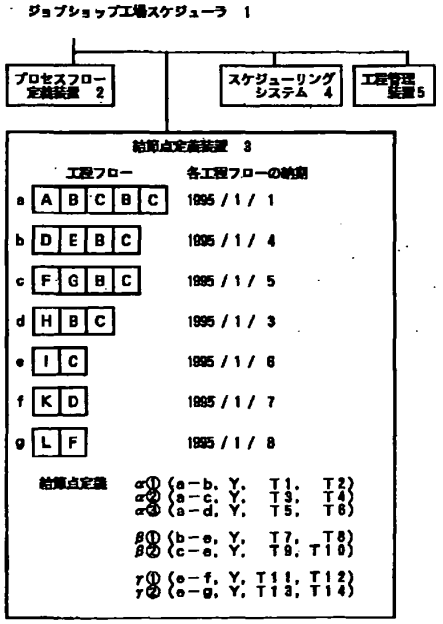
(74)代理人　弁理士　藤谷　修

(54)【発明の名称】　ジョブショップ工場スケジューラ

(57)【要約】

【目的】ジョブショップ工場の分離結合の多い工程フローにおいて効率良くスケジューリングできるスケジューリングシステムを提供すること。

【構成】結節点定義手段である結節点定義装置３によって、工程フローを結合分節して、それぞれの結節点α～γで分断して、分断された工程末尾に納期を与え、それぞれ分断された工程フローを独立したロットの工程フローと見なす。それでそれぞれの分岐のない工程フローを扱うことになるため、複雑なロジックを用いずに汎用的なスケジューラで扱う。また、最終的に結節点定義データによって元の分岐を含む工程フローとして工程管理を実施する。各工程群の終わりに付く納期データは、イレギュラが発生したとしても余裕時間によって吸収できるため、ほとんど計画された時刻には製品が準備完了となる。



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【特許請求の範囲】
【請求項１】分離結合の多い工程を有する各製品ロットの進行を管理する工程管理装置を含み、各設備の正味の加工時間の合計であるスケジューリング用加工時間合計に余裕時間を加えた手配リードタイムによってスケジューリングし、マスタースケジュールを立てて自動的に各製品ロットを各設備に割り当てるジョブショップ工場のスケジューラにおいて、
各設備ごとに仕掛りタイミングを算出・指示するスケジューリングデータとして、各製品ロットにおける工程フローをそれぞれの結節点で分断して、分断された工程フロー末尾に前記手配リードタイムを基にして納期を与える結節点定義手段を有し、それぞれ分断された工程フローを独立した製品ロットと見なして取り扱うことを特徴とするジョブショップ工場スケジューラ。
【発明の詳細な説明】
【０００１】
【産業上の利用分野】本発明は、作業の結合分離の多いジョブショップ工場の生産指示に使用されているジョブショップ工場スケジューラに関し、特に、効率よく自動的に運用することを目指したジョブショップ工場スケジューラに関する。
【０００２】
【従来の技術】従来、製品製造のための個々の作業の結合分離の多いジョブショップ工場で、生産指示に使用されているスケジューラに関するものとして工程データ（プロセスフロー、工程フロー）から仕掛り品の結合分離関係および仕掛り品の流れを行列化してシミュレーションのために行列変換を施す技術が特開平4-303256号公報に示されており、この技術をスケジューリングシステムの一部として活用することができる。この技術は工程フローを分離結合することをうまく数学的に表現することで効率的な扱いを目指している。
【０００３】
【発明が解決しようとする課題】しかしながら、その行列は、行列式の行と列に最大値を設置する必要があり、工程が複雑で、分離結合が多い場合には対応が困難となるか、膨大な処理となる、という問題がある。また、スケジューリングシステムの処理としてロジックを組まければならなくなるという点もある。
【０００４】通常では、必要とされる工程フローに対して、スケジューラは、順次前からあるいは後ろ側から各工程の仕掛り時間を決定していく手法が取られる。分離結合関係があるジョブショップ工場のような場合は、単純に立案することができずに、一旦構築したスケジュールが納期達成できない場合、再び組み直して納期が達成するまで時間のかかるスケジューリングを行わなければなかった。
【０００５】従って本発明の目的は、ジョブショップ工場の分離結合の多い工程フローにおいて、効率良くスケジューリングできるスケジューリングシステムを提供することである。また、無限に連鎖する分離結合関係をも簡便に処理することである。

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【０００６】
【課題を解決するための手段】上記の課題を解決するため本発明の構成は、分離結合の多い工程を有する各製品ロットの進行を管理する工程管理装置を含み、各設備の正味の加工時間の合計であるスケジューリング用加工時間合計に余裕時間を加えた手配リードタイムによってスケジューリングし、マスタースケジュールを立てて自動的に各製品ロットを各設備に割り当てるジョブショップ工場のスケジューラにおいて、各設備ごとに仕掛りタイミングを算出・指示するスケジューリングデータとして、各製品ロットにおける工程フローをそれぞれの結節点で分断して、分断された工程フロー末尾に前記手配リードタイムを基にして納期を与える結節点定義手段を有し、それぞれ分断された工程フローを独立した製品ロットと見なして取り扱うことを特徴とする。
【作用】結節点定義手段によって、工程フローを結合分節して、それぞれの結節点で分断して、分断された工程フロー末尾に納期を与え、それぞれ分断された工程フローを独立した製品ロットのフローと見なす。それでそれぞれの分岐のない工程フローを扱うことになるため、複雑なロジックを用いずに汎用的なスケジューラで扱う。また、最終的に分節点定義データによって元の分岐を含む工程フローとして工程管理する。各工程フローの終わりに付く納期データは、イレギュラが発生したとしても余裕時間によって吸収できるため、ほとんど計画された時刻には製品が準備完了となる。
【０００７】
【発明の効果】複雑な分岐を持つ工程フローの扱いが、節点定義手段によって分断して扱うことができるので、複雑なロジックを必要とせず、汎用のスケジューラで取り扱うことができ、かつ容易に結果を得ることができる。各結節点における納期が確実に得られ、最終納期の遅れが発生することが抑制される、という利点がある。
【０００８】
【実施例】以下、本発明を具体的な実施例に基づいて説明する。図１は本発明のジョブショップ工場で製品を製造する際の生産計画であるマスタースケジュールを構築するジョブショップ工場スケジューラ１（以後、簡単にスケジューラと記す）のブロック構成図である。このスケジューラ１は、ジョブショップ工場で実施される分岐結合構造を含んだプロセスフロー１００全体をスケジューリング用加工時間を合計した時間に余裕時間を含めた手配リードタイムに基づいて設計・構築するプロセスフロー定義装置２、定義されたプロセスフロー１００を結節点を基準にして各工程フローに分離独立して扱うための結節点定義装置３、分離独立された工程フローに対して最適なスケジューリングを実施するスケジューリング

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システム４、最適に計画されたプロセスフロー１００を実施させるための工程管理装置５から構成される。

【０００９】例えば図２に示すようなジョブショップ工場におけるプロセスフロー１００がプロセスフロー定義装置２で構築されるとする。ここでは製造工程を大まかに捉えて簡単に説明するために、各作業の集まりである工程を単位に、工程Ａ～Ｌ（Ｊは無し）によって構築されるプロセスフロー１００を示している。最終的な製品は①～③の３種類があって、最初の工程フローａはどの製品に対しても共通であり、工程Ａ、Ｂ、Ｃ、Ｂ、Ｃというような順になっている。そして結節点αで最初の工程フローａから三つに分けられる。たとえば、最初の工程フローａが30枚のウエハで処理したとして、次の工程フローｂ、ｃ、ｄにそれぞれ10枚づつ分けるというようにできる。そして製品①は工程フローｂ、製品②は工程フローｃ、製品③は三つの工程Ｈ、Ｂ、Ｃから成る工程フローｄとなり、製品③はこの工程フローｄで終了して出荷（入庫）となる。そして製品それぞれに対してロットの流れが存在することになる。

【００１０】そして工程フローｂと工程フローｃは、それぞれ工程Ｄ、Ｅ、Ｂ、Ｃおよび工程Ｆ，Ｇ、Ｂ、Ｃから成り、再び結節点βで一つにされて工程フローｅとなる。つまり製品①と製品②は同時に同じ工程フローｅを行う。工程フローｅは工程Ｉ、Ｃの二工程からなり、再び結節点γで二つに別れて、再びそれぞれ別れて、工程フローｆと工程フローｇが実施される。工程フローｆは工程Ｋ，Ｄからなり、ここで製品①の全ての工程が終了する。もう一つの工程フローｇは工程Ｌ，Ｆから成り、やはりここで製品②のすべての工程が終了する。従って、このプロセスフロー１００においては、分岐する箇所が３か所あり、そこが結節点α、β、γであり、７つに分割可能な工程フローからなっていることになる。

【００１１】本発明の特徴である結節点定義装置３は、図２に示すようなプロセスフロー１００を分解して分岐のない工程フローとして扱うために、図１の結節点定義装置３に示すような結節点定義データを準備する。それによって、図１に示すようにプロセスフロー１００をそれぞれの工程フローａ～ｇに分離独立させることができる。またそれぞれの工程フローの最後には、工程管理装置５よりそれぞれの納期データが付加され、納入計画の変更により自動変更される。図１では納期データとして西暦で日付を付けた例が示してある。

【００１２】図１に示す結節点定義データは、一例として表現したもので、(1) 最初のカラムから結節点、(2) 製品番号、(3) 該当ロットの前後の工程フロー、(4) 後工程フローに自動投入するしないのフラグ、(5) 該当ロットの手配リードタイム、(6) 前工程フローおよび後工程フローに対する手配リードタイム、というようなデータとしてある。このようなデータを定義しておき、スケジューリングシステム４で最適なスケジューリングを決

定した後、キーとして最初の結節点、製品番号を用いて、それぞれの工程フローを結びつけ、工程管理装置５にて生産管理を実施する。

【００１３】プロセスフロー１００を結節点定義装置３で個々の工程フローを独立した構成にするには、図１に示すように、それぞれの工程フローａ～ｇに対して、工程の末尾に納期を算出し、それぞれの結節点のデータを形成するだけでできる。これは、結節点α～γが予めわかっているので、その箇所に中間納期のデータを付与するだけでよいからである。そして分離した工程フローそれぞれの結節関係を、結節点定義として図１や上記(1)～(6) に示すようにキーとして定義付けておく。そして独立した各工程フローによって最適なスケジューリングをスケジューリングシステム２で実施して、結節点定義のキーによって再び分割したフローを結び付けて、全体のフローを構築する。

【００１４】図３はスケジューリングシステム４に二重化されたリードタイム、即ち、各工程で使用される各設備の正味の加工時間の総計であるスケジューリング用加工時間合計（リードタイム１）と、その時間に一定倍数をかけるなどして余裕時間を持たせた手配リードタイム（リードタイム２）とを用い、生産計画においては、余裕時間を含ませた手配リードタイムで立案し、実際の加工は正味の加工時間で管理していく場合を示すものである。ここでは説明のために一つのロットに着目して、そのロットが係わるすべての工程を仕掛（投入）の工程Ｍから納期側の工程Ｒまでとして、連続した並びに示してある。実際にはこれらの工程間に結節点が含まれる。

【００１５】ここで、図３で示すリードタイム２で示すように、例えば工程Ｎに必要とする加工時間はリードタイム１で示すような正味加工時間であるので、Ｎ’だけの時間幅の内に実施（例えば図３の〔1〕～〔3〕）すればよい。従ってなんらかの影響で工程Ｎの開始が遅れたとしても、工程Ｏの開始は予定通りとすることができ、最終納期を守ることができる。

【００１６】以上のように、分割してプロセスフロー１００を構築しても、実際にロットを流しているわけではないので、自由に入替えなどが実施でき、最適なスケジューリングが実施できる。また、工程フロー構成とすることで、それぞれの工程フローは単純な工程フローとなっており、もとの分離・結節を含む複雑なフロー構成よりもスケジュールを最適に決定する算出が容易である。従ってよりレスポンスの良いスケジューリングが実現し、システムの効率的な利用が実現する。

【図面の簡単な説明】

【図１】本発明を適用するジョブショップ工場スケジューラの構成概念図および結節点定義装置の説明図。

【図２】プロセスフローの構成を示した説明図。

【図３】二重化されたリードタイムの構成概念図。

【符号の説明】

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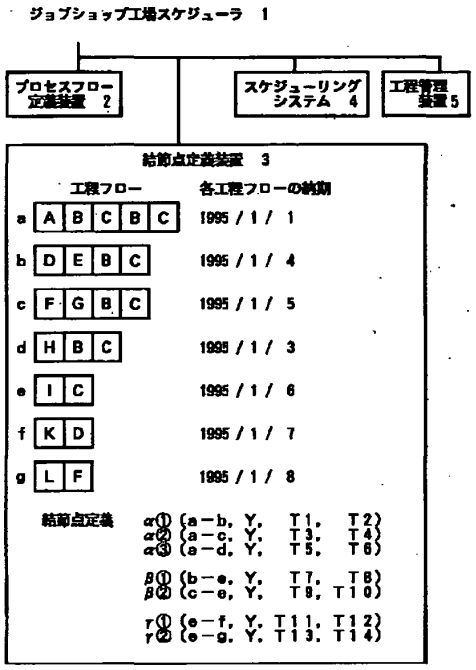
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1　ジョブショップ工場スケジューラ
2　プロセスフロー定義装置
3　結節点定義装置
4　スケジューリングシステム

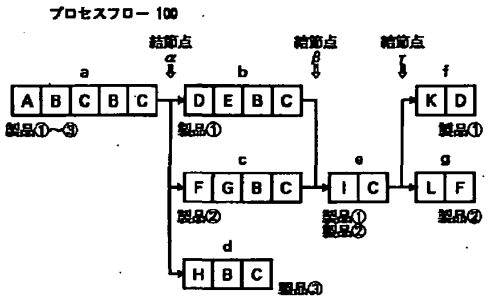
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5　工程管理装置
100　プロセスフロー
a～g　工程フロー
α～γ　結節点

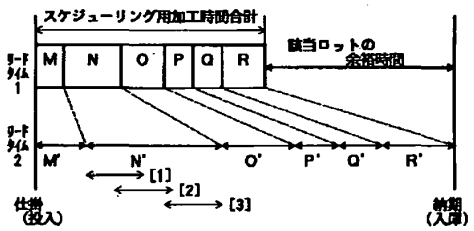
【図1】



【図2】



【図3】



リードタイム 1 ：製造加工時間・搬送時間等、正味加工時間を段階毎に設定されたものの合計

リードタイム 2 ：製品として設定された（生産管理上の）手配リードタイム

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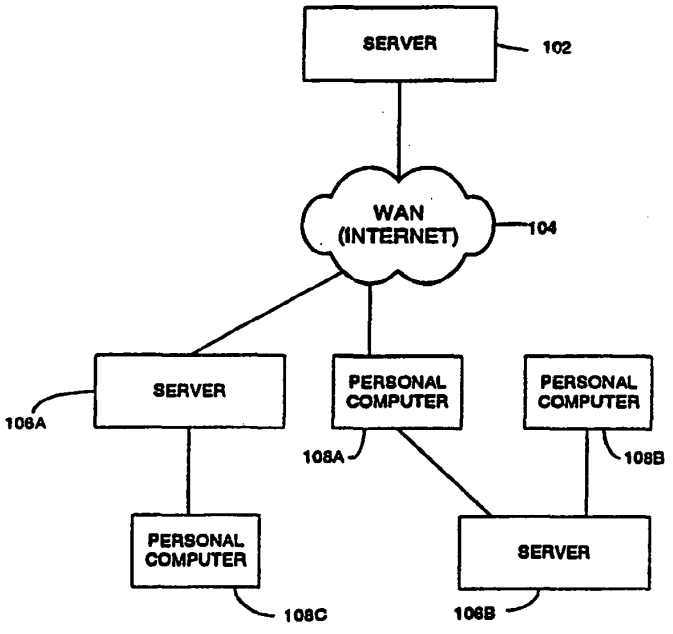
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(57) Abstract

A system and method for creating, transmitting, and receiving web pages from a web server. The present invention enables a user to create a new web site by either creating new web pages or extracting information from previously created web pages. The invention enables a web site master to control the entire presentation of data to the user. In one embodiment of the present invention, a web site can include a first web page having a main menu. The present invention then permits the web site master to prepare a preset sequence of web pages that are displayed to the user for each menu item. The user of the web page selects one menu item from a menu display and then can passively receive information in a logical sequence. The control of the web page sequence can be used by advertisers, for example, to effectively present all information deemed helpful in attempting to convince the user to use the advertised product or service. In contrast to conventional web sites, a user accessing a web site developed according to the present invention will have a predefined sequence of web pages displayed in order to maximize the benefit to the web site master, e.g., to increase the behavioral modifications of the client due to controlled advertising. The present invention also increases the effectiveness of web sites having multiple web pages by using an artificial intelligence preloading methodology to reduce the delay in displaying a web page on the user's computer.



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SYSTEM AND METHOD FOR DISPLAYING INFORMATION AND MONITORING COMMUNICATIONS OVER THE INTERNET

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of U.S. Patent Application No. 08/745.899, filed by Frederick Lenz on November 7, 1996, entitled "System and Method for Displaying Information Over the Internet", Applicant's reference number 2608, which is incorporated by reference herein in its entirety.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to the field of Internet communication and more specifically to a system and method for generating and displaying world wide web site information.

2. Description of Background Art

The volume of traffic on and the number of users using the Internet and the world wide web (WWW) have increased significantly since the early 1990s and such increases are expected to continue. Previously, many users of the Internet and world wide web were technically sophisticated. Many, if not most, of the users in the future are expected to be technical novices. That is, many current and future users of the WWW will not understand "hyperlinks" and "applets." Many technically unsophisticated users of the Internet and WWW are intimidated by the current techniques required to move between pages in a web site. For example, one conventional technique for moving between pages in a web site involves searching through the text of a web page for one of many hyperlinks that may be of interest to the user and then selecting one hypertext or hypergraphic that is associated with the hyperlink to proceed to the page addressed by the hyperlink. While many technically sophisticated users do not have trouble understanding this web page addressing technique, less technically sophisticated users have trouble understanding hyperlinks and this web page navigation technique.

Another problem with conventional web sites is that the size of the data files that need to be downloaded by a user is increasing significantly. For example, it is not uncommon for a web site having complex images, e.g., color photographs, movie clips, or satellite images, to exceed several megabytes in size. A typical home user of a personal computer may have a maximum modem connection rate of 14.4 kilobits per second (kbps) which is approximately 1.8 kilobytes per second. Using such a modem, a web page whose data size is two megabytes requires over

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18 minutes to download by the typical home computer, and only if the server that is sending the data is transmitting the data at the maximum permitted rate. While the data is being downloaded, conventional web sites display partial information on the screen of the users display monitor.

One growing use of the Internet and WWW is the creation of web sites for advertising. Advertisers are drawn by the low cost of the WWW. However, a significant drawback for advertisers is the slow rate of data transfer to typical home users. If an advertiser creates a web site where one page of the web site has a large size, e.g., two megabytes, then, as described above, a typical user having a 14.4 kbps modem will require over 18 minutes to download the single web page. A significant number of users will be reluctant to download such large advertisement web pages due to the large time commitment.

Another significant drawback for advertisers is that conventional web sites require the user to search hypertext and hypergraphics in each web page in order to proceed to what the user thinks is of interest. Therefore, an advertiser operating a web site having several pages frequently has users browse the web pages in a haphazard manner. However, successful advertisers prefer more control of the presentation sequence of an advertisement.

Accordingly, what is needed is a system and method for operating a web site that: (1) decreases the complexity of current web sites to reduce the intimidation of less sophisticated users of the web site; (2) decreases the waiting time between web page displays without increasing the data transmission rate; and (3) enables a web site owner to have more control over the presentation of web pages to a user.

SUMMARY OF THE INVENTION

The present invention is a new model for creating, transmitting, and receiving web pages from a web server. The present invention enables a user to create a new web site by either creating new web pages or extracting information from previously created web pages. The invention enables a web site master to control the entire presentation of data to the user. In one embodiment of the present invention, a web site can include a first web page having a main menu. The present invention then permits the web site master to prepare a preset sequence of web pages that are displayed to the user for each menu item. The user of the web page selects one menu item from a menu display and then can passively receive information in a logical sequence. The control of the web page sequence can be used by advertisers, for example, to effectively present all information deemed helpful in attempting to convince the user to use the

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advertised product or service. In contrast to conventional web sites, a user accessing a web site developed according to the present invention will have a predefined sequence of web pages displayed in order to maximize the benefit to the web site master, e.g., to increase the behavioral modifications of the client due to controlled advertising.

The present invention also increases the effectiveness of web sites having multiple web pages by using an artificial intelligence preloading methodology to reduce the delay in displaying a web page on the user's computer.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an illustration of a communication system in which the preferred of the present invention resides.

Figure 2 is a more detailed illustration of the server of the preferred embodiment of the present invention.

Figure 3 is a more detailed illustration of the server storage device of the preferred embodiment of the present invention.

Figure 4 is a flow chart describing the method performed by the server module according to one embodiment of the present invention.

Figure 5 is a flow chart describing the step of analyzing a web site according to one embodiment of the present invention.

Figure 6 is an illustration of a computer screen display showing information extracted from the web pages of the web site during the analyze web site 408 process according to one embodiment of the present invention.

Figure 7 is flow chart describing the step of configuring a modified web site according to one embodiment of the present invention.

Figure 8 is an illustration of a computer screen display for use in the web site configuration process according to one embodiment of the present invention.

Figure 9 is an illustration of an edit transition display according to one embodiment of the present invention.

Figure 10 is an illustration of a configuration image menu display according to one embodiment of the present invention.

Figure 11 is an illustration of a client computer storage device according to one embodiment of the present invention.

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Figure 12 is a flow chart describing the method performed by the Vayu Web client module according to one embodiment of the present invention.

Figure 13 is a flow chart describing the method performed by the web page preload module according to one embodiment of the present invention.

Figure 14 is an illustration of a web page control panel according to one embodiment of the present invention.

Figure 15 is an illustration of a first menu web page according to an alternate embodiment of the present invention.

Figure 16 is an illustration of a second web site menu page according to an alternate embodiment of the present invention.

Figure 17 is an illustration of a site repository information according to an alternate embodiment of the present invention.

Figure 18 is an illustration of a screen display of the web site presentation properties of various web site sequences developed by the web site designer according to an alternate embodiment of the present invention.

Figure 19 is an illustration of a web page sequence properties screen display according to an alternate embodiment of the present invention.

Figure 20 is an illustration of a web page property screen display according to an alternate embodiment of the present invention.

Figure 21 is an illustration of a sequence optimizer screen display according to an alternate embodiment of the present invention.

Figure 22 is an illustration of the site layout screen display that is displayed to the web site designer according to an alternate embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A preferred embodiment of the present invention is now described with reference to the figures where like reference numbers indicate identical or functionally similar elements. Also in the figures, the left most digit(s) of each reference number correspond(s) to the figure in which the reference number is first used.

Figure 1 is an illustration of a communication system in which the preferred embodiment of the present invention resides. The communication system includes a web server 102, a wide area network 104, destination servers 106A, 106B, and personal computers 108A-C. The personal computers 108A-C are conventional personal computers, e.g., an Apple computer

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or a Compaq computer. The personal computers 108 can be independent or part of a network, for example. The personal computers 108 can be connected directly to the WAN, using a modem, for example, or can be connected to the WAN 102 via a server 106A that uses a leased line, for example. The server 106A can operate using a conventional operating system, for example, UNIX or Windows NT. In order for a user of a computer, e.g., destination computer 108A to access data representing world wide web pages (web pages) from a web server 102, the user of the personal computer 108A identifies a uniform resource locator (URL) address to a web page in the web server 102 and transmits a request signal to the WAN 104. The WAN 104 is conventional, e.g., the Internet, and can use routers to route the request signal to the web server 102. A conventional web server receives a request and transmits the requested web page to the destination computer 108A. The destination computer 108A receives the web page data and displays the web page. This process can repeat several times for each web page requested by the user. The multiple requests per page are to obtain each multimedia object embedded in the page, e.g., pictures, sounds, and videos.

The present invention is a new model for creating, transmitting, and receiving web pages from a web server 102. The invention includes a server module and a client module. The server module is stored and implemented by the web server 102. The client module is stored in the web server 102 and is transmitted from the web server 102 to the destination computer 108A after the web server 102 receives a request from the destination computer 108A. The client module is executed by the destination computer 108A when displaying the web pages of the web site. A more detailed discussion of the server module and the client module is set forth below.

Figure 2 is a more detailed illustration of the web server 102 of the preferred embodiment of the present invention. As stated above, the web server is conventional and includes a conventional central processing unit 202, e.g., a Pentium Pro processor that is commercially available from Intel Corporation, Santa Clara, California, a conventional input/output system 204, conventional random access memory 206, and a conventional storage device 208 having unconventional computer application programs stored therein. The computer application programs stored in the storage device 208 are described in detail below.

Figure 3 is a more detailed illustration of the web server storage device 208 of the preferred embodiment of the present invention. The storage device 208 includes a server web site module 302, a web site project database 304 having menu information 308 and web page information 306, a web site analyzer 310, and a web site configuration module 312. The server

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web site module 302 includes web site data including MIME files. MIME files can include MIME types that provide a technique for enabling web browsers, e.g., Netscape Navigator, to automatically launch a viewing program associated with a received file, hypertext markup language (HTML) data, and common gateway interface (CGI) data. The web site project databases 304 includes menu information 308 and data from web pages 306 extracted from the web page by the web site analyzer 310. A more detailed description of the web site project database is set forth below. The web site analyzer 310 analyzes each web page of the web site, extracts data from each web page, and stores the data in the web site project database 304. The web site configuration module 312 enables a user to create a menu and to create an ordered sequence of web pages that can be presented to a user (client) when a menu item is selected.

Figure 4 is a flow chart describing the method performed by the server module 102 according to one embodiment of the present invention. If the desired web pages of a web site do not yet exist 402 then the web pages are created 404 using conventional web page creation techniques. A web site creation description is provided in Chandler, Running a Perfect Web Site, Que Corporation (1995) that is incorporated by reference herein in its entirety. If the web pages that will be part of the web site exist 402 then the server 102 defines 406 a new site project, analyzes 408 the web pages of the web site, configures 410 the new web site, and saves 412 the web site. A more detailed description of steps 406, 408, 410, and 412 is set forth below. Alternatively, web pages for the web site can be developed concurrently using the present invention.

As stated above, the web server 102 defines 406 a new site project. In one embodiment a new site project is a data structure that is stored in the server storage module 208. When fully defined, the new site project includes or references all of the information about a web site. The information stored about each web site includes general information about the web site and a list of the web pages in the web site. The general information includes information such as: (a) the company's name where the company can be the party to which the web site information is directed, e.g., the company who is advertising on the web site; (b) the webmaster name, e.g., the creator of the web site; (c) the webmaster electronic-mail (e-mail) address. The list of web pages includes information about each web page, such as:(1) the URL of the web page; (2) a list of links out of the page; (3) a list of links into the page from other web pages in the web site; (4) the title of the web page; (5) the content type of the page, e.g., text, html, and image; (6) a list of pictures/videos/sounds in the page; and (7) the size of the web page. The size (in bytes) of the web page can be determined using any of a variety of techniques. In one embodiment, the size

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of the web page is the sum of the number of bytes in the page's HTML, the size of all image <IMG>, sound <BGSOUND>, object <OBJECT>, applet <APPLET>, and script <SCRIPT> tag files. The information stored about each web page is determined during the steps of analyzing 408 the web site and configuring 410 the web site as described below.

Figure 5 is a flow chart describing the step of analyzing 408 a web site by the web site analyzer 310 according to one embodiment of the present invention. The web site analyzer determines the size of the web page and determines the links into and out of the page as described below. The web site analyzer 310 determines 502 if more web pages need to be analyzed. The web site analyzer 310 selects a web page by selecting one of the hyperlinks of a previously analyzed web page. The web page analyzer 310 analyzes the web page and sets a flag indicating that the web page has been analyzed. If the web site analyzer 310 determines that the web page has already been analyzed, then the web site analyzer sets a pointer to the memory location in the server storage 208 containing the information previously extracted during the web page analysis.

The web page analyzer 310 extracts 504 the title of the web page. In one embodiment, the title of the web page is extracted by identifying the text associated with the title tag (<TITLE>). The title can be displayed in order to identify the web page to the user. The web page analyzer 310 then extracts 506 the hyperlinks of the web page. In one embodiment, the hypertext links are extracted by identifying the anchor tags (<A>), the frame tags (<FRAME>), and map tags (<MAP>) in the web page. The web page analyzer 310 extracts 510 image file names by, for example, identifying the file associated with the image tag (<IMG>), and the web page analyzer 310 determines the size of the image file by (a) reading the HTTP size header or (b) downloading the file. In one embodiment, the HTTP size header is read since it is typically faster than downloading the file. The web page analyzer 310 also extracts 512 embedded file names in the web page by, for example, identifying the file associated with the embedded tag (<EMBED>). Then the web page analyzer 310 determines the size of each embedded file by (a) reading the HTTP size header or (b) downloading the file. The web page analyzer 310 also extracts 512 object files in the web page by, for example, identifying the file associated with the object tag (<OBJECT>). Then the web page analyzer 310 determines the size of each object file by (a) reading the HTTP size header or (b) downloading the file. The web page analyzer 310 also extracts 512 sound files in the web page by, for example, identifying the file associated with the bgsound tag (<BGSOUND>). Then the web page analyzer 310 determines the size of each sound file by (a) reading the HTTP size header; or (b) downloading the file. The web page

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analyzer 310 extracts 514 class file names by, for example, identifying the file names associated with a class file name tag, e.g., <APPLET> in the Java programming language commercially available from Sun Microsystems, Inc., Santa Clara, California. The web page analyzer then determines a list of links out of the web page by downloading and scanning the contents of each class file. The web page analyzer 310 also extracts 516 additional information from the web page. For example, the web page analyzer 310 identifies scripts, e.g., Javascripts and VBScripts, associated with a script tag (<SCRIPT>), downloads the scripts and scans the scripts for links out of the web page. After extracting the above identified information, the web page analyzer 310 determines 518 the size of the web page by summing the number of bytes in (1) the HTML of the web page, and (2) all of the image/embed/class/bgsound/object/script tag files. Steps 504-518 are repeated for each web page.

Figure 6 is an illustration of a computer screen display showing information extracted from the web pages of the web site during the analyze web site process 408, described above, according to one embodiment of the present invention. The computer display illustrated in Figure 6 displays web page information including the web site name 602 "http://McJava/sampletree/morelink.htm", and the status of the analysis 612, a current page identifier 614, the total number of pages 616, the total number of links found in all of the analyzed pages 618. In addition, the display includes information concerning the parsed pages 620 and parsing details 622. The parsed pages 620 shows the list of web pages as they are being parsed. The pages are displayed in a tree structure format that shows the hierarchical nature of the web site. The parsing details 622 shows a detailed list of the links and files found in the page being currently parsed. The site name 602 is the URL of the web site being analyzed. Host information (not shown) can also be displayed. The host is the name of the host machine on which the web site resides. Similarly, a tree level indicator (not shown) can also be displayed. The tree level represents the hierarchical level of the web page in the web site. Any web page may exist at a number of levels (e.g., it may appear as a hyperlink in many different pages in the web site). The level represented here is the level closest to the top of the tree that the page appears. It will be apparent to persons skilled in the art that more or less information can be available to the webmaster when configuring the web site.

After the web site analyzer 310 analyzes 408 the web site, the web site configuration module 312 configures the web site. Although the web site analyzer 310 has searched and analyzed each web page in the web site, the web site analyzer 310 does not modify the original web site. The web site configuration module 312 enables the web site developer, e.g., a

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webmaster, to construct a menu. In one embodiment of the present invention this menu is typically approximately 8-10 items, although it is envisioned that any number of items can be part of the menu. Each item will consist of a sequence of web pages that are displayed in a fixed order. In one embodiment of the present invention the web pages themselves are not modified except for the web page having the menu. In other embodiments the web pages are modified to, for example, ensure that all links out of the web page are deactivated, except for the links defined by the user. Figure 7 is a flow chart describing the step of configuring a modified web site by the web site configuration module 312 according to one embodiment of the present invention. The web site configuration module 312 enables the webmaster to create a menu structure that can be the first web page displayed in the web site. For example, Figure 8 is an illustration of a computer screen display for use in the web site configuration process according to one embodiment of the present invention. The display includes a menu configuration portion 802, a current web site structure portion 804, a status portion 814, and various control buttons that can be selected by the webmaster using a conventional mouse or other pointing device, for example. The control buttons in one embodiment include a menu shuffle up button 806, a menu shuffle down button 808, an add image button 810, an add transition button 812, and a status display 814.

The webmaster determines 704 if any more menu selections need to be modified. If the webmaster decides to modify or define a menu selection, the webmaster selects a menu, and defines 706 a sequence of web pages that will be displayed when the menu is selected. One process for assigning a web page to a menu is: (a) a user highlights the menu in the menu configuration portion 802 using the mouse or keyboard; (b) the user then highlights the web page in current web site structure portion 804; and (c) the user selects the Add button 816. The chosen web page will be added to the menu and will be displayed in the menu configuration portion 802 of the display. For example, a first menu is identified as "Luxury Vehicles" 820 in the menu configuration portion 802 of the display. The menu configuration portion 802 also includes information about the web pages that the webmaster has associated with the menu. For example, the top menu item is "Luxury Vehicles" 820. There are two web pages 822/824 associated with this menu item. These two web pages will be displayed in this order, i.e., web page 822 and then web page 824, when the user ultimately views this web site with their client PC and browser.

The shuffle up button 806 and the shuffle down button 808 enable a user to modify the web site structure by moving a web page up or down in the displayed menu configuration

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portion 802 of the display. These buttons simplify the web site editing procedure for the web master. For example, a web page can be selected by the webmaster and associated with one of the menu items. The webmaster can then move, add, delete, or copy web pages in order to develop a suitable web site presentation sequence. The webmaster can also introduce transitions that can control the transition between web pages by selecting the "Add Transition" button 812. For example, a transition may be a timer of 10 seconds, or a keyclick from the user. In one embodiment the webmaster ensures that the user will view the web pages associated with each menu (if any) only in the predefined sequence by automatically showing the next page in response the transition event. For example, if a timer of 10 seconds has been selected by the web master then after 10 seconds has elapsed the next page will automatically be displayed. The user does not need to perform any action. In alternate embodiments, a limited number of page links are included that enable the user to advance to the next page, return to the previous page, or return to the main menu, for example.

As noted above, conventional web sites are created such that a client who accesses the web site can view the various pages in the web site in almost any sequence. One potentially significant use of the Internet and the WWW is in advertising. In one embodiment, the present invention can be utilized to create a web site having advertisement as a significant purpose of the web site. For example, an automobile company, e.g., General Motors, can develop a web site that advertises its currently available cars and trucks. One important aspect of advertising is the process of creating a need that can be satisfied by the advertiser. In order to efficiently and successfully accomplish this, it is helpful if the advertiser is able to control the sequence of information presented to the user. For example, if a car manufacturer developed a web site, they may not want the client to immediately jump to the web page having the cost of the vehicles. Instead, the advertiser could be more successful and effective if a description of the features and benefits of one or more car models were first shown to the user in order to familiarize the client with the cars and to therefore help persuade the client that the cars offered by the manufacturer will satisfy the needs of the client. After providing the information to the user, the web page having pricing information can be presented to the user. It will be apparent to persons skilled in the art that the above example is merely one example of how the current invention could be used and that many alternatives exist for developing and strategically planning the web page presentation sequence in a web site. The present invention provides the necessary tools to enable a webmaster to quickly, efficiently, and effectively generate a web site that gives control of the web site presentation to the web site owner instead of the client.

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The page link can be displayed as a "Next Page" button or the webmaster can select to have one or more of the web pages transition automatically. Figure 9 is an illustration of an edit transition display 902 according to one embodiment of the present invention. In the example illustrated in Figure 9 the user has the ability to define the event that will trigger a web page transition for any particular web page, e.g., the "Leasing Information" web page as displayed in the menu item display area 904. The available types of transitions are displayed in the available transition portion 906 of the display. The webmaster selects one of the available transition types and activates the Add button 912, and the selection is displayed in the current transition portion 908 of the display. If the webmaster selects the timer option, the webmaster can set the delay between pages by entering the delay in the delay definition portion 910 of the display. To remove a selection from the Current Transition 908 display the web master uses the Remove button 914.

The webmaster also has the opportunity to provide 708 additional information concerning the web site and the individual web pages. For example, some of the information stored in the new site project data structure is defined by the webmaster, e.g., information concerning the company name, webmaster name, webmaster e-mail, and the URL of the main menu page or one or more web pages in the web site, for example. The webmaster has the opportunity to provide this information before or after the defining 706 the web page display sequence for the web site.

Figure 10 is an illustration of a configuration image menu dialog box display 1002 according to one embodiment of the present invention. The dialog box 1002 enables the user to generate a menu display by selecting a menu, e.g., Menu_4, and defining the active regions in the display portion 1006 for the selected menu. In Figure 10, the active region for Menu_4 ("New for '97") is defined in the active region definition dialog box 1008. In some embodiments of the present invention the webmaster does not create an initial menu page, instead only one web page sequence is defined and when the client selects the first page the sequence of the remaining web pages of the web site are displayed to the client in the predefined sequence.

After the webmaster defines the menus and defines the web page sequence associated with each menu, the modified web site is saved 412. In one embodiment of the present invention, the web site is saved as a series of files that are used when web site information is transferred to a client accessing the web site. In one embodiment these files are used to transfer the information gathered by the server tool to the client. The files include a stub Java Applet that is inserted into the home page of the site. One example of such a file is set forth in Table 1.

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```
<APPLET CODE="browser.class" WIDTH="10" HEIGHT="10">

<PARAM NAME="menu_1" VALUE="[MENU_ITEM NAME='Luxury
Vehicles' AUTO=TRUE RECT=199,92,230,34 IMG=menu.gif]">

     <PARAM NAME="menu_1_1" VALUE="[LINK
     URL=http://www.xyzmotors.com/L2_N2.HTM SIZE=3514
     TRANSIT=TIMER DELAY=10]">

          <PARAM NAME="menu_1_1_1" VALUE="[LINK_OBJECT
          URL=http:// www.xyzmotors.com /Images\I_1_9.GIF
          SIZE=1059 CONTENT=image/gif]">

     <PARAM NAME="menu_1_2" VALUE="[LINK_FILE
     NAME=xyzmotors_menu_1.brw]">

<PARAM NAME="menu_2" VALUE="[MENU_ITEM NAME='Sport Utility'
RECT=199,129,229,39 IMG=menu.gif]">

     <PARAM NAME="menu_2_1" VALUE="[LINK URL=http://
     www.xyzmotors.com /L1_N1.HTM SIZE=12117
     TRANSIT=MENU]">

          <PARAM NAME="menu_2_1_1" VALUE="[LINK_OBJECT
          URL=http:// www.xyzmotors.com /Images\I_1_1.GIF
          SIZE=1257 CONTENT=image/gif]">

     <PARAM NAME="menu_2_2" VALUE="[LINK_FILE NAME=
     xyzmotors _menu_2.brw]">

<PARAM NAME="menu_3" VALUE="[MENU_ITEM NAME='Trucks and
Vans' RECT=198,173,230,47 IMG=menu.gif]">

     <PARAM NAME="menu_3_1" VALUE="[LINK URL=http://
     www.xyzmotors.com /L1_N1.HTM SIZE=12117 TRANSIT=TIMER
     DELAY=10]">

          <PARAM NAME="menu_3_1_1" VALUE="[LINK_OBJECT
          URL=http:// www.xyzmotors.com /Images\I_1_1.GIF
          SIZE=1257 CONTENT=image/gif]">

     <PARAM NAME="menu_3_2" VALUE="[LINK_FILE NAME=
     xyzmotors _menu_3.brw]">

<PARAM NAME="menu_4" VALUE="[MENU_ITEM NAME='Family Fare'
RECT=195,224,232,40 IMG=menu.gif]">

     <PARAM NAME="menu_4_1" VALUE="[LINK URL=http://
     www.xyzmotors.com /L1_N1.HTM SIZE=12117 TRANSIT=TIMER
     DELAY=10]">

          <PARAM NAME="menu_4_1_1" VALUE="[LINK_OBJECT
          URL=http:// www.xyzmotors.com /Images\I_1_1.GIF
          SIZE=1257 CONTENT=image/gif]">

     <PARAM NAME="menu_4_2" VALUE="[LINK_FILE NAME=
     xyzmotors _menu_4.brw]">
```


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```
<PARAM NAME="menu_5" VALUE="[MENU_ITEM NAME='New For
'97']">

     <PARAM NAME="menu_5_1" VALUE="[LINK URL=http://
     www.xyzmotors.com /L1_N1.HTM SIZE=12117 TRANSIT=TIMER
     DELAY=10]">

          <PARAM NAME="menu_5_1_1" VALUE="[LINK_OBJECT
          URL=http:// www.xyzmotors.com /Images\I_1_1.GIF
          SIZE=1257 CONTENT=image/gif]">

     <PARAM NAME="menu_5_2" VALUE="[LINK_FILE NAME=
     xyzmotors _menu_5.brw]">

</APPLET>
```

Table 1

These parameters in Table 1 contain specific information about each link on the menu illustrated in the display portion 1006 of Figure 10, and the contents of the pages linked thereto. The menu items are passed as parameters. In the example set forth in Table 1, a naming convention is used to determine the order and structure of the menu. The data is structured with a format that is similar to HTML, but uses square brackets ([and]) instead of angle brackets (< and >). The first parameter (PARAM) is for the first item in the menu, named *menu_1*. Its type is *MENU_ITEM*, and the item's name is *Sport Utility*. The next *PARAM* is a page assigned to the *menu_1*, and its name is *menu_1_1*. The type is *LINK*, its *URL* is http://McJava/dealers/dealers.html, the *TRANSIT* is *TIMER*, and the *DELAY* is 10 seconds. The third *PARAM* is also assigned to the *menu_1* item, but it points to a file that contains the rest of the links for *menu_1*. The file name is *McJava_menu_2.brw*. There are one of these files for each menu item that has more than one link assigned to it. These files are used to limit the amount of information that is transmitted from the server to the client in the initial transmission. Since the number of web pages that could be assigned to all of the menu items could range into the hundreds and thousands, it is generally more efficient to send down a portion of menu information, and then retrieve more menu information as needed. The file structure design is extensible such that as new information is needed new name/value pairs are added. Older version of the software will ignore name/value pairs they do not understand. Newer version of the software will have reasonable defaults if they encounter an older file with missing name/value pairs.

As described above, a client utilizes a computer, e.g., a destination computer 108A, to access the defined web site stored on the server 102. The personal computer used by the client

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can be a conventional personal computer, e.g., an IBM personal computer that is commercially available from IBM Corporation, Armonk, NY. The destination computer 108A includes a conventional CPU, conventional RAM, and a conventional storage device, that can be similar to the server 102 described above. Figure 11 is an illustration of a client computer storage device 1100 according to one embodiment of the present invention. The storage device 1100 includes a conventional Internet browser 1102, a Vayu Web client module 1104, a web page preload module 1106, menu files 1108, and a TCP/IP Internet connection protocol module 1110. The conventional Internet browser provides an Internet gateway to the destination computer 108A. The client uses the Internet browser 1102 to request access to the web site stored in the server storage module 208. The menu files 1108 include the files received from the server 102 in response to the access request. In addition, the personal computer storage module 1100 receives the Vayu Web client module 1104 and the web page preload module 1106 from the server 102. The operation of these modules is described in greater detail below.

In one embodiment, the Vayu Web client module has been implemented using three different techniques. These three techniques allow the client module to operate across the wide variety of client machines currently in use across the Internet, e.g., IBM PC, Apple Macintosh, Sun Microsystems Sparcstation, and across the wide variety of WWW Browsers currently in use, e.g., Netscape versions 2.n and 3.n, and Microsoft Internet Explorer versions 2.n and 3.n. The three techniques are: (1) as a Java Applet; (2) as a Javascript script where Javascript is a Internet language developed by Netscape Corporation; (3) as a Client-Pull mechanism using a <META> tag in the HTML file, that causes the browser itself to automatically load pages on a timed basis. The CONTENT argument contains the time in seconds. The URL contains the target URL. The <META> tag can be:

<META HTTP-EQUIV=REFRESH CONTENT="1 URL=target_url">

Figure 12 is a flow chart describing the method performed by the Vayu Web client module according to one embodiment of the present invention. As described above, the client requests information from the web site server 102 and the destination computer 108A downloads 1202 web site server information. The web site server information initially downloaded includes the Vayu Web client module 1104, the web page preload module 1106, and the new site project data structure that is stored in the menu files 1108. As described above, the new site project data includes information about the web site and includes references to web pages in the web site but does not include all of the web page data. The destination computer 108A implements 1204 a web page preload routine that is executed concurrently with the

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remaining functions performed by the Vayu Web client module, as described below. Figure 13 is a flow chart describing the method performed by the web page preload module 1106 according to one embodiment of the present invention. The web page preload module 1106 gathers local environmental information concerning the client personal computer. This information includes the speed of the modem, the time of day, Internet service provider service level, browser type and version, and operating system type and version. This information is used by the artificial intelligence expert system to dynamically select a preload strategy to optimize the performance of the presentation of web pages to the client. The web page preload module 1106 preloads 1304 the first web page from each of the menus.

While the web page preload module 1106 is preloading the first web page associated with each of the menus, the Vayu Web client module 1104 displays 1206 the menu page and waits for the user to select a menu. When the user selects 1208 a menu item, the Vayu Web client module 1104 identifies 1210 the first web page in the predefined sequence of web pages associated with the menu item and displays 1212 the first web page. Before the user selects a menu item, the web page preload module 1106 preloads the first web page associated with each menu item, as stated above, and then determines the web page loading sequence for subsequent web pages based upon a determination of the most likely menu item selection. The web page preload module 1106 determines the most likely menu item selection based upon the selections of previous clients or, if no clients have previously accessed the web page, the webmaster may indicate which menu item to show first, or the first menu item is selected as the most likely to be selected. The web page preload module 1106 preloads web pages from the sequence of web pages associated with the most likely menu item selection by implementing the rule based expert system of the present invention, described below.

After the client selects a menu item, the Vayu Web client module 1104 and the web page preload module 1106 receive the web page sequence and web page information from the new site data structure in the menu files 1108. Specifically, the new site data structure includes the overall size of the web page, the number of embedded objects in each web page, and the size of the embedded objects in each web page, as described above. In one embodiment of the present invention, the web page preload module 1106 determines a priority for each web page in the web page sequence based upon the environmental parameters of the destination computer 108A, described above, a queue location of the web page in the predefined sequence, the size of the web page, the number of embedded objects in the web page, and the size of the embedded objects in the web page, for example. In addition, the web page preload module is keeping track

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of how long it actually takes to load each page. From this information it calculates the actual throughput that the current client is getting. This throughput is used by the expert system to make decisions about preload strategies. For example, if the throughput falls below a certain value, the preload module may stop preloading certain types of MIME files (e.g., video, sound). The trigger value would be set by the web master during the menu configuration stage. described above. One example of a rule based expert system is set forth in Table 2.

```
; Set preload strategy based upon throughput
IF
     system.throughput < 6kpbs
THEN
     preload.order = STRATEGY_7
ENDIF

; Set preload strategy based upon throughput
IF
     system.throughput < 2kpbs
THEN
     mime.image = NOLOAD
ENDIF

; Set priority based upon size of an embedded object
IF
     object1.size > 250000
THEN
     object1.preload_priority = 5
ENDIF

; Set priority based upon size of an embedded object
IF
     object1.size > 500000
THEN
     object1.preload_priority = 7
ENDIF

; Set priority based upon size of an embedded object
IF
     object1.size > 1000000
THEN
     object1.preload_priority = 10
ENDIF

; Set priority based upon the number of embedded
; objects in a page
IF
     page1.objects > 5
THEN
     page1.preload_priority = 3
ENDIF

; Set priority based upon the number of embedded
; objects in a page
IF
```


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```
     page1.objects > 10
THEN
     page1.preload_priority = 8
ENDIF

; Set preload order based upon browser type and time
of
; day
; MSIE_3x is Microsoft's Internet Explorer Version 3.x
IF
     ; night time hours
     browser.type = MSIE_3x AND (env.timeofday > 20:00
AND env.timeofday < 08:00)
THEN
     preload.order = SEQUENTIAL
ENDIF

; Set preload order based upon browser type and time
of
; day
; STRATEGY_7 is load page 1, then 2, then largest to
; smallest
IF
     ; business hours
     browser.type = MSIE_3x  AND (env.timeofday >
08:00 AND env.timeofday < 20:00)
THEN
     preload.order = STRATEGY_7
ENDIF
```

Table 2

After determining the preloading priority for each web page, the web page preload module 1106 preloads 1308 the web pages having the highest priority. The web page preload module 1106 monitors 1310 the preloading procedure to reduce any delay in displaying web page to the client. The monitoring function of the web page preload module 1106 permits the preload function to be dynamic in that if a problem occurs 1312 in the web page loading process, the web page preload module 1106 sorts and reorganizes 1314 the data. Examples of problems include: (a) when a page is needed to be displayed and has not yet been preloaded or (b) when the preloading is sufficiently ahead of the display so that the local PC web page cache is full, and pages must be discarded (and reloaded). When a problem occurs the expert system is re-initialized with the current data (including the throughput and modified menu files without the web pages that have already been displayed). A modified preload strategy is then determined 1306.

The client continues navigating 1210 through web pages while the destination computer 108A continues displaying 1212 web pages. As described above, in one embodiment of the present invention, the client can passively watch the sequence of web page displays. In alternate

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embodiments, the user has the option of selecting a next page button. Within each web page the client also has the option of manipulating a control panel. Figure 14 is an illustration of a web page control panel 1400 according to one embodiment of the present invention. In this embodiment, the user has the option of returning to the beginning of the web page by selecting control panel button 1402, proceeding to the end of the web page (for example, a video clip embedded in the web page may be skipped) by selecting control panel button 1404, continuing or beginning the execution of the web page display by selecting control panel button 1406, pausing the execution of the web page by selecting control panel button 1408, decreasing the speed of web page execution by selecting control panel button 1410, increasing the speed of web page execution by selecting control panel button 1412, or stopping web page execution by selecting control panel button 1414.

An alternate (preferred) embodiment of the present invention is described below with reference to Figures 15-22. This alternate embodiment includes a standard structure and navigation for the menus (pages containing buttons) and menu items (buttons), allowing the user a set of options at each web page. One benefit of using the standard structure is to make the web site easier to use by the end user and to offer the web site designer more control over what is displayed to the user.

Figure 15 is an illustration of a first menu web page according to an alternate embodiment of the present invention. The first menu page 1500 illustrated in Figure 15 includes a single large button 1502 that includes the name of the company that is the subject of the advertising, e.g., "Vayu Web". The user can select the button 1502 to continue or the user can exit from the web site. In addition, the present invention enables the company to add a graphic display to the button or to the background to enhance the screen display.

The first menu web page can include a tool bar 1504 having various control buttons thereon. These control buttons are enabled and disabled for each web page based upon the web site definitions defined by the webmaster. When the user selects the button 1502, a sequence of pages may automatically be presented after which another menu page appears containing more items. Alternatively, the sequence can be skipped and the next menu page can be presented immediately. While the user is viewing a dynamic sequence, the control functions are typically disabled. The control functions include pause, fast forward, reverse, and exit. In alternate embodiments these control functions are enabled during the presentation of dynamic sequences. While a dynamic sequence is playing the user typically watches the display until the next menu page is reached.

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Figure 16 is an illustration of a second web site menu page according to an alternate embodiment of the present invention. At the next web site menu page 1600, the user has three options, (1) return to the previous menu page, (2) select one of the menu items 1602, or (3) select the auto-play button 1604 to automatically cycle through the sequences following each menu item, for example. The order of cycling through the menu items is determined by the web site designer (web site master). Some items can be excluded from this "autoplay". A menu page can comprise any number of items. In this alternate embodiment the number of items is typically between 1 and 10. The web site designer can add their own graphics to the items or to the page background.

Certain web pages can be static, i.e., they do not automatically display another web page. Frequently, for static web pages, the "pause" and "forward" buttons on the tool bar 1504 are enabled. In this case, the page may include a description of a product and/or ordering information, for example. A maximum viewing time can be specified by the web site designer to proceed to the next page after some amount of time has elapsed, or the web site designer can permit the user to continue to the next web page by selecting a next page control button.

In this alternate embodiment, the tool bar 1504 is located at the top of the screen. The web site designer may choose not to display the tool bar 1504 for certain screens when, for example, the user has no other options within these screens but to wait for the next page. The tool bar 1504 can also include status indicators 1606 to show the remaining time left to view this page. This tool bar 1504 can be used for every page displayed using the present invention.

Another feature of the present invention is that the user is permitted to create multiple versions of each web site where the present invention permits optimization of each web site for different internet throughput rates. For example, the throughput range for different types of Internet access devices commonly used today varies from 14.4 kbps (modem) to 56 kbps (ISDN) to 1.5 megabits/sec (T1). This variation exceeds a factor of 100. Furthermore, users of the present invention on Intranets, e.g., local area networks (LANs) can reach data transfer rates exceeding 10 megabits/sec. Due to transfer rate constraints at the lower throughput speeds, the web site designer may include several versions of a web page, or several versions of a sequence, where a sequence includes a series of pages which are automatically displayed, with each version being a different size to optimize the web site display for different throughput environments. The database can include information about the various page and sequence versions. The artificial intelligence module of the present invention that was described above with respect to the expert system and is described in greater detail below, can automatically

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select the appropriate page version depending on the throughput environment it has determined for a user. The Virtual Design Studio, which is the tool that the web site designer uses to assemble the web pages into advertisement sequences, is designed to assist the web designer in creating optimal sequences for various throughput environments. The Virtual Design Studio will also allow the web site designers to preview the web pages of the web site using a simulator of the present invention in order to simulate environments having various data throughput rates.

It will be apparent to persons skilled in the art that the use of different versions of the web pages is not required to operate the present invention. However, if the web site designer is expecting users with different throughput environments to access the web site, it may be advantageous to create versions of certain web pages that contain videos, sound, etc., so users with faster connections can view web pages having greater detail, while users with lower connections can still get the full benefits of this web site by viewing pages of a smaller size.

The present invention permits different versions of web pages and web sites by providing the web site designer with the option of providing high-quality (larger) pages for users connected at higher throughput rates and lower-quality (smaller) pages for users connected at lower throughput rates. The present invention enables the web site designer to easily mix the smaller pages with the larger pages when the throughput is fast. However, adding larger pages to a low-throughput connection requires the designer to carefully sequence the pages so a large page is preloaded while several smaller ones are being viewed. In addition, some pages take longer to view, for example if they contain detailed textual information that takes longer to read. This longer viewing time can be used to preload larger files. The Virtual Design Studio of the present invention includes modules which assist in the intelligent sequencing of pages in this manner not only to reduce the user's waiting time but also to improve the quality of the pages that can be viewed with slower connections.

Another factor to consider is that the actual throughput rate during an Internet connection session can vary greatly. For example, with a nominal connection speed of 28.8 kbps, the actual transfer rate can easily vary between 10 kbps and 28.8 kbps. Therefore, the artificial intelligence (AI) module of the present invention makes real-time adjustments during a connection session to keep the presentation flowing and prevent waiting time for the user. One of the techniques implemented by the AI module is to leave out certain pages that the designer has identified as being large but with low impact or information content. Another technique is to dynamically switch a higher-quality presentation to a lower one when the throughput slows

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down, and then to switch back to the higher-quality one if the throughput picks up again. The artificial intelligence unit is described in greater detail below.

Figures 6, 8, 9, and 10 are illustrations of screen displays during the analyze web site process 408 and the configure web site process 410 for one embodiment of the present invention as described above. Figures 17-22 are illustrations of screen displays displayed to the web site designer during the analyze web site process 408 and the configure web site process 410 according to an alternate embodiment of the present invention. The Virtual Design Studio is stored in the web site analyzer 310 and enables a web site designer to: (1) construct presentation sequences from pre-existing and newly created web pages; (2) optimize the presentation sequences for different throughput environments and specify alternatives to be used by the artificial intelligence module to compensate for throughput variations in real time; and (3) create menu structures and user navigation through the web site. The virtual design studio includes a site repository information screen that is illustrated in Figure 17. The site repository information screen allows a web site designer to view, insert, delete and edit web page information and web page sequences. For example, the site repository information screen allows the web site designer to assemble pages into the sequences which form the basis of the automated web site content. The site repository information screen also enables the web site designer to modify and maintain the web site.

Figure 18 is an illustration of a screen display of the web site presentation properties of various web site sequences developed by the web site designer. Figure 18 illustrates two alternate web sites, the first web site 1802 is defined to be accessed by clients having a high data transmission connection, e.g., a client having a T1 line. The second web site 1804 is defined to be access by clients having a low data transmission connection, e.g., a client having a 14.4 or a 28.8 kbps modem connection.

Figure 19 is an illustration of a web page sequence properties screen display 1900. The web page sequence properties screen display 1900 identifies the optimal data connection rate for a particular web site sequence. In Figure 19, the optimal user has a connection rate between 14.4 kbps and 33.3 kbps. The web page sequence properties screen display also enables the user to identify a slower alternate web page sequence and a faster alternate web page sequence that can be selected by the artificial intelligence unit, as described below.

Figure 20 is an illustration of a web page property screen display according to an embodiment of the present invention. The web page property screen display 2000 includes information about various components of each web page including the size and download time

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of each component, whether the web page is static or dynamic, as defined above, and defines various timing features of the web page including the nominal load time, the ideal viewing time, the minimum viewing time and the maximum viewing time. In addition the page property enables the user to select various options including the display of control buttons, e.g., the forward and pause button, and enables the user to identify web pages that can be skipped if the actual data throughput is slower than the anticipated data throughput, as determined by the artificial intelligence unit, described below.

Figure 21 is an illustration of a sequence optimizer screen display according to an alternate embodiment of the present invention. The sequence optimizer screen display allows the user to optimize the arrangement of web pages within a web site and to optimize the length of time each web page is displayed. The sequence optimizer screen display is an easy-to-use graphical interface that displays the ideal and estimated viewing times for each page. The sequence optimizer is part of the web site configuration module 312 illustrated in Figure 3. The sequence optimizer of the present invention calls a web page display simulator that is also part of the web site configuration module 312 which provides feedback to the web site designer regarding the presentation of the sequence of web pages to the user under different network throughput conditions. The present invention determines the ideal and estimated viewing times based upon the amount of text in the web page, the level of detail in visual objects, and the length of video objects, for example. The user can modify the viewing time for each page.

Using this ideal viewing time and the estimated page loading time under various network throughput conditions, the Sequence Optimizer graphically displays for each page the amount of credit time, i.e., the time differential between the viewing time and the time at which the page has been preloaded, or the amount of debit time, the time differential between the time at which the page will be preloaded and the viewing time. The user can adjust the parameters for each page and see this credit/debit value change for each page. The parameters that can be set for each page include: the ideal view time, which is the amount of time the designer wants page to display, and the optional view flag, which indicates whether a page can be skipped over if the system is too busy, for example.

In addition the Virtual Design Studio unit automatically computes for each page the estimated minimum view time, which is the minimum time estimate that the page must be displayed before the next page is ready for display, and the normal load time, which is an estimate of the amount of time it will take to download a page in the throughput environment that the designer has set for this sequence.

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The site layout studio unit is part of the web site configuration module 312 and enables the web site designer to create menus and define the web page sequence of the web site. The site layout studio unit displays a site menu page display and a menu item that displays the name of the site. When a user selects the menu item, one of at least two things happen: (1) a sequence of pages will play, or (2) another menu will appear, each of which can contain up to ten menu items. Using this model, sequences and menus can be nested infinitely. Figure 22 is an illustration of the site layout screen display that is displayed to the web site designer according to an alternate embodiment of the present invention. The site layout screen display 2200 includes a menu portion 2202, a menu layout portion 2204, and a control portion 2206. The menu portion 2202 includes the tree of menus and menu items within a site and the links there between. Selecting an object expands it and shows the menus and items linked hierarchically below it. The menu layout portion 2204 displays the screen layout of the menu items on each menu. Selecting a menu in the upper screen causes that menu to be displayed in the menu layout portion 2204. The user has the option of changing the menu style, by selecting the menu style button 2208 in the control portion 2206 in terms of the types of standard menu styles supported by the present invention, e.g., by modifying the displayed graphics and colors.

The virtual design studio unit includes a relational database that resides on the same computer the Virtual Design Studio is on, which can be the web site designer's computer. This database contains all the information regarding the automated web site except for the pages themselves, which are stored in files on the web server. A conventional HTML Generator module of the Virtual Design Studio creates an encoding of the database contents into a format that can be easily read by the client-side software on the user's computer. When the web site designer has completed defining the menus, pages, and sequences for the automated web site, the web site designer runs the HTML generator to create a file which is placed on the web server computer. These generated files contain the HTML code which the client-side processor and AI processing module uses to perform.

The web page preload module 1106 is described above with reference to Figures 11-13. In an alternate embodiment the web page preload module includes an artificial intelligence (AI) module that performs the functions described below. The artificial intelligence module supports the selection of different page versions and additional real-time decisions on page preloading. In other embodiments the artificial intelligence module can be stored on the server instead of the client computer.

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After a user connects to the server having the web site, the AI module is downloaded to the client computer and collects information about the client computer environment including the operating system, processor capacity, Java support capabilities, types of video and audio formats that are supported, and the current throughput rate of the Internet connection. Using this information the AI module makes decisions regarding which version of Java to use and which version of the page sequence to use. Since network conditions can change during the session, the AI module continually monitors the network conditions, e.g., the rate of data throughput, and can modify the web page sequence by skipping a web page, for example, in order to reduce the waiting time for the user. The AI module periodically assesses the state of the session, and makes decisions accordingly. The functions performed by the AI module includes: (1) preloading pages; (2) canceling the preloading process; (3) modifying the rate of play of the current sequence; (4) inserting an additional page, e.g., a message, into the sequence; (5) skipping a page in a sequence being presented; (6) replaying one of the components, e.g., sound or video; and (7) switching to presenting another sequence of pages with a different ideal throughput requirement. A more detailed description of the AI module operation is described below.

In the alternate embodiment the AI module is downloaded to the client computer. Specifically, when the user contacts the web site, a client module is downloaded on the first page and the HTML code output by the HTML generator module of the virtual design studio, described above is also downloaded. This HTML code is used by the client code module and the AI module, and contains the complete description of the web site in terms of the menus, menu items, sequences, and pages found in each sequence. The client module performs three major functions: (1) probing the client machine to determine the client environment and the throughput rate, and uploading the HTML code; (2) displaying menus and pages; and (3) processing user toolbar input.

The client module implements the site template as designed by the web designer. The first menu page is displayed, and the user can choose one of the available options. When the user selects an option, the sequence of web pages associated with that option is displayed in sequence on a display device, e.g., a computer monitor, coupled to the client computer. Each web page can be displayed for a certain period of time, and the client module is responsible for switching pages after the view time has expired.

As stated above, some web pages may have an active toolbar. For example, some pages with a great deal of text may require that the user indicate when the user has finished reading the

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text. It is possible to have a single view time that would work for all users. however fast readers may become frustrated if the view time is too long since the view time would need to be long enough to accommodate slower readers.

The client-server interaction and processing on the Internet World Wide Web is complex, and is greatly affected by factors such as network traffic, the number of clients accessing a particular site. the amount of content the client requested, the computer hardware speed, and the software efficiency. While some of these factors (e.g. modem speed) stay the same during an Internet session, other ones, such as network traffic, varies constantly.

To deliver an uninterrupted or nearly uninterrupted presentation to the user, the AI module frequently monitors the network, the server, and the client environment during a session, and makes complex decisions regarding how to proceed with the presentation. The AI module accounts for processes happening both on the server and on the client computer. The AI module synchronizes these processes while gathering information and while making decisions. The AI module constantly performs "what-if" scenarios, examining different options for preventing interruptions to the pages appearing on the user's display screen.

The AI module relies on the sequences being constructed in an optimal manner for nominal throughput for a particular environment. For example, if the nominal throughput for the sequence is 20 kbps. the AI module presumes that the sequence was constructed to flow smoothly as long as the connection uniformly maintains this throughput. However. the present invention is designed to work under various network conditions, under different server responsiveness. and with a variety of client computer environments, e.g., low-end personal computers with basic web browsers or high-end workstations supporting more powerful web browsers.

As described above, at the beginning of the client session, the AI module determines the client's environment and the current state of the Internet connection. Some of the parameters which will affect the decisions of the AI module are: (1) the processing and Input/Output (I/O) speed of the server machine; (2) the throughput capabilities of the Web Server software; (3) the operating system on the client machine; (4) the client computer's support of Java applets; (5) the client computer's support of JavaScript; (6) the client computer's support of Client Pull technology; (7) the types of video and audio formats that can be played by the browser or plug-in components of the client computer; (8) the maximum number of simultaneous connections to the Server that the client permits; (9) the browser cache size of the client computer; (10) the

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number of users currently communicating with the Web Server: and (11) the current throughput rate of the Internet connection.

In one embodiment of the present invention, the AI module determines the following parameters at the beginning of a session and monitors the following parameters throughout the session: (1) the number of users currently communicating with the Web Server; (2) the current throughput rate of the Internet connection; and (3) the volatility of the network throughput rate.

At the beginning of each presentation, the AI module, based on the parameters of the session: (1) selects the versions of the requested presentation that are supported by the client environment, e.g., Java, JavaScript, ClientPull, or Generic; and (2) selects the starting version of the presentation. As described above, since network conditions may change during the presentation, the present invention can utilize all of the selected versions by, for example, switching between web page sequence versions in response to a variations in network conditions. In addition, the present invention sets the following parameters: (1) the maximum number of simultaneous connections the present invention utilizes; (2) the rate of change of the speed of the presentation sequence in response to change in network conditions; and (3) the types of filler pages, filler applications and special effects to be used during the presentation. In addition, as the session progresses, the AI module preloads new pages, graphics, sound, video and other presentation components. The AI module uses the information obtained during its network monitoring operation to determine whether the original sequence still can be played without interruptions. The AI module also monitors the progress of each component being preloaded from the Web Server, in order to make decisions about when to cancel preloading, or initiate new component preloading, as described above.

Appendix A includes a psuedo-code representation used to implement the AI module and is incorporated by reference herein.

The following is an example of the operation of the AI module. After the client connects to a server, the present invention determines, for example, that the client computer utilizes the Windows 95 Operating System, supports Java applets, supports running QuickTime videos, permits a maximum of two simultaneous connections to the server, and has a browser cache size of 10 megabytes. The AI module determines that versions of the top-level presentation can utilize Java applets and QuickTime video technology.

A probe page is downloaded to the client computer, and the present invention determines that the number of users currently communicating with the web server is at about half of Server's capacity and the current throughput rate of this Internet connection is 1000 kbps.

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The present invention then selects the starting version of the presentation that corresponds to network throughput rate of 1000 kbps, and preloads the first page of the web site. The AI module determines that there are two components currently being downloaded, one from the next page, and one from the following page.

The presentation begins, and the present invention starts presenting selected sequence of pages, while continuing to monitor the presentation and network conditions.

During the presentation, and as a result of the network monitoring performed by the AI module, the present invention detects a drop in network connection's throughput, for example down to 100 kbps.

The AI module of the present invention sets up a virtual scenario of canceling the process of preloading the second component because even though the first component would download sooner, the timing for the next page would still be late.

The AI module determines that current page has an animated GIF component that can be replayed at the end of the page and adds this replay to the scenario being considered. However, invoking a what-if analysis still results in unacceptable timing. Therefore, the expert system consults a presentation script, and determines that at this point a "Skip page", or "Special Effect" actions are not available and, accordingly, rejects this scenario.

The expert system then runs through some other viable "what-if" scenarios, and rejects all of them except the one requiring switching to the sequence corresponding to a 56 kbps throughput.

The AI module then instructs the Vayu Web client module 1104 to modify the selected sequence of pages. The AI module then continues monitoring the presentation and network conditions.

Later in the presentation, the AI module detects an increase in network connection's throughput up to 900 kbps. The expert system sets up a virtual scenario of switching to the sequence corresponding to 1000 kbps throughput, and runs a what-if analysis on that scenario, whose result is acceptable. The AI module then switches back to the sequence of pages corresponding to 1000 kbps throughput, and continues with the presentation.

While the present invention has been particularly shown and described with reference to a preferred embodiment, it will be understood by persons skilled in the relevant art that various changes in form and details can be made therein without departing from the spirit and scope of the invention.

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Appendix A

The following is Java-based pseudo-code for the AI module for an embodiment of the present invention.

Class Definitions

```
class PrSite
{
        //describes the site (e.g. "General Goods")
        //for which presentations are built
        string                  name;
        PrSiteViewVec &     siteViewVec;  //presentation projects
};


class PrSiteView
{
        //hierarchical tree of presentations accessible to user logging-in
        string                  name;
        PrSite &                site;
        PrPage &                rootMenuPage;       //top-level menu
        Presentation &          rootPresentation;   //top-level presentation
};


typedef Vector<Presentation> PresVec

class Presentation
{
        //describes a presentation corresponding to a menu item
        string              name;
        string              type;         //sequence, white-paper, order-form
        PrSiteView &        siteView;
        Presentation &              parent;             //parent in the pres. tree
        PresVec &           childVec;     //first child in the pres. tree
        SequenceVec &       sequenceVec;  //list of alternate page-sequences
        PrPage &            tailMenuPage; //menu to display after presentation
        PrPageVec &         tailPageVec;  //list of pages tacked-on (e.g. order-
                                          //form)
};

class PrSequence
{
        //sequence of pages making up a presentation
        //a presentation may have several alternative sequences
        //for different communication speed, Java support, plug-in support
        string              name;
        string              type;
        string              environmentType;//e.g. for Java-supporting browsers
        Presentation &              presentation; //back pointer to presentation owning
        PrSeqItemVec &              itemVec;      //list of items (pages) comprising this
};

class PrSequenceItem
{
        //item of the presentation sequence
        PrSequence &        sequence;
        PrPage &            page;         //page (usually HTML)
        long                idealViewTime;//prescribed under normal state
        long                minViewTime;
        long                maxViewTime;
        long                loadTime;     //expected load time at throughput
                                          //for which sequence was designed
```


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```
        int             pauseAllowed; // user pauses when this item is displayed
        int             forwardAllowed;//enable "forward" button when displayed
        int             skipAllowed; //allow skipping this page
        PrPage &        preloadPage; //when displaying this item, start preloading
                                     //preloadPage before preloading next page
        PrFxVex     &   fxVec;            //list of available "special effects"
                                     //to be used when timing is Late
        PrSequence &    upSequence;  //another sequence to switch to
                                     //when Internet conditions improve
        PrSequenceItem & upItem;          //item within sequence to switch to
                                     //when Internet conditions improve
        PrSequence &    downSequence;//another sequence to switch to
                                     //when Internet conditions degrade
        PrSequenceItem & downItem;   //item within sequence to switch to
                                     //when Internet conditions degrade
};

class PrPage
{
        //HTML page, or special effect page, or applet
        string                  name;
        string                  type; //HTML, VRML, Applet, FX
        string                  url;  //locator
        long                    size; //file size (for download monitoring)
        PrComponentVec &    componentVec; //list of components (images, sound, video)
};

class PrComponent
{
        //image, video, sound, applet and other non-text components of a page
        string                  name;
        string                  mime_type;   //image, sound, etc.
        long                    size;        //file size
        long                    playTime;    //play (display) time; for timimg
        string                  url;         //locator
};

class PrFx
{
        //special effect (filler to smooth out the presentation at changing conditions)
        string                  name;
        string                  type;        //text msg, applet, animation clip
        string                  selectionType;      //random, by priority, specific
        PrPageVec &             pageVec;     //page containing this FX
};


class PrEnvironment
{
        //class of browser environment
        //for which sequences can be created
        string                  name;
};

#include "VauyWebPresSmooth.h"


class PresentationManager : public Applet
{
        int ProbePage()
        {
                //spawn a separate thread to gauge throughput rate
                spawnThread( "ThroughputTest");
```


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```
        //get maximum number of simultaneous connections
        //the browser is allowed to open
        maxConnectionCnt = Browser.getMaxConnectionCnt();

        //get browser's buffer size
        netBufferSize = Browser.getNeetBufferSize();

        //inquire what kinds of plugins the browser has
        Browser.getPlugins(pluginVec);
        for( plugin = pluginVec.firstElement;
             plugin != NULL;
             plugin = plugin.nextElement())
        {
             switch plugin.type
             {
             case pluginStreamingVideo:
                  streamVideoType = StreamVideoTypeVec[plugin.vendor];
                  break;
             case pluginVirtualReality:
                  vrPlayer = Yes;
                  break;
             }    //switch
        }

        // wait for completion of the throughput test thread
        waitFor( finish, "ThroughputTest");


        //now we have all parameters needed to determine
        //which of the presentation environment to choose
        environ = determineEnvironment();

        //preload the top-level menu, and display it
        spawnThread( "PreloadPage", presView.rootMenuPage);
        curPage = presView.rootMenuPage;
        displayPage( curPage);

        //determine which sequences will potentially be used
        //in the presentation, as well as starting sequence
        rootPresentation.startSequence = DetermineSequences( sequenceVec);

        //preload first page of the chosen sequence
        spawnThread( "PreloadPage", "Fx", presView.rootPresentation);

        //spawn controlling thread
        spawnThread( "rootSequenceManager");

        //spawn a separate thread to monitor throughput rate
        spawnThread( "PeriodicThroughputTest");

    }    //ProbePage()


    int Presentation::SequenceManager()
    {
        curSequence = startSequence;
        curEnv = startEnv;

        //go through all items of the sequence
        seqItem = mainSequence.pageVec.firstElement;
        while( true)
        {
            //reassess the state of the network (since prev. page)
```


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```
curState = assessState();
switch curState
{
case stThroughputDidNotChangeDramatically:
      //can we preload one more component?
      if( preloadedCount >= MaxPreloadedCount)
      {
            break;
      }
      nextPreloadSeqItem =
            curSequence.getNextPreloadSeqItem();
      nextPreloadComp =
            curSequence.getNextPreloadComponent();
      //check if this comp is already cached
      nextPreloadComp.calcDownloadTime( curEnv);
      nextDownloadOK = true;

      //for each comp being downloaded,
      //see if starting new download will thwart timing
      for(i = 0; i < MaxPreloadedCount; ++i)
      {
            comp = componentBeingDownloaded[ i];
            if( comp.status != stInProgress)
                  continue;
            comp.calcTimeToStart();
            comp.calcRemainingTimeToDownload();

            if( comp.timeToStart <
                        comp.remainTimeDL +
                        nextPreloadComp.totTimeDL)
            {
                  //timing = Late; it is not OK to download
                  nextDownloadOK = false;
                  break;
            }
      }
      if( !nextDownloadOK)
            break; //switch
      //OK to download this component; do it
      spawnThread( nextPreloadComp.preload);
      break; //switch

case stUrlNotFound:        //file not found
      //can we skip this page?
      if( nextPreloadSeqItem.skipAllowed)
            //yes: skip it
            nextPreloadSeqItem.setSkip();
      else
            //no: try to switch sequences
            nextPreloadSeqItem.setJumpSequence();

case stThroughputIncreased:
      //keep count of how steady is the increase
      ThroughputIncreasedCount++;
      ThroughputDecreasedCount = 0;
      nextSequence.nextItem = curSequenceItem.upSeqItem();
      //can we afford (timing-wise) to go up the sequence
      nextSequence.nextItem.calcTiming();
      if(nextSequence.nextItem.timingOK)
            //yes: switch
            setNextItem(nextSequence.nextItem);
      else
            //no: act as if no change
            setStatus(stNormal);
```


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```
                        break;

                case stThroughputDecreased:
                        //keep count of how steady is the decrease
                        ThroughputDecreasedCount++;
                        ThroughputIncreasedCount = 0;

                        calcCurTiming();
                        if(curSequenceItem.timingOK)
                                //we are still OK for this and next page
                                break;

                        //try different ways to handle oncoming delay
                        //(returns success if we can handle it)
                        if( (status = handleLateTiming()) == Success)
                                break;

                        //cannot handle delay with any other method
                        //try to switch to lower sequence
                        curSequence = curItem.lowSequence;
                        nextItem = curItem.getLowSeqItem();

                        break;

                case stThroughputLow:
                        //keep count of how steady is the decrease
                        ThroughputDecreasedCount++;
                        ThroughputIncreasedCount = 0;
                        calcCurTiming();
                        if(curSequenceItem.timingOK)
                                //we are still OK for this and next page
                                break;
                        else
                        {
                                setStatus(stThroughputDecreased);
                                continue;  //next iteration picks it up and handles
it
                        }

                }       //switch
        }       //while
}       //manager()

int handleLateTiming()
{
        //if we currently are displaying text,
        //inclrease viewing time by 20%
        //(whehter it helps or not)
        if(curItem.page.mimeType = "text")
        {
                increaseViewTime(curItem, percentIncreaseForText);
                calcCurTiming();
                if(curSequenceItem.timingOK)
                {
                        return Success;
                }
        }


        //can we replay any components already loaded?
        if( curItem.replayCompVec != NULL)
        {
                //rule: if comp i is replayed,
                //then i+1, i+2, ... must be replayed
                comp = curItem.replayCompVec.lastElement();
```


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```
                while (comp != NULL)
                {
                        virtualAddComp( comp);
                        calcCurTiming();
                        if(curSequenceItem.timingOK)
                        {
                                curItem.setReplay(comp);
                                return Success;
                        } else
                                //try one more replay-components
                                comp = comp.PreviousElement();
                }
        }
        //are we preloading two pages ahead?
        //see if stopping that will help
        //if it does not help, do NOT stop preloading it yet!
        while(1)
        {
                seqItem = getLatestItemForWhichCompBeingPreloaded();
                if( seqItem != curItem
                        && seqItem != curItem.nextElement)
                {
                        virtualStopDownload(seqItem.downloadingComponents);
                        calcCurTiming();
                        if(curSequenceItem.timingOK)
                        {
                                //we will be OK for this and next page
                                stopDownload(seqItem.downloadingComponents);
                                return Success;
                        }
                } else
                        break;
        }       //while

        //can we skip next page (or couple)?
        while( curItem.nextElement.skipAllowed)
        {
                curItem.nextElement.setSkip();
                calcCurTiming();
                if(curSequenceItem.timingOK)
                {
                        //we will be OK for this and next page
                        return Success;
                }
        }
        //try FXs available
        if( curItem.FxVec != NULL)
        {
                fx = curItem.FxVec.firstElement();
                while( fx != NULL)
                {
                        virtualApplyFx( fx);
                        calcCurTiming();
                        if(curSequenceItem.timingOK)
                        {
                                //we will be OK for this and next page
                                return Success;
                        }
                }
        }
        return Fail;
}       //handleLateTiming()

}       //class
```


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CLAIMS

What is claimed is:

1. A computer based method for generating a web site having a plurality of web pages, the computer having a storage module and having a wide area network interface. the method comprising the steps of:

designing a menu web page having one or more menu items;

designing a sequence of web pages, including a first and second web page, for each of said menu items, said first web page only capable of accessing one of said second web page and said menu web page, said second web page only capable of accessing the immediately subsequent web page in said sequence of web pages and said menu web page, said sequence of web pages;

identifying each menu item with one of said sequence of web pages; and

storing said menu web page and web page sequence information in the storage module.

2. The method of claim 1, wherein said sequence of web pages is designed by a webmaster. said sequence of web pages enables the webmaster to control the content and sequence of information displayed to the client.

3. The method of claim 2, further comprising the step of:

receiving a request signal from a destination computer via the wide area network interface, for requesting access to the web site;

transmitting said menu web page and said web page sequence information to said destination computer via the wide area network;

displaying said menu web page to a client on a display device coupled to said destination computer;

preloading additional web pages before said client selects a menu item;

receiving a menu item selection from a client;

preloading said sequence of web pages associated with said selected menu item. using a dynamic preload algorithm: and

displaying said sequence of web pages to the client without permitting the client to alter said sequence.

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4. The method of claim 3, wherein said step of preloading said sequence of web pages includes the steps of:

determining a data receiving rate of the destination computer;

determining the size of two or more web pages in said sequence of web pages;

setting a priority value for each of said two or more web pages in said sequence of web pages based upon said data receiving rate, said size of said web page, and the position in said sequence of said web page;

preloading one of said two or more web pages into said destination computer storage module, based upon said priority value; and

dynamically modifying said priority value of one or more web pages to reduce any delay in displaying one of said web pages to the client.

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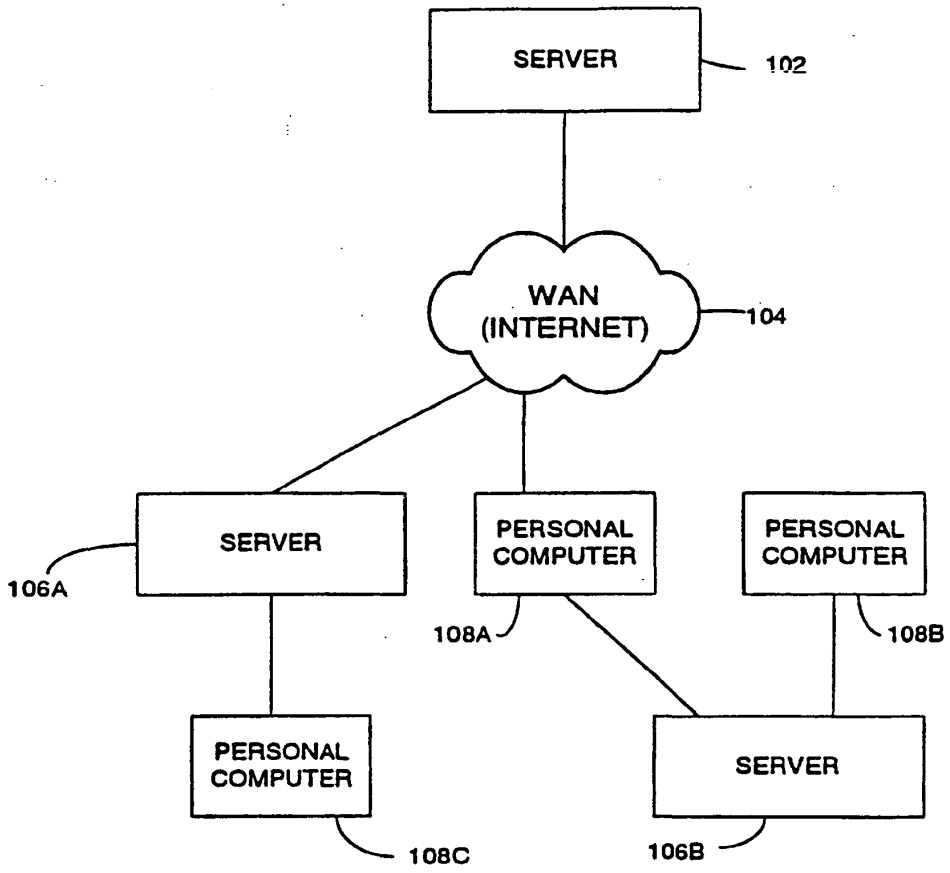


FIGURE 1

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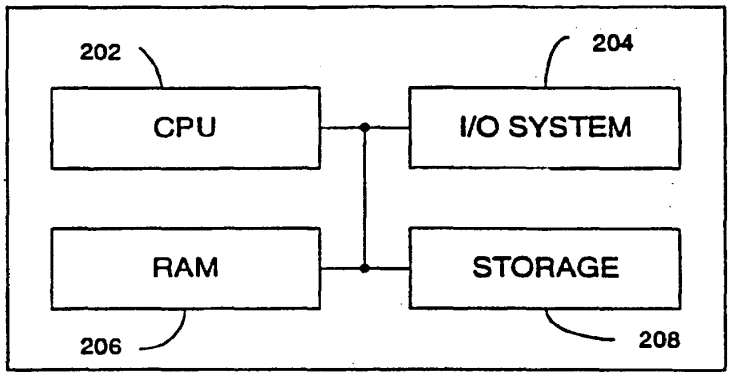


FIGURE 2

SDOCID: <WO___9820434A2_I_>

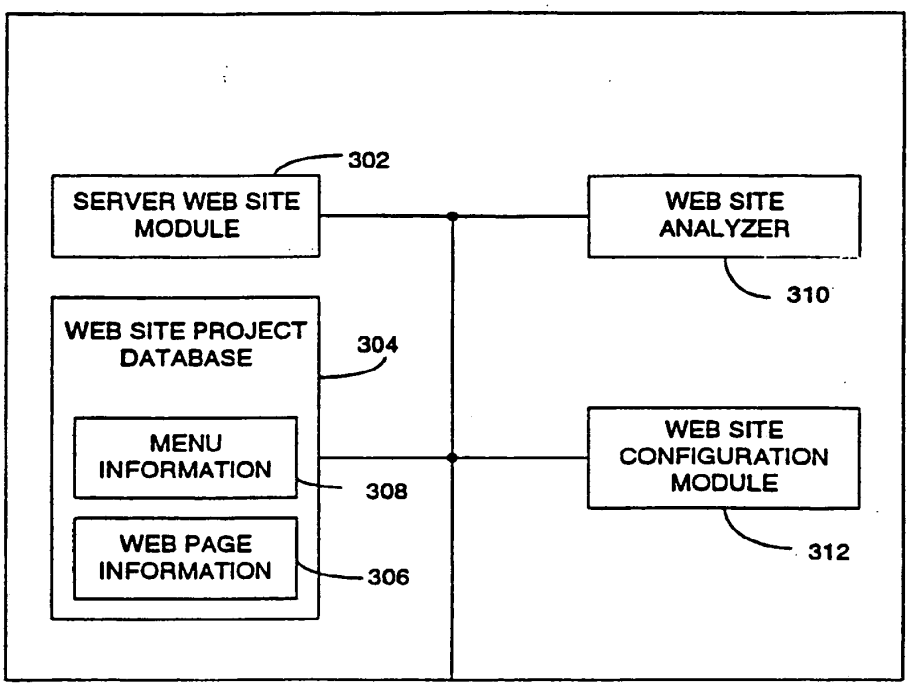


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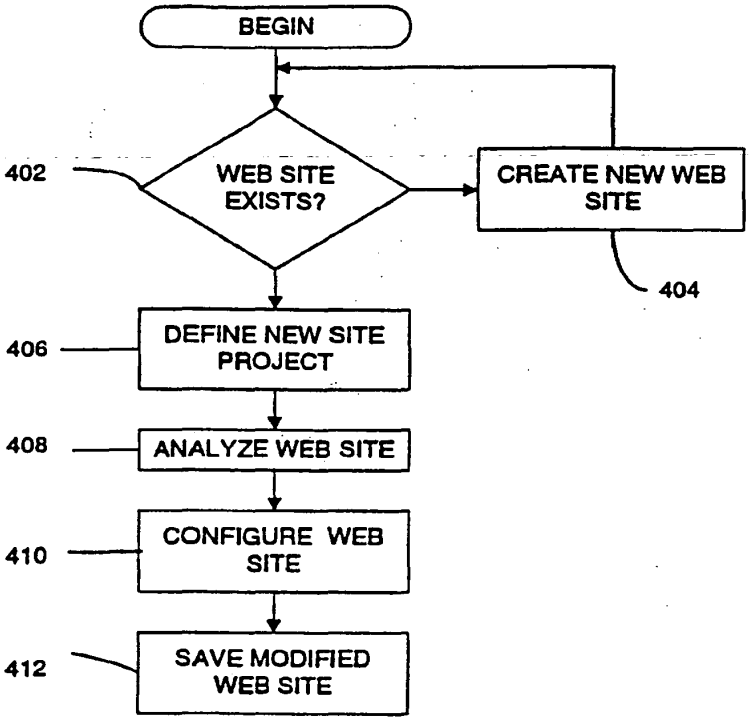


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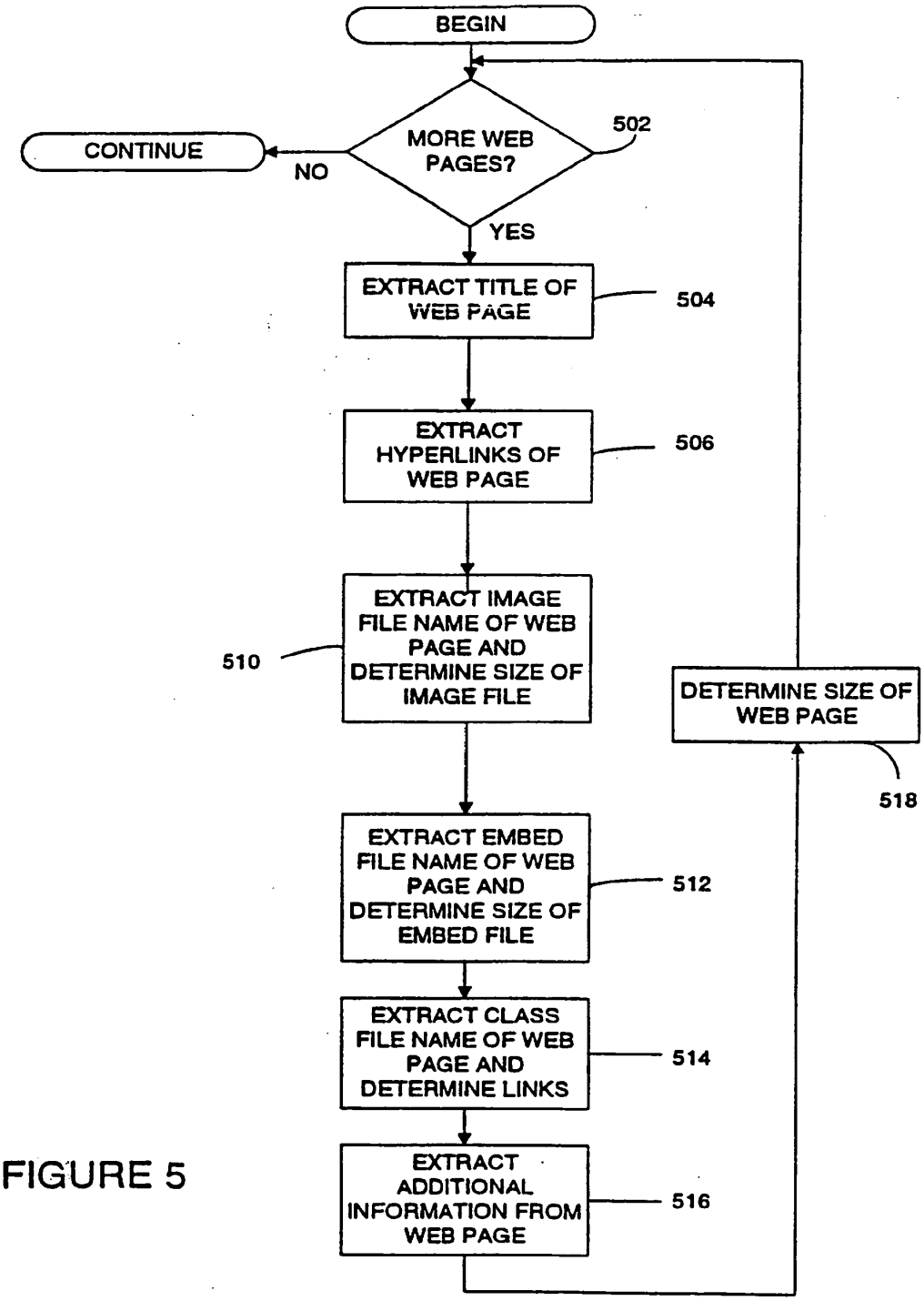


FIGURE 5

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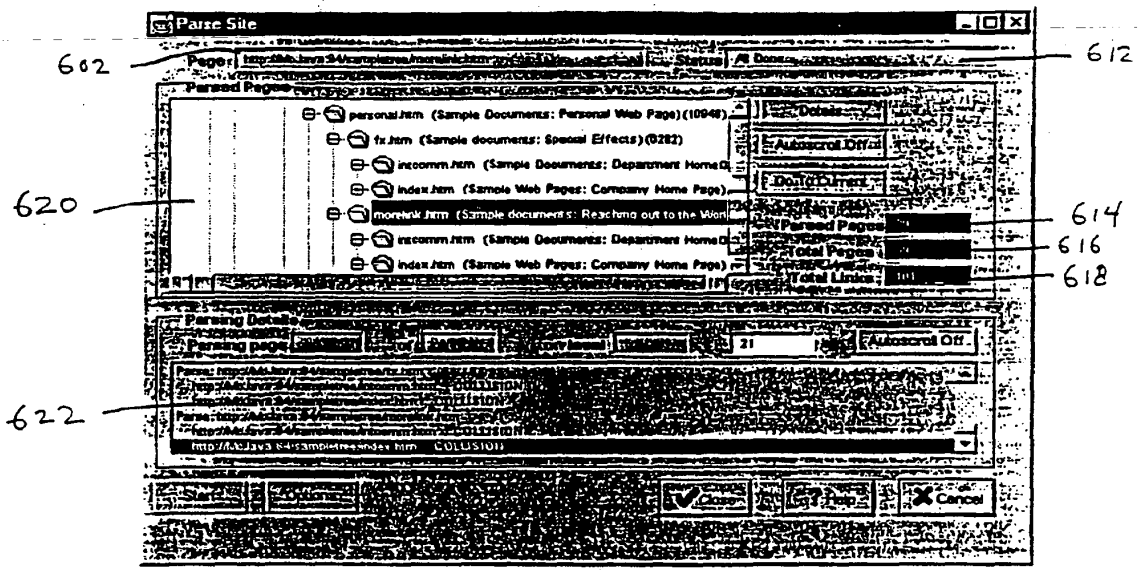


Figure 6

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American Airlines, Ex. 1008, p.144
American Airlines v. Advanced Transactions
IPR2023-01370

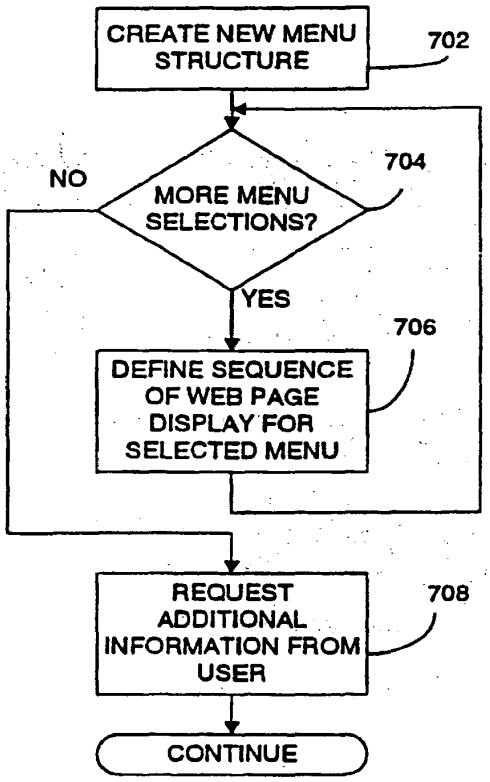


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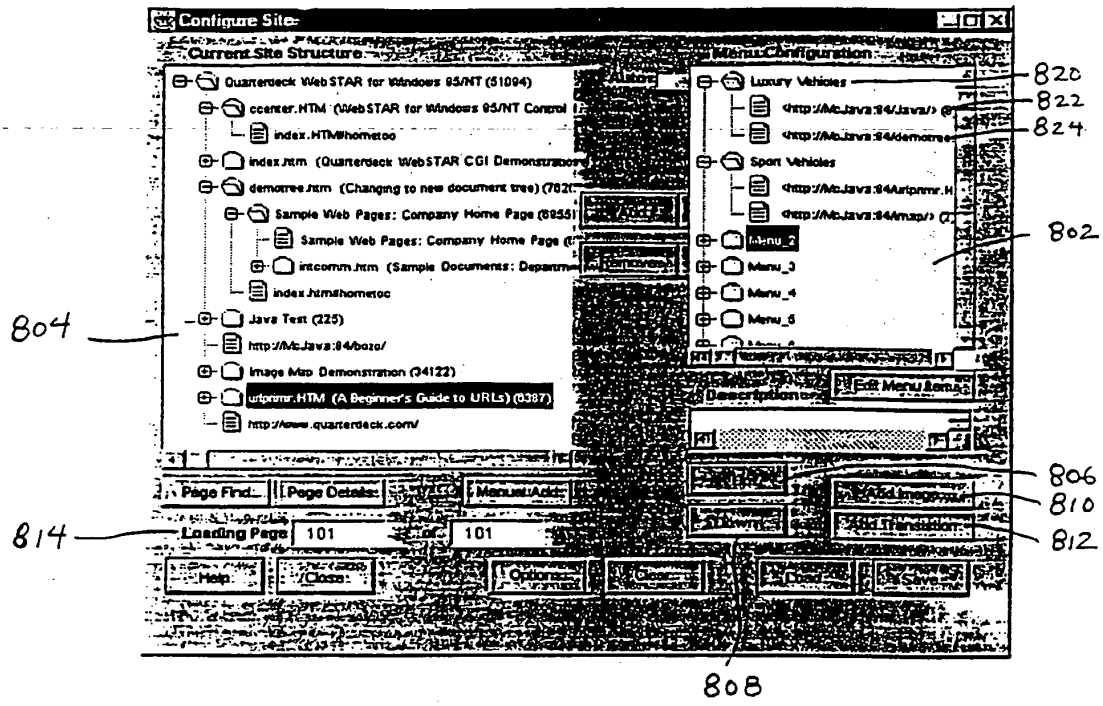


Figure 8

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IPR2023-01370

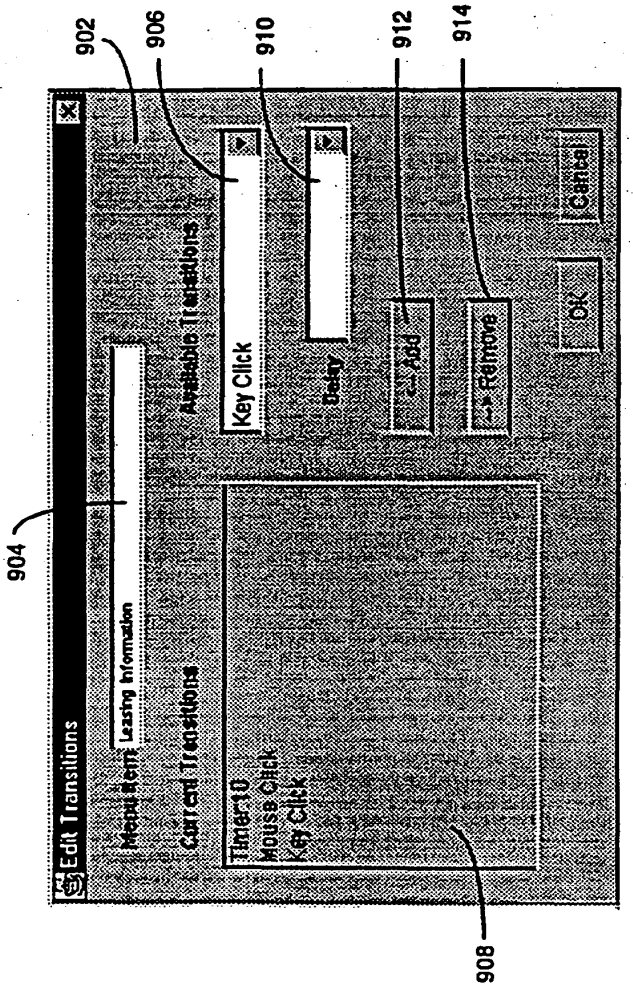


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SDOCID: <WO__9820434A2_I_>

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American Airlines v. Advanced Transactions
IPR2023-01370

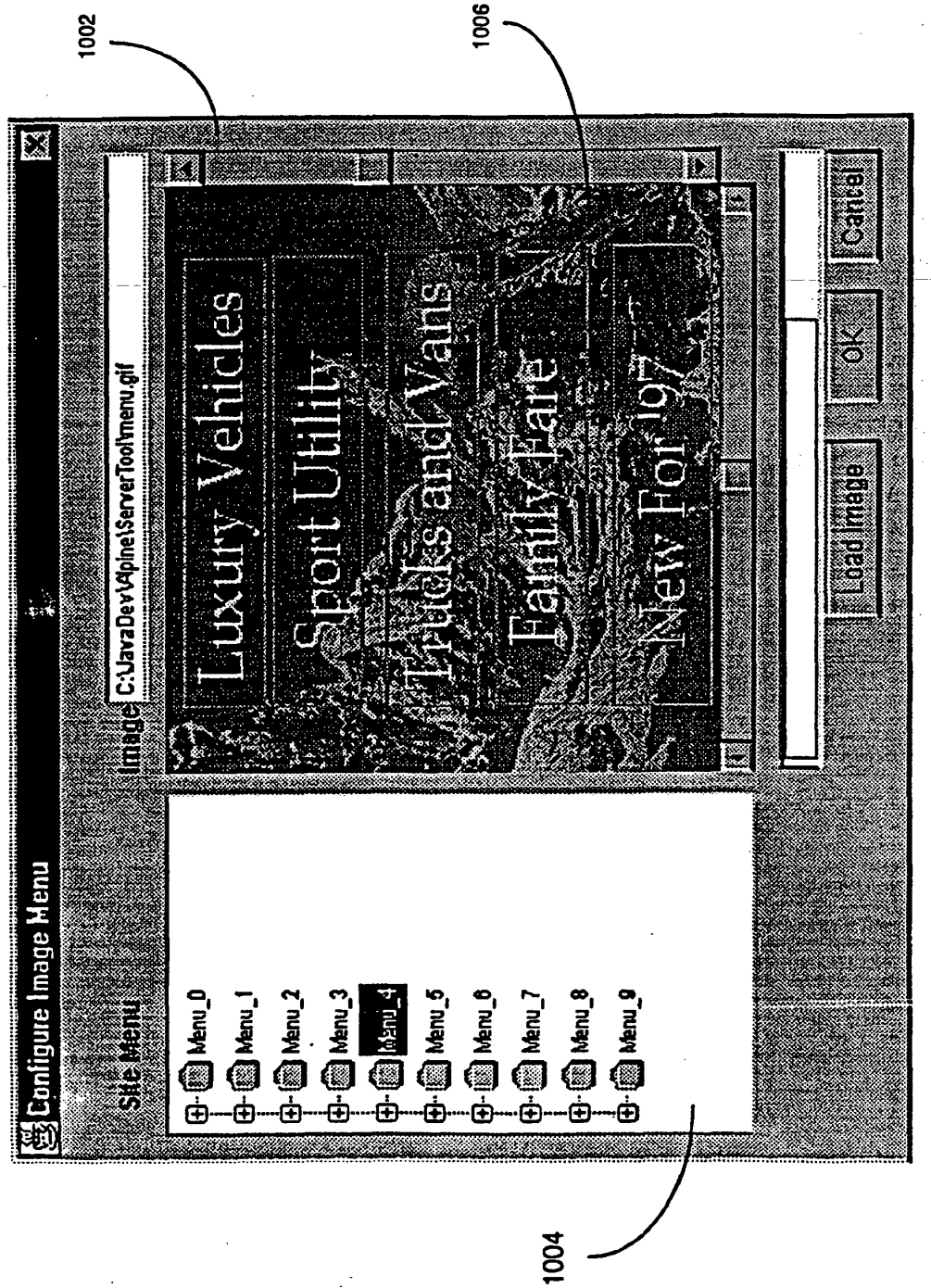


Figure 10

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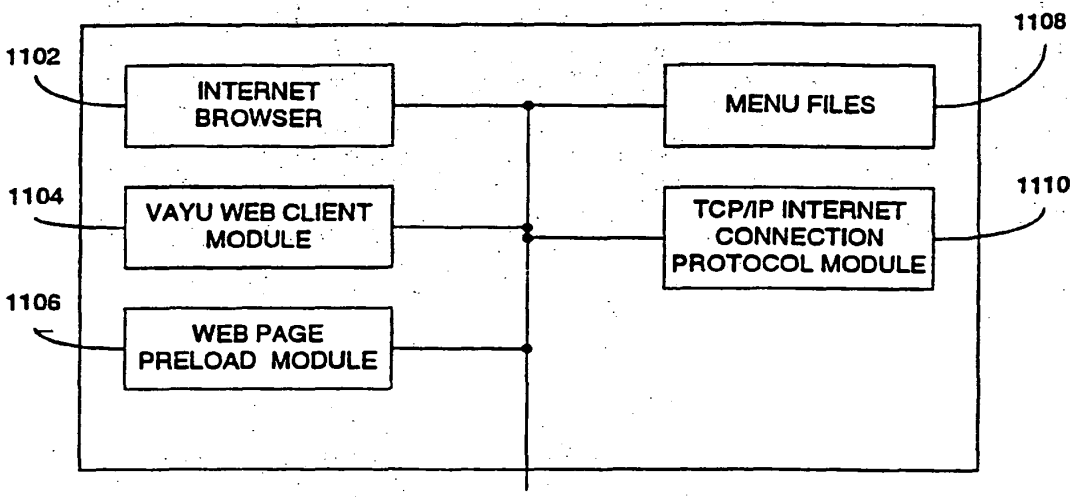


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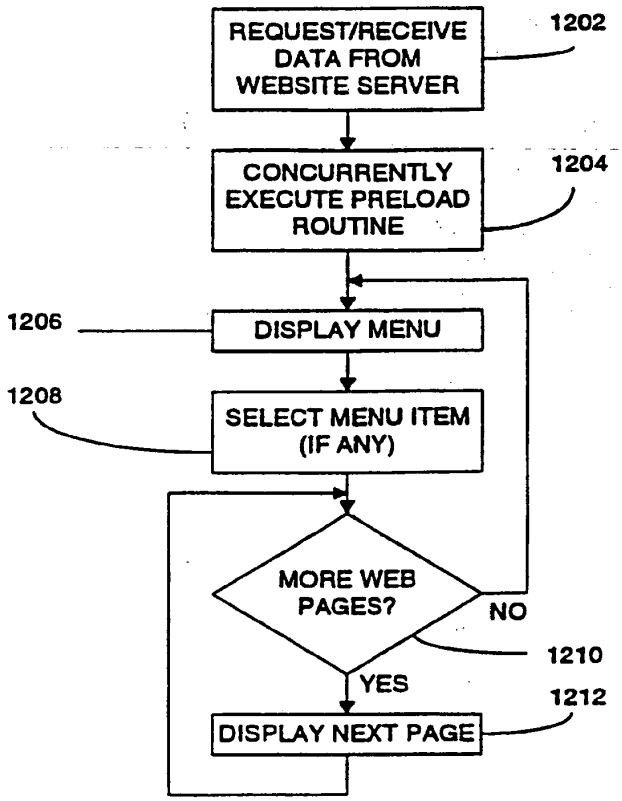


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ISDOCID: <WO___9820434A2_I_>

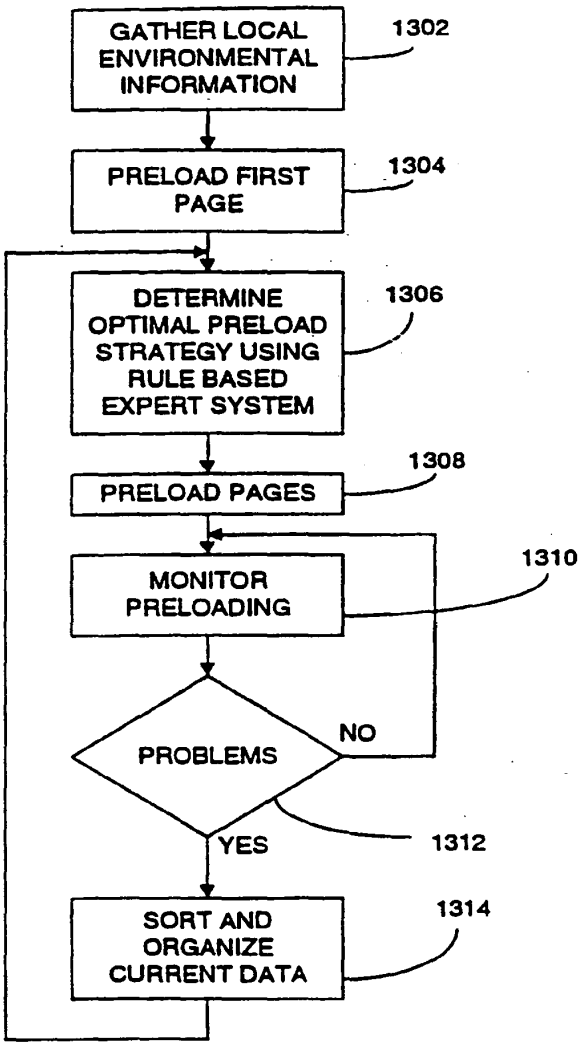


FIGURE 13

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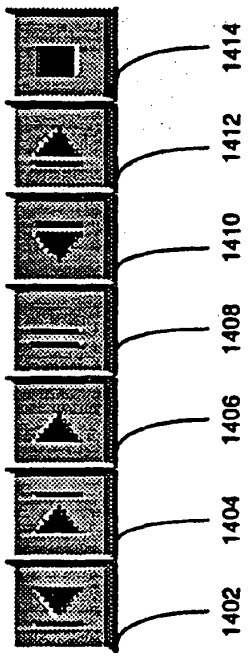


Figure 14

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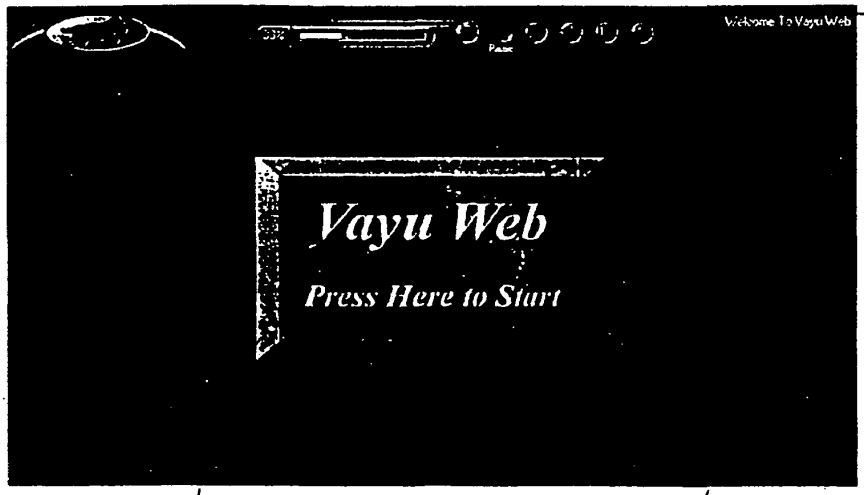


FIGURE 15

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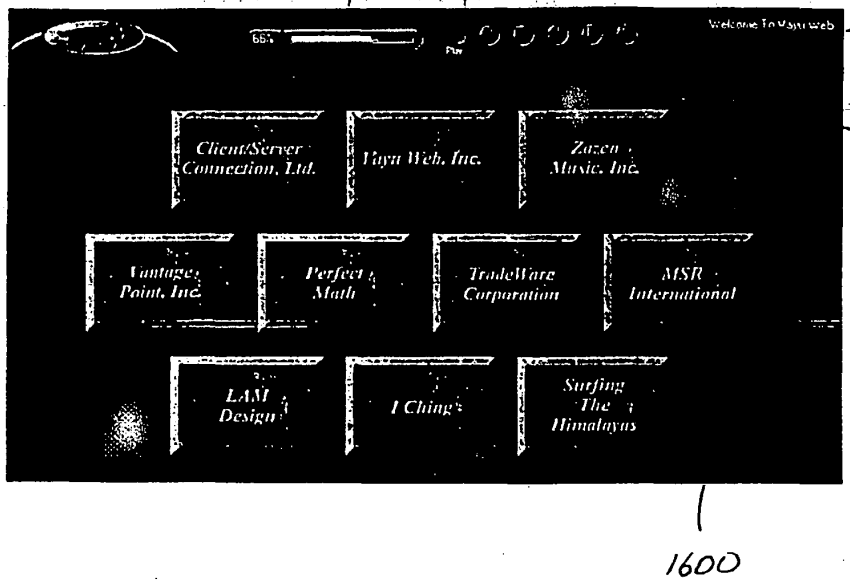


FIGURE 16

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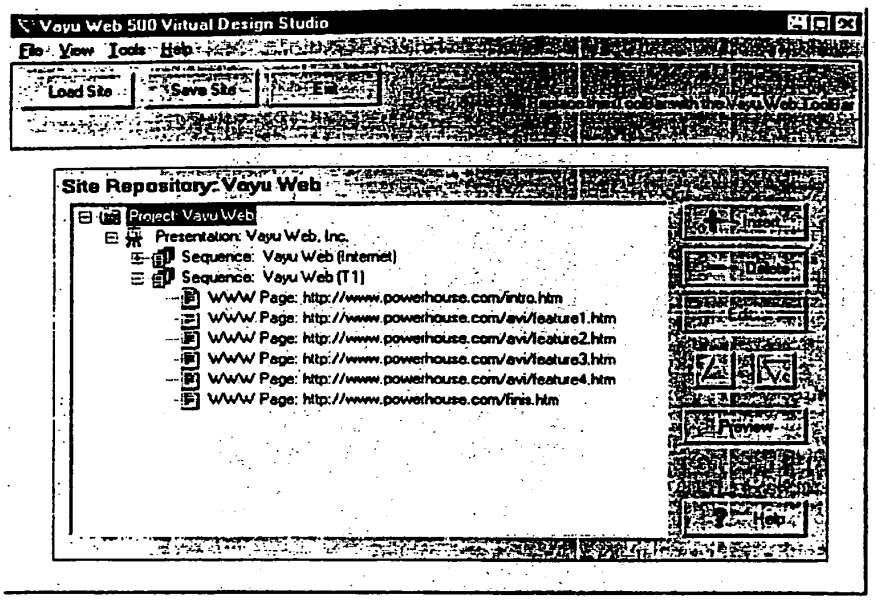


FIGURE 17

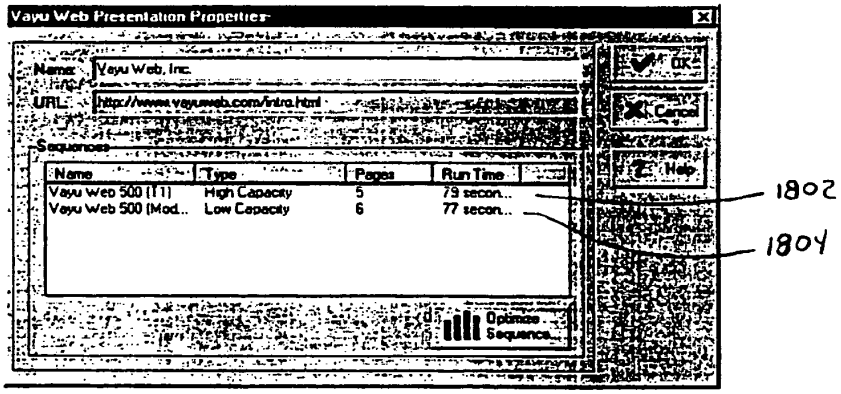


FIGURE 18

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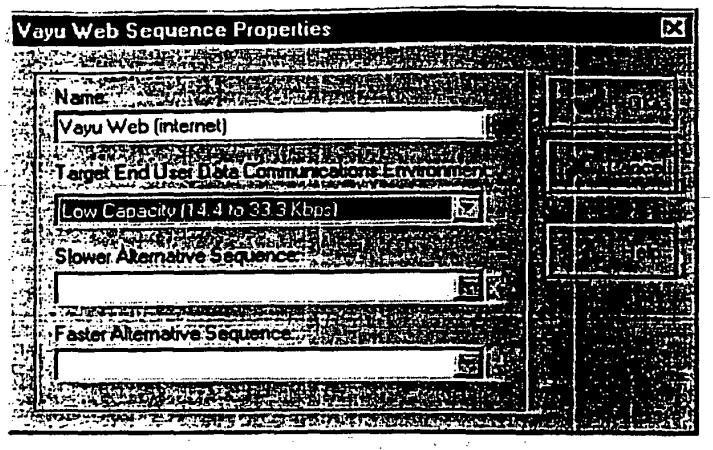


FIGURE 19

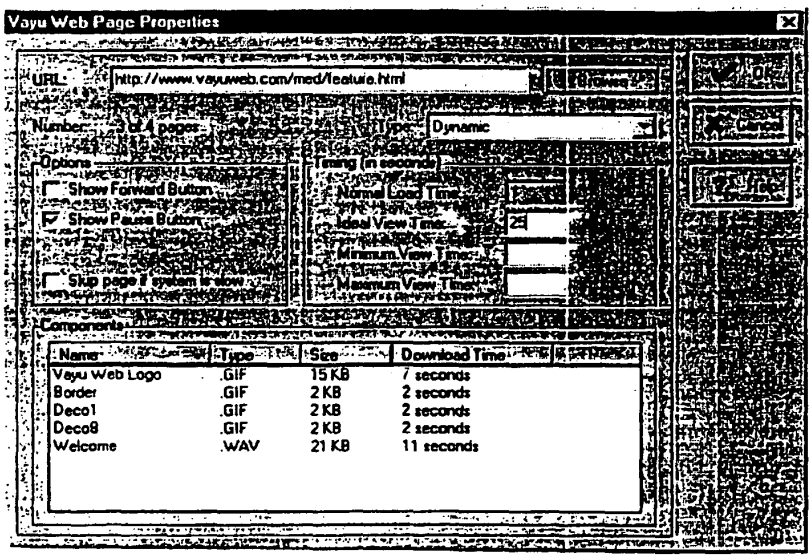


FIGURE 20

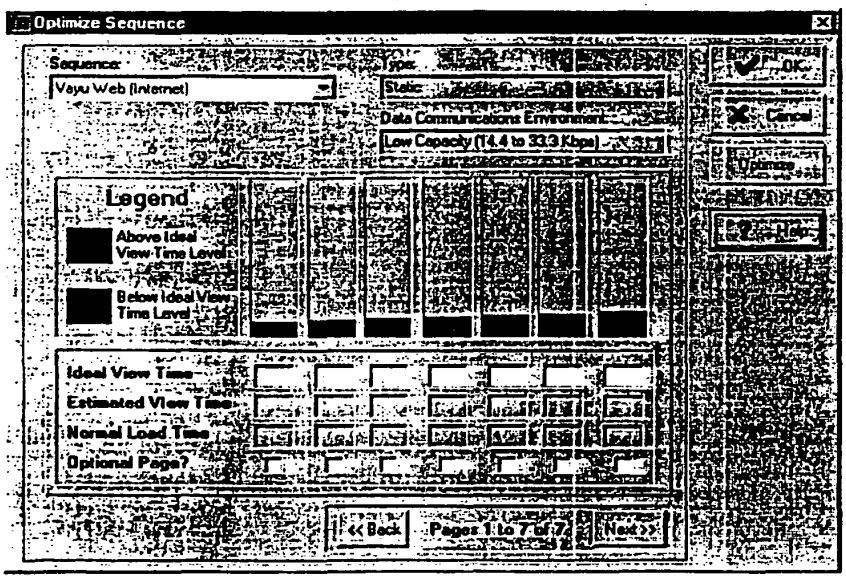
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FIGURE 21



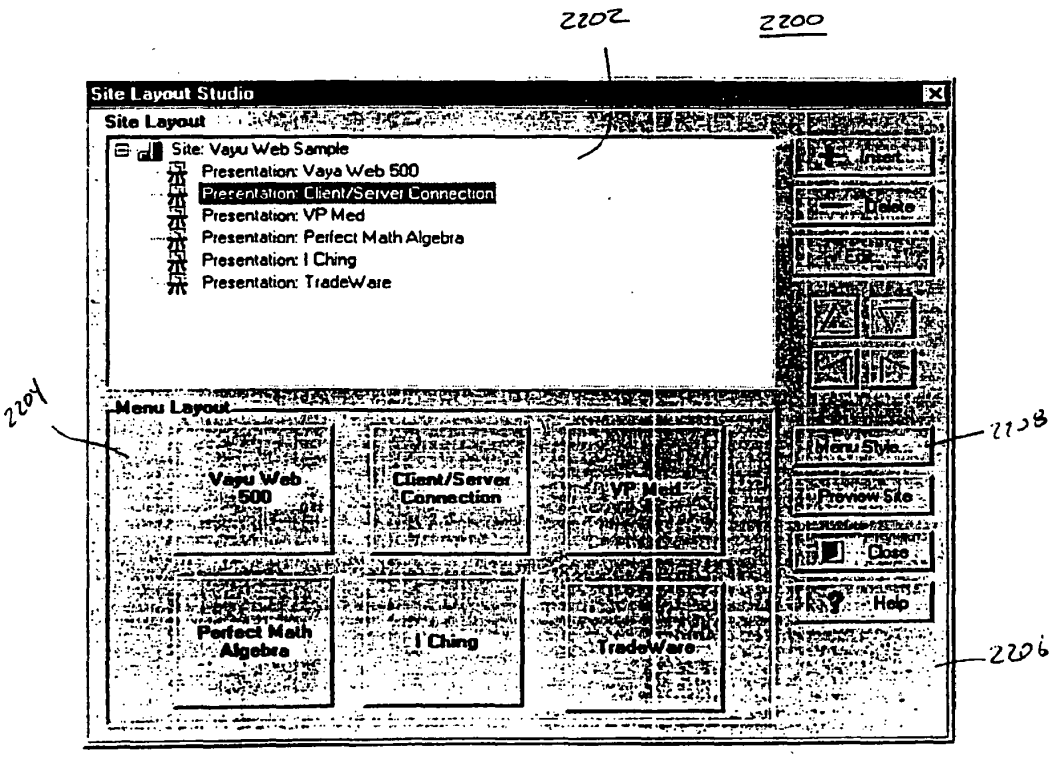
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FIGURE 22



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(71) Applicant: VAYU WEB, INC. [US/US]; Suite 206, 309 Mamaroneck Avenue, White Plains, NY 10605 (US).

(72) Inventor: LENZ, Frederick, P.; 183 Old Field Road, Old Field, NY 11733 (US).

(74) Agents: MCNELIS, John, T. et al.; Fenwick & West LLP, Suite 700, Two Palo Alto Square, Palo Alto, CA 94306 (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, 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, UZ, VN, YU, ZW, ARIPO patent (GH, 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).

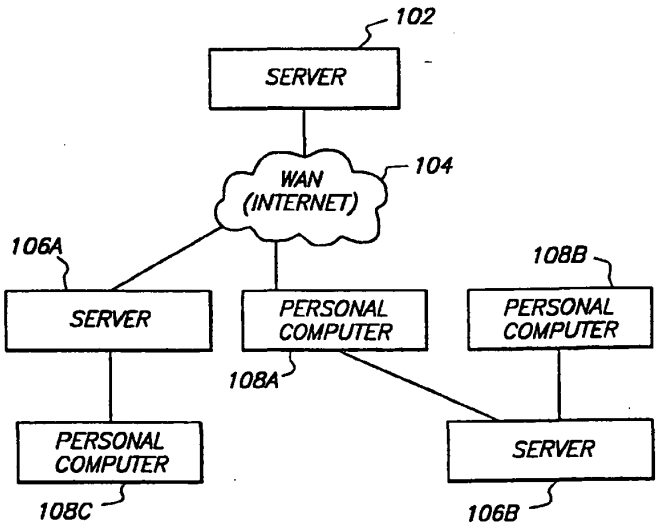
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(54) Title: SYSTEM AND METHOD FOR DISPLAYING INFORMATION AND MONITORING COMMUNICATIONS OVER THE INTERNET

(57) Abstract

A system and method for creating, transmitting, and receiving web pages from a web server. The present invention enables a user to create a new web site by either creating new web pages or extracting information from previously created web pages. The invention enables a web site master to control the entire presentation of data to the user. In one embodiment of the present invention, a web site can include a first web page having a main menu. The present invention then permits the web site master to prepare a preset sequence of web pages that are displayed to the user for each menu item. The user of the web page selects one menu item from a menu display and then can passively receive information in a logical sequence. The control of the web page sequence can be used by advertisers, for example, to effectively present all information deemed helpful in attempting to convince the user to use the advertised product or service. In contrast to conventional web sites, a user accessing a web site developed according to the present invention will have a predefined sequence of web pages displayed in order to maximize the benefit to the web site master, e.g., to increase the behavioral modifications of the client due to controlled advertising. The present invention also increases the effectiveness of web sites having multiple web pages by using an artificial intelligence preloading methodology to reduce the delay in displaying a web page on the user's computer.



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INTERNATIONAL SEARCH REPORT

Int ional Application No
PCT/US 97/19719

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 G06F17/30

According to International Patent Classification (IPC) or to both national classification and IPC

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Minimum documentation searched (classification system followed by classification symbols)
IPC 6 G06F H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CRESPO A ET AL: "WebWriter: A browser-based editor for constructing Web applications" COMPUTER NETWORKS AND ISDN SYSTEMS, vol. 11, no. 28, May 1996, page 1291-1306 XP004018228 see page 1291, column 2, line 6 - page 1291, column 2, line 17 see page 1293, column 1, line 15 - page 1293, column 2, line 31 see figure 2	1,2
Y	--- -/--	3,4

[X] Further documents are listed in the continuation of box C.

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1

Date of the actual completion of the international search	Date of mailing of the international search report
24 April 1998	04/05/1998

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Abbing, R

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American Airlines v. Advanced Transactions
IPR2023-01370

INTERNATIONAL SEARCH REPORT

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PCT/US 97/19719

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Y	PATENT ABSTRACTS OF JAPAN vol. 015, no. 476 (E-1140), 4 December 1991 & JP 03 204259 A (NIPPON TELEGR & TELEPH CORP), 5 September 1991, see abstract	3
Y	EP 0 669 587 A (AT & T CORP) 30 August 1995 see abstract see column 2, line 55 - column 3, line 18 see column 18, line 34 - column 21, line 13	4
X	LADD D A ET AL: "PROGRAMMING THE WEB: AN APPLICATION-ORIENTED LANGUAGE FOR HYPERMEDIA SERVICE PROGRAMMING" INTERNATIONAL WORLD WIDE WEB CONFERENCE, December 1995, pages 1-17, XP002049893 see page 6, line 24 - page 7, line 9	1,2

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 97/19719

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0669587 A	30-08-95	CA 2140850 A	25-08-95
		US 5715404 A	03-02-98

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A3

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08/745,899 7 November 1996 (07.11.96) US
08/762,289 9 December 1996 (09.12.96) US

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(74) Agents: MCNELIS, John, T. et al.; Fenwick & West LLP, Suite 700, Two Palo Alto Square, Palo Alto, CA 94306 (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, 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, UZ, VN, YU, ZW, ARIPO patent (GH, 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).

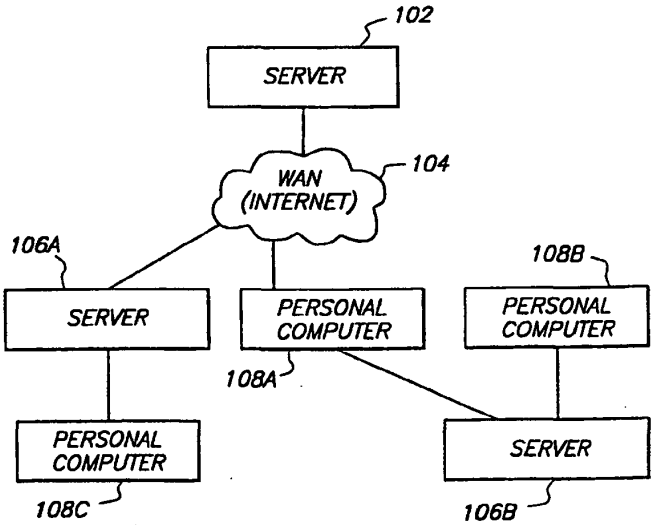
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*(Referred to in PCT Gazette No. 39/1998, Section II)

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SYSTEM AND METHOD FOR DISPLAYING INFORMATION AND MONITORING COMMUNICATIONS OVER THE INTERNET

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of U.S. Patent Application No. 08/745.899. filed by Frederick Lenz on November 7, 1996, entitled "System and Method for Displaying Information Over the Internet", Applicant's reference number 2608, which is incorporated by reference herein in its entirety.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to the field of Internet communication and more specifically to a system and method for generating and displaying world wide web site information.

2. Description of Background Art

The volume of traffic on and the number of users using the Internet and the world wide web (WWW) have increased significantly since the early 1990s and such increases are expected to continue. Previously, many users of the Internet and world wide web were technically sophisticated. Many, if not most, of the users in the future are expected to be technical novices. That is, many current and future users of the WWW will not understand "hyperlinks" and "applets." Many technically unsophisticated users of the Internet and WWW are intimidated by the current techniques required to move between pages in a web site. For example. one conventional technique for moving between pages in a web site involves searching through the text of a web page for one of many hyperlinks that may be of interest to the user and then selecting one hypertext or hypergraphic that is associated with the hyperlink to proceed to the page addressed by the hyperlink. While many technically sophisticated users do not have trouble understanding this web page addressing technique, less technically sophisticated users have trouble understanding hyperlinks and this web page navigation technique.

Another problem with conventional web sites is that the size of the data files that need to be downloaded by a user is increasing significantly. For example, it is not uncommon for a web site having complex images, e.g., color photographs, movie clips, or satellite images. to exceed several megabytes in size. A typical home user of a personal computer may have a maximum modem connection rate of 14.4 kilobits per second (kbps) which is approximately 1.8 kilobytes per second. Using such a modem, a web page whose data size is two megabytes requires over

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18 minutes to download by the typical home computer, and only if the server that is sending the data is transmitting the data at the maximum permitted rate. While the data is being downloaded, conventional web sites display partial information on the screen of the users display monitor.

One growing use of the Internet and WWW is the creation of web sites for advertising. Advertisers are drawn by the low cost of the WWW. However, a significant drawback for advertisers is the slow rate of data transfer to typical home users. If an advertiser creates a web site where one page of the web site has a large size, e.g., two megabytes, then, as described above, a typical user having a 14.4 kbps modem will require over 18 minutes to download the single web page. A significant number of users will be reluctant to download such large advertisement web pages due to the large time commitment.

Another significant drawback for advertisers is that conventional web sites require the user to search hypertext and hypergraphics in each web page in order to proceed to what the user thinks is of interest. Therefore, an advertiser operating a web site having several pages frequently has users browse the web pages in a haphazard manner. However, successful advertisers prefer more control of the presentation sequence of an advertisement.

Accordingly, what is needed is a system and method for operating a web site that: (1) decreases the complexity of current web sites to reduce the intimidation of less sophisticated users of the web site; (2) decreases the waiting time between web page displays without increasing the data transmission rate; and (3) enables a web site owner to have more control over the presentation of web pages to a user.

SUMMARY OF THE INVENTION

The present invention is a new model for creating, transmitting, and receiving web pages from a web server. The present invention enables a user to create a new web site by either creating new web pages or extracting information from previously created web pages. The invention enables a web site master to control the entire presentation of data to the user. In one embodiment of the present invention, a web site can include a first web page having a main menu. The present invention then permits the web site master to prepare a preset sequence of web pages that are displayed to the user for each menu item. The user of the web page selects one menu item from a menu display and then can passively receive information in a logical sequence. The control of the web page sequence can be used by advertisers, for example, to effectively present all information deemed helpful in attempting to convince the user to use the

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advertised product or service. In contrast to conventional web sites, a user accessing a web site developed according to the present invention will have a predefined sequence of web pages displayed in order to maximize the benefit to the web site master, e.g., to increase the behavioral modifications of the client due to controlled advertising.

The present invention also increases the effectiveness of web sites having multiple web pages by using an artificial intelligence preloading methodology to reduce the delay in displaying a web page on the user's computer.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an illustration of a communication system in which the preferred of the present invention resides.

Figure 2 is a more detailed illustration of the server of the preferred embodiment of the present invention.

Figure 3 is a more detailed illustration of the server storage device of the preferred embodiment of the present invention.

Figure 4 is a flow chart describing the method performed by the server module according to one embodiment of the present invention.

Figure 5 is a flow chart describing the step of analyzing a web site according to one embodiment of the present invention.

Figure 6 is an illustration of a computer screen display showing information extracted from the web pages of the web site during the analyze web site 408 process according to one embodiment of the present invention.

Figure 7 is flow chart describing the step of configuring a modified web site according to one embodiment of the present invention.

Figure 8 is an illustration of a computer screen display for use in the web site configuration process according to one embodiment of the present invention.

Figure 9 is an illustration of an edit transition display according to one embodiment of the present invention.

Figure 10 is an illustration of a configuration image menu display according to one embodiment of the present invention.

Figure 11 is an illustration of a client computer storage device according to one embodiment of the present invention.

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Figure 12 is a flow chart describing the method performed by the Vayu Web client module according to one embodiment of the present invention.

Figure 13 is a flow chart describing the method performed by the web page preload module according to one embodiment of the present invention.

Figure 14 is an illustration of a web page control panel according to one embodiment of the present invention.

Figure 15 is an illustration of a first menu web page according to an alternate embodiment of the present invention.

Figure 16 is an illustration of a second web site menu page according to an alternate embodiment of the present invention.

Figure 17 is an illustration of a site repository information according to an alternate embodiment of the present invention.

Figure 18 is an illustration of a screen display of the web site presentation properties of various web site sequences developed by the web site designer according to an alternate embodiment of the present invention.

Figure 19 is an illustration of a web page sequence properties screen display according to an alternate embodiment of the present invention.

Figure 20 is an illustration of a web page property screen display according to an alternate embodiment of the present invention.

Figure 21 is an illustration of a sequence optimizer screen display according to an alternate embodiment of the present invention.

Figure 22 is an illustration of the site layout screen display that is displayed to the web site designer according to an alternate embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A preferred embodiment of the present invention is now described with reference to the figures where like reference numbers indicate identical or functionally similar elements. Also in the figures, the left most digit(s) of each reference number correspond(s) to the figure in which the reference number is first used.

Figure 1 is an illustration of a communication system in which the preferred embodiment of the present invention resides. The communication system includes a web server 102, a wide area network 104, destination servers 106A, 106B, and personal computers 108A-C. The personal computers 108A-C are conventional personal computers, e.g., an Apple computer

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or a Compaq computer. The personal computers 108 can be independent or part of a network, for example. The personal computers 108 can be connected directly to the WAN, using a modem, for example, or can be connected to the WAN 102 via a server 106A that uses a leased line, for example. The server 106A can operate using a conventional operating system, for example, UNIX or Windows NT. In order for a user of a computer, e.g., destination computer 108A to access data representing world wide web pages (web pages) from a web server 102, the user of the personal computer 108A identifies a uniform resource locator (URL) address to a web page in the web server 102 and transmits a request signal to the WAN 104. The WAN 104 is conventional, e.g., the Internet, and can use routers to route the request signal to the web server 102. A conventional web server receives a request and transmits the requested web page to the destination computer 108A. The destination computer 108A receives the web page data and displays the web page. This process can repeat several times for each web page requested by the user. The multiple requests per page are to obtain each multimedia object embedded in the page, e.g., pictures, sounds, and videos.

The present invention is a new model for creating, transmitting, and receiving web pages from a web server 102. The invention includes a server module and a client module. The server module is stored and implemented by the web server 102. The client module is stored in the web server 102 and is transmitted from the web server 102 to the destination computer 108A after the web server 102 receives a request from the destination computer 108A. The client module is executed by the destination computer 108A when displaying the web pages of the web site. A more detailed discussion of the server module and the client module is set forth below.

Figure 2 is a more detailed illustration of the web server 102 of the preferred embodiment of the present invention. As stated above, the web server is conventional and includes a conventional central processing unit 202, e.g., a Pentium Pro processor that is commercially available from Intel Corporation, Santa Clara, California, a conventional input/output system 204, conventional random access memory 206, and a conventional storage device 208 having unconventional computer application programs stored therein. The computer application programs stored in the storage device 208 are described in detail below.

Figure 3 is a more detailed illustration of the web server storage device 208 of the preferred embodiment of the present invention. The storage device 208 includes a server web site module 302, a web site project database 304 having menu information 308 and web page information 306, a web site analyzer 310, and a web site configuration module 312. The server

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web site module 302 includes web site data including MIME files. MIME files can include MIME types that provide a technique for enabling web browsers, e.g., Netscape Navigator. to automatically launch a viewing program associated with a received file, hypertext markup language (HTML) data. and common gateway interface (CGI) data. The web site project databases 304 includes menu information 308 and data from web pages 306 extracted from the web page by the web site analyzer 310. A more detailed description of the web site project database is set forth below. The web site analyzer 310 analyzes each web page of the web site, extracts data from each web page, and stores the data in the web site project database 304. The web site configuration module 312 enables a user to create a menu and to create an ordered sequence of web pages that can be presented to a user (client) when a menu item is selected.

Figure 4 is a flow chart describing the method performed by the server module 102 according to one embodiment of the present invention. If the desired web pages of a web site do not yet exist 402 then the web pages are created 404 using conventional web page creation techniques. A web site creation description is provided in Chandler, Running a Perfect Web Site, Que Corporation (1995) that is incorporated by reference herein in its entirety. If the web pages that will be part of the web site exist 402 then the server 102 defines 406 a new site project, analyzes 408 the web pages of the web site, configures 410 the new web site. and saves 412 the web site. A more detailed description of steps 406, 408, 410, and 412 is set forth below. Alternatively, web pages for the web site can be developed concurrently using the present invention.

As stated above. the web server 102 defines 406 a new site project. In one embodiment a new site project is a data structure that is stored in the server storage module 208. When fully defined, the new site project includes or references all of the information about a web site. The information stored about each web site includes general information about the web site and a list of the web pages in the web site. The general information includes information such as: (a) the company's name where the company can be the party to which the web site information is directed, e.g., the company who is advertising on the web site; (b) the webmaster name. e.g.. the creator of the web site; (c) the webmaster electronic-mail (e-mail) address. The list of web pages includes information about each web page, such as:(1) the URL of the web page; (2) a list of links out of the page; (3) a list of links into the page from other web pages in the web site; (4) the title of the web page; (5) the content type of the page, e.g., text, html. and image; (6) a list of pictures/videos/sounds in the page; and (7) the size of the web page. The size (in bytes) of the web page can be determined using any of a variety of techniques. In one embodiment. the size

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of the web page is the sum of the number of bytes in the page's HTML, the size of all image <IMG>, sound <BGSOUND>, object <OBJECT>, applet <APPLET>, and script <SCRIPT> tag files. The information stored about each web page is determined during the steps of analyzing 408 the web site and configuring 410 the web site as described below.

Figure 5 is a flow chart describing the step of analyzing 408 a web site by the web site analyzer 310 according to one embodiment of the present invention. The web site analyzer determines the size of the web page and determines the links into and out of the page as described below. The web site analyzer 310 determines 502 if more web pages need to be analyzed. The web site analyzer 310 selects a web page by selecting one of the hyperlinks of a previously analyzed web page. The web page analyzer 310 analyzes the web page and sets a flag indicating that the web page has been analyzed. If the web site analyzer 310 determines that the web page has already been analyzed, then the web site analyzer sets a pointer to the memory location in the server storage 208 containing the information previously extracted during the web page analysis.

The web page analyzer 310 extracts 504 the title of the web page. In one embodiment, the title of the web page is extracted by identifying the text associated with the title tag (<TITLE>). The title can be displayed in order to identify the web page to the user. The web page analyzer 310 then extracts 506 the hyperlinks of the web page. In one embodiment, the hypertext links are extracted by identifying the anchor tags (<A>), the frame tags (<FRAME>), and map tags (<MAP>) in the web page. The web page analyzer 310 extracts 510 image file names by, for example, identifying the file associated with the image tag (<IMG>), and the web page analyzer 310 determines the size of the image file by (a) reading the HTTP size header or (b) downloading the file. In one embodiment, the HTTP size header is read since it is typically faster than downloading the file. The web page analyzer 310 also extracts 512 embedded file names in the web page by, for example, identifying the file associated with the embedded tag (<EMBED>). Then the web page analyzer 310 determines the size of each embedded file by (a) reading the HTTP size header or (b) downloading the file. The web page analyzer 310 also extracts 512 object files in the web page by, for example, identifying the file associated with the object tag (<OBJECT>). Then the web page analyzer 310 determines the size of each object file by (a) reading the HTTP size header or (b) downloading the file. The web page analyzer 310 also extracts 512 sound files in the web page by, for example, identifying the file associated with the bgsound tag (<BGSOUND>). Then the web page analyzer 310 determines the size of each sound file by (a) reading the HTTP size header; or (b) downloading the file. The web page

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analyzer 310 extracts 514 class file names by, for example, identifying the file names associated with a class file name tag, e.g., <APPLET> in the Java programming language commercially available from Sun Microsystems, Inc., Santa Clara, California. The web page analyzer then determines a list of links out of the web page by downloading and scanning the contents of each class file. The web page analyzer 310 also extracts 516 additional information from the web page. For example, the web page analyzer 310 identifies scripts, e.g., Javascripts and VBScripts, associated with a script tag (<SCRIPT>), downloads the scripts and scans the scripts for links out of the web page. After extracting the above identified information, the web page analyzer 310 determines 518 the size of the web page by summing the number of bytes in (1) the HTML of the web page, and (2) all of the image/embed/class/bgsound/object/script tag files. Steps 504-518 are repeated for each web page.

Figure 6 is an illustration of a computer screen display showing information extracted from the web pages of the web site during the analyze web site process 408, described above, according to one embodiment of the present invention. The computer display illustrated in Figure 6 displays web page information including the web site name 602 "http://McJava/sampletree/morelink.htm", and the status of the analysis 612, a current page identifier 614, the total number of pages 616, the total number of links found in all of the analyzed pages 618. In addition, the display includes information concerning the parsed pages 620 and parsing details 622. The parsed pages 620 shows the list of web pages as they are being parsed. The pages are displayed in a tree structure format that shows the hierarchical nature of the web site. The parsing details 622 shows a detailed list of the links and files found in the page being currently parsed. The site name 602 is the URL of the web site being analyzed. Host information (not shown) can also be displayed. The host is the name of the host machine on which the web site resides. Similarly, a tree level indicator (not shown) can also be displayed. The tree level represents the hierarchical level of the web page in the web site. Any web page may exist at a number of levels (e.g., it may appear as a hyperlink in many different pages in the web site). The level represented here is the level closest to the top of the tree that the page appears. It will be apparent to persons skilled in the art that more or less information can be available to the webmaster when configuring the web site.

After the web site analyzer 310 analyzes 408 the web site, the web site configuration module 312 configures the web site. Although the web site analyzer 310 has searched and analyzed each web page in the web site, the web site analyzer 310 does not modify the original web site. The web site configuration module 312 enables the web site developer, e.g., a

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webmaster, to construct a menu. In one embodiment of the present invention this menu is typically approximately 8-10 items, although it is envisioned that any number of items can be part of the menu. Each item will consist of a sequence of web pages that are displayed in a fixed order. In one embodiment of the present invention the web pages themselves are not modified except for the web page having the menu. In other embodiments the web pages are modified to, for example, ensure that all links out of the web page are deactivated, except for the links defined by the user. Figure 7 is a flow chart describing the step of configuring a modified web site by the web site configuration module 312 according to one embodiment of the present invention. The web site configuration module 312 enables the webmaster to create a menu structure that can be the first web page displayed in the web site. For example, Figure 8 is an illustration of a computer screen display for use in the web site configuration process according to one embodiment of the present invention. The display includes a menu configuration portion 802, a current web site structure portion 804, a status portion 814, and various control buttons that can be selected by the webmaster using a conventional mouse or other pointing device, for example. The control buttons in one embodiment include a menu shuffle up button 806, a menu shuffle down button 808, an add image button 810, an add transition button 812, and a status display 814.

The webmaster determines 704 if any more menu selections need to be modified. If the webmaster decides to modify or define a menu selection, the webmaster selects a menu, and defines 706 a sequence of web pages that will be displayed when the menu is selected. One process for assigning a web page to a menu is: (a) a user highlights the menu in the menu configuration portion 802 using the mouse or keyboard; (b) the user then highlights the web page in current web site structure portion 804; and (c) the user selects the Add button 816. The chosen web page will be added to the menu and will be displayed in the menu configuration portion 802 of the display. For example, a first menu is identified as "Luxury Vehicles" 820 in the menu configuration portion 802 of the display. The menu configuration portion 802 also includes information about the web pages that the webmaster has associated with the menu. For example, the top menu item is "Luxury Vehicles" 820. There are two web pages 822/824 associated with this menu item. These two web pages will be displayed in this order, i.e., web page 822 and then web page 824, when the user ultimately views this web site with their client PC and browser.

The shuffle up button 806 and the shuffle down button 808 enable a user to modify the web site structure by moving a web page up or down in the displayed menu configuration

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portion 802 of the display. These buttons simplify the web site editing procedure for the web master. For example, a web page can be selected by the webmaster and associated with one of the menu items. The webmaster can then move, add, delete, or copy web pages in order to develop a suitable web site presentation sequence. The webmaster can also introduce transitions that can control the transition between web pages by selecting the "Add Transition" button 812. For example, a transition may be a timer of 10 seconds, or a keyclick from the user. In one embodiment the webmaster ensures that the user will view the web pages associated with each menu (if any) only in the predefined sequence by automatically showing the next page in response the transition event. For example, if a timer of 10 seconds has been selected by the web master then after 10 seconds has elapsed the next page will automatically be displayed. The user does not need to perform any action. In alternate embodiments, a limited number of page links are included that enable the user to advance to the next page, return to the previous page, or return to the main menu, for example.

As noted above, conventional web sites are created such that a client who accesses the web site can view the various pages in the web site in almost any sequence. One potentially significant use of the Internet and the WWW is in advertising. In one embodiment, the present invention can be utilized to create a web site having advertisement as a significant purpose of the web site. For example, an automobile company, e.g., General Motors, can develop a web site that advertises its currently available cars and trucks. One important aspect of advertising is the process of creating a need that can be satisfied by the advertiser. In order to efficiently and successfully accomplish this, it is helpful if the advertiser is able to control the sequence of information presented to the user. For example, if a car manufacturer developed a web site, they may not want the client to immediately jump to the web page having the cost of the vehicles. Instead, the advertiser could be more successful and effective if a description of the features and benefits of one or more car models were first shown to the user in order to familiarize the client with the cars and to therefore help persuade the client that the cars offered by the manufacturer will satisfy the needs of the client. After providing the information to the user, the web page having pricing information can be presented to the user. It will be apparent to persons skilled in the art that the above example is merely one example of how the current invention could be used and that many alternatives exist for developing and strategically planning the web page presentation sequence in a web site. The present invention provides the necessary tools to enable a webmaster to quickly, efficiently, and effectively generate a web site that gives control of the web site presentation to the web site owner instead of the client.

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The page link can be displayed as a "Next Page" button or the webmaster can select to have one or more of the web pages transition automatically. Figure 9 is an illustration of an edit transition display 902 according to one embodiment of the present invention. In the example illustrated in Figure 9 the user has the ability to define the event that will trigger a web page transition for any particular web page, e.g., the "Leasing Information" web page as displayed in the menu item display area 904. The available types of transitions are displayed in the available transition portion 906 of the display. The webmaster selects one of the available transition types and activates the Add button 912, and the selection is displayed in the current transition portion 908 of the display. If the webmaster selects the timer option, the webmaster can set the delay between pages by entering the delay in the delay definition portion 910 of the display. To remove a selection from the Current Transition 908 display the web master uses the Remove button 914.

The webmaster also has the opportunity to provide 708 additional information concerning the web site and the individual web pages. For example, some of the information stored in the new site project data structure is defined by the webmaster, e.g., information concerning the company name, webmaster name, webmaster e-mail, and the URL of the main menu page or one or more web pages in the web site, for example. The webmaster has the opportunity to provide this information before or after the defining 706 the web page display sequence for the web site.

Figure 10 is an illustration of a configuration image menu dialog box display 1002 according to one embodiment of the present invention. The dialog box 1002 enables the user to generate a menu display by selecting a menu, e.g., Menu_4, and defining the active regions in the display portion 1006 for the selected menu. In Figure 10, the active region for Menu_4 ("New for '97") is defined in the active region definition dialog box 1008. In some embodiments of the present invention the webmaster does not create an initial menu page, instead only one web page sequence is defined and when the client selects the first page the sequence of the remaining web pages of the web site are displayed to the client in the predefined sequence.

After the webmaster defines the menus and defines the web page sequence associated with each menu, the modified web site is saved 412. In one embodiment of the present invention, the web site is saved as a series of files that are used when web site information is transferred to a client accessing the web site. In one embodiment these files are used to transfer the information gathered by the server tool to the client. The files include a stub Java Applet that is inserted into the home page of the site. One example of such a file is set forth in Table 1.

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<APPLET CODE="browser.class" WIDTH="10" HEIGHT="10">

<PARAM NAME="menu_1" VALUE="[MENU_ITEM NAME='Luxury
Vehicles' AUTO=TRUE RECT=199,92,230,34 IMG=menu.gif]">

     <PARAM NAME="menu_1_1" VALUE="[LINK
     URL=http://www.xyzmotors.com/L2_N2.HTM SIZE=3514
     TRANSIT=TIMER DELAY=10]">

          <PARAM NAME="menu_1_1_1" VALUE="[LINK_OBJECT
          URL=http:// www.xyzmotors.com /Images\I_1_9.GIF
          SIZE=1059 CONTENT=image/gif]">

     <PARAM NAME="menu_1_2" VALUE="[LINK_FILE
     NAME=xyzmotors_menu_1.brw]">

<PARAM NAME="menu_2" VALUE="[MENU_ITEM NAME='Sport Utility'
RECT=199,129,229,39 IMG=menu.gif]">

     <PARAM NAME="menu_2_1" VALUE="[LINK URL=http://
     www.xyzmotors.com /L1_N1.HTM SIZE=12117
     TRANSIT=MENU]">

          <PARAM NAME="menu_2_1_1" VALUE="[LINK_OBJECT
          URL=http:// www.xyzmotors.com /Images\I_1_1.GIF
          SIZE=1257 CONTENT=image/gif]">

     <PARAM NAME="menu_2_2" VALUE="[LINK_FILE NAME=
     xyzmotors _menu_2.brw]">

<PARAM NAME="menu_3" VALUE="[MENU_ITEM NAME='Trucks and
Vans' RECT=198,173,230,47 IMG=menu.gif]">

     <PARAM NAME="menu_3_1" VALUE="[LINK URL=http://
     www.xyzmotors.com /L1_N1.HTM SIZE=12117 TRANSIT=TIMER
     DELAY=10]">

          <PARAM NAME="menu_3_1_1" VALUE="[LINK_OBJECT
          URL=http:// www.xyzmotors.com /Images\I_1_1.GIF
          SIZE=1257 CONTENT=image/gif]">

     <PARAM NAME="menu_3_2" VALUE="[LINK_FILE NAME=
     xyzmotors _menu_3.brw]">

<PARAM NAME="menu_4" VALUE="[MENU_ITEM NAME='Family Fare'
RECT=195,224,232,40 IMG=menu.gif]">

     <PARAM NAME="menu_4_1" VALUE="[LINK URL=http://
     www.xyzmotors.com /L1_N1.HTM SIZE=12117 TRANSIT=TIMER
     DELAY=10]">

          <PARAM NAME="menu_4_1_1" VALUE="[LINK_OBJECT
          URL=http:// www.xyzmotors.com /Images\I_1_1.GIF
          SIZE=1257 CONTENT=image/gif]">

     <PARAM NAME="menu_4_2" VALUE="[LINK_FILE NAME=
     xyzmotors _menu_4.brw]">
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<PARAM NAME="menu_5" VALUE="[MENU_ITEM NAME='New For
'97']">

     <PARAM NAME="menu_5_1" VALUE="[LINK URL=http://
     www.xyzmotors.com /L1_N1.HTM SIZE=12117 TRANSIT=TIMER
     DELAY=10]">

          <PARAM NAME="menu_5_1_1" VALUE="[LINK_OBJECT
          URL=http:// www.xyzmotors.com /Images\I_1_1.GIF
          SIZE=1257 CONTENT=image/gif]">

     <PARAM NAME="menu_5_2" VALUE="[LINK_FILE NAME=
     xyzmotors _menu_5.brw]">

</APPLET>
```

Table 1

These parameters in Table 1 contain specific information about each link on the menu illustrated in the display portion 1006 of Figure 10, and the contents of the pages linked thereto. The menu items are passed as parameters. In the example set forth in Table 1, a naming convention is used to determine the order and structure of the menu. The data is structured with a format that is similar to HTML, but uses square brackets ([and]) instead of angle brackets (< and >). The first parameter (PARAM) is for the first item in the menu, named *menu_1*. Its type is *MENU_ITEM*, and the item's name is *Sport Utility*. The next *PARAM* is a page assigned to the *menu_1*, and its name is *menu_1_1*. The type is *LINK*, its *URL* is http://McJava/dealers/dealers.html, the *TRANSIT* is *TIMER*, and the *DELAY* is 10 seconds. The third *PARAM* is also assigned to the *menu_1* item, but it points to a file that contains the rest of the links for *menu_1*. The file name is *McJava_menu_2.brw*. There are one of these files for each menu item that has more than one link assigned to it. These files are used to limit the amount of information that is transmitted from the server to the client in the initial transmission. Since the number of web pages that could be assigned to all of the menu items could range into the hundreds and thousands, it is generally more efficient to send down a portion of menu information, and then retrieve more menu information as needed. The file structure design is extensible such that as new information is needed new name/value pairs are added. Older version of the software will ignore name/value pairs they do not understand. Newer version of the software will have reasonable defaults if they encounter an older file with missing name/value pairs.

As described above, a client utilizes a computer, e.g., a destination computer 108A, to access the defined web site stored on the server 102. The personal computer used by the client

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can be a conventional personal computer. e.g., an IBM personal computer that is commercially available from IBM Corporation, Armonk, NY. The destination computer 108A includes a conventional CPU, conventional RAM, and a conventional storage device, that can be similar to the server 102 described above. Figure 11 is an illustration of a client computer storage device 1100 according to one embodiment of the present invention. The storage device 1100 includes a conventional Internet browser 1102, a Vayu Web client module 1104, a web page preload module 1106, menu files 1108, and a TCP/IP Internet connection protocol module 1110. The conventional Internet browser provides an Internet gateway to the destination computer 108A. The client uses the Internet browser 1102 to request access to the web site stored in the server storage module 208. The menu files 1108 include the files received from the server 102 in response to the access request. In addition, the personal computer storage module 1100 receives the Vayu Web client module 1104 and the web page preload module 1106 from the server 102. The operation of these modules is described in greater detail below.

In one embodiment, the Vayu Web client module has been implemented using three different techniques. These three techniques allow the client module to operate across the wide variety of client machines currently in use across the Internet, e.g., IBM PC, Apple Macintosh, Sun Microsystems Sparcstation, and across the wide variety of WWW Browsers currently in use, e.g., Netscape versions 2.n and 3.n, and Microsoft Internet Explorer versions 2.n and 3.n. The three techniques are: (1) as a Java Applet; (2) as a Javascript script where Javascript is a Internet language developed by Netscape Corporation; (3) as a Client-Pull mechanism using a <META> tag in the HTML file, that causes the browser itself to automatically load pages on a timed basis. The CONTENT argument contains the time in seconds. The URL contains the target URL. The <META> tag can be:

<META HTTP-EQUIV=REFRESH CONTENT="1 URL=target_url">

Figure 12 is a flow chart describing the method performed by the Vayu Web client module according to one embodiment of the present invention. As described above, the client requests information from the web site server 102 and the destination computer 108A downloads 1202 web site server information. The web site server information initially downloaded includes the Vayu Web client module 1104, the web page preload module 1106, and the new site project data structure that is stored in the menu files 1108. As described above, the new site project data includes information about the web site and includes references to web pages in the web site but does not include all of the web page data. The destination computer 108A implements 1204 a web page preload routine that is executed concurrently with the

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remaining functions performed by the Vayu Web client module, as described below. Figure 13 is a flow chart describing the method performed by the web page preload module 1106 according to one embodiment of the present invention. The web page preload module 1106 gathers local environmental information concerning the client personal computer. This information includes the speed of the modem, the time of day, Internet service provider service level, browser type and version, and operating system type and version. This information is used by the artificial intelligence expert system to dynamically select a preload strategy to optimize the performance of the presentation of web pages to the client. The web page preload module 1106 preloads 1304 the first web page from each of the menus.

While the web page preload module 1106 is preloading the first web page associated with each of the menus, the Vayu Web client module 1104 displays 1206 the menu page and waits for the user to select a menu. When the user selects 1208 a menu item, the Vayu Web client module 1104 identifies 1210 the first web page in the predefined sequence of web pages associated with the menu item and displays 1212 the first web page. Before the user selects a menu item, the web page preload module 1106 preloads the first web page associated with each menu item, as stated above, and then determines the web page loading sequence for subsequent web pages based upon a determination of the most likely menu item selection. The web page preload module 1106 determines the most likely menu item selection based upon the selections of previous clients or, if no clients have previously accessed the web page, the webmaster may indicate which menu item to show first, or the first menu item is selected as the most likely to be selected. The web page preload module 1106 preloads web pages from the sequence of web pages associated with the most likely menu item selection by implementing the rule based expert system of the present invention, described below.

After the client selects a menu item, the Vayu Web client module 1104 and the web page preload module 1106 receive the web page sequence and web page information from the new site data structure in the menu files 1108. Specifically, the new site data structure includes the overall size of the web page, the number of embedded objects in each web page, and the size of the embedded objects in each web page, as described above. In one embodiment of the present invention, the web page preload module 1106 determines a priority for each web page in the web page sequence based upon the environmental parameters of the destination computer 108A, described above, a queue location of the web page in the predefined sequence, the size of the web page, the number of embedded objects in the web page, and the size of the embedded objects in the web page, for example. In addition, the web page preload module is keeping track

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of how long it actually takes to load each page. From this information it calculates the actual throughput that the current client is getting. This throughput is used by the expert system to make decisions about preload strategies. For example, if the throughput falls below a certain value, the preload module may stop preloading certain types of MIME files (e.g., video, sound). The trigger value would be set by the web master during the menu configuration stage, described above. One example of a rule based expert system is set forth in Table 2.

```
; Set preload strategy based upon throughput
IF
     system.throughput < 6kpbs
THEN
     preload.order = STRATEGY_7
ENDIF

; Set preload strategy based upon throughput
IF
     system.throughput < 2kpbs
THEN
     mime.image = NOLOAD
ENDIF

; Set priority based upon size of an embedded object
IF
     object1.size > 250000
THEN
     object1.preload_priority = 5
ENDIF

; Set priority based upon size of an embedded object
IF
     object1.size > 500000
THEN
     object1.preload_priority = 7
ENDIF

; Set priority based upon size of an embedded object
IF
     object1.size > 1000000
THEN
     object1.preload_priority = 10
ENDIF

; Set priority based upon the number of embedded
; objects in a page
IF
     page1.objects > 5
THEN
     page1.preload_priority = 3
ENDIF

; Set priority based upon the number of embedded
; objects in a page
IF
```


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```
     page1.objects > 10
THEN
     page1.preload_priority = 8
ENDIF

; Set preload order based upon browser type and time
of
; day
; MSIE_3x is Microsoft's Internet Explorer Version 3.x
IF
     ; night time hours
     browser.type = MSIE_3x AND (env.timeofday > 20:00
AND env.timeofday < 08:00)
THEN
     preload.order = SEQUENTIAL
ENDIF

; Set preload order based upon browser type and time
of
; day
; STRATEGY_7 is load page 1, then 2, then largest to
; smallest
IF
     ; business hours
     browser.type = MSIE_3x  AND (env.timeofday >
08:00 AND env.timeofday < 20:00)
THEN
     preload.order = STRATEGY_7
ENDIF
```

Table 2

After determining the preloading priority for each web page, the web page preload module 1106 preloads 1308 the web pages having the highest priority. The web page preload module 1106 monitors 1310 the preloading procedure to reduce any delay in displaying web page to the client. The monitoring function of the web page preload module 1106 permits the preload function to be dynamic in that if a problem occurs 1312 in the web page loading process, the web page preload module 1106 sorts and reorganizes 1314 the data. Examples of problems include: (a) when a page is needed to be displayed and has not yet been preloaded or (b) when the preloading is sufficiently ahead of the display so that the local PC web page cache is full, and pages must be discarded (and reloaded). When a problem occurs the expert system is re-initialized with the current data (including the throughput and modified menu files without the web pages that have already been displayed). A modified preload strategy is then determined 1306.

The client continues navigating 1210 through web pages while the destination computer 108A continues displaying 1212 web pages. As described above, in one embodiment of the present invention, the client can passively watch the sequence of web page displays. In alternate

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embodiments, the user has the option of selecting a next page button. Within each web page the client also has the option of manipulating a control panel. Figure 14 is an illustration of a web page control panel 1400 according to one embodiment of the present invention. In this embodiment, the user has the option of returning to the beginning of the web page by selecting control panel button 1402, proceeding to the end of the web page (for example, a video clip embedded in the web page may be skipped) by selecting control panel button 1404, continuing or beginning the execution of the web page display by selecting control panel button 1406, pausing the execution of the web page by selecting control panel button 1408, decreasing the speed of web page execution by selecting control panel button 1410, increasing the speed of web page execution by selecting control panel button 1412, or stopping web page execution by selecting control panel button 1414.

An alternate (preferred) embodiment of the present invention is described below with reference to Figures 15-22. This alternate embodiment includes a standard structure and navigation for the menus (pages containing buttons) and menu items (buttons), allowing the user a set of options at each web page. One benefit of using the standard structure is to make the web site easier to use by the end user and to offer the web site designer more control over what is displayed to the user.

Figure 15 is an illustration of a first menu web page according to an alternate embodiment of the present invention. The first menu page 1500 illustrated in Figure 15 includes a single large button 1502 that includes the name of the company that is the subject of the advertising, e.g., "Vayu Web". The user can select the button 1502 to continue or the user can exit from the web site. In addition, the present invention enables the company to add a graphic display to the button or to the background to enhance the screen display.

The first menu web page can include a tool bar 1504 having various control buttons thereon. These control buttons are enabled and disabled for each web page based upon the web site definitions defined by the webmaster. When the user selects the button 1502, a sequence of pages may automatically be presented after which another menu page appears containing more items. Alternatively, the sequence can be skipped and the next menu page can be presented immediately. While the user is viewing a dynamic sequence, the control functions are typically disabled. The control functions include pause, fast forward, reverse, and exit. In alternate embodiments these control functions are enabled during the presentation of dynamic sequences. While a dynamic sequence is playing the user typically watches the display until the next menu page is reached.

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Figure 16 is an illustration of a second web site menu page according to an alternate embodiment of the present invention. At the next web site menu page 1600, the user has three options, (1) return to the previous menu page, (2) select one of the menu items 1602, or (3) select the auto-play button 1604 to automatically cycle through the sequences following each menu item, for example. The order of cycling through the menu items is determined by the web site designer (web site master). Some items can be excluded from this "autoplay". A menu page can comprise any number of items. In this alternate embodiment the number of items is typically between 1 and 10. The web site designer can add their own graphics to the items or to the page background.

Certain web pages can be static, i.e., they do not automatically display another web page. Frequently, for static web pages, the "pause" and "forward" buttons on the tool bar 1504 are enabled. In this case, the page may include a description of a product and/or ordering information, for example. A maximum viewing time can be specified by the web site designer to proceed to the next page after some amount of time has elapsed, or the web site designer can permit the user to continue to the next web page by selecting a next page control button.

In this alternate embodiment, the tool bar 1504 is located at the top of the screen. The web site designer may choose not to display the tool bar 1504 for certain screens when, for example, the user has no other options within these screens but to wait for the next page. The tool bar 1504 can also include status indicators 1606 to show the remaining time left to view this page. This tool bar 1504 can be used for every page displayed using the present invention.

Another feature of the present invention is that the user is permitted to create multiple versions of each web site where the present invention permits optimization of each web site for different internet throughput rates. For example, the throughput range for different types of Internet access devices commonly used today varies from 14.4 kbps (modem) to 56 kbps (ISDN) to 1.5 megabits/sec (T1). This variation exceeds a factor of 100. Furthermore, users of the present invention on Intranets, e.g., local area networks (LANs) can reach data transfer rates exceeding 10 megabits/sec. Due to transfer rate constraints at the lower throughput speeds, the web site designer may include several versions of a web page, or several versions of a sequence, where a sequence includes a series of pages which are automatically displayed, with each version being a different size to optimize the web site display for different throughput environments. The database can include information about the various page and sequence versions. The artificial intelligence module of the present invention that was described above with respect to the expert system and is described in greater detail below, can automatically

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select the appropriate page version depending on the throughput environment it has determined for a user. The Virtual Design Studio, which is the tool that the web site designer uses to assemble the web pages into advertisement sequences, is designed to assist the web designer in creating optimal sequences for various throughput environments. The Virtual Design Studio will also allow the web site designers to preview the web pages of the web site using a simulator of the present invention in order to simulate environments having various data throughput rates.

It will be apparent to persons skilled in the art that the use of different versions of the web pages is not required to operate the present invention. However, if the web site designer is expecting users with different throughput environments to access the web site, it may be advantageous to create versions of certain web pages that contain videos, sound, etc., so users with faster connections can view web pages having greater detail, while users with lower connections can still get the full benefits of this web site by viewing pages of a smaller size.

The present invention permits different versions of web pages and web sites by providing the web site designer with the option of providing high-quality (larger) pages for users connected at higher throughput rates and lower-quality (smaller) pages for users connected at lower throughput rates. The present invention enables the web site designer to easily mix the smaller pages with the larger pages when the throughput is fast. However, adding larger pages to a low-throughput connection requires the designer to carefully sequence the pages so a large page is preloaded while several smaller ones are being viewed. In addition, some pages take longer to view, for example if they contain detailed textual information that takes longer to read. This longer viewing time can be used to preload larger files. The Virtual Design Studio of the present invention includes modules which assist in the intelligent sequencing of pages in this manner not only to reduce the user's waiting time but also to improve the quality of the pages that can be viewed with slower connections.

Another factor to consider is that the actual throughput rate during an Internet connection session can vary greatly. For example, with a nominal connection speed of 28.8 kbps, the actual transfer rate can easily vary between 10 kbps and 28.8 kbps. Therefore, the artificial intelligence (AI) module of the present invention makes real-time adjustments during a connection session to keep the presentation flowing and prevent waiting time for the user. One of the techniques implemented by the AI module is to leave out certain pages that the designer has identified as being large but with low impact or information content. Another technique is to dynamically switch a higher-quality presentation to a lower one when the throughput slows

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down, and then to switch back to the higher-quality one if the throughput picks up again. The artificial intelligence unit is described in greater detail below.

Figures 6, 8, 9, and 10 are illustrations of screen displays during the analyze web site process 408 and the configure web site process 410 for one embodiment of the present invention as described above. Figures 17-22 are illustrations of screen displays displayed to the web site designer during the analyze web site process 408 and the configure web site process 410 according to an alternate embodiment of the present invention. The Virtual Design Studio is stored in the web site analyzer 310 and enables a web site designer to: (1) construct presentation sequences from pre-existing and newly created web pages; (2) optimize the presentation sequences for different throughput environments and specify alternatives to be used by the artificial intelligence module to compensate for throughput variations in real time; and (3) create menu structures and user navigation through the web site. The virtual design studio includes a site repository information screen that is illustrated in Figure 17. The site repository information screen allows a web site designer to view, insert, delete and edit web page information and web page sequences. For example, the site repository information screen allows the web site designer to assemble pages into the sequences which form the basis of the automated web site content. The site repository information screen also enables the web site designer to modify and maintain the web site.

Figure 18 is an illustration of a screen display of the web site presentation properties of various web site sequences developed by the web site designer. Figure 18 illustrates two alternate web sites, the first web site 1802 is defined to be accessed by clients having a high data transmission connection, e.g., a client having a T1 line. The second web site 1804 is defined to be access by clients having a low data transmission connection, e.g., a client having a 14.4 or a 28.8 kbps modem connection.

Figure 19 is an illustration of a web page sequence properties screen display 1900. The web page sequence properties screen display 1900 identifies the optimal data connection rate for a particular web site sequence. In Figure 19, the optimal user has a connection rate between 14.4 kbps and 33.3 kbps. The web page sequence properties screen display also enables the user to identify a slower alternate web page sequence and a faster alternate web page sequence that can be selected by the artificial intelligence unit, as described below.

Figure 20 is an illustration of a web page property screen display according to an embodiment of the present invention. The web page property screen display 2000 includes information about various components of each web page including the size and download time

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of each component, whether the web page is static or dynamic, as defined above, and defines various timing features of the web page including the nominal load time, the ideal viewing time, the minimum viewing time and the maximum viewing time. In addition the page property enables the user to select various options including the display of control buttons, e.g., the forward and pause button, and enables the user to identify web pages that can be skipped if the actual data throughput is slower than the anticipated data throughput, as determined by the artificial intelligence unit, described below.

Figure 21 is an illustration of a sequence optimizer screen display according to an alternate embodiment of the present invention. The sequence optimizer screen display allows the user to optimize the arrangement of web pages within a web site and to optimize the length of time each web page is displayed. The sequence optimizer screen display is an easy-to-use graphical interface that displays the ideal and estimated viewing times for each page. The sequence optimizer is part of the web site configuration module 312 illustrated in Figure 3. The sequence optimizer of the present invention calls a web page display simulator that is also part of the web site configuration module 312 which provides feedback to the web site designer regarding the presentation of the sequence of web pages to the user under different network throughput conditions. The present invention determines the ideal and estimated viewing times based upon the amount of text in the web page, the level of detail in visual objects, and the length of video objects, for example. The user can modify the viewing time for each page.

Using this ideal viewing time and the estimated page loading time under various network throughput conditions, the Sequence Optimizer graphically displays for each page the amount of credit time, i.e., the time differential between the viewing time and the time at which the page has been preloaded, or the amount of debit time, the time differential between the time at which the page will be preloaded and the viewing time. The user can adjust the parameters for each page and see this credit/debit value change for each page. The parameters that can be set for each page include: the ideal view time, which is the amount of time the designer wants page to display, and the optional view flag, which indicates whether a page can be skipped over if the system is too busy, for example.

In addition the Virtual Design Studio unit automatically computes for each page the estimated minimum view time, which is the minimum time estimate that the page must be displayed before the next page is ready for display, and the normal load time, which is an estimate of the amount of time it will take to download a page in the throughput environment that the designer has set for this sequence.

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The site layout studio unit is part of the web site configuration module 312 and enables the web site designer to create menus and define the web page sequence of the web site. The site layout studio unit displays a site menu page display and a menu item that displays the name of the site. When a user selects the menu item, one of at least two things happen: (1) a sequence of pages will play, or (2) another menu will appear, each of which can contain up to ten menu items. Using this model, sequences and menus can be nested infinitely. Figure 22 is an illustration of the site layout screen display that is displayed to the web site designer according to an alternate embodiment of the present invention. The site layout screen display 2200 includes a menu portion 2202, a menu layout portion 2204, and a control portion 2206. The menu portion 2202 includes the tree of menus and menu items within a site and the links there between. Selecting an object expands it and shows the menus and items linked hierarchically below it. The menu layout portion 2204 displays the screen layout of the menu items on each menu. Selecting a menu in the upper screen causes that menu to be displayed in the menu layout portion 2204. The user has the option of changing the menu style, by selecting the menu style button 2208 in the control portion 2206 in terms of the types of standard menu styles supported by the present invention, e.g., by modifying the displayed graphics and colors.

The virtual design studio unit includes a relational database that resides on the same computer the Virtual Design Studio is on, which can be the web site designer's computer. This database contains all the information regarding the automated web site except for the pages themselves, which are stored in files on the web server. A conventional HTML Generator module of the Virtual Design Studio creates an encoding of the database contents into a format that can be easily read by the client-side software on the user's computer. When the web site designer has completed defining the menus, pages, and sequences for the automated web site, the web site designer runs the HTML generator to create a file which is placed on the web server computer. These generated files contain the HTML code which the client-side processor and AI processing module uses to perform.

The web page preload module 1106 is described above with reference to Figures 11-13. In an alternate embodiment the web page preload module includes an artificial intelligence (AI) module that performs the functions described below. The artificial intelligence module supports the selection of different page versions and additional real-time decisions on page preloading. In other embodiments the artificial intelligence module can be stored on the server instead of the client computer.

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After a user connects to the server having the web site, the AI module is downloaded to the client computer and collects information about the client computer environment including the operating system, processor capacity, Java support capabilities, types of video and audio formats that are supported, and the current throughput rate of the Internet connection. Using this information the AI module makes decisions regarding which version of Java to use and which version of the page sequence to use. Since network conditions can change during the session, the AI module continually monitors the network conditions, e.g., the rate of data throughput, and can modify the web page sequence by skipping a web page, for example, in order to reduce the waiting time for the user. The AI module periodically assesses the state of the session, and makes decisions accordingly. The functions performed by the AI module includes: (1) preloading pages; (2) canceling the preloading process; (3) modifying the rate of play of the current sequence; (4) inserting an additional page, e.g., a message, into the sequence; (5) skipping a page in a sequence being presented; (6) replaying one of the components, e.g., sound or video; and (7) switching to presenting another sequence of pages with a different ideal throughput requirement. A more detailed description of the AI module operation is described below.

In the alternate embodiment the AI module is downloaded to the client computer. Specifically, when the user contacts the web site, a client module is downloaded on the first page and the HTML code output by the HTML generator module of the virtual design studio, described above is also downloaded. This HTML code is used by the client code module and the AI module, and contains the complete description of the web site in terms of the menus, menu items, sequences, and pages found in each sequence. The client module performs three major functions: (1) probing the client machine to determine the client environment and the throughput rate, and uploading the HTML code; (2) displaying menus and pages; and (3) processing user toolbar input.

The client module implements the site template as designed by the web designer. The first menu page is displayed, and the user can choose one of the available options. When the user selects an option, the sequence of web pages associated with that option is displayed in sequence on a display device, e.g., a computer monitor, coupled to the client computer. Each web page can be displayed for a certain period of time, and the client module is responsible for switching pages after the view time has expired.

As stated above, some web pages may have an active toolbar. For example, some pages with a great deal of text may require that the user indicate when the user has finished reading the

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text. It is possible to have a single view time that would work for all users, however fast readers may become frustrated if the view time is too long since the view time would need to be long enough to accommodate slower readers.

The client-server interaction and processing on the Internet World Wide Web is complex, and is greatly affected by factors such as network traffic, the number of clients accessing a particular site, the amount of content the client requested, the computer hardware speed, and the software efficiency. While some of these factors (e.g. modem speed) stay the same during an Internet session, other ones, such as network traffic, varies constantly.

To deliver an uninterrupted or nearly uninterrupted presentation to the user, the AI module frequently monitors the network, the server, and the client environment during a session, and makes complex decisions regarding how to proceed with the presentation. The AI module accounts for processes happening both on the server and on the client computer. The AI module synchronizes these processes while gathering information and while making decisions. The AI module constantly performs "what-if" scenarios, examining different options for preventing interruptions to the pages appearing on the user's display screen.

The AI module relies on the sequences being constructed in an optimal manner for nominal throughput for a particular environment. For example, if the nominal throughput for the sequence is 20 kbps, the AI module presumes that the sequence was constructed to flow smoothly as long as the connection uniformly maintains this throughput. However, the present invention is designed to work under various network conditions, under different server responsiveness, and with a variety of client computer environments, e.g., low-end personal computers with basic web browsers or high-end workstations supporting more powerful web browsers.

As described above, at the beginning of the client session, the AI module determines the client's environment and the current state of the Internet connection. Some of the parameters which will affect the decisions of the AI module are: (1) the processing and Input/Output (I/O) speed of the server machine; (2) the throughput capabilities of the Web Server software; (3) the operating system on the client machine; (4) the client computer's support of Java applets; (5) the client computer's support of JavaScript; (6) the client computer's support of Client Pull technology; (7) the types of video and audio formats that can be played by the browser or plug-in components of the client computer; (8) the maximum number of simultaneous connections to the Server that the client permits; (9) the browser cache size of the client computer; (10) the

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number of users currently communicating with the Web Server: and (11) the current throughput rate of the Internet connection.

In one embodiment of the present invention, the AI module determines the following parameters at the beginning of a session and monitors the following parameters throughout the session: (1) the number of users currently communicating with the Web Server; (2) the current throughput rate of the Internet connection; and (3) the volatility of the network throughput rate.

At the beginning of each presentation, the AI module, based on the parameters of the session: (1) selects the versions of the requested presentation that are supported by the client environment, e.g., Java, JavaScript, ClientPull, or Generic; and (2) selects the starting version of the presentation. As described above, since network conditions may change during the presentation, the present invention can utilize all of the selected versions by, for example, switching between web page sequence versions in response to a variations in network conditions. In addition, the present invention sets the following parameters: (1) the maximum number of simultaneous connections the present invention utilizes; (2) the rate of change of the speed of the presentation sequence in response to change in network conditions; and (3) the types of filler pages, filler applications and special effects to be used during the presentation. In addition, as the session progresses, the AI module preloads new pages, graphics, sound, video and other presentation components. The AI module uses the information obtained during its network monitoring operation to determine whether the original sequence still can be played without interruptions. The AI module also monitors the progress of each component being preloaded from the Web Server, in order to make decisions about when to cancel preloading, or initiate new component preloading, as described above.

Appendix A includes a psuedo-code representation used to implement the AI module and is incorporated by reference herein.

The following is an example of the operation of the AI module. After the client connects to a server, the present invention determines, for example, that the client computer utilizes the Windows 95 Operating System, supports Java applets, supports running QuickTime videos, permits a maximum of two simultaneous connections to the server, and has a browser cache size of 10 megabytes. The AI module determines that versions of the top-level presentation can utilize Java applets and QuickTime video technology.

A probe page is downloaded to the client computer, and the present invention determines that the number of users currently communicating with the web server is at about half of Server's capacity and the current throughput rate of this Internet connection is 1000 kbps.

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The present invention then selects the starting version of the presentation that corresponds to network throughput rate of 1000 kbps, and preloads the first page of the web site. The AI module determines that there are two components currently being downloaded, one from the next page, and one from the following page.

The presentation begins, and the present invention starts presenting selected sequence of pages, while continuing to monitor the presentation and network conditions.

During the presentation, and as a result of the network monitoring performed by the AI module, the present invention detects a drop in network connection's throughput, for example down to 100 kbps.

The AI module of the present invention sets up a virtual scenario of canceling the process of preloading the second component because even though the first component would download sooner, the timing for the next page would still be late.

The AI module determines that current page has an animated GIF component that can be replayed at the end of the page and adds this replay to the scenario being considered. However, invoking a what-if analysis still results in unacceptable timing. Therefore, the expert system consults a presentation script, and determines that at this point a "Skip page", or "Special Effect" actions are not available and, accordingly, rejects this scenario.

The expert system then runs through some other viable "what-if" scenarios, and rejects all of them except the one requiring switching to the sequence corresponding to a 56 kbps throughput.

The AI module then instructs the Vayu Web client module 1104 to modify the selected sequence of pages. The AI module then continues monitoring the presentation and network conditions.

Later in the presentation, the AI module detects an increase in network connection's throughput up to 900 kbps. The expert system sets up a virtual scenario of switching to the sequence corresponding to 1000 kbps throughput, and runs a what-if analysis on that scenario, whose result is acceptable. The AI module then switches back to the sequence of pages corresponding to 1000 kbps throughput, and continues with the presentation.

While the present invention has been particularly shown and described with reference to a preferred embodiment, it will be understood by persons skilled in the relevant art that various changes in form and details can be made therein without departing from the spirit and scope of the invention.

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Appendix A

The following is Java-based pseudo-code for the AI module for an embodiment of the present invention.

Class Definitions

```
class PrSite
{
        //describes the site (e.g. "General Goods")
        //for which presentations are built
        string                  name;
        PrSiteViewVec &     siteViewVec;  //presentation projects
};


class PrSiteView
{
        //hierarchical tree of presentations accessible to user logging-in
        string                  name;
        PrSite &                site;
        PrPage &                rootMenuPage;       //top-level menu
        Presentation &          rootPresentation;   //top-level presentation
};


typedef Vector<Presentation> PresVec

class Presentation
{
        //describes a presentation corresponding to a menu item
        string              name;
        string              type;       //sequence, white-paper, order-form
        PrSiteView &        siteView;
        Presentation &              parent;             //parent in the pres. tree
        PresVec &           childVec;     //first child in the pres. tree
        SequenceVec &       sequenceVec;  //list of alternate page-sequences
        PrPage &            tailMenuPage; //menu to display after presentation
        PrPageVec &         tailPageVec;  //list of pages tacked-on (e.g. order-
                                          //form)
};

class PrSequence
{
        //sequence of pages making up a presentation
        //a presentation may have several alternative sequences
        //for different communication speed, Java support, plug-in support
        string              name;
        string              type;
        string              environmentType;//e.g. for Java-supporting browsers
        Presentation &              presentation; //back pointer to presentation owning
        PrSeqItemVec &              itemVec;      //list of items (pages) comprising this
};

class PrSequenceItem
{
        //item of the presentation sequence
        PrSequence &        sequence;
        PrPage &            page;         //page (usually HTML)
        long                idealViewTime;//prescribed under normal state
        long                minViewTime;
        long                maxViewTime;
        long                loadTime;     //expected load time at throughput
                                          //for which sequence was designed
```


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```
        int                 pauseAllowed; // user pauses when this item is displayed
        int                 forwardAllowed;//enable "forward" button when displayed
        int                 skipAllowed;   .allow skipping this page
        PrPage &            preloadPage;  .//when displaying this item, start preloading
                                          //preloadPage before preloading next page
        PrFxVex       &     fxVec;              //list of available "special effects"
                                          //to be used when timing is Late
        PrSequence &        upSequence;    //another sequence to switch to
                                          //when Internet conditions improve
        PrSequenceItem &    upItem;             //item within sequence to switch to
                                          //when Internet conditions improve
        PrSequence &        downSequence; //another sequence to switch to
                                          //when Internet conditions degrade
        PrSequenceItem &    downItem;     //item within sequence to switch to
                                          //when Internet conditions degrade
};

class PrPage
{
        //HTML page, or special effect page, or applet
        string                      name;
        string                      type;  //HTML, VRML, Applet, FX
        string                      url;   //locator
        long                        size;  //file size (for download monitoring)
        PrComponentVec &    componentVec; //list of components (images, sound, video)
};

class PrComponent
{
        //image, video, sound, applet and other non-text components of a page
        string                      name;
        string                      mime_type;    //image, sound, etc.
        long                        size;         //file size
        long                        playTime;     //play (display) time; for timimg
        string                      url;          //locator
};

class PrFx
{
        //special effect (filler to smooth out the presentation at changing conditions)
        string                      name;
        string                      type;         //text msg, applet, animation clip
        string                      selectionType;       //random, by priority, specific
        PrPageVec &                 pageVec;      //page containing this FX
};


class PrEnvironment
{
        //class of browser environment
        //for which sequences can be created
        string                      name;
};

#include "VauyWebPresSmooth.h"


class PresentationManager : public Applet
{
        int ProbePage()
        {
                //spawn a separate thread to gauge throughput rate
                spawnThread( "ThroughputTest");
```


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```
        //get maximum number of simultaneous connections
        //the browser is allowed to open
        maxConnectionCnt = Browser.getMaxConnectionCnt();

        //get browser's buffer size
        netBufferSize = Browser.getNeetBufferSize();

        //inquire what kinds of plugins the browser has
        Browser.getPlugins(pluginVec);
        for( plugin = pluginVec.firstElement;
             plugin != NULL;
             plugin = plugin.nextElement())
        {
             switch plugin.type
             {
             case pluginStreamingVideo:
                  streamVideoType = StreamVideoTypeVec[plugin.vendor];
                  break;
             case pluginVirtualReality:
                  vrPlayer = Yes;
                  break;
             }    //switch
        }

        // wait for completion of the throughput test thread
        waitFor( finish, "ThrougnputTest");


        //now we have all parameters needed to determine
        //which of the presentation environment to choose
        environ = determineEnvironment();

        //preload the top-level menu, and display it
        spawnThread( "PreloadPage", presView.rootMenuPage);
        curPage = presView.rootMenuPage;
        displayPage( curPage);

        //determine which sequences will potentially be used
        //in the presentation, as well as starting sequence
        rootPresentation.startSequence = DetermineSequences( sequenceVec);

        //preload first page of the chosen sequence
        spawnThread( "PreloadPage", "Fx", presView.rootPresentation);

        //spawn controlling thread
        spawnThread( "rootSequenceManager");

        //spawn a separate thread to monitor throughput rate
        spawnThread( "PeriodicThroughputTest");

    }   //ProbePage()


    int Presentation::SequenceManager()
    {
        curSequence = startSequence;
        curEnv = startEnv;

        //go through all items of the sequence
        seqItem = mainSequence.pageVec.firstElement;
        while( true)
        {
             //reassess the state of the network (since prev. page)
```


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```
curState = assessState();
switch curState

case stThroughputDidNotChangeDramatically:
        //can we preload one more component?
        if( preloadedCount >= MaxPreloadedCount)
        {
                break;
        }
        nextPreloadSeqItem =
                curSequence.getNextPreloadSeqItem();
        nextPreloadComp =
                curSequence.getNextPreloadComponent();
        //check if this comp is already cached
        nextPreloadComp.calcDownloadTime( curEnv);
        nextDownloadOK = true;

        //for each comp being downloaded,
        //see if starting new download will thwart timing
        for(i = 0; i < MaxPreloadedCount; ++i)
        {
                comp = componentBeingDownloaded[ i];
                if( comp.status != stInProgress)
                        continue;
                comp.calcTimeToStart();
                comp.calcRemainingTimeToDownload();

                if( comp.timeToStart <
                                comp.remainTimeDL +
                                nextPreloadComp.totTimeDL)
                {
                        //timing = Late; it is not OK to download
                        nextDownloadOK = false;
                        break;
                }
        }
        if( !nextDownloadOK)
                break; //switch
        //OK to download this component; do it
        spawnThread( nextPreloadComp.preload);
        break; //switch

case stUrlNotFound:         //file not found
        //can we skip this page?
        if( nextPreloadSeqItem.skipAllowed)
                //yes: skip it
                nextPreloadSeqItem.setSkip();
        else
                //no: try to switch sequences
                nextPreloadSeqItem.setJumpSequence();

case stThroughputIncreased:
        //keep count of how steady is the increase
        ThroughputIncreasedCount++;
        ThroughputDecreasedCount = 0;
        nextSequence.nextItem = curSequenceItem.upSeqItem();
        //can we afford (timing-wise) to go up the sequence
        nextSequence.nextItem.calcTiming();
        if(nextSequence.nextItem.timingOK)
                //yes: switch
                setNextItem(nextSequence.nextItem);
        else
                //no: act as if no change
                setStatus(stNormal);
```


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```
                        break;

                    case stThroughputDecreased:
                        //keep count of how steady is the decrease
                        ThroughputDecreasedCount++;
                        ThroughputIncreasedCount = 0;

                        calcCurTiming();
                        if(curSequenceItem.timingOK)
                            //we are still OK for this and next page
                            break;

                        //try different ways to handle oncoming delay
                        //(returns success if we can handle it)
                        if( (status = handleLateTiming()) == Success)
                            break;

                        //cannot handle delay with any other method
                        //try to switch to lower sequence
                        curSequence = curItem.lowSequence;
                        nextItem = curItem.getLowSeqItem();

                        break;

                    case stThroughputLow:
                        //keep count of how steady is the decrease
                        ThroughputDecreasedCount++;
                        ThroughputIncreasedCount = 0;
                        calcCurTiming();
                        if(curSequenceItem.timingOK)
                            //we are still OK for this and next page
                            break;
                        else
                        {
                            setStatus(stThroughputDecreased);
                            continue;  //next iteration picks it up and handles
it
                        }

                    }       //switch
                }       //while
            }       //manager()

            int handleLateTiming()
            {
                //if we currently are displaying text,
                //inclrease viewing time by 20%
                //(whehter it helps or not)
                if(curItem.page.mimeType = "text")
                {
                    increaseViewTime(curItem, percentIncreaseForText);
                    calcCurTiming();
                    if(curSequenceItem.timingOK)
                    {
                        return Success;
                    }
                }


                //can we replay any components already loaded?
                if( curItem.replayCompVec != NULL)
                {
                    //rule: if comp i is replayed,
                    //then i+1, i+2, ... must be replayed
                    comp = curItem.replayCompVec.lastElement();
```


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```
                while (comp != NULL)
                {
                        virtualAddComp( comp);
                        calcCurTiming();
                        if(curSequenceItem.timingOK)
                        {
                                curItem.setReplay(comp);
                                return Success;
                        } else
                                //try one more replay-components
                                comp = comp.PreviousElement();
                }
        }
        //are we preloading two pages ahead?
        //see if stopping that will help
        //if it does not help, do NOT stop preloading it yet!
        while(1)
        {
                seqItem = getLatestItemForWhichCompBeingPreloaded();
                if( seqItem != curItem
                        && seqItem != curItem.nextElement)
                {
                        virtualStopDownload(seqItem.downloadingComponents);
                        calcCurTiming();
                        if(curSequenceItem.timingOK)
                        {
                                //we will be OK for this and next page
                                stopDownload(seqItem.downloadingComponents);
                                return Success;
                        }
                } else
                        break;
        }       //while

        //can we skip next page (or couple)?
        while( curItem.nextElement.skipAllowed)
        {
                curItem.nextElement.setSkip();
                calcCurTiming();
                if(curSequenceItem.timingOK)
                {
                        //we will be OK for this and next page
                        return Success;
                }
        }
        //try FXs available
        if( curItem.FxVec != NULL)
        {
                fx = curItem.FxVec.firstElement();
                while( fx != NULL)
                {
                        virtualApplyFx( fx);
                        calcCurTiming();
                        if(curSequenceItem.timingOK)
                        {
                                //we will be OK for this and next page
                                return Success;
                        }
                }
        }
        return Fail;
}       //handleLateTiming()

}       //class
```


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CLAIMS

What is claimed is:

1. A computer based method for generating a web site having a plurality of web pages, the computer having a storage module and having a wide area network interface, the method comprising the steps of:

designing a menu web page having one or more menu items;

designing a sequence of web pages, including a first and second web page, for each of said menu items, said first web page only capable of accessing one of said second web page and said menu web page, said second web page only capable of accessing the immediately subsequent web page in said sequence of web pages and said menu web page, said sequence of web pages;

identifying each menu item with one of said sequence of web pages; and

storing said menu web page and web page sequence information in the storage module.

2. The method of claim 1, wherein said sequence of web pages is designed by a webmaster, said sequence of web pages enables the webmaster to control the content and sequence of information displayed to the client.

3. The method of claim 2, further comprising the step of:

receiving a request signal from a destination computer via the wide area network interface, for requesting access to the web site;

transmitting said menu web page and said web page sequence information to said destination computer via the wide area network;

displaying said menu web page to a client on a display device coupled to said destination computer;

preloading additional web pages before said client selects a menu item;

receiving a menu item selection from a client;

preloading said sequence of web pages associated with said selected menu item, using a dynamic preload algorithm; and

displaying said sequence of web pages to the client without permitting the client to alter said sequence.

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4. The method of claim 3, wherein said step of preloading said sequence of web pages includes the steps of:

determining a data receiving rate of the destination computer:

determining the size of two or more web pages in said sequence of web pages:

setting a priority value for each of said two or more web pages in said sequence of web pages based upon said data receiving rate, said size of said web page, and the position in said sequence of said web page:

preloading one of said two or more web pages into said destination computer storage module, based upon said priority value; and

dynamically modifying said priority value of one or more web pages to reduce any delay in displaying one of said web pages to the client.

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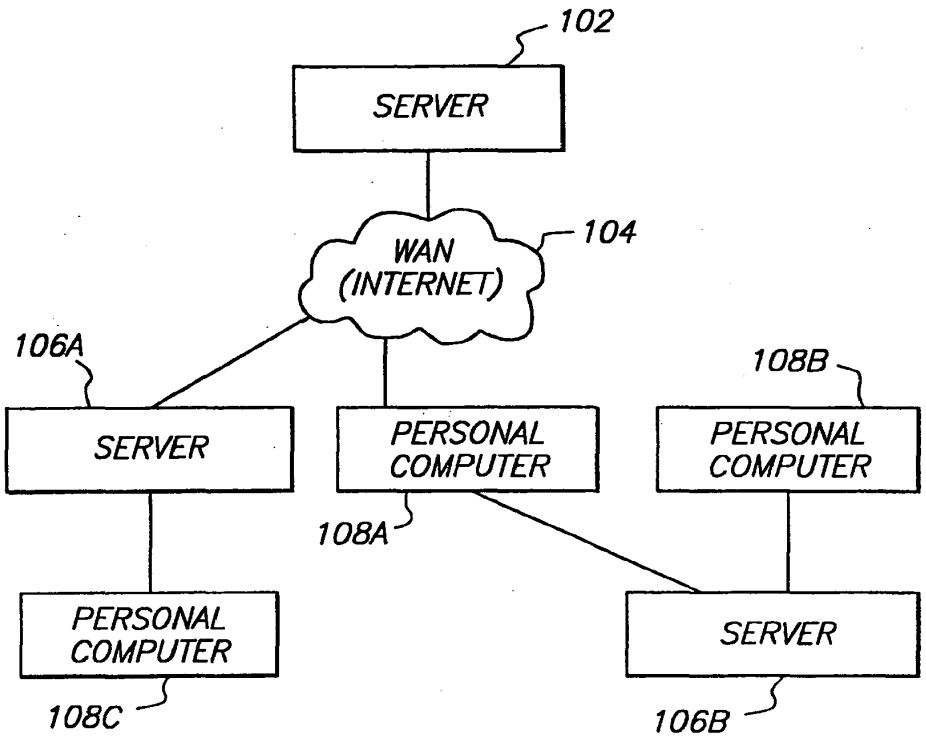


FIG. 1

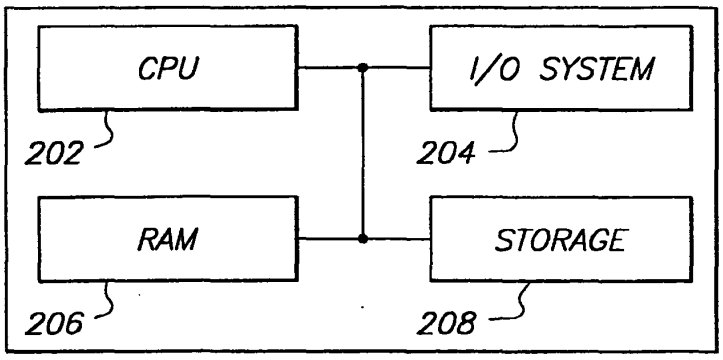


FIG. 2

ISDOCID: <WO___9820434A3_IA>

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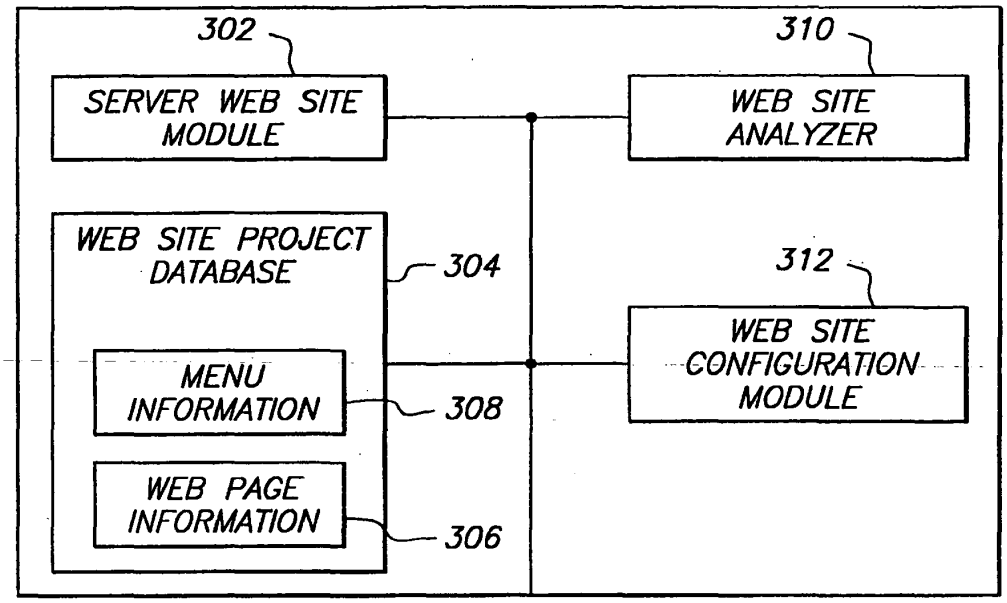


FIG. 3

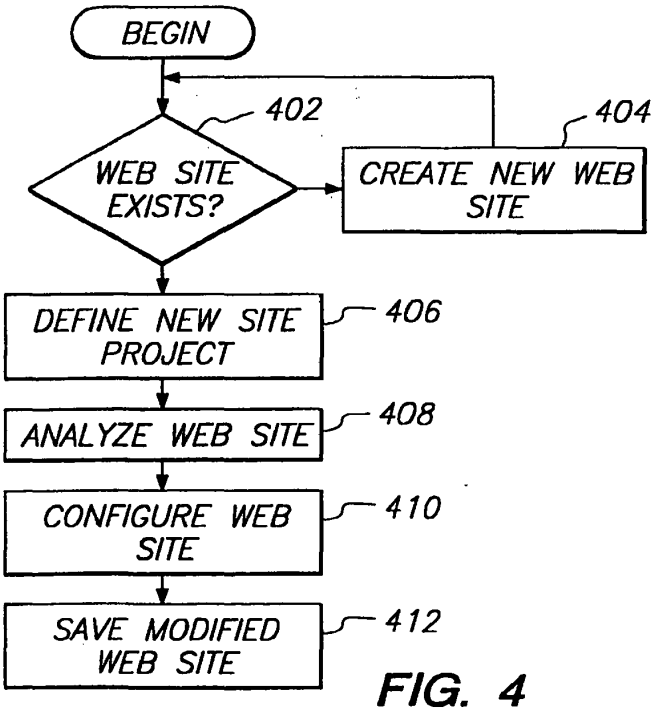


FIG. 4

SDOCID: <WO___9820434A3_IA>

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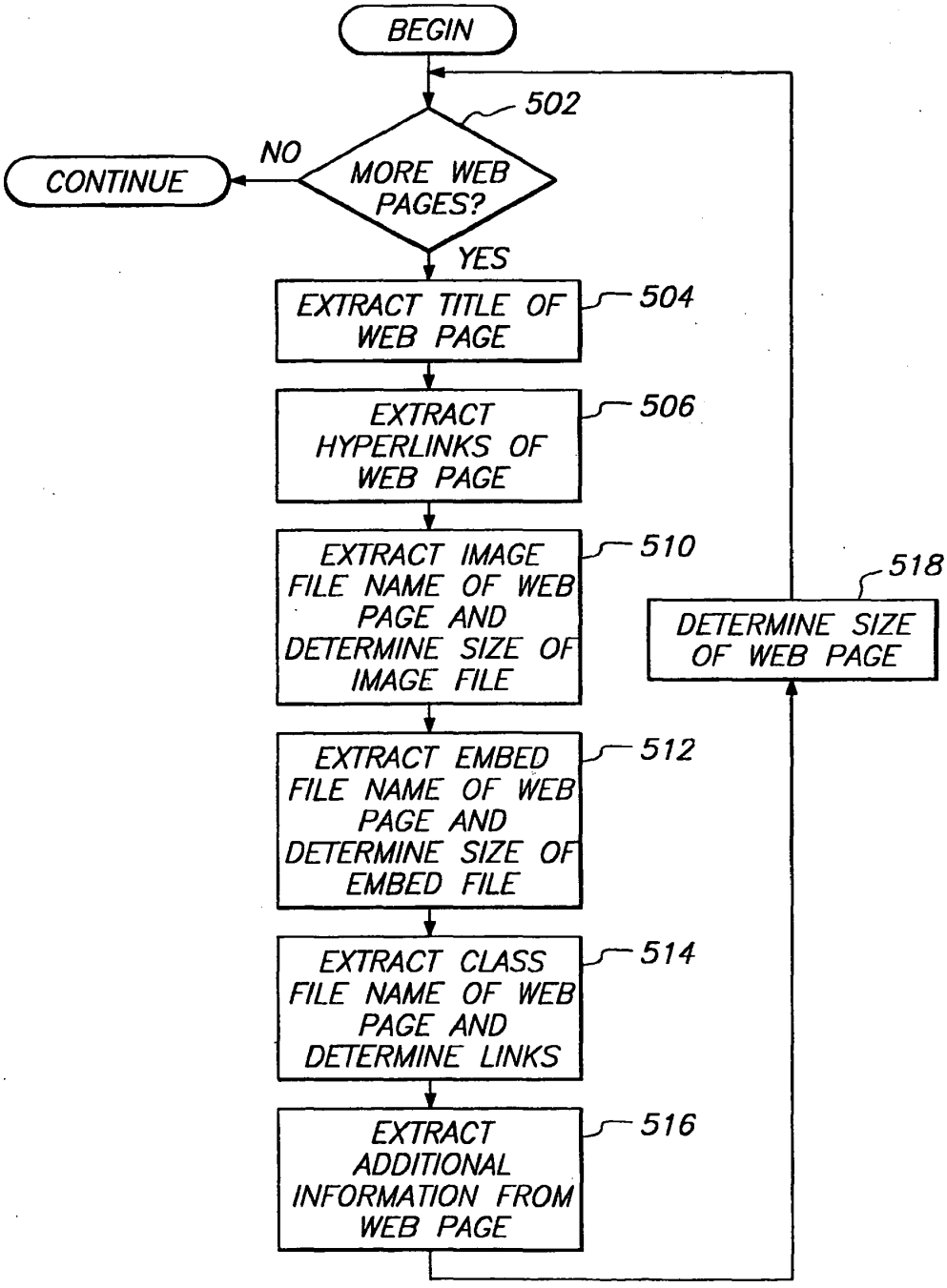


FIG. 5

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<SDOCID: <WO___9820434A3_IA>

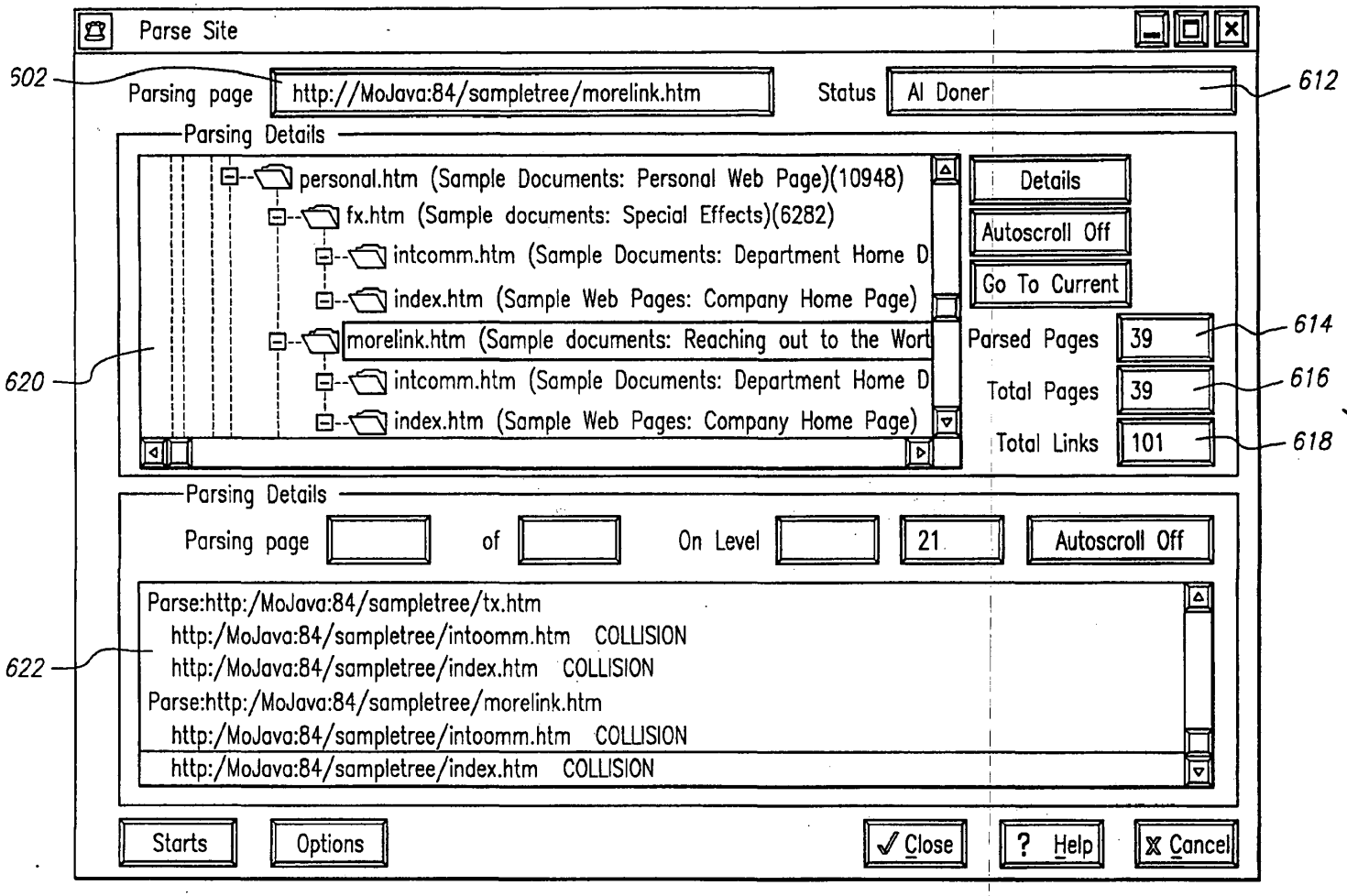


FIG. 6

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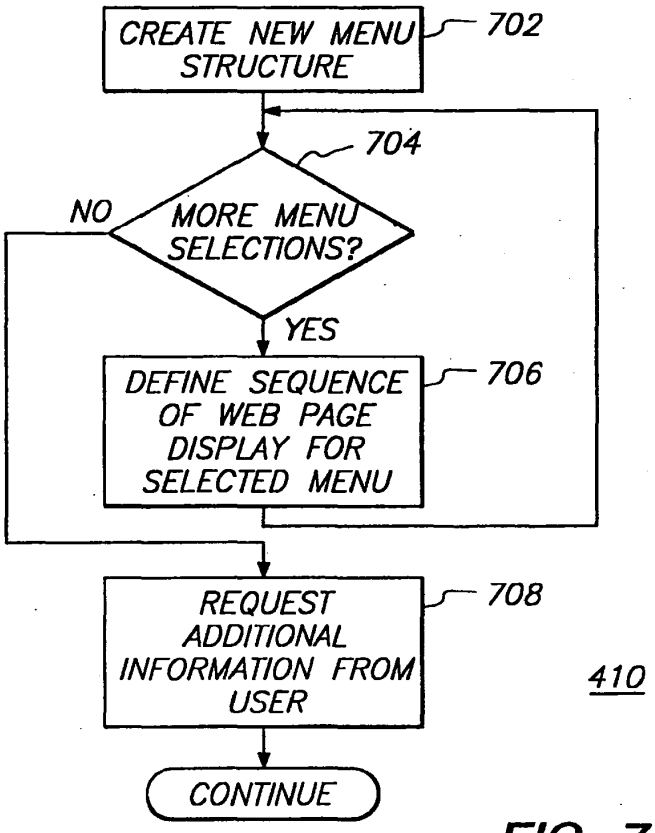


FIG. 7

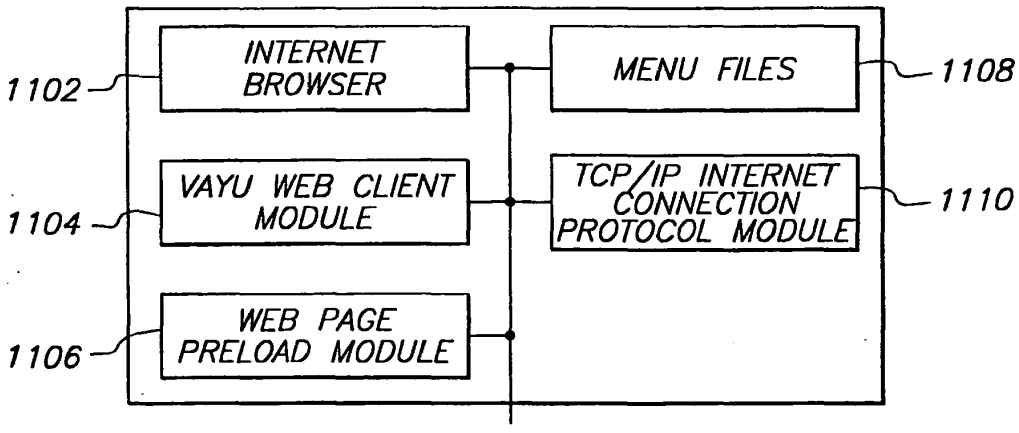


FIG. 11

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<SDOCID: <WO__9820434A3_IA>

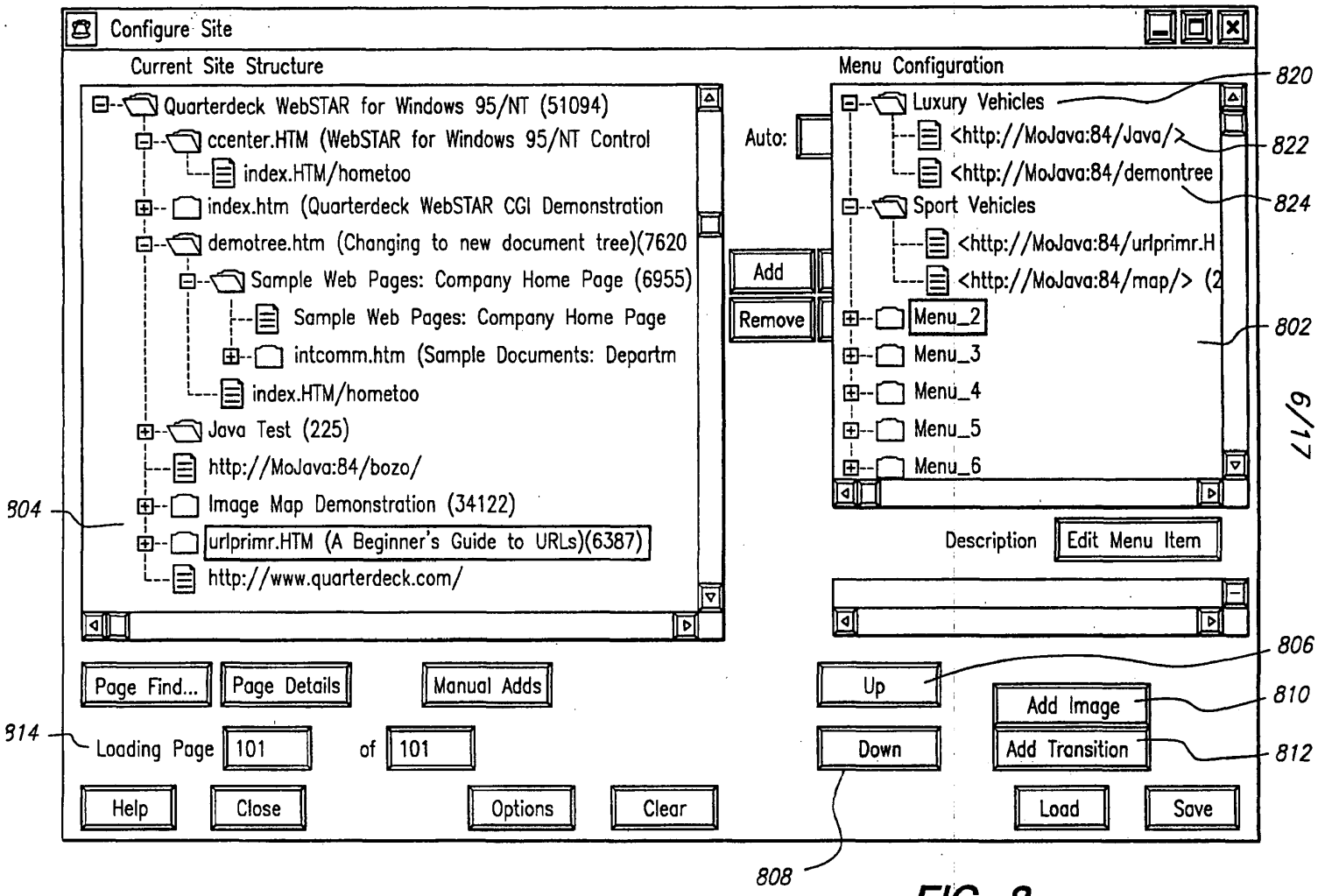


FIG. 8

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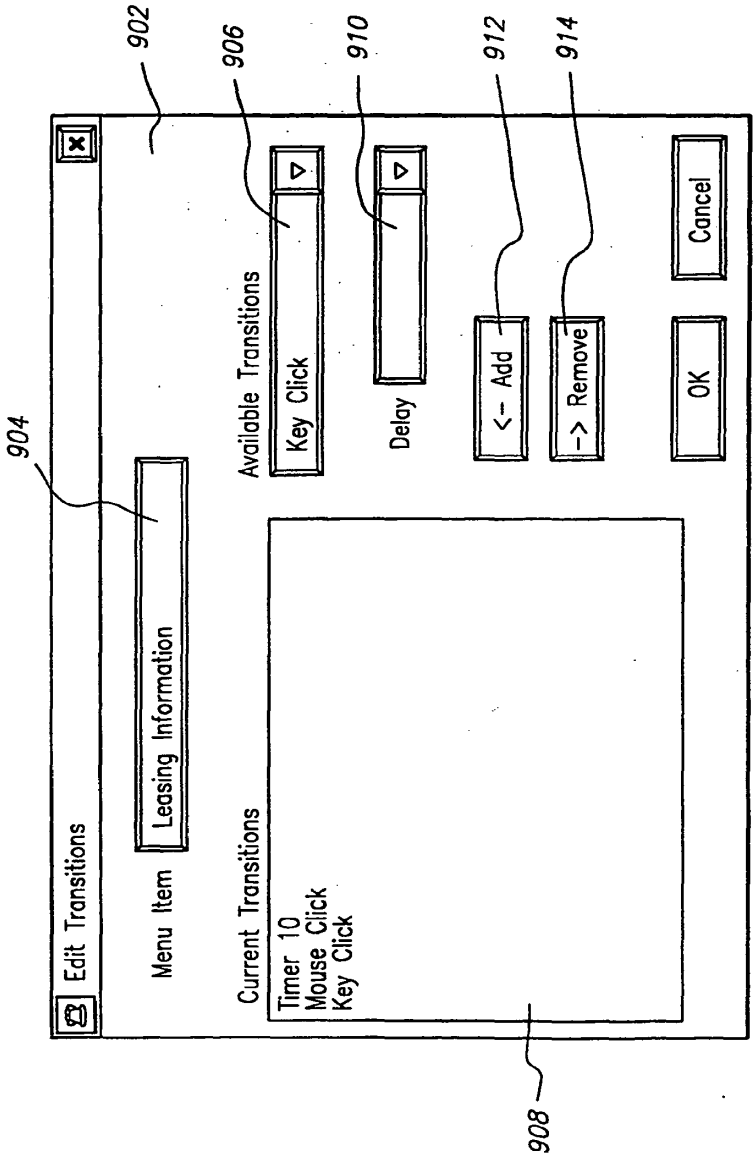


FIG. 9

{SDOCID: <WO___9820434A3_IA>

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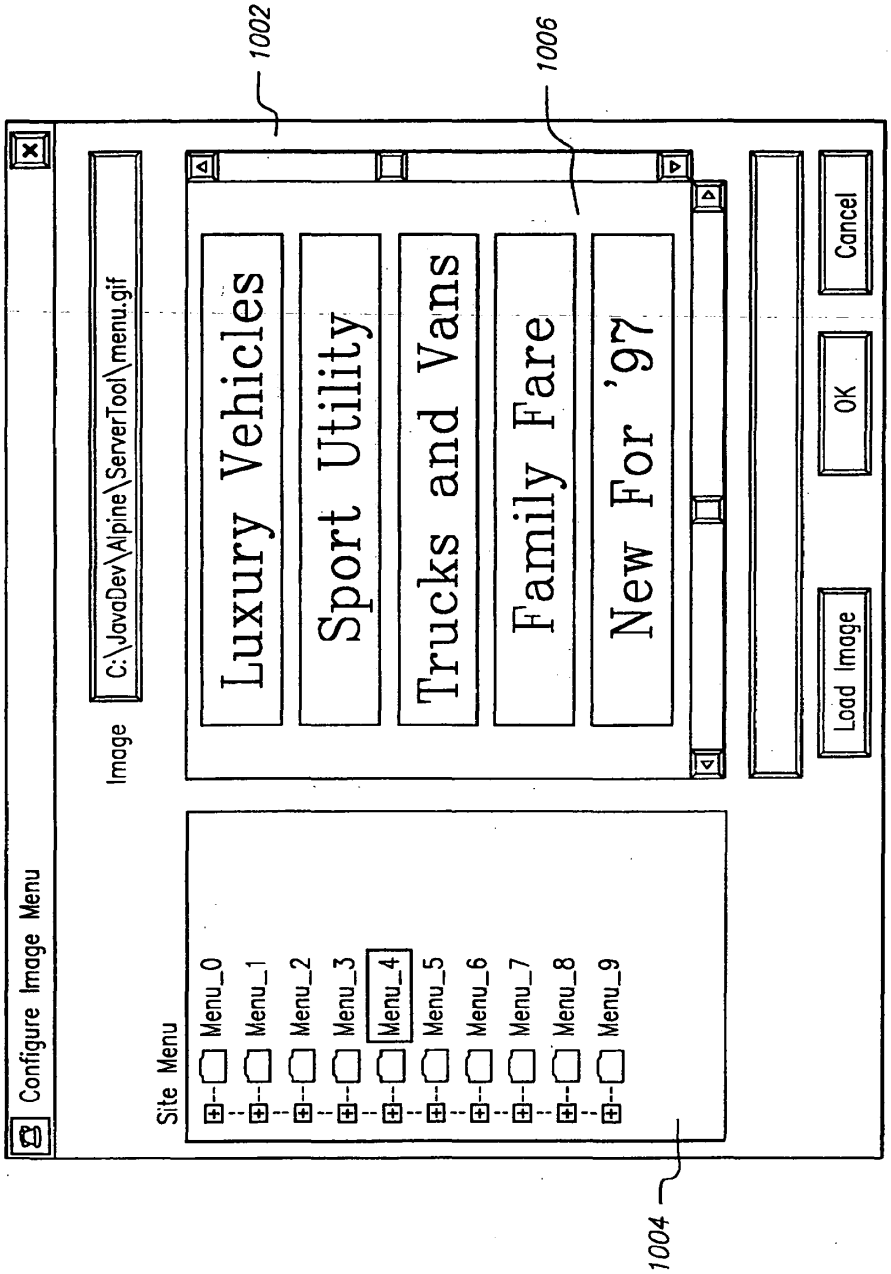


FIG. 10

ISDOCID: <WO___9820434A3_IA>

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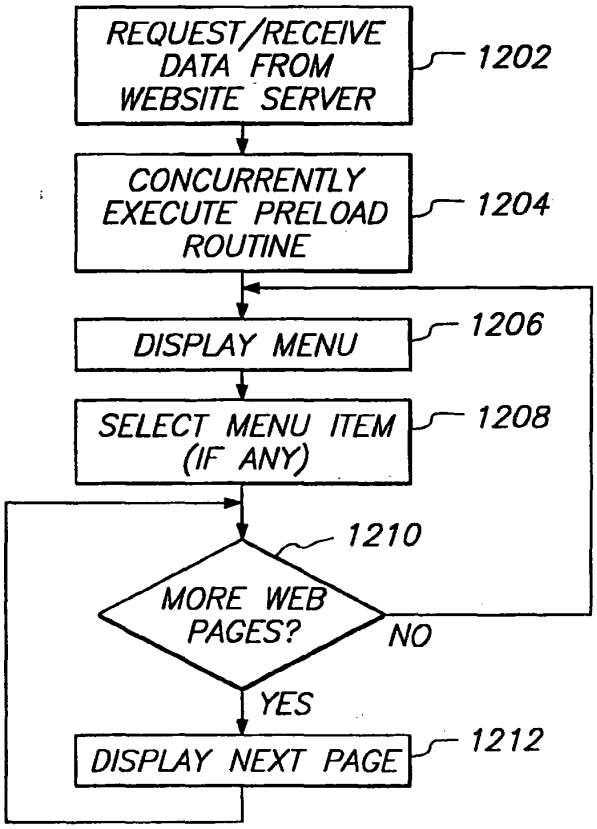


FIG. 12

SDOCID: <WO___9820434A3_IA>

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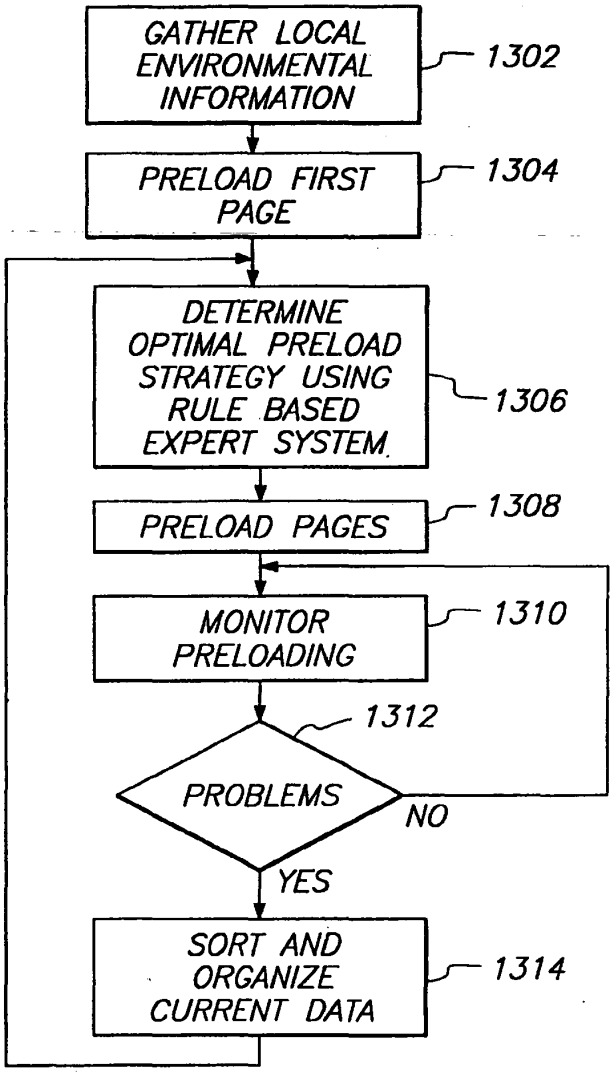


FIG. 13

{SDOCID: <WO___9820434A3_IA>

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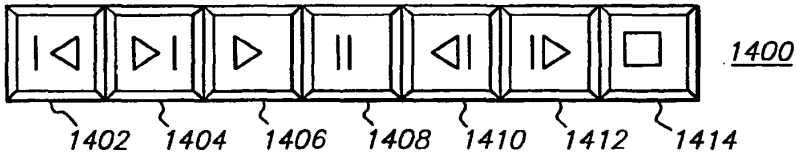


FIG. 14

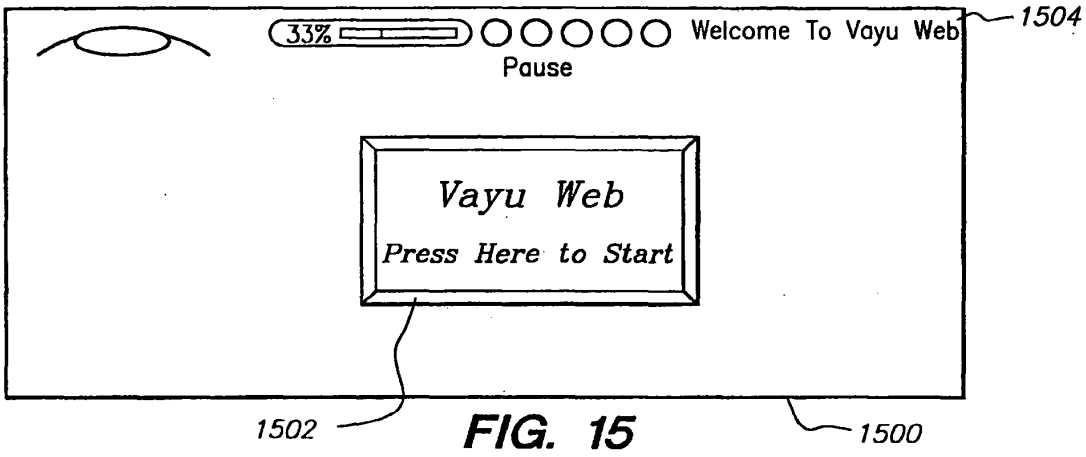


FIG. 15

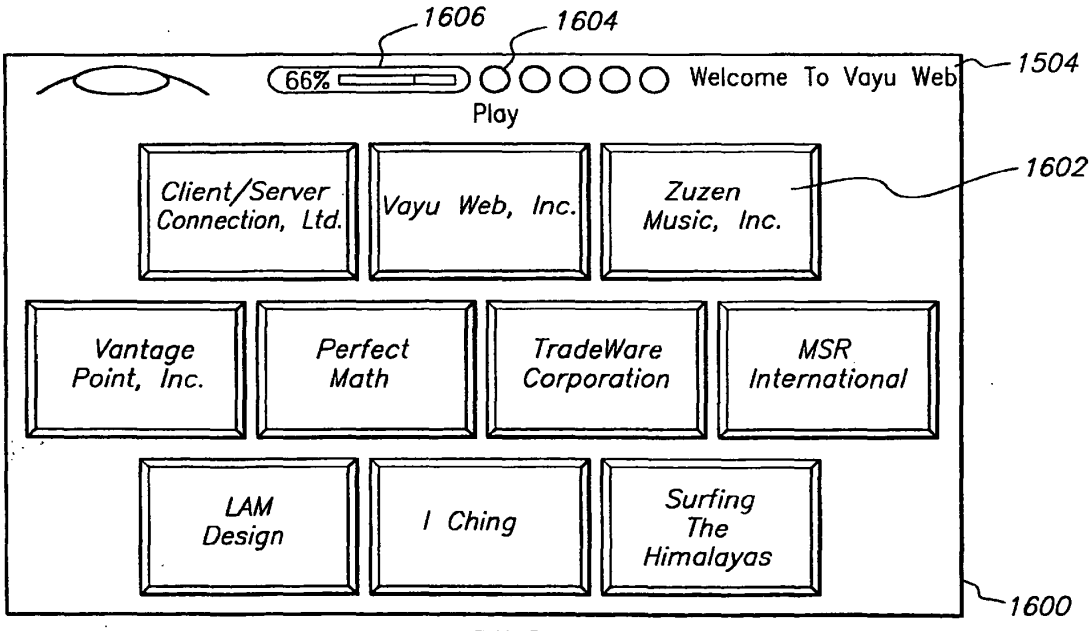


FIG. 16

SDOCID: <WO___9820434A3_IA>

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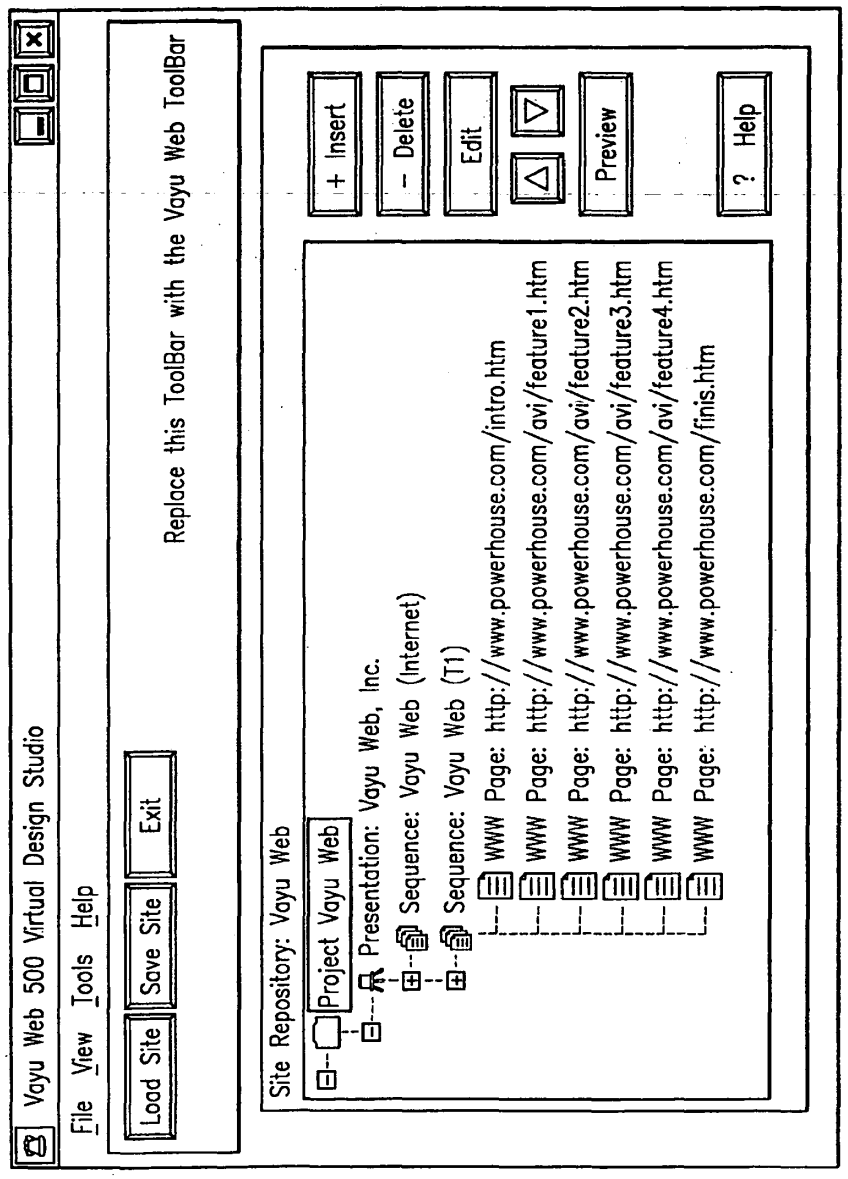


FIG. 17

ISDOCID: <WO___9820434A3_IA>

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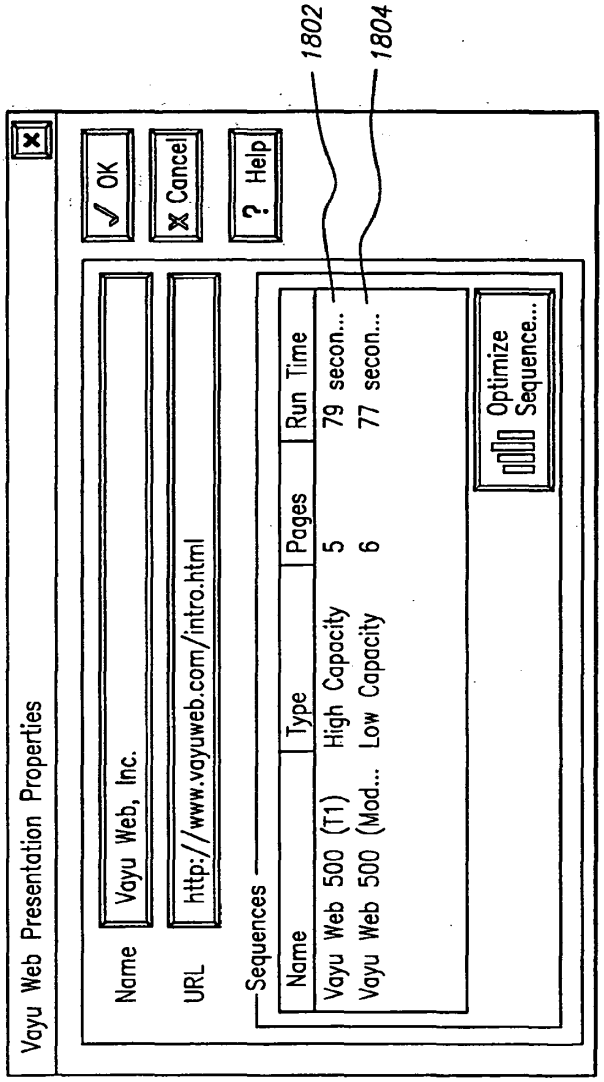


FIG. 18

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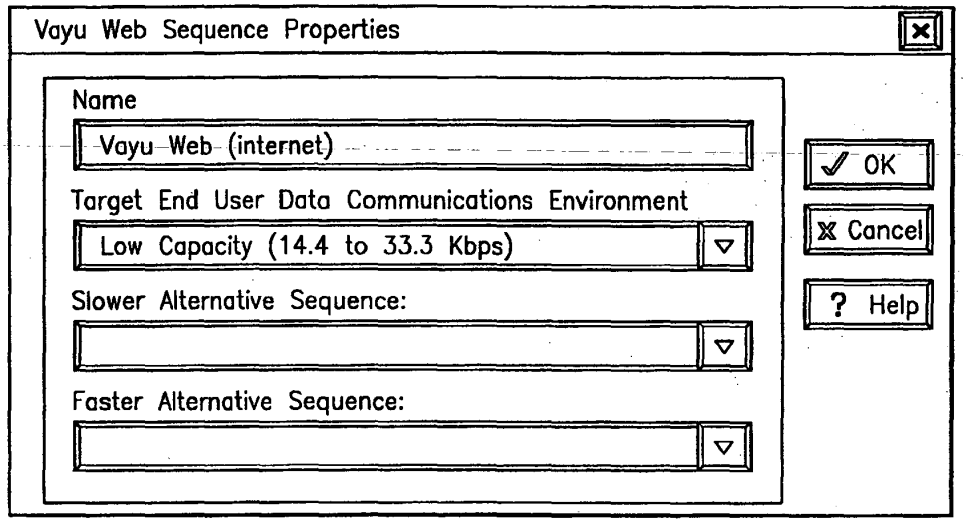


FIG. 19

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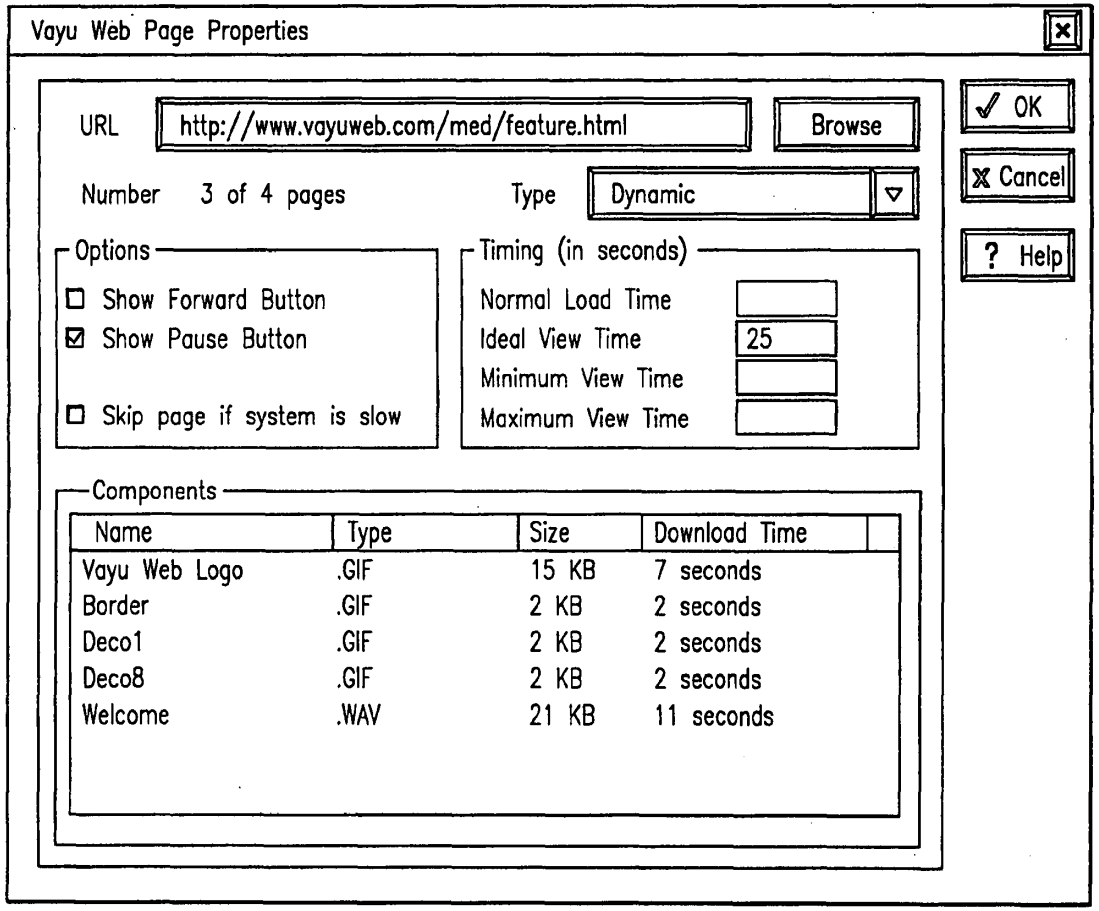


FIG. 20

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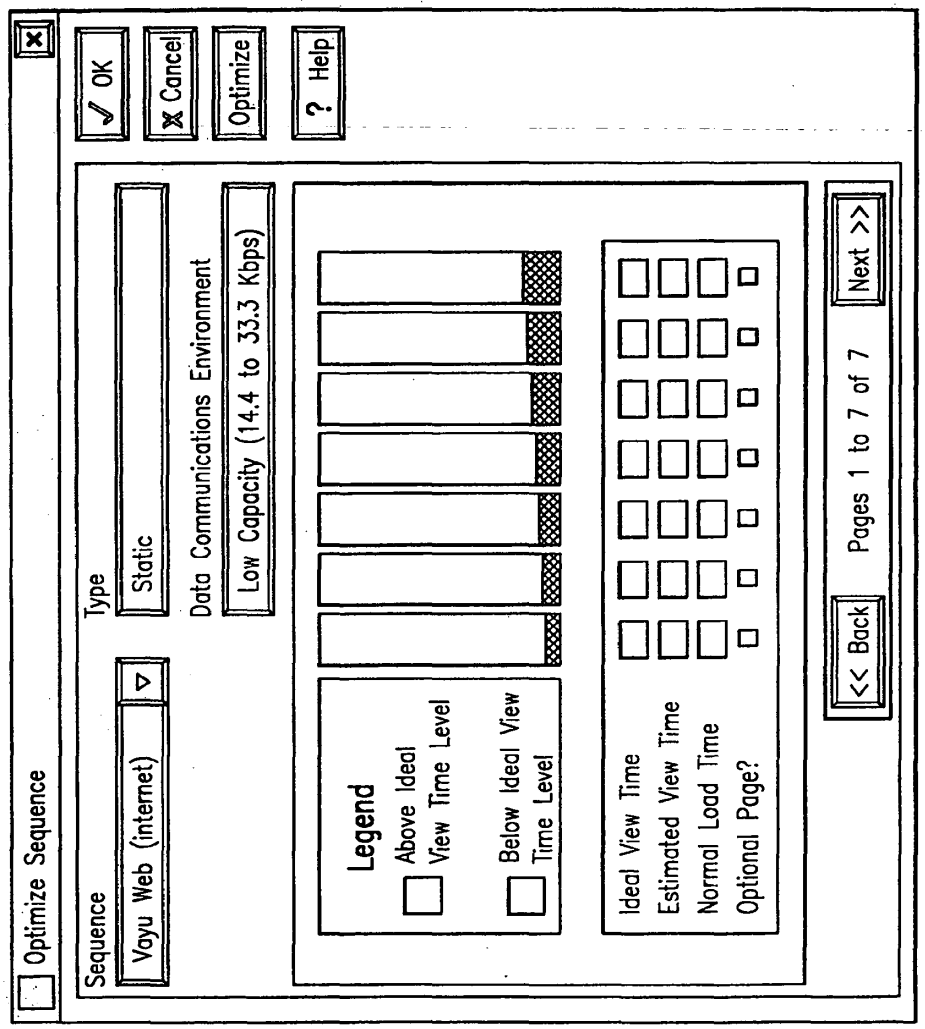


FIG. 21

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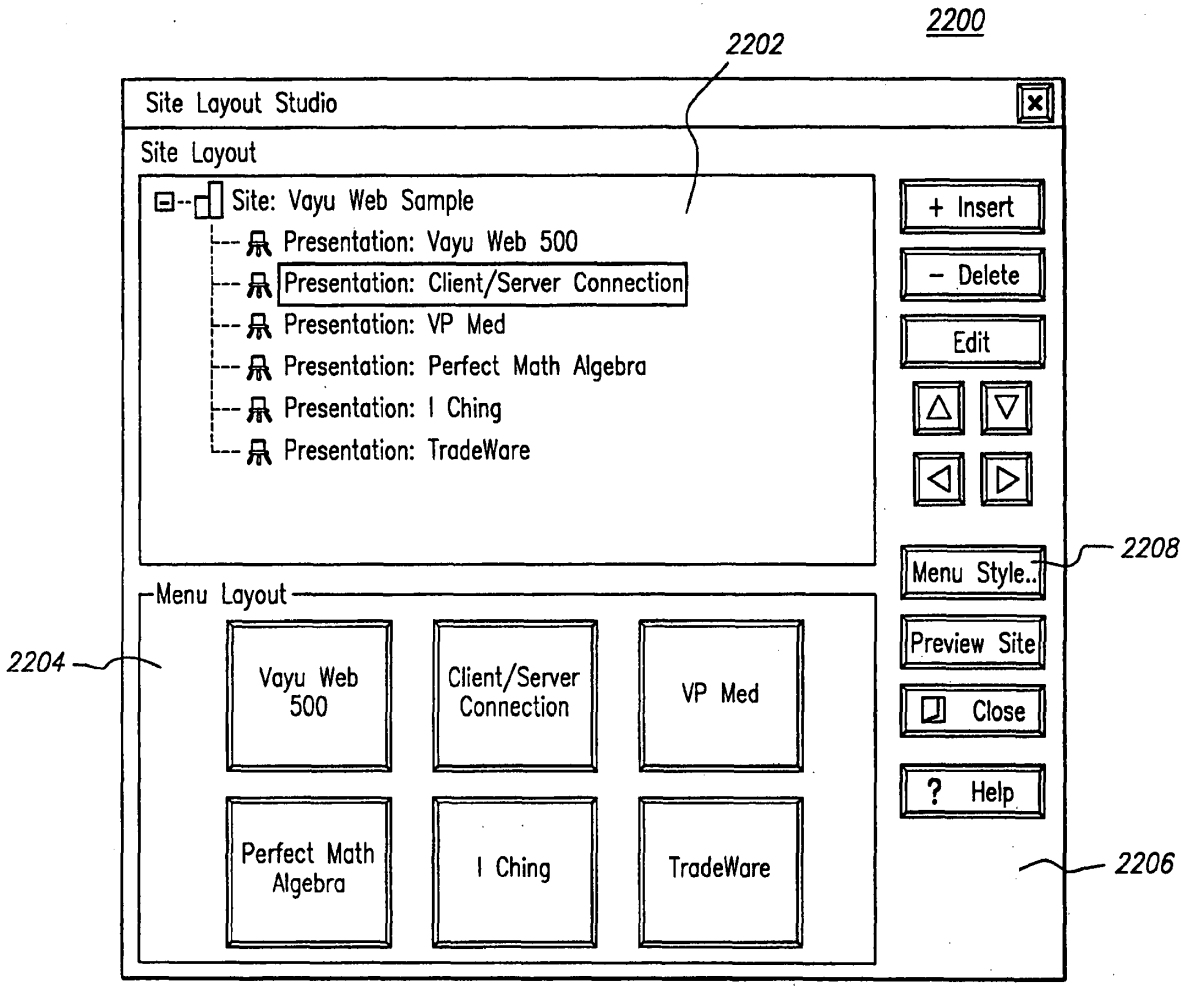


FIG. 22

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INTERNATIONAL SEARCH REPORT

Int ional Application No
PCT/US 97/19719

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 G06F17/30

According to International Patent Classification(IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 G06F H04L

Documentation searched other than minimumdocumentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CRESPO A ET AL: "WebWriter: A browser-based editor for constructing Web applications" COMPUTER NETWORKS AND ISDN SYSTEMS, vol. 11, no. 28, May 1996, page 1291-1306 XP004018228 see page 1291, column 2, line 6 - page 1291, column 2, line 17 see page 1293, column 1, line 15 - page 1293, column 2, line 31 see figure 2	1,2
Y	--- -/--	3,4

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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1

Date of the actual completion of theinternational search	Date of mailing of the international search report
24 April 1998	04/05/1998

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Abbing, R

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INTERNATIONAL SEARCH REPORT

Int. Jonal Application No
PCT/US 97/19719

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the *relevant* passages	Relevant to claim No.
Y	PATENT ABSTRACTS OF JAPAN vol. 015, no. 476 (E-1140), 4 December 1991 & JP 03 204259 A (NIPPON TELEGR & TELEPH CORP), 5 September 1991, see abstract	3
Y	EP 0 669 587 A (AT & T CORP) 30 August 1995 see abstract see column 2, line 55 - column 3, line 18 see column 18, line 34 - column 21, line 13	4
X	LADD D A ET AL: "PROGRAMMING THE WEB: AN APPLICATION-ORIENTED LANGUAGE FOR HYPERMEDIA SERVICE PROGRAMMING" INTERNATIONAL WORLD WIDE WEB CONFERENCE, December 1995, pages 1-17, XP002049893 see page 6, line 24 - page 7, line 9	1,2

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte ional Application No
PCT/US 97/19719

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0669587 A	30-08-95	CA 2140850 A	25-08-95
		US 5715404 A	03-02-98

Form PCT/ISA/210 (patent family annex) (July 1992)

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08/846,900	1 May 1997 (01.05.97)	US

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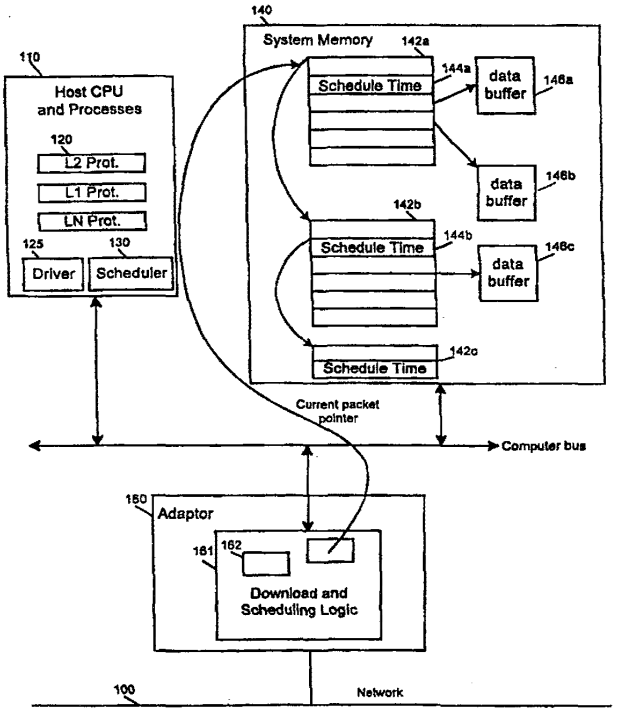
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(54) Title: METHOD AND APPARATUS FOR TIME-BASED DOWNLOAD CONTROL

(57) Abstract

A network transmitter schedules packets so that packets are transmitted to a host or group of hosts so as not to overload any particular part of the network. In an embodiment, the transmitter uses packet data structures with a schedule indication for packets placed in the queue (146a–c) so that an independently running adaptor (160) may know when to remove packets from the queue (146a–c) and transmit them. In an alternative embodiment, packets are scheduled by setting a future interrupt for transmitting a packet or group of packets. In a further embodiment, packets are placed in temporal sets where a temporal set is a group of packets that can be transmitted in succession without violating the bandwidth limitations of any network segment.



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METHOD AND APPARATUS FOR TIME-BASED DOWNLOAD CONTROL

BACKGROUND OF THE INVENTION

This application claims priority from provisional patent application serial number 60/032,124, filed December 5, 1996, which discussed a number of background concepts related to the invention.

The current invention relates to the field of electronic circuits. More particularly, the current invention relates to improvements in networked computer environments and has particular applications to the transmission of information between digital devices over a communications medium. A wide variety of types of computer systems and networks exists, each having variations in particular implementations. The present invention will be described with reference to particular types of systems for clarity, but this should not be taken to limit the invention. It will be apparent to those of skill in the art that the invention has applications in many different types of computer and network systems. The invention therefore should not be seen as limited except as specifically provided in the attached claims.

Digital computer networks have become ubiquitous in academic, industry, and office environments. A number of different aspects of computer networks are discussed in co-assigned pending U.S. applications serial nos. 08/313,674; 08/542,157; 08/506,533; and 08/329,714 each of which are incorporated herein by reference to the extent necessary to understand the invention.

This specification presumes familiarity with the general concepts, protocols, and devices currently used in LAN networking and WAN internetworking applications such as, for example, the IEEE 802 and ISO 8802 protocol suites and other series of documents released by the Internet Engineering Task Force. Many examples of such protocols are publicly available and are discussed in more detail in the above-referenced

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patent applications and therefore will not be fully discussed here.

Fig. 1

Fig. 1 illustrates a local area network (LAN) 40 of a type that might be used today in a moderate-sized office or academic environment as an example of a type of network in which the present invention may be employed. LANs are arrangements of various hardware and software elements that operate together to allow a number of digital devices to exchange data within the LAN and also may include internet connections to external wide area networks (WANs) such as WANs 82 and 84. Typical modern LANs such as 40 are comprised of one to many LAN intermediate systems (ISs) such as ISs 60-62 and 67 that are responsible for data transmission throughout the LAN and a number of end systems (ESs) such as ESs 50a-d, 51a-c, and 52a-g, that represent the end user equipment. The ESs may be familiar end-user data processing equipment such as personal computers, workstations, and printers and additionally may be digital devices such as digital telephones or real-time video displays. Different types of ESs can operate together on the same LAN. In one type of LAN, LAN ISs 60-61 are referred to as *bridges* and WAN ISs 64 and 66 are referred to as *routers*, and IS 67 is referred to as a *repeater*, however many different LAN configurations are possible, and the invention is not limited in application to the network shown in Fig. 1.

The LAN shown in Fig. 1 has segments 70a-e, 71a-e, and 72a-e, and 73a. A segment is generally a single interconnected medium, such as a length of contiguous wire, optical fiber, or coaxial cable or a particular frequency band. A segment may connect just two devices, such as segment 70a, or a segment such as 72d may connect a number of devices using a carrier sense multiple access/collision detect (CSMA/CD) protocol or other multiple access protocol such as a token bus or token ring. A signal transmitted on a single segment, such as 72d, is generally simultaneously heard by all of the ESs and ISs connected to that segment.

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Drivers and Adaptors

The ISs and ESs in Fig. 1 generally each includes one or more *adaptors* and a set of *drivers*. An adaptor generally includes circuitry and connectors for communication over a segment and translates data from the digital form used by the computer circuitry in the IS or ES into a form that may be transmitted over the segment, e.g., electrical signals, optical signals, radio waves, etc. An ES such as 50b will generally have one adaptor for connecting to its single segment. A LAN IS such as 61 will have five adaptors, one for each segment to which it is connected.

A driver is a set of instructions resident on a device that allows the device to accomplish various tasks as defined by different network protocols. Drivers are generally software programs stored on the ISs or ESs in a manner that allows the drivers to be modified without necessarily modifying the IS or ES hardware.

Adaptor to Host Interface

Another aspect of networks is the interface between the network, the adaptor, and the host operating system. Some types of network protocols may require a large amount of attention from a host processor. This can be undesirable where a host's activity on the network impinges on the host processor's ability to perform other host functions. Adaptors may also differ in their ability to buffer network traffic. Some adaptors rely on the host to buffer most network traffic and do not include a large amount of buffer memory on the adaptor itself.

Need For Improved Transmission Scheduling

In recent years, the amount and type of data that users wish to transmit over a network has increased dramatically. This increase is not only in the total amount of data transmitted, but also in the number of different types of data streams that might be carried on the same network. Increasingly, users desire a LAN such as that shown in Fig. 1, to carry digital data, such as electronic messages or program

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and data files, real-time audio signals, and real-time video signals, all over the same network. These different data streams may have widely different requirements in terms of total bandwidth and sensitivity to latency and jitter.

What is needed is an improved network component that can effectively operate on a network carrying different types of data traffic with different operating speeds and prevent slower components in a network from degrading the transmission performance of other components.

SUMMARY OF THE INVENTION

The present invention comprises techniques and devices for improved computer network adaptors and drivers that schedule packets to be transmitted so as to optimize network performance. In some types of prior art adaptors, packets of data are assembled by the host processor and *placed* in a queue in a shared system memory. Once these packets are complete, the adaptor generally will, when it is ready, begin to *download* queued packets from shared system memory and *transmit* them over the network when its network connection is available. In many prior art adaptors, packets are downloaded by the adaptor and transmitted over the network in first-in/first-out (FIFO) order, with the first packet placed in system memory by the host processor being the first transmitted by the adaptor. While the invention has advantages in adaptors that transmit packets in FIFO order, it may also be used in adaptors that order packets based on destinations in order to spread packets, such as described in coassigned patent application S/N _____.

In general, in prior art networks of the kind described herein, particularly in ethernet-type networks, a transmitting host and transmitting adaptor are unaware of the speed at which the destination host or the network connecting the source to the destination can receive packets. Packets are transmitted by the adaptor as soon as the network is available. While prior adaptors may observe rules regarding prioritizing packets and may defer transmission of lower priority packets for higher priority packets, the adaptor does

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not control the rate at which it transmits packets based on the rate that the network or receiver can receive them.

In the present invention, the host processor, or, more precisely, a scheduling process running on the host processor or possibly and alternatively on an adaptor processor, attempts to schedule transmitted packets so as not to transmit packets faster than a receiver can receive them or, in another embodiment, faster than the network (i.e. intermediate systems) can deliver the packets.

According to the invention, a scheduler is provided with information regarding bandwidth capabilities of network destinations or of intermediate paths in the network through which the packets will flow. This information may be provided in a variety of ways, including but not limited to: a protocol of end-system bandwidth notification as described in coassigned, copending application S/N _____, wherein end-systems may communicate with each other and the network information regarding their bandwidth capabilities; entry of network topology and bandwidth information by a network administrator; a mechanism for timing the round-trip or one-way delay of a packet delivered to a destination, or any other means. The particular mechanism by which the bandwidth capabilities of the destination or network is known to the transmitter is not a part of the present invention.

The scheduler, knowing the bandwidth of a particular destination, determines a schedule for transmitting packets so that a destination does not receive packets faster than it can handle those packets. The scheduler may do this according to a variety of algorithms. These various scheduler algorithms may take into account a number of different network characteristics, including but not limited to the buffer capacity of various intermediate systems (which may be thought of as network elasticity), alert response latency of a particular adaptor or operating system, minimum jitter requirements, or any other inherent or desired characteristic of network transmitter performance.

The scheduler controls transmission of packets by providing for packet transmission alerts to the adaptor to

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transmit the packets. Two specific alternative mechanisms for generating alerts are described in detail below (interrupt-based download control and descriptor-based download control), but other mechanism for generating alerts are possible within the invention.

In interrupt-based download control, the scheduler sets (or *programs*) a future interrupt for a to-be-transmitted packet based on the schedule for that destination. When the interrupt occurs, the driver instructs the adaptor to transmit the scheduled packet.

In descriptor-based download control, the scheduler attaches a scheduling indication to packets placed in system memory, and the adaptor uses that indication to determine when to download that packet from system memory and transmit the packet on the network.

According to the invention, other techniques, including grouping packets into temporal sets, may be used by the scheduler to control the flow of transmitted packets to optimize network performance. Temporal sets are groups of packets that the scheduler determines can be transmitted in back-to-back fashion without violating the target bandwidth of any destination. When packets are grouped into temporal sets, the scheduler may set just one alert for a group of packets.

Specific aspects of the invention will be better understood upon reference to the following description of specific embodiments and the attached claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram of a moderate sized network of one type in which the invention may be effectively employed;

FIG. 2A is a diagram illustrating a simplified network consisting of a transmitter transmitting to three receivers to illustrate aspects of the invention;

FIG. 2B is an alternative diagram illustrating the network of FIG 2A using one particular type of switching device to implement the network.

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FIG. 3A is a block diagram of an end system having system memory and an adaptor using descriptor based download control according to one embodiment of the invention.

FIG. 3B is a block diagram of an end system having system memory and an adaptor using interrupt based download control according to one embodiment of the invention.

FIGs. 4A and 4B illustrate adding a packet to a temporal set according to an embodiment of the invention.

FIG. 5 illustrates one example of a packet data structure (stored in system memory) according to an embodiment of the invention.

FIG. 6 illustrates the format of a ScheduleTime value according to the invention.

FIG. 7 is a block diagram of the download and scheduling logic used in the adaptor shown in FIG. 3C.

FIG. 8 illustrates the state sequence for the schedule time polling of the circuit illustrated in FIG. 6.

FIG. 9 illustrates the dnPollCnt counter according to a specific embodiment of the invention.

FIG. 10 shows the real time count register according to one embodiment of the invention.

FIG. 11 illustrates the dnPollCnt register according to an embodiment of the invention.

DETAILED DESCRIPTION OF SPECIFIC EMBODIMENTS

The invention consists of a number of functional units which work together to effect methods of the invention. It will be apparent to those of skill in the art and from the description below that some of these functional units can be employed independently to accomplish aspects of the invention. It will also be apparent that various alternative components described below can be combined to construct a system according to the invention.

Packet Scheduling to Control Transmitter Bandwidth

FIGS. 2A and 2B are alternative simplified diagrams of a network showing a transmitter T connected to three

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receivers A, B, and C as an example of a network connection in order to illustrate aspects of the invention.

FIGS 3A and 3B are each diagrams of an ES such as 500b with an adaptor according to alternative embodiments of the invention. FIGS. 3A and 3B both show a host 110 having a CPU process 115, system memory 140, and adaptor 160. Within host 110's processor and address space are higher layer network protocols 120, communicating with adaptor 160 through driver 125. Driver 125 operates in conjunction with a scheduler 130. According to the invention, scheduler 130 determines a schedule for packets to be transmitted based on a target bandwidth for a destination or group of destinations.

Where FIGS 3A and 3B differ is the manner in which scheduler 130 sets alerts to control packet transmission in order to schedule packets to meet the target transmission bandwidth, as discussed in the section below.

Scheduler 130 determines a time that the next packet for a given destination should be queued on the adaptor for transmission by computing a current time (i.e. the download start time for the present packet to that destination) plus the time it will take to transmit the present packet on the network at the target bandwidth rate known to the scheduler, and then possibly adjusted by values that represent the local transmitter connection transmit time or possibly other local or network intermediate system delay times.

As described below, the invention may include a factor that causes packets to be transmitted from the transmitter slightly sooner than the scheduled time for the next packet, relying on elasticity (i.e. buffering capacity) in network intermediate systems to not deliver packets to the ultimate destination before the destination can receive them.

The target destination bandwidth rate may be set according to the actual bandwidth that can be handled by the destination, or may be set for other reasons, such as the control of different types of traffic or the carrying of traffic based on charges levied for access of the network. While the invention is designed for use in networks with variable-width or with fixed-width packets, the invention has

particular application when large amounts of data are being transmitted to a destination, and in this case, packets will often be of a maximum (and therefore fixed) size. Therefore, packets of the same size are assumed in some of the following examples.

The operation of a scheduler such as 130 according to the invention will now be explained with reference to the example connections shown in FIGS. 2A-B. For purposes of this discussion, assume that T is a 100 Mbps device on a 100 Mbps link transmitting packets to destinations B and C, each having a target bandwidth of 10 Mbps, and to destination A having a target bandwidth of 30 Mbps. It will be obvious that many other target destinations are possible. If each packet takes 120 microseconds (μs) to transmit over the network at 100 Mbps, and therefore 1200 microseconds at 10 Mbps, according to the invention, if a packet is scheduled for destination B at time 0, the next packet for destination B should be queued by scheduler 130 for download at 0 + 1200 or 1200 μs. In a different embodiment, the transmit time may be adjusted by a value to take into account various latencies that may be associated with the network or to take advantage of network elasticity. For example, a value such as 120 μs might be subtracted from the queue time for the next packet (perhaps representing the local transmitter time from T to the network) in which case the transmit time for the next packet would be 0 + 1200 - 120, or 1080, microseconds. This would cause the transmitter to slightly "lead" the target bandwidth, but with the assumption that the extra bandwidth can be absorbed by buffering capacity in network intermediate and end system adaptors.

Further, the above formula assumes that the adaptor can transmit a packet as soon as it downloads the first byte from host memory, as described in coassigned patent 5,412,782. If the adaptor does not have that capability, the scheduling is adjusted by adding the delay time it takes to download the packet from the host to the adaptor to the 120 value subtracted from the packet transmit time.

The third packet for destination B is scheduled for download at 1200 + 1200 or 2400 microseconds. The fourth is scheduled for 1200 + 1200 + 1200 or 3600 microseconds. In each of these cases, the schedule could also be adjusted either to cause leading in the network or to take into account latency as described above. A packet schedule is similarly determined for other destinations for which the scheduler has received packets.

Temporal Sets Simplify Controlling Transmission of Packets

According to a further embodiment of the invention, a scheduler can schedule a number of packets to one, or to a variety of destinations, together in a *temporal set*. A temporal set is composed of a set of packets which can be transmitted in a back-to-back fashion by the adaptor on its network link without violating the maximum target bandwidth of any destinations.

Temporal sets are defined by scheduler 130 according to a number of alternative methodologies, depending on the requirements of the particular application.

In one embodiment, for each destination, or group of linked destinations, scheduler 130 determines a desired transmit time for each packet as described above for destination B such that packets to that destination will be transmitted near the target bandwidth of that destination. Scheduler 130 then places as many packets as possible in a temporal set, essentially filling up the set with packets so long as there is a packet available for some destination that could be transmitted immediately after the previous packet (i.e. transmitted back-to-back) without violating the bandwidth of any destination. When there are not more packets ready to be queued that meet that rule, scheduler 130 closes the temporal set and develops an alert for a future time determined by the next packet that needs to be delivered to a destination. Scheduler 130 places packets into their appropriate temporal sets and adjust sets as described below.

Placing a new packet in a temporal set

A temporal set is characterized by a temporal set download start time (*Set_TxQueue_Time*) and an estimated set transmission end time (*Set_Tx_End*) for packets currently in the temporal set. According to one embodiment of the invention, a packet is placed in a temporal set by scheduler 130 when that packet's desired download start time (*Packet_TxQueue_Time*) is greater than or equal to *Set_TxQueue_Time* and is less than or equal to *Set_Tx_End* plus the packet transmission time (*Packet_Tx_Time*). Furthermore, according to one embodiment, the set's start time (*Set_TxQueue_Time*) and *Set_Tx_End* are adjusted by a value determined by the start time and transmission time of the packet. One embodiment is represented by the code below:

```
If Packet_TxQueue_Time + Packet_Tx_Time < Set_Tx_End
     Set_TxQueue_Time = Set_TxQueue_Time - Packet_Tx_Time
Else
     Diff_Time = Packet_TxQueue_Time + Packet_Tx_Time -
     Set_Tx_End
     Set_Tx_End = Packet_TxQueue_Time + Packet_Tx_Time
     Set_TxQueue_Time = Set_TxQueue_Time - Diff_Time
End
```

FIG. 4 illustrates the mechanism described above for scheduling a new packet received by scheduler 130 once a number of temporal sets have been defined for packets to be transmitted, according to one embodiment of the invention. In FIG. 4, assume that a packet D1 is presented to scheduler 130 after sets 1 and 2 have been defined as shown. According to one embodiment, D1 is placed in temporal set 1 if D1's *Packet_TxQueue_Time* (or *Packet_Download_Time*) is greater than or equal to Set 1's *Set_TxQueue_Time* (or *Set_Download_Time*) and less than or equal to the *Set_Tx_End_Time* plus D1's *Packet_Tx_Duration*. In other words, D1 is added to the set if its scheduled *Packet_Download_Time* falls within the window as shown in FIG. 4.

According to a further specific embodiment, a temporal set's *Set_Download_Time* may be adjusted when a new packet needs to be added to a temporal set. This may result in some packets in the temporal set being transmitted slightly ahead of their desired scheduled time, but this in general is

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not a problem in real networks because the intermediate devices such as 67 in the networks provide some elasticity (or intermediate buffering capacity) allowing them to accept a packet on one port even if they are not yet ready to transmit it out of another port. The following code provides one example of adding D1 to the end of a set taking advantage of this elasticity, with the cases as illustrated in FIG. 4:

```
Case A:  If Packet_Download_Time + Packet_Tx_Duration < Set_Tx_End_Time
             Set_Download_Time = Set_Download_Time - Packet_Tx_Duration
Case B:  Else
             Overlap_Time =  Set_Tx_End_Time - Packet_Download_Time
             Set_Tx_End_Time = Packet_Download_Time + Packet_Tx_Duration
             Set_Download_Time = Set_Download_Time - Overlap_Time
         Endif
```

It will be seen that in Case A, the new packet fits entirely within existing *Set_Tx_Time* and scheduler 130, according to the invention, adjusts the set's download time earlier and adds the new packet to the end of the set. In Case B, a new packet overlays the end of existing *Set_Tx_Time*, but still meets criteria for being added to the set. Scheduler 130 in this case will adjust the set's download time earlier by the amount of non-overlap, and add the new packet to end.

It will be apparent to those of skill in the art that other formulas for adjusting the set's start time are possible and may be adjusted depending on the characteristics of the particular network.

As a further example, assume destinations A, B, and C, all connected via a network to a server/transmitter T, as shown in Fig. 2. A is connected directly to a 100 megabit network, but can only receive packets at 30 mbps. B and C are 10 megabit systems connected via a buffering switch to the same 100 megabit network. Assume the jitter estimate is 50 microseconds. Assume the following packets are submitted for transmission to a scheduler according to the invention at transmitter T with packets A1 being the first packet submitted with a destination A, packet A2 being the second packet for A, etc: A1, A2, A3, A4, B1, B2, B3, C1, C2, C3. For simplicity, assume each packet takes 120 microseconds to transmit at 100

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Mbps, 400 microseconds at 30 Mbps, and 1200 microseconds at 10 Mbps. With all of this information known to scheduler 130 at transmitter T, scheduler 130 would take the actions shown in Table 1.

Scheduler 130 would first determine a desired transmission schedule for the three destinations as follows:

A1 = 0, A2 = 400, A3 = 800, A4 = 1200;

B1 = 0, B2 = 1200, B3 = 2400;

C1 = 0, C2 = 1200, C3 = 2400.

Table 1

	Real-time Count	Packet Download Time	Assumed Local Tx complete	
Programmed Alert	-50 μs	NA	NA	(Alert latency is 50 μs)
Temporal Set 1				
Alert	0	NA	NA	(Alert latency is 50 μs)
Queue A1	0	0	120 μs	
Queue B1	0	0	240 μs	
Queue A2	0	400	360 μs	
Queue C1	0	0	480 μs	
Program Alert for time 630 μs	0			(680 = 800 - 120 - 50)
Temporal Set 2				
Alert	630 μs	NA	NA	(Alert latency is 50 μs)
Queue A3	680 μs	800	800 μs	
Queue B2	680 μs	1200	920 μs	(800 >= 1200 - 360 - 50)
Queue C2	680 μs	1200	1040 μs	
Queue A4	680 μs	1200	1160 μs	
Program Alert for 2110 μs	680 μs	NA	NA	(2230 = 2400 - 120 - 50)
Temporal Set 3				
Alert	2230 μs	NA	NA	(Alert latency is 50 μs)
Queue B3	2280 μs	2400	2280 μs	
Queue C3	2280 μs	2400	2400 μs	

Note that in this particular embodiment the scheduler does not take into account the actual download time or transmission time of a packet for a given destination when scheduling subsequent packets for that destination. Though packet C1, for example, is not completely locally transmitted into the network until time 480 μs, scheduler 130, in this embodiment, schedules packet C2 as though it should ideally be transmitted at 1200 μs. In this embodiment, scheduler 130 is primarily concerned with controlling bandwidth to a transmitter, and assumes that once the schedule for a given

destination is set to control the bandwidth to that destination, elasticity within the network can handle the leading of some packets. This assumption both simplifies the design of scheduler 130 and leads to improved network throughput. Other embodiments of the invention of more complex design are possible where scheduler 130 accounts for the delays caused to one destination by congestion from another destination in the scheduling of packets. However, in many situations the embodiment just described will provide superior network throughput and will be more simple to implement.

In a further embodiment, an adaptor driver residing in a host may perform set gluing, whereby when a set's start time or end time are adjusted so that it overlaps with an adjacent set, temporal sets are combined so that the host receives just one alert to initiate transmission of the packets.

Mechanisms for alerting the host to send scheduled packets

Once the scheduler 130 has determined a schedule for packets in order to control transmission bandwidth, according to further alternative embodiments of the invention, scheduler 130 employs various mechanisms to set some future time at which the adaptor will be instructed to transmit a packet or a group of packets. The time-based downloading just described may be used with either of the below described alert mechanisms or with other alert mechanisms.

Descriptor Based Alerts Scheduling

FIG. 3A illustrates a scheduler in an adaptor employing descriptor based scheduling. FIG. 3B illustrates an alternative embodiment of a scheduler in an adaptor employing programmed interrupt alerts to schedule packets and will be described in more detail below. According to this embodiment, scheduler 130 uses bits placed in packet descriptors to specify a time at which packet download will begin, in either absolute or relative terms. An adaptor according to the invention examines the scheduling indication in a packet

descriptor and uses that indication to determine when packets should be downloaded from system memory and transmitted on the network. According to this aspect of the invention, each packet descriptor may carry a scheduling indication, or packets may be grouped in temporal sets, with the indication for the first packet in the group being the alert to the adaptor to then transmit the set.

In one embodiment, adaptor 160 reads schedule time 144a from the data structure 142a and compares that to a real-time counter 162. If real-time counter 162 has a lower value than the schedule time, the adaptor waits and does not transmit the packet on the network. If the real-time counter has a higher value than the schedule time, the adaptor downloads the packet for transmission. In one embodiment, a packet is stored in one or more packet data buffers 146a-c in system memory 140.

FIG. 5 illustrates one example of a packet descriptor data structure 142 (stored in system memory) including schedule indications according to a specific hardware embodiment of the invention. In some embodiments, this descriptor will be stored in a different place than the packet data, and the descriptor will be separately passed to the adaptor before the adaptor downloads the data from system memory for transmission. The labels in the figure indicate the following:

DnNextPtr points to the next data structure of this kind, allowing a chained list of packet data structures, which can be used for indicating the next packet in a temporal set;

ScheduleTime contains information fields controlling when this packet is to be downloaded;

FrameStartHeader contains control information for the packet;

Each DnFragAddr/DnFragLen pair describes a data buffer in system memory (such as 146a and 146b). The buffers are downloaded (moved from system memory to the adaptor) one by one; together the buffers comprise the packet to be transmitted.

FIG. 6 defines the format of ScheduleTime as stored with a packet descriptor in system memory according to one embodiment of the invention. In this embodiment, an initial value is loaded into counter 162 when a scheduler first begins scheduling a stream of packets. This value initiates the RealTimeCnt and in many cases can be thought of as zero. The labels in the figure indicate the following:

loadTimeCnt [bit 28]: This bit, when set, instructs the adaptor to load the value in the scheduleTime field into the RealTimeCnt register, and download the packet immediately. When loadTimeCnt is set, scheduleTimeValid is ignored by the adaptor.

scheduleTime [bits 23:0]: Provides either a count value time at which to download this packet, or a value to be loaded into RealTimeCnt to initiate counter 162, or is ignored, depending upon the values of load TimeCnt and scheduleTimeValid.

When scheduleTimeValid is set, scheduleTime represents the time at which the packet is to be downloaded. When the adaptor sees scheduleTimeValid set, circuits therein compare scheduleTime against the value in the RealTimeCnt counter register. If RealTimeCnt is less, then the adaptor goes into a polling mode, in which it periodically re-fetches the ScheduleTime word and compares it against RealTimeCnt. The poll rate is determined by the value in DnPoll. ScheduleTime specifies a time in increments of 800 ns.

scheduleTimeValid [bit 29]: When set, indicates that scheduleTime contains a value that is to be compared to the RealTimeCnt. When not set, indicates that the packet is to be transmitted under control of a preceding packets scheduleTime, i.e. it indicates that the packet is part of a temporal set whose start time is located in an earlier packet's descriptor.

FIG. 7 is a block diagram of the operation of download and scheduling logic 161 and FIG. 8 illustrates the state sequence for testing schedule time and for polling. As shown in FIG. 7, a packet is downloaded from system memory to the adaptor when one of these three conditions is true, as determined by comparison logic 166 and conveyed to state

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machine 174 via the download packet signal: (1) the packet data structure contains an initial value to be loaded into RealTimeCnt (loadTimeCnt = 1); (2) the packet data structure, as placed in DataHoldRegister 168, contains a ScheduleTime entry, and RealTimeCnt ≥ ScheduleTime. (If RealTimeCnt < ScheduleTime, the adaptor waits a time period specified by dnPoll [6:0] and refetches ScheduleTime.); or (3) both LoadTimeCnt and scheduleTime Valid in the packet data structure are zero (indicating there is no meaningful data in scheduleTime, and that the packet is part of a temporal set whose start time is determined by an earlier packet in the set.

FIG. 9 shows the manner in which the dnPollCnt counts down once every pulse of a 3120 Khz clock from the value loaded from DnPoll register.

FIG. 10 shows real time count register 162 according to one embodiment of the invention. RealTimeCnt is a real-time counter which supports the packet download scheduling function. RealTimeCnt counts continuously, incrementing every 800 ns (0.8 μs), and wrapping to zero when it reaches its maximum value. When a transmit packet is scheduled for download, the download starts when RealTimeCnt is greater than or equal to the value in the packet data structure's scheduleTime field. RealTimeCnt is loaded with the value in scheduleTime when the loadTimeCnt bit is set. This has the side effect of causing the packet to be downloaded immediately. RealTimeCnt is cleared by reset.

FIG. 11 shows the register format wherein the value in DnPoll determines the rate at which the current packet data structure is polled. Packet data structures are polled for two different reasons: (1) When a zero DnNextPtr is fetched from the current packet data structure, DnNextPtr is polled to determine when a new packet data structure is ready to be processed; (2) When packet download is delayed with ScheduleTime, the packet data structure is polled to determine when the RealTimeCnt has reached the required ScheduleTime. Polling is disabled when DnPoll is cleared. DnPoll is cleared

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by reset. The value in DnPoll represents 320 ns time intervals. The maximum value represents 40.64 μs.

Fig. 3B illustrates an alternative embodiment of the invention including an interrupt's based alert mechanism. In this embodiment, scheduler 130 programs an interrupt in interrupt timer 190. When the time for the interrupt arises, interrupt 190 generates an interrupt which is received by CPU process 115. CPU 115 then alerts driver 125 that an interrupt has occurred. Driver 125 may then initiate packet fetch through packet controller 192 for the next packet or group of packets and scheduler 130 may then set a next interrupt. Note that interrupts may be generated on a packet by packet basis, or interrupts may be taken for temporal sets of packets which are then transmitted back-to-back on the network.

The invention has now been explained with reference to specific and alternative embodiments. Other embodiments will be obvious to those of skill in the art. The invention therefore should not be limited except as provided for in the attached claims as extended by allowable equivalents.

WHAT IS CLAIMED IS:

1. A method for scheduling packets to be downloaded from a host to an adaptor in order to control packet transmission rate comprising:

creating a temporal set of packets that can be transmitted in a back-to-back fashion without violating a maximum bandwidth requirement of said packets' target destination addresses;

characterizing said temporal set by a download start time and an estimated transmission end time;

grouping a packet into a temporal set based on a grouping rule for said packet; and

adjusting said temporal sets' download start time and estimated transmission end time according to said grouping rule.

2. The method according to claim 1 wherein said grouping rule involves grouping a packet into a temporal set when the packet's download start time is greater than or equal to the set download start time and less than or equal to the set transmission end time plus the packet transmission time.

3. The method according to claim 1 wherein said grouping rule involves adjusting the set download start time by an amount determined by an overlap between the desired packet download time of said new packet and said set download start and end times.

4. The method according to claim 3 wherein said grouping rule involves adjusting the set transmission end time by an amount determined by the time necessary to transmit the new packet.

5. The method according to claim 2 wherein scheduling may be represented by the formula:

If Packet TxQueue Time + Packet Tx Time < Set Tx End

Set TxQueue Time = Set TxQueue Time - Packet Tx Time,
Else Diff Time = Packet TxQueue Time + Packet Tx Time - Set Tx End
Set Tx End = Packet TxQueue Time + Packet Tx Time
Set TxQueue Time = Set TxQueue Time - Diff Time.

6. The method according to claim 1 further comprising computing a download delay until a next temporal set.

7. The method according to claim 6 further comprising generating a programmed interrupt at the time for the next set.

8. The method according to claim 4 further comprising set gluing, whereby temporal set are combined when the start time of one temporal set approaches the end time of another temporal set.

9. The method according to claim 6 further comprising including bits in packet descriptors in system memory specifying the time at which packet download will begin in either absolute or relative terms.

10. A network transmitter capable of controlling its rate of transmission to meet a target bandwidth comprising:
a destination bandwidth identifier for determining a target bandwidth for a particular destination or group of destinations;
a scheduler for determining when a next packet for a particular destination should be queued for transmit in order to meet said target bandwidth and for programming an alert;
a programmable alert controller for causing transmission of said next packet; and
an interface for receiving packets to be transmitted;

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11. The device according to claim 10 further comprising:

a set builder for grouping scheduled packets into sets in order to allow said alert controller to cause an alert for a set of packets, said set of packets transmitted in back-to-back fashion.

12. The device according to claim 10 wherein said alert controller comprises an interrupt controller for programming a future interrupt to initiate the future transmission of a packet.

13. The device according to claim 10 wherein said alert controller comprises a packet descriptor scheduler for placing schedule time indications in packet descriptors to indicate download times for a packet.

14. The device according to claim 10 wherein said network transmitter comprises an adaptor driver.

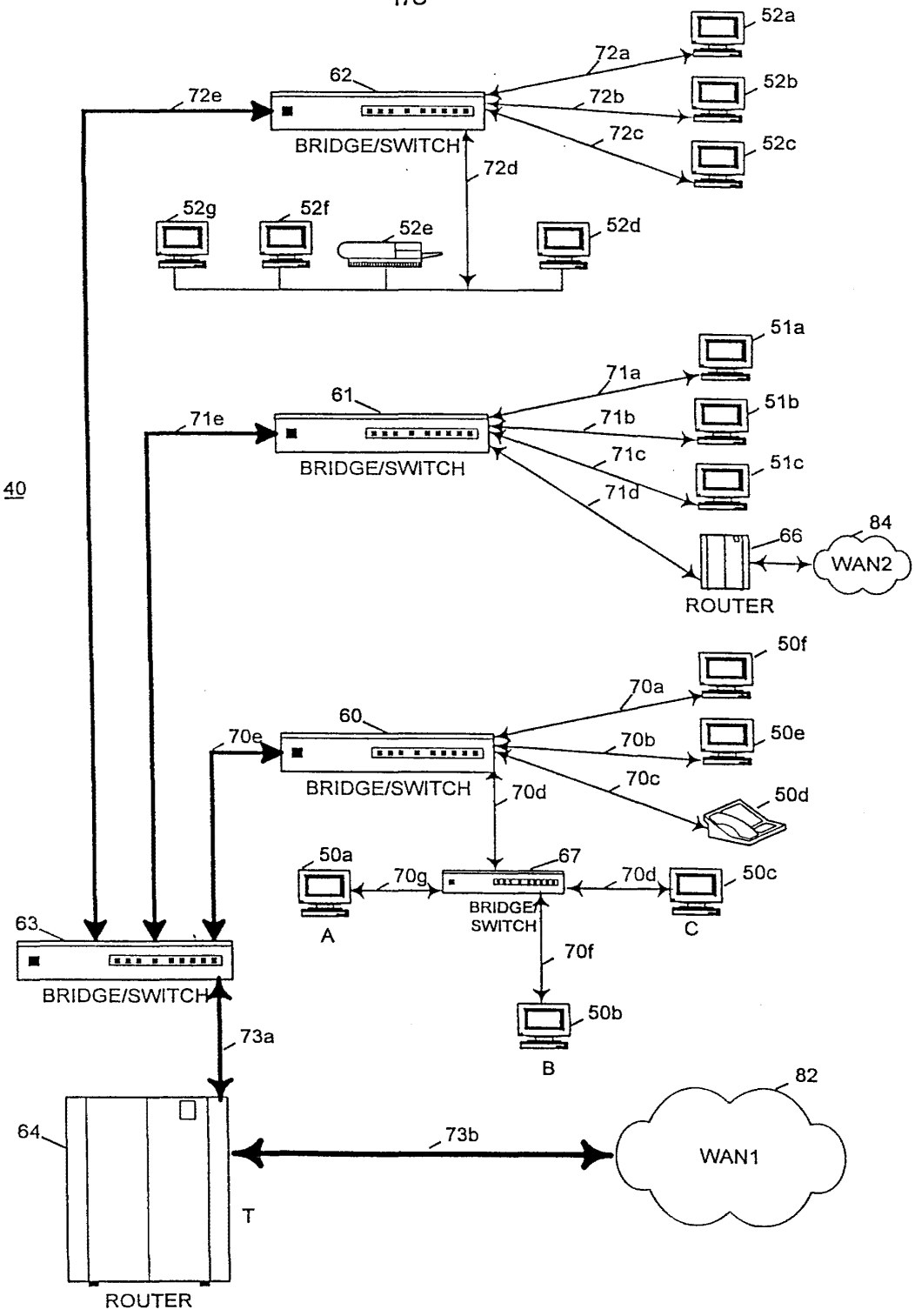

52a
72a
62
72e
72b
52b
BRIDGE/SWITCH
72c
52c
72d
52g
52f
52e
52d
51a
71a
61
71e
51b
BRIDGE/SWITCH
71b
71c
51c
40
71d
84
66
WAN2
ROUTER
50f
70a
60
70e
50e
70b
BRIDGE/SWITCH
70c
70d
50d
50a
67
70g
70d
50c
BRIDGE/
SWITCH
A
C
63
70f
BRIDGE/SWITCH
50b
B
73a
82
64
73b
WAN1
T
ROUTER

FIG. 1

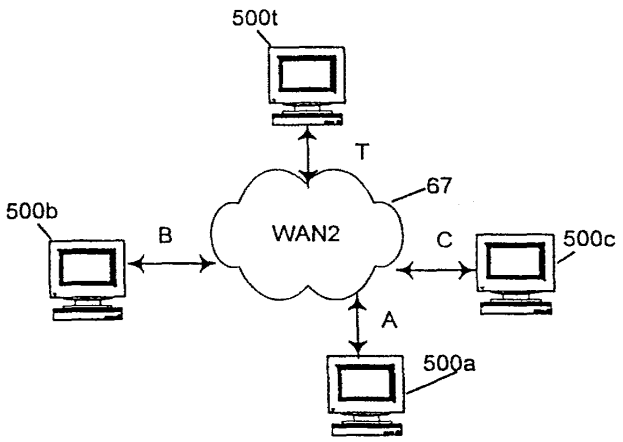

500t
T
67
500b
B
WAN2
C
500c
A
500a

FIG. 2A

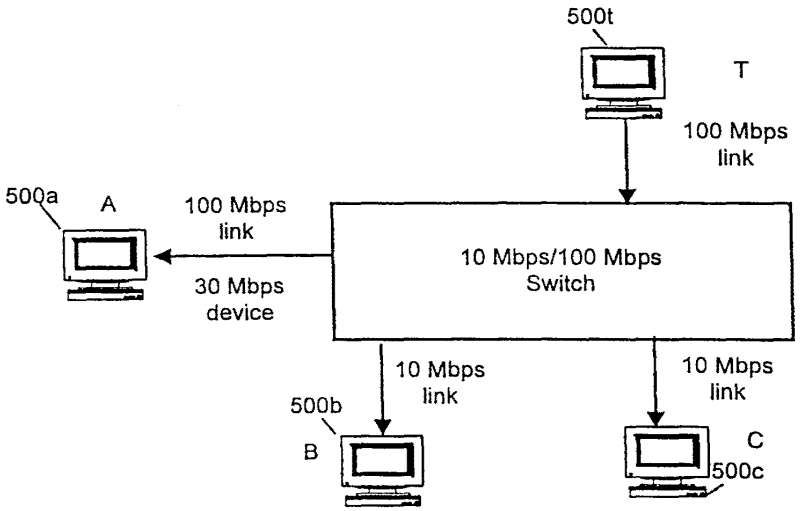

500t
T
100 Mbps
link
500a
A
100 Mbps
link
10 Mbps/100 Mbps
Switch
30 Mbps
device
10 Mbps
link
10 Mbps
link
500b
B
C
500c

FIG. 2B

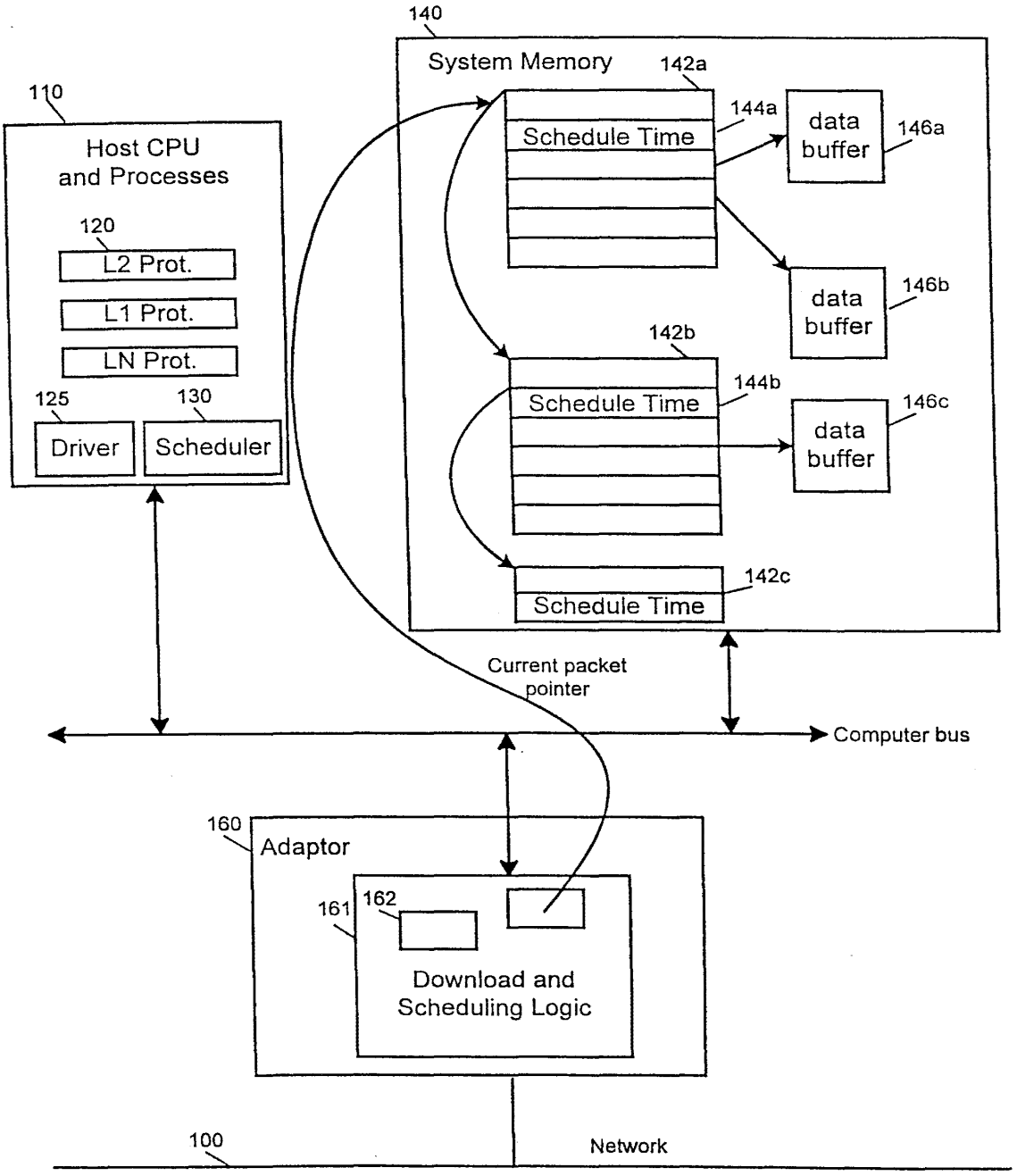


FIG. 3A

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Interrupt Based

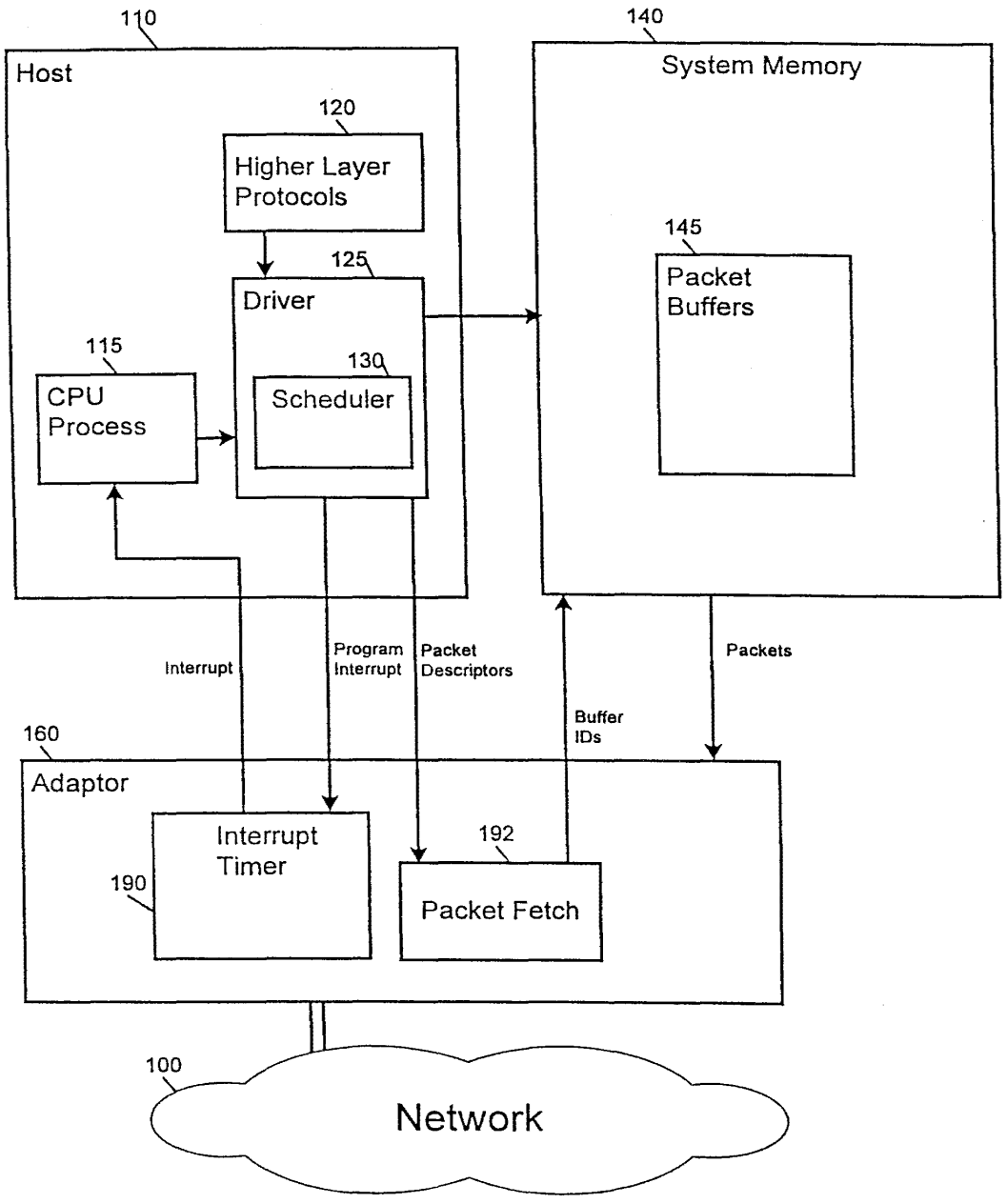


FIG. 3B

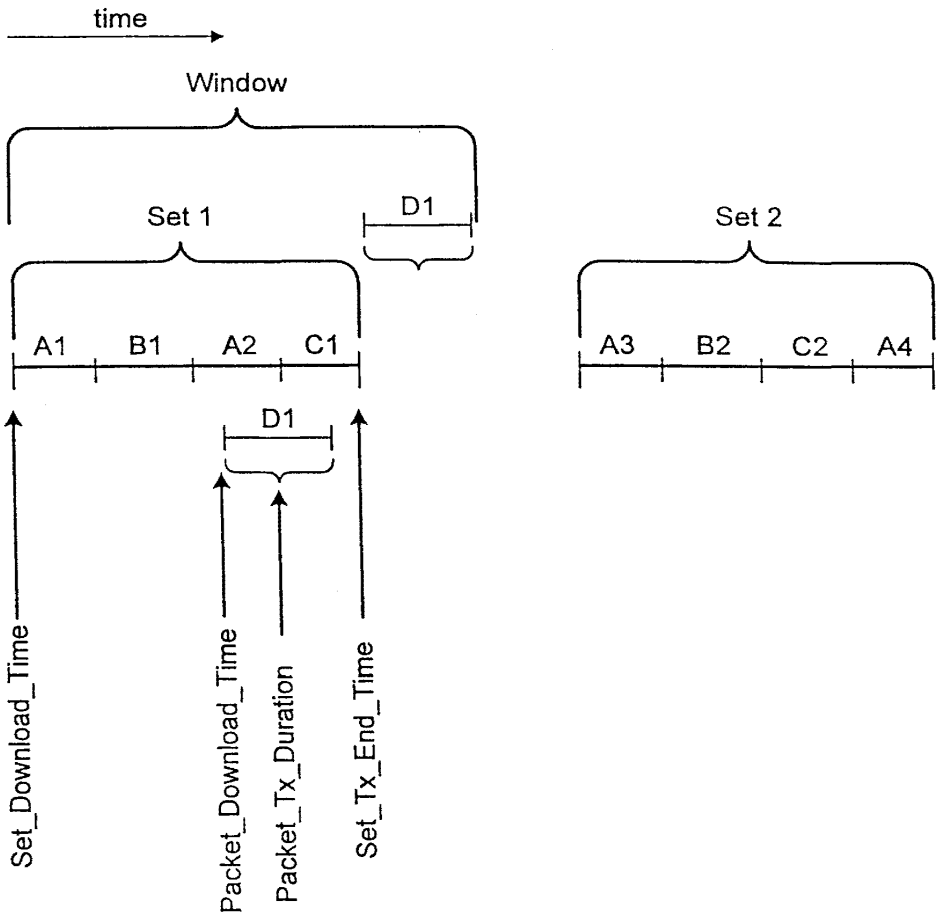

time
Window
Set 1
D1
Set 2
A1
B1
A2
C1
A3
B2
C2
A4
D1
Set_Download_Time
Packet_Download_Time
Packet_Tx_Duration
Set_Tx_End_Time

FIG. 4A

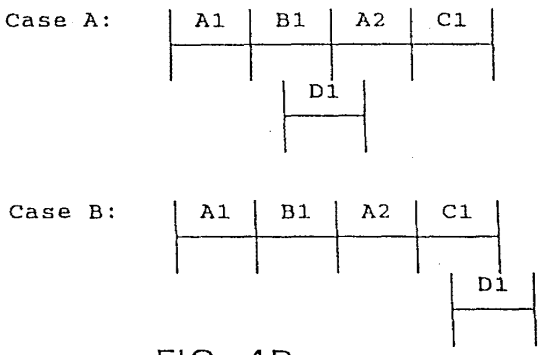


FIG. 4B

*n*th DnFragLen	(n X 8) + 4
*n*th DnFragAddr	n X 8
1st DnFragLen	14
1st DnFragAddr	10
(reserved)	c
FrameStartHeader	8
ScheduleTime	4
DnNextPtr	0

FIG. 5

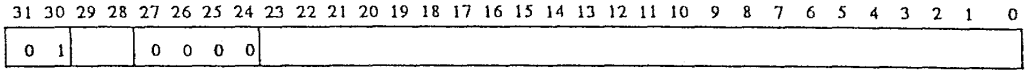


FIG. 6

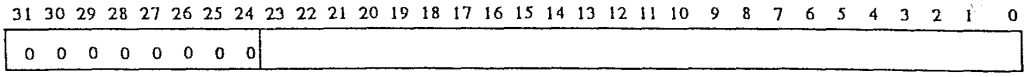


FIG. 10

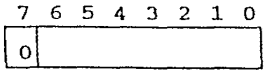


FIG. 11

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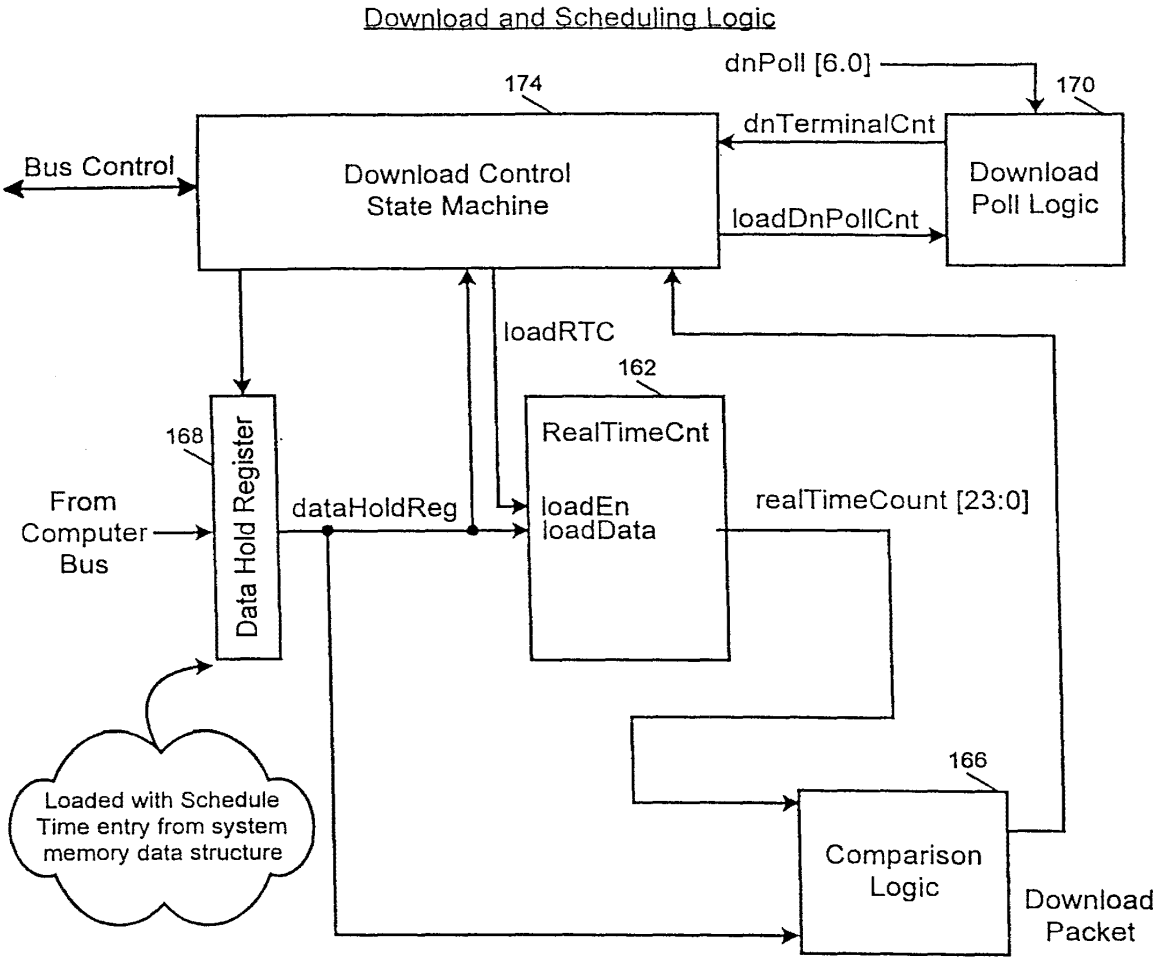

Download and Scheduling Logic
dnPoll [6.0]
174
170
dnTerminalCnt
Bus Control
Download Control State Machine
Download Poll Logic
loadDnPollCnt
loadRTC
162
168
RealTimeCnt
From Computer Bus
dataHoldReg
loadEn
loadData
realTimeCount [23:0]
Data Hold Register
Loaded with Schedule Time entry from system memory data structure
166
Comparison Logic
Download Packet

FIG. 7

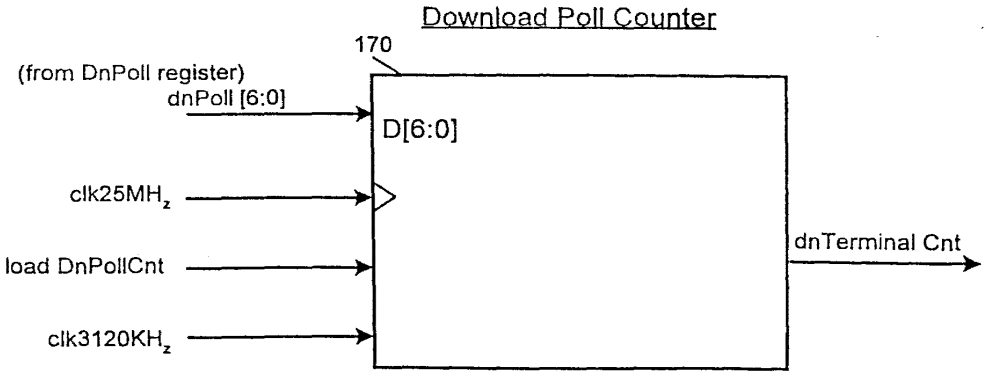

Download Poll Counter
170
(from DnPoll register)
dnPoll [6:0]
D[6:0]
clk25MHz
dnTerminal Cnt
load DnPollCnt
clk3120KHz

FIG. 9

STATE SEQUENCE FOR TESTING
SCHEDULE TIME AND POLLING

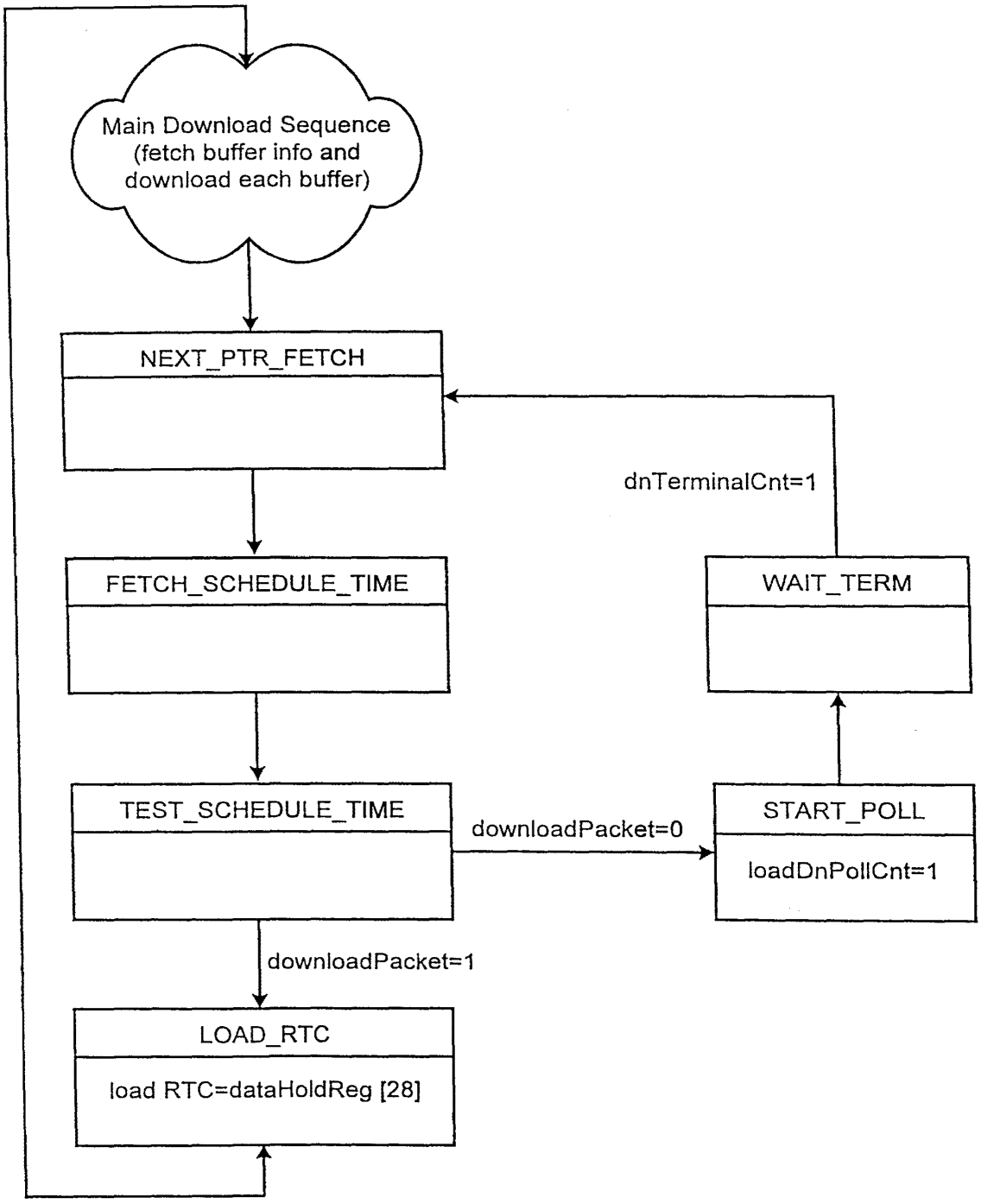


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/22151

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :H04L 12/56
US CL :370/229-238, 392-394, 412, 415, 416, 428, 429
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 370/229-238, 392-394, 412, 415, 416, 428, 429

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS, IEEE ONDISC
search terms: schedule, packet, queue, bandwidth, window, set

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	RAMAKRISHNAN, K.K., "Scheduling Issues for Interfacing to High Speed Networks", GLOBECOM'92. Communication for Global Users. IEEE Global Telecommunications Conference. December 1992. Vol. 1, pages 622-626, see entire reference.	10, 12, 14 --- 1-9, 11, 13
Y	KALMANEK, C.R.,"Rate Controlled Servers for Very High-Speed Networks" GLOBECOM'90. IEEE Global Telecommunications Conference and Exhibition. 'Communications: Connecting the Future'. December 1990, Vol. 1, pages 12-20, see entire reference.	1-9, 11, 13
A	HUNG, A.,"Bandwidth Scheduling for Wide-Area ATM Networks Using Virtual Finishing Times" IEEE/ACM Transactions on Networking. February 1996. Vol. 4, Issue 1, pages 49-54.	1

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 26 MARCH 1998	Date of mailing of the international search report 01 JUN 1998
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer MELVIN MARCELO Telephone No. (703) 305-3900

Form PCT/ISA/210 (second sheet)(July 1992)★

INTERNATIONAL SEARCH REPORT

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,020,055 A (MAY, JR.) 28 May 1991, figures 8 and 9.	1
A	US 5,166,930 A (BRAFF et al) 24 November 1992, column 1, lines 43-53.	1
A	US 5,379,297 A (GLOVER et al) 03 January 1995, table 1-2.	1

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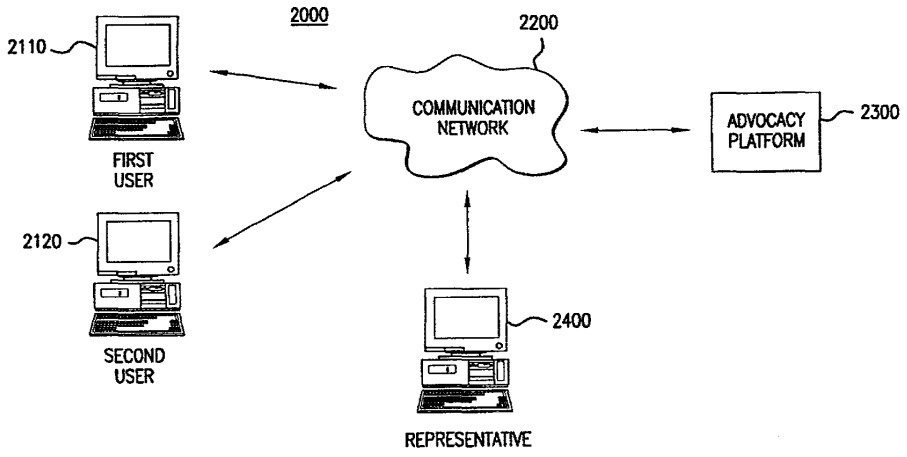
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(57) Abstract

A method of operating an advocacy network (2000) is provided. One or more users (2110, 2120) are selected based on information in a user database (2330) containing, for example, demographic or psychographic information about users (2110, 2120) as well as information identifying a representative (2400) associated with each user (2110, 2120) such as a home address. An advocacy message (2500) is sent to a user through a first communication network (2200), such as by sending an advocacy message associated with an e–mail message. The advocacy message (2500) may include a portion that lets the user generate an indication, such as by clicking on a portion of a computer screen. When an indication is received, a response message (2600) is sent to the representative (2400) associated with the user (2110, 2120). The response message (2600) includes information about the user (2110, 2120), such as the user's name and home address, and may be sent at a pre–determined time along with response messages (2600) from other users (2110, 2120).

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METHOD AND APPARATUS FOR DELIVERING ELECTRONIC ADVOCACY MESSAGES

Field of the Invention

The present invention is directed to communication networks. In particular, the present invention is directed to a method and apparatus for delivering electronic advocacy messages.

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Background of the Invention

Electronic mail (or "e-mail") is becoming a popular way for people to communicate. Using e-mail, a person can send messages and other information (such as pictures, sound recordings, formatted documents, etc. that are in digital form) electronically to other e-mail users.

E-mail communication systems are generally regarded as multi-cast store-and-forward bi-directional communication systems. A user can send e-mail messages to one or more recipients at a time. An e-mail system is regarded as bi-directional as, usually, a user can both send and receive e-mail messages.

When using e-mail to communicate, a user will typically create a message using an e-mail program running on a computer that is or can be connected by a network to other computers. The message will include the e-mail address of the intended recipient. When the user has finished entering the message, the user will "send" the message to the intended recipient -- the message is electronically transmitted via the computer network. The recipient, also using an e-mail program running on a computer connected to the computer network, can then read the received message.

A common computer network used to send and receive e-mail is the Internet. The Internet allows users to send and receive e-mail to and from computers around the world. Typically, each user will have an Internet e-mail address unique to that user, e.g., bob@pto.com. A user with an e-mail account and a computer that can connect to the Internet can easily send and receive e-mail over the Internet.

There are a number of ways that a user can connect to the Internet to send and receive e-mail. A user can have an account with a proprietary on-line network, such as, for example, Prodigy, America Online, CompuServe or Microsoft Network. Using a computer with a modem, the user dials up the on-line network's access number and connects to the on-line network. The user can then send and receive e-mail to and from other users of the on-line network and, provided that the on-line

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network is connected to the Internet, with those having an Internet e-mail address. An alternative method to connect with the Internet is via an Internet Service Provider. Using a modem, the user dials the access number of the Internet Service Provider, and establishes a connection with a computer "directly" connected to or part of the Internet. The user can then operate an e-mail program, such as Eudora, to send and receive e-mail over the Internet.

In many existing systems, users read and write e-mail while on-line, i.e., while connected to the on-line network or the Internet Service Provider. Costs of operating the on-line network (including communication and hardware costs) are higher when users are connected to the network. Also, some on-line networks and Internet Access Providers charge per minute of connect time. Accordingly, it is more cost effective if users read and write e-mail messages when off-line (e.g., when not connected to the on-line network).

Some existing on-line services display additional content to users. For example, advertisements are shown on part of the screen to users of the America Online network. When accessing certain World Wide Web sites on the Internet, advertisements are often included as part of the web page seen by the user. Often in such systems, each user accessing a certain screen or site is shown the same advertisement. Sophisticated systems have the capability to change the advertisement after a certain period of time. However, in such systems the user must remain connected to the network to see the replacement advertisement.

When using a browser program (such as Netscape's Navigator program) to access pages on the World Wide Web, information, which may include additional content such as advertisements, may be downloaded and cached at a user's computer. This information can be flushed from the cache at a later time, as determined by the browser program. In some cases, this information may be flushed when the browser program is "off-line." However, additional content such as an advertisement is not automatically replaced in a web page and new, unseen content is not displayed as part of a web page when in such disconnected mode.

Accordingly, there is a need for a system that displays and automatically

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replaces additional content while disconnected from the network. In particular, there is a need for an e-mail system that operates mostly off-line and that can display and automatically replace additional content while off-line.

Suppliers of additional content, such as advertisers, find it desirable to target content to relevant potential customers. For example, an advertiser of stockings would prefer to target women rather than men with its advertising. A Boston restaurant would prefer to target residents of Boston and business travelers rather than children living in San Francisco. Moreover, advertisers prefer to pay for advertising based upon the number of relevant consumers who are actually exposed to the advertisement. For prior on-line systems and networks, including the World Wide Web, it is often difficult for an advertiser to precisely determine whether its advertisements were actually viewed by a user and for how long, and whether the advertisement induced a response. Accordingly, there exists a need for a targeted system that also can provide information as to the characteristics of those who were exposed to the additional content, for how long the user was exposed, and at what times.

Existing e-mail systems have other disadvantages. In existing dial-up e-mail systems, a user is provided with an access telephone number to connect to the network. Typically, at the network there are a number of mail servers and each user's received e-mail messages are stored on one of those mail servers. Because many users use the same access number to connect to the network, the network requires capabilities to switch users to the mail server that stores that user's e-mail. Existing e-mail networks determine at the server side and while the user is on-line who the user is and that user's mail server, and then switch the user to that mail server -- a time consuming operation, especially if there are many users accessing the network. There exists a need for an e-mail system where the network does not have to decide, as part of the switching process, which mail server is to be accessed by each user.

The present invention addresses problems that may arise when an advocacy group wants to have a number of people contact a representative, government

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official or entity, such as a particular elected representative. As used herein, an advocacy group may represent any person or group of people who want to send information about an issue to the public. The advocacy group may, for example, encourage a large number of people to contact a particular congressperson about an upcoming vote. It should be noted that the term advocacy group is not limited to groups committed to influencing particular legislative votes, but may include, by way of example, groups interested in administrate rule-making, public referendums, petitions, and other actions associated with issue advocacy.

By way of example, a member of the public traditionally contacts a representative by writing a letter or by making a telephone call. Today, the use of e-mail messages for this purpose is increasingly common. In either case, however, a person is often not aware of important issues that may be affected by legislative (or other) action, when a vote might be scheduled that concerns a particular issue, who his or her representative is, how to contact the representative or whether the representative serves on a particular committee. Moreover, a person may not have time to find out this information, or the time to compose a detailed message about an issue.

To make it easier for a person to contact a representative, an advocacy group can set up an advocacy Web page. Generally, a person that visits such a Web page is asked to provide a name and address that is used to automatically create and send an e-mail message to that person's representative, such as an elected representative. The person's address may be used, for example, to select one or more representatives associated with that person (such as by correlating a ZIP code with a congressional district) and to sign the e-mail message with that address (so that the representative will understand that a constituent is sending the e-mail message). With this approach, however, only a limited group of people, already interested in the issue, will likely access the Web page - and those people may already be fully informed about an upcoming vote and/or how to contact their representative. In other words, an advocacy group may prefer to "push" information to the public as opposed to "pulling" the public to the information.

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Additionally, many people are not comfortable sending a name and address through a public communications network such as the Internet. In general, requesting detailed information will simply reduce the effectiveness, i.e. lower the response rate, of an advocacy Web page.

Moreover, an advocacy group may want to reach a group of people having particular geographic, demographic and/or psychographic characteristics. The advocacy group may also want to receive contact information about such people or to receive answers to survey questions from such people. In addition, the advocacy group may want to receive a summary, or report, about a group's response to a particular advocacy message. The advocacy group may also want to test a number of different messages about an issue, and to compare the result (such as the response rate) of various styles or arguments.

Summary of the Invention

The present invention is directed to a method and apparatus for delivering electronic advocacy messages. In a representative embodiment, one or more users are selected based on information in a user database containing, for example, demographic or psychographic information about users as well as information (such as a home address) that identifies at least one representative associated with each user. An advocacy message is sent to a user through a first communication network, such as by sending an advocacy message associated with an e-mail message. The advocacy message may include a portion that lets the user generate an indication, such as by clicking on a portion of a computer screen. When an indication is received, a response message is sent to the representative associated with the user. The response message includes information about the user, such as the user's name and home address, and may be sent at a pre-determined time along with response messages from other users. The response message may be an e-mail message, a facsimile message, a printed letter or a telephone call. The user can also provide answers to survey questions and/or grant permission to have his or her contact information provided to an advocacy party.

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According to another embodiment of the present invention, a server system may utilize the information in a member profile to determine which advocacy messages, and/or other messages such as advertisements, should be directed to the user. Accordingly, an advertisement distribution scheduler of the server system may decide which advocacy messages are eligible for distribution for each user. The distribution scheduler of the server system may determine which advocacy messages and/or other messages are eligible for distribution to each user and can utilize information in an event log file and/or message statistics file in making the determination as to which advertisements are eligible for distribution to a particular user. The server system may also include a download scheduler module that determines when to download and/or display (i.e., transfer) a particular message to a user.

A client program may include a scheduler module that determines which advocacy message, and/or other messages such as advertisements, to display to the user and for how long.

The client scheduler module, the distribution scheduler and the download scheduler module are disclosed in U.S. Patent No. 5,848,397 entitled "Method and Apparatus for Scheduling the Presentation of Messages to Computer Users" to Marsh et. al.

Brief Description of the Drawings

Fig. 1 is a system diagram of a representative embodiment of the present invention.

Fig. 2 is a block diagram of the client computer of Fig. 1.

Fig. 3 is a flowchart of the client computer initialization process.

Fig. 4 is a flowchart detailing account activation.

Fig. 5 represents actions that take place at the client computer.

Fig. 6 illustrates information communicated between the client computer and the server system.

Fig. 7 shows a portion of an exemplary survey to create a member profile.

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Fig. 8 illustrates an example read screen used to read received e-mail messages.

Fig. 9 is a flowchart of the communication process that takes place between the client computer and the server system as performed by the client computer.

Fig. 10 illustrates an example showcase advertisement.

Fig. 11 is a flowchart of the communication process that takes place between the client computer and the server system as performed by the server system.

Fig. 12 illustrates an example write screen used to create e-mail messages.

Fig. 13 is a system diagram of an advocacy network according to an embodiment of the present invention.

Fig. 14 is a more detailed view of the advocacy platform shown in FIG. 13.

Fig. 15 illustrates an example of an advocacy advertisement.

Fig. 16 illustrates an example of an advocacy e-mail message.

Fig. 17 is another example of an advocacy advertisement.

Fig. 18 is another example of an advocacy e-mail message.

Detailed Description

Referring now to the drawings, Fig. 1 illustrates an exemplary system configuration 100 of a representative embodiment of the present invention. The representative embodiment is described in reference to an electronic mail system where a number of users can create, send, receive and read e-mail messages. E-mail messages can be sent between users of the present invention and external users who have e-mail accounts. However, the principles of the present invention should not be regarded as limited solely to e-mail systems. For example, the principles of the present invention apply to on-line services that present advertising to users while the user is accessing other content. Thus, an e-mail message may be regarded as an example of content provided to a user.

As shown in Fig. 1, a client computer 101, preferably a workstation or personal computer, executes a client program. The client computer can be used by one or more users.

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Connected to the client computer 101 is a communication interface 102 for allowing the client computer 101 to communicate with other computer systems. The communication interface may be, for example, a modem operating at 56 kilobits per second (kb/s) or at a higher rate (such as a cable modem). As illustrated, the communications interface 102 is external to the client computer 101, but a communication interface 102 that is internal to or part of the client computer 101 is also acceptable. Although the communication interface 102 illustrated is a modem, the communication interface 102 alternatively could be a network interface unit or a network card or the like for providing connectivity to other computer systems over a network using such protocols as X.25, Ethernet, or TCP/IP, or any device that allows, directly or indirectly, computer-to-computer communications.

The client computer 101 is coupled via the communications interface 102 to a network 103. In the representative embodiment, the network 103 is the public telephone network, but it may be, for example, a proprietary wide area network or the like.

Fig. 2 illustrates in further detail the hardware configuration of the client computer 101 of Fig. 1. In the representative embodiment, the client computer 101 comprises a central processing unit 209 for executing computer programs (including the client program according to the present invention) and managing and controlling the operation of the client computer 101. A storage device 205, such as a floppy disk drive, is coupled to the central processing unit 209 for, e.g., reading and writing data and computer programs to and from removable storage media such as floppy disks. Storage device 206, coupled to the central processing unit 209, also provides a means for storing computer programs and data. Storage device 206 is preferably a hard disk having a high storage capacity. A dynamic memory device 207 such as a RAM, is coupled to the central processing unit 209. The client computer 101 includes typical input/output devices, such as, for example, a keyboard 203, a mouse 204 and a monitor 208.

Referring again to Fig. 1, the client computer 101 selectively communicates with a server system 104 over the network 103 using the communication interface

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102. The server system 104 is coupled to the network 103 via a communications server 105.

Although Fig. 1 shows only one client computer 101, it will be appreciated that the representative embodiment of the present invention can include many client computers 101 each capable of being coupled to the server system 104.

The server system 104 is preferably a computer system designed to communicate electronic mail (e-mail) messages. In the representative embodiment, the server system 104 is coupled to one or more external networks 107, such as the Internet, that allow for the sending and receiving of e-mail messages. The server system 104, acting as an intermediary, receives e-mail messages from and causes e-mail messages to be sent to users who have established an account with the server system 104 and with external parties with e-mail addresses, such as Internet users or users of proprietary on-line services.

According to the present invention, the server system 104 also provides other information to and receives information from users of client computers 101, such as, for example, advertisements, software patches, statistical information, etc., as discussed in detail below.

In the representative embodiment, the server system 104 comprises a plurality of mail servers M0 - Mn. Each mail servers M0 - Mn stores e-mail messages for users of client computers 101 who have established an account with the server system 104.

Received e-mail messages, addressed to users who have accounts with the server system 104, are stored in the mail servers M0 - Mn. According to the representative embodiment of the present invention, each user is assigned to one mail server M0 - Mn. Messages received for a user who has an account with the server system 104 are stored in a directory on the mail server M0 - Mn assigned to that user account. Each received e-mail message is stored in a file in the intended recipient's directory until the intended recipient requests received e-mail messages, as discussed below.

E-mail messages sent from a user are stored temporarily on a disk at the

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server system before transmission to the intended recipient.

One or more of the mail servers M0 - Mn is preferably configured to transmit e-mail messages to and receive e-mail messages from non-users of the server system 104 (e.g., users of other e-mail systems) via external networks such as the Internet 107.

The server system 104 of the representative embodiment includes a database management system 106, coupled to each of the mail servers M0 - Mn. The database management system 106 manages and stores information related to the operation of the present invention, such as, for example, member profile information, advertisement information, information used to bill advocacy groups, etc. The database management system 106 preferably includes a plurality of high capacity storage devices for storing and managing large amounts of data. (The hardware configuration of the database management system 106 can easily be varied, and may comprise, for example, a single processor coupled to a high speed storage device, or a distributed system comprising a plurality of servers.)

Alternative configurations of the server system 104 can be accommodated by the present invention. For example, e-mail messages may be stored centrally in a database management system such as the database management system 106 of the server system 104. Thus, each time a user connects to the server system 104, that user's received e-mail messages are retrieved from a central storage location.

In the representative embodiment of the present invention, the server system 104 also includes a plurality of signup servers S0 - Sn. The signup servers S0 - Sn allow for communication with first time users, preferably establishing and activating user accounts and providing new users with "binding" information (as described below).

Fig. 3 illustrates, in flow chart form, the installation and account creation steps that take place at a client computer 101. Typically, the user is provided (e.g., on disk or electronically downloaded over the Internet) with a copy of a software program (the client program) that is executed by the client computer 101 according to the principles of the present invention. The user will install the client program on

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the client computer 101, for example, by executing an install program. The install program will create a directory on the storage device 206 and load the client program into that directory. In the representative embodiment, the install program will determine if there is enough space in the storage device 206 to install the client program and to later download advertisements. For example, the install program will set aside five megabytes of storage space on the storage device 206 for advertisements. This will ensure that there is a minimum amount of storage space available for the required number of advertisements that may be downloaded and stored in the future. The install program may also determine if the client program has previously been installed and if an old version of the client program has been installed that requires updating.

The client program and associated files are organized on the storage device 206 of the client computer 101 in a plurality of sub-directories. For example, assuming that the directory in which the client program is installed is named "mail", then in the representative embodiment, sub-directories of "mail" include "ads", "bad", "bin", "lib", "tmp", "user0". The "ads" subdirectory stores advertisements and an ad log recording statistics relating to advertisements. The "bad" subdirectory stores files not recognized by the advertisement system. The "bin" subdirectory stores the executable client program and related "dll" files. The "lib" subdirectory stores help files, modem configuration files, and bitmap images used in the display of the graphical user interface. The "tmp" subdirectory is used for temporary files. The "user0" subdirectory is a subdirectory created when a user establishes an account. Each time a user creates a new account (or a different user creates an account using the same client computer 101), a new subdirectory is created for that user account, e.g., "user1", "user2", etc. The "user" subdirectory includes an e-mail address book file, a user preferences and configuration file, and "get" and "put" subdirectories are "spooling" directories where data is temporarily stored while in transit between the client computer 101 and the server system 104.

Because files associated with the present invention are stored at the client computer 101, especially files comprising advertisements and usage information, a

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user may accidentally or maliciously delete, tamper with or add to such files and/or subdirectories. Accordingly, the present invention includes an authentication scheme to prevent and/or detect certain undesirable modifications. One such authentication scheme is disclosed in U.S. Patent No. 5,838,790, entitled "Advertisement Authentication System in Which Advertisements Are Downloaded for Off-line Display" to McAuliffe et. al., which is expressly incorporated herein by reference.

Advertisements may be displayed to the user during installation.

Once the client computer software has been installed, the user can initiate local execution of the client computer software. In the representative embodiment, the client computer software operates in a graphical user interface (GUI) environment such as Microsoft Windows, Mac/OS, OS/2 and the like.

The first time that the client computer software is executed on the client computer 101 (and whenever a user wishes to establish a new account with the server system 104), the client program performs various functions intended to establish a new account for the user. In the representative embodiment, the first step is to collect new account information (step 301). At the request of the client program, the user inputs name, address, telephone number and other identification data. This information is stored on storage device 206.

Next, the client program configures the communication interface 102 to operate with the client program (step 302). For example, the client program may ask the user to identify the modem and modem speed or may autodetect the modem and modem speed. The user may also be asked to identify the type of telephone line (e.g., tone or pulse) and whether one must dial a certain number to reach an external line.

The client program requests that the user select an e-mail address and password (step 303).

The client program then initiates a connection with the server system 104 to activate an account for the user (step 304). Fig. 4 illustrates this activation step in further detail. The client computer 101 establishes communication with the server

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system 104 via the communication interface 102 (step 401). In the representative embodiment, first time users interfacing with the server system 104 are coupled to one of the plurality of signup servers S0 - Sn. The particular signup server Sx that the user is first connected to is selected by the server system 104 in a round robin fashion.

On first time use, the client program passes to the server system 104 the selected user name and password. Signup server Sx establishes an account for the user, e.g., queries the database management system 106 to determine whether the requested e-mail address is unique to the server system 104, and if it is, creates an entry in the database management system for that user (step 402). Signup server Sx then assigns (or "binds") the user to one of the plurality of mail servers M0 - Mn (step 402). The binding information (e.g., the identity of the mail server) is transmitted to the client computer 101 and stored on the storage device 206 for later use.

After the account has been activated, the client computer disconnects from (i.e., terminates communication with) the server system 104 (step 404), and in particular disconnects from signup server Sx.

Referring again to Fig. 3, once the user's account is activated (step 304), the user is asked to complete a member profile (step 305). This step takes place when the client computer 101 is off-line, i.e., not connected to the server system 104. In particular, the client computer 101 requests that the user provide information such as interests, hobbies, recent purchases, demographic information, etc., in the form of a survey. Fig. 7 shows as an example of one portion of a representative survey. Illustrated is question fifteen 701 of the member profile. The user responds to the illustrated question 701 by clicking on the appropriate circle next to each option, thus "filling in" the circle. For example, in response to "What sorts of programs do you like to watch on TV?," - if the user watches "News" 702, the user clicks on the circle representing an appropriate answer. Thus, if the user watches the "News" 702 often, he clicks on circle 703. After clicking on all the appropriate circles representing responses, the user may move ahead in the profile - that is, to the next

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questions - by clicking on a "Next >" button 704. If the user wants to go back to earlier questions and responses, possibly to change an answer, the user clicks on a "< Back" button 705.

The user's responses (i.e., the completed member profile) are stored on the client computer 101 storage device 206 for future transmission to the server system 104. In the representative embodiment, the member profile is transmitted to the server system 104 when the user first sends or receives e-mail. The information can be used by the server system 104 to aid in selecting or targeting advertisements and e-mail messages containing advertisements to desired users. The member profile can be updated by the user and will then be transmitted to the server system 104 when the user next connects with the server system 104 to sent or receive e-mail messages. When transmitted, the member profile is stored at the server system 104 on the database management system 106.

Once the member profile is completed, initialization is complete. The user at the client computer 101 can now create, send, receive, and read e-mail messages.

It will be appreciated that in alternative embodiments, the member profile may be transmitted to the server system 104 at step 304 along with the selected e-mail address and password.

Fig. 5 illustrates, in flow chart form, typical steps followed by the client computer 101 when the client software is executed after the initial sign-up process. This flow chart is for purpose of explanation and does not necessarily reflect all possible paths of control flow in the execution of the client program.

The client computer 101 displays advertisements on a portion of the user's display terminal 202 (step 501). As illustrated, advertisements are displayed continuously during the operation of the client software, and in particular, when the client computer 101 is not in communication with the server system 104. This is possible because the advertisements are stored on the client computer 101.

In the representative embodiment there are two types of advertisements. Banner advertisements 800 are displayed at step 501 when the user is reading and creating e-mail messages, or performing other administrative tasks, e.g., moving e-

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mail messages between folders. In the representative embodiment, banner advertisements 800 are displayed in a box at the top right side of the window (see Figs. 8 and 12). Showcase advertisements are displayed whenever the user is attempting to establish a connection with the server system 104 and when information is being transferred between the client computer 101 and the server system 104. The banner and showcase advertisements may be textual, graphical, or video data (or combinations thereof) and may be stored in a standard compressed data format, such as JPEG or MPEG, or in a proprietary format, or in an uncompressed format. Typically, advertisements are simple graphics files. Sounds may also be included.

The banner advertisement 800 shown to the user prior to sending or receiving e-mail messages for the first time can be an advertisement previously received from the server system 104 (e.g., during the account creation process) or an advertisement obtained from the installation disk. The banner advertisement 800 displayed is stored in a file on storage device 206 (e.g., in the "ads" subdirectory). The stored banner advertisements 800 can be stored in a compressed format and decompressed immediately prior to display.

In the representative embodiment, each banner advertisement 800 is replaced by another one of the stored banner advertisements after a predetermined time has elapsed. The banner advertisement is continuously updated or replaced by the client computer 101 while the client program of the present invention is executing. Each banner advertisement 800 is displayed for a predetermined time and in accordance with a schedule that is preset or determined by the client program "on-the-fly". The client scheduler module, the distribution scheduler and the download scheduler module are disclosed in U.S. Patent No. 5,848,397 entitled "Method and Apparatus for Scheduling the Presentation of Messages to Computer Users" to Marsh et. al.

The banner advertisements 800 may be interactive. For example, by clicking on the banner advertisement 800, the user may be provided with further information concerning the subject matter of the current banner advertisement 800. The further information may be, for example, another related banner advertisement 800 stored

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on storage device 206.

By clicking on the banner advertisement 800, the user may be provided with an e-mail message template to create an e-mail message (as described in connection with Fig. 12 below), having the addressee already filled in with the e-mail address of a company or advocacy group associated with the subject matter of the current banner advertisement 800. In this manner, the user may, for example, provide comments to the company or advocacy group regarding the subject matter of the banner advertisement 800 or request further information. Alternatively, clicking on the banner advertisement 800 may cause an e-mail message to be automatically completed (including the message) and either transmitted immediately or stored in the user's "outbox" folder (described later). The message may merely identify the user to the addressee of the e-mail message as someone interested in the subject matter of the banner advertisement 800.

In accordance with the representative embodiment, advertisements are preferably described in a file using a page description language ("PDL"). The PDL is a simple notation for describing the graphical objects or elements that form each advertisement. Accordingly, associated with each advertisement is a file containing the advertisement's description written in the PDL. A specification for a representative PDL is illustrated below:

Type:	Page Head
Name:	Name of the page
Width:	width of page in pixels
Height:	height of page in pixels
Color <optional>:	color
File Name <optional>:	file name
...	
Type:	Text
Name:	Name of the element
Left:	position w/r/t left side of

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	ad page
Top:	position w/r/t top of ad page
Width:	width of text in pixels
Height:	height of text in pixels
Text:	textual message
Font<optional>:	font
Font Style<optional>:	Bold|Italic|Underline|Strikeout
Font Height <optional>:	font height in pixels
FG Color <optional>: text color	
BG Color <optional>:	background color
Justify <optional>:	Right|Center|Left(default)
...	
Type:	Button
Name:	Name of the element
Left:	position w/r/t left side of ad page
Top:	position w/r/t top of ad page
Width:	width of text in pixels
Height:	height of text in pixels
Text:	textual message
Up <optional>:	file name of bitmap for button in up position
Down <optional>:	file name of bitmap for button in down position
Focus <optional>:	file name of bitmap for focus button
OnClick/Action:	action to be performed when user clicks the button. Choose one

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		action of the following: • pdl modal <file name> create new dialog to display the new ad • pdl inherit <file name> use the current dialog to display the ad • log <an id assigned to the ad> log an event to the ad log to be processed by the server • submit <form name> submit all the values from the form collected in the ad • request <recipient E-mail> <subject line> compose a message and put it into user's outbox • mail <recipient e-mail> <subject line> switch to the writer, fill in the To and Subject • msg <message text> display a message
Message <optional>:		message to be displayed when user clicks the button
Data:		specify any auxiliary data for the action
Font:		font
Font Style:		Bold|Italic|Underline|Strikeout
Font height:		font height in pixels
...		
Type:		Hotspot
Name:		Name of the element
Left:		position w/r/t left side of ad page
Top:		position w/r/t top of ad page
Width:		width of text in pixels
Height:		height of text in pixels

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Text:	textual message
OnClick/Action:	action to be performed when user clicks the hotspot. Choose one action of the following: • pdl modal <file name> :create new dialog to display the new ad • pdl inherit <file name> :use the current dialog to display the ad • log <an id assigned to the ad> : log an event to the ad log to be processed by the server • request <recipient e-mail> <subject line> : compose a message and put it into user's outbox • mail <recipient e-mail> <subject line> : switch to the writer, fill in the To and Subject • msg <message text> : display a message
Message <optional>:	message to be displayed when user clicks the hot spot
Data:	specify any auxiliary data for the action
...	

Type:	Background
Name:	Name of the element
Left:	position w/r/t left side of ad page
Top:	position w/r/t top of ad page
Width:	width of text in pixels
Height:	height of text in pixels
Color:	color
File name <optional>:	specify the bitmap to use

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	or the bitmap which contains the background color
...	
Type:	BMP
Name:	Name of the element
Left:	position w/r/t left side of ad page
Top:	position w/r/t top of ad page
Width:	width of text in pixels
Height:	height of text in pixels
File name:	the bitmap file
Wipe <optional>:	TRUE (do wipe with any of the available wipe modes)|FALSE (no wipe)|LTOR (left to right)|RTOL (right to left)|MID (expand from middle)|END (start from two ends)
...	

In the representative embodiment, all advertisement definitions include a "Page head" and may include one or more of the other illustrated types.

Type: Page Head:

"Page Head" defines the basic structure of the advertisement including the "Width" and "Height" of the advertisement, as well as the color ("Color" or "File Name" fields).

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Type: Text:

"Text" specifies a text string at a particular location. The "Name" field defines an identifier for the "Text" object being defined. The "Left" and "Top" fields indicate the position of the text string within the advertisement. "Width" and "Height" provide the dimensions of the text. The "Text" field specifies the text string to be displayed. The "Font," "Font Style," and "Font Height" fields identify textual font information. "FG Color" and "BG Color" identify the color of the text and the color of the background respectively. The "Justify" field specifies the text justification.

Type: Button:

"Button" defines a clickable GUI button. The "Name" field specifies an identifier for the button being defined. "Left" and "Top" specify the position of the button while "Width" and "Height" define the dimensions of the button.

The "Text" field specifies a text string to be displayed on the button. For a bitmap button, "Up," "Down," and "Focus" specify bitmaps for the button in the up, down, and focus positions respectively.

The "OnClick/Action" field specifies the action to be performed when a user clicks on the button. One of six actions may be performed. If "pdl modal <file name>" is specified, a new dialog is created to display a new advertisement. The file name specified is the file containing the definition of new advertisement. If "pdl inherit <file name>" is specified, the current dialog is used to display the new advertisement defined in file "file name." If "log" is specified, an event is logged into the ad log.

"Request <recipient e-mail> <subject line>" causes the client computer to automatically compose an e-mail message addressed to the identified "recipient." The subject of the e-mail message is filled in with the text specified in the second parameter, i.e., subject line. The e-mail message is then put into the user's outbox.

If "mail <recipient e-mail> <subject line>" is defined as the action to be performed, the client computer switches to the "write" screen, automatically filling

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in the address and the subject of an e-mail message. The user can then fill in the message body.

Finally, if "msg" is specified, a textual message is displayed to the user when the user clicks the button.

The "Message" field for type "Button" specifies a message to be displayed when the user clicks on the button.

The "Data" field identifies auxiliary data for the action.

Additionally, for each button, "Font," "Font height," and "Font style" may be specified for the button text.

Type: Hotspot:

"Hotspot" is similar to a GUI button and is defined in a fashion similar to a button.

Type: Background:

"Background" is used to fill a specified rectangle with a selected color or identifies a bitmap to fill the specified rectangle. The "Left" and "Top" fields define the position of the background while the "Width" and "Height" fields define the dimensions of the background. The "Color" field identifies the color of the background. The "File name" field identifies a bitmap to use to fill in the rectangle.

Type: BMP:

"BMP" specifies a bitmap. The "Left" and "Top" fields define the position where the bitmap is to be displayed while "Width" and "Height" define the display dimensions of the bitmap. The "File name" field identifies the bitmap file. Finally, the "Wipe" field specifies if the bitmap is to wipe when display, and if so, how it should be wiped.

The client computer 101 also logs statistics regarding the advertisements displayed (also step 501) in a file stored on storage device 206. For example, each

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time a new banner advertisement 800 is displayed, the client computer 101 logs the identification of the banner advertisement 800, the time and date it was displayed, and duration of the display.

While the banner advertisement 800 is displayed, the user can read and create e-mail messages using a graphical user interface of the present invention (steps 500 and 502-507). At step 502, the client program causes a main screen to be displayed. Fig. 8 is a representative example of a typical main screen.

As illustrated in Fig. 8, the user is presented with two "tabs" representing main system functions, a read tab 801 and a write tab 802. Clicking on read tab 801 (step 503) or write tab 802 (step 505) causes a screen for either reading or creating e-mail messages to be displayed. In Fig. 8, the read tab 801 has been selected, thus allowing the user to read e-mail messages that have been transferred to the client computer 102. Thus, from Fig. 8, if the user selects the write tab 802 (step 505), a write screen 1220 is displayed as in Fig. 12 (step 506). From Fig. 12, if the user selects the read tab 801, a read screen 820 is displayed as in Fig. 8 (step 504).

When the read screen 820 is displayed, the user can read e-mail messages that have been transferred to the client computer 101. When the write screen 1220 is displayed, the user can create e-mail messages. It will be appreciated that reading and creating e-mail messages is done off-line, and that banner advertisements 800 are displayed to the user and updated while the user is reading and creating e-mail messages. E-mail messages that are created can be textual, graphical, and may include attached files.

Referring now to the read screen 820 of Fig. 8, the user at client computer 101 is presented with various read subfunctions displayed as clickable buttons labeled "Reply" 803, "Forward" 804, "Delete" 805, "Print" 806, "Move to Folder" 807, "Copy to Folder" 808, "Get New Mail" 809, "Address Book" 810. In the representative embodiment, e-mail messages are stored in folders, e.g., an Inbox folder for received e-mail messages and an Outbox folder for unsent e-mail messages. The user may create additional folders, and move e-mail messages between folders. The folders are subdirectories in the subdirectory allocated to a

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particular user (e.g., subdirectory "user1") of the client computer 101.

The read screen 820 displays the name of the current e-mail folder 811, a status display 812 showing the status of e-mail messages stored in the current e-mail folder 811, an e-mail list 813 showing a list of the e-mail messages stored in the current e-mail folder, and an open e-mail text box 824 displaying the content (e.g., text) of a selected e-mail message.

Information concerning e-mail messages stored in the current folder is displayed in an e-mail list 813. The information preferably includes the user name and address of the sender ("From" 815), the subject of the e-mail message ("Subject" 816), the date of the e-mail message ("Date" 817), and the status of the e-mail message ("Status" 818). As shown in Fig. 8, information concerning only three e-mail messages is displayed, but the user can scroll through information concerning other e-mail messages stored in the folder using scroll bar 819.

By selecting (e.g., clicking on) one of the displayed list elements in e-mail list 813, the user can "open" the corresponding e-mail message. Once opened, the content of the e-mail message is displayed in the e-mail text box 824. The user can scroll through the content of the message using scroll bar 821.

Once an e-mail message is open, the user can read the message and choose to reply to the message by clicking on the reply button 803. This opens the write screen 1220 (Fig. 12) and creates a template for an e-mail message, with the addressee field completed. In particular, if a user replies to the e-mail message highlighted in Fig. 8, the reply e-mail message will be addressed to "Steve@demo.juno.com". Processing of this new message is similar to that of other e-mail messages created by the user.

The user can also choose to forward the open e-mail message by clicking on the Forward button 804. In response to clicking on the Forward button, the client computer 101 creates a template for an e-mail message and also attaches a copy of the open e-mail message.

The user can also choose to delete the open message by clicking on the Delete button 805. This causes the client computer 101 to erase or remove the file

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containing the open e-mail message from the storage device 206. In the representative embodiment, the file may be marked as "deleted" and then actually deleted at the end of the user's session.

The open e-mail message can also be printed on a printer that is coupled to client computer 101. To print an e-mail message, the user selects the Print button 806.

Received e-mail messages can be moved to and copied to other folders by clicking on the "Move to Folder" button 807 and "Copy to Folder" buttons 808 respectively. When the "Move to Folder" button 807 is clicked, the user is asked to identify the folder to which the open e-mail message is to be moved. If the user identifies a non-existent folder, the client computer 101 creates a new folder with the name identified by the user and associates the e-mail message with the new folder, removing the e-mail message from the old folder. Otherwise, the open e-mail message is associated with the identified existing folder and is removed from the old folder.

Clicking the "Copy to Folder" 808 copies the open e-mail into a folder identified by the user and leaves the original e-mail message in the old folder.

The user can retrieve new e-mail messages and send created e-mail messages (step 507). The user can choose to retrieve new e-mail messages from the server system 104 by clicking on the "Get New Mail" button 809. The user can choose to send e-mail messages by clicking on the "Send Mail" button 1209 of Fig. 12. (The user is also given the option to retrieve new e-mail messages whenever the user starts the client program.)

Fig. 9 illustrates in detail the steps performed by the client computer when the user sends or receives e-mail messages. When a user decides to send or get e-mail messages, the client computer 101 connects to a mail server M0 - Mn of the server system 104 through communications server 105 (step 901). Among the other connection parameters passed from the client computer 101 to the communication interface 102 is the user name and binding information (e.g., the network login) that identifies which of the plurality of mail servers M0 - Mn the user's client computer

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101 should be connected to. Each user is associated or "bound" to a particular mail server M0 - Mn.

Once the client computer 101 is connected to the appropriate mail server M0 - Mn, the user must then be "authenticated." Authentication is accomplished using a challenge/response protocol. The mail server issues a challenge to which the client computer 101 responds by computing a keyed hash value of the challenge using the user's password. The client system 101 transmits the user's name and the hash value back to the mail server. The mail server then compares the client's hash value with a hash value it computes locally based on the asserted identity of the user. If it matches, the user is authenticated.

In the representative embodiment, if the server 105 has migrated the user's server-side data to a different mail server M0 - Mn, the client computer 101 receives a notification that the binding has changed. This notification includes new binding information. The client then establishes a new connection utilizing the new binding information.

After the client is connected to the appropriate mail server and has been authenticated, the client computer 101 transmits the user's member profile stored on storage device 106 to the mail server for that user if appropriate(step 902). The user's member profile will only be transmitted if it has been modified since the last time the client computer 101 transmitted the profile. The creation of the user's member profile was discussed above in connection with Fig. 3.

The client computer 101 also transmits statistical information to the mail server Mn. In the representative embodiment, the statistical information includes, for example (i) which advertisements are shown to the user, for how long and at what times; (ii) whether any advertisement has been altered by the user or corrupted by the system; (iii) the number of remaining exposures for an advertisement; and (iv) when an advertisement is expired for a user or for all users. This information is stored in an advertisement statistics file. The statistical information may also include (i) when a user activates the client program; (ii) how long the client program was used; (iii) when there is a period of inactivity when the client program is

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running on the client computer, for example, if the user does not enter an instruction for a period of five minutes; (iv) modem configuration problems; (v) information as to how well the client program functioned; (vi) any communication problems with the server system; and (vii) other statistical information useful to predict a user's future behavior with respect to the client program. This information is stored in an event log file.

As appropriate, e-mail messages are communicated between the client computer 101 and the server system 104 (step 904). The client computer 101 receives (and the mail server transmits) new e-mail messages addressed to the user. The client computer 101 stores each new e-mail messages on storage device 106 and associates the new messages with the Inbox folder. The client computer 101 sends (and the mail server receives) e-mail messages created by the user and stored on storage device 106. In the representative embodiment, these messages were associated with the Outbox folder.

Additionally, new banner and showcase advertisements and corresponding scheduling information can be received by the client computer 101 (step 905) from the mail server Mn, and are stored on storage device 106, in, for example, the "ads" subdirectory. Expired advertisements may be overwritten. The scheduling information may include information such as how many times each message should be displayed to each user, what time of day the message should be displayed, how many days the advertisement remains current and eligible for display, etc.

The new banner and showcase advertisements are not correlated in any way to the user's e-mail. In fact, a user may receive the advertisements even if the user does not receive any e-mail or have any e-mail to send.

The client computer 101 may also receive other information from the mail server Mn (step 906). This other information may be, for example, software patches, modem configuration data, and new POP information. The new POP information allows easy changes and additions to the points of presence (usually modem banks and terminal servers) that enable connections between the client computers 101 and the server system 104.

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As the client program may occasionally need to be updated to incorporate new features or correct errors (bugs), software patches are also transmitted to the client computer 101. Thus, when a software patch is available, the client computer 101 receives and stores it, and preferably, applies the update sometime in the future.

POP information includes both dialing scripts and telephone numbers.

Finally, after the client computer 101 has transmitted and received all of the necessary information, the client computer 101 is disconnected from the mail server Mn (step 907).

While the client computer 101 is establishing communications with, and actually communicating with the server system 104 through mail server Mn, showcase advertisements 1001 are displayed to the user. Fig. 10 illustrates a screen display that is shown to the user during steps 901 to 907. Like the banner advertisement 800, the showcase advertisement 1001 can be replaced after a predetermined time, with a different showcase advertisement that is stored on storage device 206. The showcase advertisement 1001 preferably takes up a large portion of the display window as illustrated. The client computer 101 records information such as the identity of the showcase advertisement, the time of the display to the user, and the duration of the display, in the advertisement statistics file, each time a showcase message is displayed.

In an alternate embodiment, a regular or "generic" banner advertisement 800 could be shown concurrently with the showcase advertisements 1001. The generic banner advertisement may, for example, use a limited number of colors, allowing the system to maximize the use of the colors in the showcase advertisements 1001.

To the left of the showcase message 1001, a transfer status 1002 is displayed. This status alerts the user to the percentage of data that has transferred between the client computer 101 and the mail server Mn and what transfer operation is being performed (e.g., modem dialing, modem connecting, transferring, disconnecting, etc.).

Fig. 11 illustrates the transfer process of Fig. 9 from the perspective of the

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server system 104. After the user connects to the appropriate mail server Mn and the user is authenticated (step 1101), and, if necessary, the mail server Mn receives from the client computer 101 the user profile (step 1102). The mail server Mn also receives statistical information from the client computer 101, such as, for example, the event log file and the advertisements statistics file (step 1103). In the representative embodiment, the user profile and the statistical information may be temporarily stored in the mail server Mn. Late at night (off-peak), a batch job may be run to incorporate all the new data into the database management system 106. This information can be used to determine which advertisements are eligible for downloading to a particular user, when the advertisements are to be downloaded, and when the advertisements are to be displayed. The event log file and the advertisement statistics file are also used to create billing information for advocacy groups. After these files are transmitted to the server system 104 by the client computer 101, a backend program at the server system 104 reads and processes these files for reporting and billing advocacy groups whose advertisements have been distributed and/or displayed.

The mail server Mn transmits e-mail messages addressed to the user to that user's client computer 101 and receives e-mail messages from the client computer 101 to be sent to others (step 1104). As indicated above, the e-mail messages addressed to each user are preferably stored at the mail server M0 - Mn to which the user is assigned, in this case, mail server Mn. Thus, to retrieve e-mail messages for a particular user, mail server Mn need only access the files containing the e-mail messages addressed to that user and transmit them to the user. Thus, in the representative embodiment, the mail server Mn does not need to remotely access another machine, thus improving performance and availability by reducing network traffic.

New banner and showcase advertisements are transmitted from the mail server Mn to the user at the client computer 101. When the user connects to mail server Mn, mail server Mn transmits the appropriate advertisements to the user.

In an exemplary embodiment of the present invention, the database

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management system 106 determines which users are eligible to receive each particular advertisement, and that advertisement will be "placed" in each eligible user's directory on the mail server. When placing an advertisement in the directory, the present invention may place a copy of the advertisement in the directory or create a symbolic link in the directory to a central or common location where the advertisement is stored. This process of determining which users are eligible to receive an advertisement and "placing" the advertisement in the user's directory may take place at an off-peak period such as very late at night.

Where there is more than one user of a particular client computer 101, the advertisements that are eligible to be transferred to all users of that client computer can be stored together on the mail server. Thus, whenever one of those users connects to the mail server, all or a portion of the advertisements for all users of that client computer 101 can be transferred to the client computer 101.

Additional information, such as software patches, new modem configuration data, and new POP data, may be transferred by the server system 104 to the client computer 101 (step 1107).

Once the mail server Mn has finished transmitting and receiving information, the client computer 101 is disconnected from the mail server Mn (step 1108).

Referring again to Fig. 8, the user can click on an "Address Book" button 810. Upon clicking on the "Address Book" button 810, the user is presented with his current list of e-mail addresses (of other system users and non-users) that the user has stored, e.g., on storage device 206. The user may add other e-mail addresses to this electronic "address book."

If the user wishes to compose an e-mail message, the user can select the write tab 802 (step 505), causing the write screen 1220 to be displayed, as shown in Fig. 12 (step 506). The write screen 1220 presents the user with a blank e-mail message template 1201 which the user can complete, as well as several GUI buttons: a "Spell Check" button 1206, a "Clear" button 1207, a "Print" button 1208, a "Send Mail" button 1209, and an "Address Book" button 1210.

As illustrated, the e-mail message template 1201 includes a "To:" field into

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which the user can enter e-mail addressees. In this case, only one e-mail addressee has been entered, "jane@demo.com," however, several different e-mail addressees could have been entered.

The e-mail template 1201 also includes a "Cc:" field 1203 for entering the e-mail addresses of users who should receive a copy of the e-mail the user is sending. Here, "janice@demo.com" is entered in the "Cc:" field 1203.

Additionally, a "Subject:" field 1204 is provided for entering information preferably identifying the subject of the e-mail message. "Perry" is the subject of the e-mail message illustrated.

Finally a "Message:" field 1205 is provided. This is the portion of the e-mail template 1201 where the user can write a message, i.e., fill in the message body.

Once the e-mail template 1201 has been completed, the user can click on the "Spell Check" button which provides checks of the spelling of information in the "Message:" field 1205.

Clicking on the "Clear:" button 1207 provides the function of clearing the e-mail message template 1201 so that the user can rapidly clear the fields of the e-mail message template.

The "Print" button 1208, when selected, causes the client computer 101 to print the e-mail template 1201, with the information entered, to a printer that is coupled to the client computer 101.

If the user decides that the e-mail message is complete, the user may select the "Send Mail" button 1209. In response, the client computer 101 asks the user whether the user wants to move the message to an "outbox" folder or whether the user wants to send (and receive) e-mail messages immediately. A user will generally elect to move the message to an "outbox" folder if the user intends to write more e-mail messages during the current session. As described earlier, the "outbox" folder is preferably for temporary storage of outgoing e-mail messages that are waiting to be sent. If the user does elect to move the message to the "outbox" folder, the message is stored on the storage device 206 of the client computer 101, and the user is again presented with a blank e-mail template.

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If instead, the user elects to send and receive e-mail immediately, the processes described in connection with Figs. 9 and 11 are performed. E-mail messages stored in the user's "outbox" folder as well as the current new e-mail message are transmitted by the client computer 101 to the mail server Mn for delivery.

If the addressees of the e-mail transmitted are users of the present invention, the e-mail will be delivered to the addressees the next time they connect to a mail server M0 - Mn. Otherwise, the mail server Mn will transmit the e-mail message outside the present system, for example, over the Internet 107.

Finally, clicking on the "Address Book" 1210 results in the display of the user's current list of e-mail addresses (of other system users and non-users) that he has stored on storage device 206. Using the electronic "address book," the user can look up the address of someone to whom the user wishes to send an e-mail message. The user may also add other e-mail addresses to the electronic address book.

When creating e-mail messages in the write screen 1220, banner advertisements 800 are displayed to the user. The client computer 101 is not connected to the server system 104 when the user is creating e-mail messages.

When the user has completed all e-mail processing, the user can exit the client program by selecting "File" 1211 positioned in a menu bar 1212 and then selecting "Exit" from a drop down menu (step 507).

More than one user may use a single client computer 101. In such case, a subdirectory is provided for each user on the client computer 101, e.g., user0, user1, etc. However, there need be only one "ads" directory storing advertisements. These advertisements may be eligible for display to all, some or one only of the users. In the representative embodiment, each advertisement contains scheduling information for each user to whom the advertisement will be shown. In addition, a list of known advertisements for each user is maintained on the client computer 101. This list is modified by an advertisement scheduler and advertisement spooler both of which run locally on the client computer 101. The advertisement scheduler removes an advertisement from a user's list when the advertisement expires. The advertisement

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spooler makes additions to the per-user data structures when a new advertisement is received.

Fig. 6 summarizes the information that is communicated between the client computer 101 and the server system 104 of the representative embodiment of the present invention. E-mail messages are compressed for transmission. Advertisement archives are transferred from the server system 104 to the client computer 101. Each advertisement archive comprises a combination of advertisement data (as discussed above with reference to the PDL) and advertisement control information. Advertisement control information includes scheduling information for that advertisement, e.g., show the advertisement twenty times, but only for the next ten days. The advertisement archive is stored in compressed format at the server system 104. (For convenience only, this specification sometimes refers to transmission of an advertisement from the server system 104 to a client computer 101. In the representative embodiment, it is an advertisement archive, not actually an advertisement, that is transmitted.)

An advertisement statistics file and an event log file are compressed prior to transmission and sent from the client computer 101 to the server system 104. A member profile file, storing information about the user, is sent for the client computer 101 to the server system 104. In the representative embodiment, this file is in a Windows INI format, and is compressed for transmission. A file comprising a debugging log is also transmitted, in compressed form, from the client computer 101 to the server system 104.

The following files are sent from the server system 104 to the client computer 101: a binary data file comprising a software patch, compressed prior to transmission; a file comprising modem configuration and identification data used by modem configuration software at the client computer 101, compressed prior to transmission; and a file of POP data, including dial scripts and telephone numbers referring to points of presence, compressed prior to transmission.

Fig. 6 also illustrates the information that is communicated between the server system 104 and an advocacy group or "advertiser" 108. In particular, files

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containing advertisement information may be communicated from the advocacy group 108 to the server system 104 for processing and storage in database management system 106.

Also, billing information and statistics may be communicated to the advocacy group 108 from the server system 104. The advertisements, billing information, and statistics may be electronically communicated between the server system 104 and the advocacy group 108, directly or indirectly, over a network, over the air waves, or over any other communication media. Alternatively, the information may simply be hand delivered on a storage media such as tape or disk.

Although Fig. 6 shows only one advocacy group 108, it will be appreciated that the representative embodiment of the present invention can include many advocacy groups.

Also illustrated in Fig. 6 is the flow of information between the server system 104 and an external network such as the Internet 107. As described above, the server system may transmit information such as e-mail messages to and from non-users of the server system 104 via the external network 107.

As can be appreciated, the present invention operates in an efficient manner. In particular, the user at the client computer 101 operates locally while composing and reading e-mail messages. Only when the user is ready to transmit or receive new e-mail messages does the client computer 101 establish a communications link with the server system 104, and the client computer 101 is disconnected as soon as all information is transmitted and received. Thus, the system operates in a "batch" mode. This, of course, keeps the costs associated with maintaining a communications link, i.e., connect or line charges, low.

Further, the present invention maximizes potential advertising time by displaying messages to a user at a client computer 101 even when the client computer 101 is "off-line" from the server system 104.

It will be appreciated that the principles of the present invention could be used to provide advertisements to users in on-line systems other than e-mail systems. For example, the present invention could be adapted to output a series of

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advertisements to users in a system that allowed downloading of a number of web pages for off-line browsing. In general, the present invention could be utilized wherever digital content is downloaded to a user for off-line access.

E-mail Advocacy Network

As briefly described above in the background of the invention, in some cases an advocacy group may want a number of people to contact a particular representative. As used herein, the term "representative" can include a specific person, a group of people or an office. That is, the representative may be, for example, an elected official, such as a member of the United States Senate or House of Representatives, or a locally elected official. The representative may also be, for example, a government agency, a quasi-governmental agency, firm or organization, or any entity that is targeted by an advocacy group. The advocacy group may, for example, encourage a number of people contact a particular congressman about an upcoming vote.

According to an embodiment of the present invention, an advocacy network, such as the system described with respect to Figs. 1-12, is used for this purpose. As shown in Fig. 13, the advocacy network 2000 includes a number of users, such as a first user 2110 and a second user 2120 that communicate with an advocacy platform 2300 through a communication network 2200. The Internet and Public Switched Telephone Network (PSTN) are examples of such a communication network 2200, but any network capable of carrying the communications described below can be used instead. The advocacy platform 2300 also communicates with a representative 2400, such as through the communication network 2200.

According to an embodiment of the present invention, the advocacy platform 2300 sends an advocacy message, such as the advocacy message 2500 shown in Fig. 15, to a number of users 2110, 2120 through an e-mail system as described above with respect to Figs. 1-12. If desired, the advocacy platform 2300 can send the advocacy message to a subset of the e-mail system users. For example, only users living in a certain state, or within a certain geographic area or ZIP code area, having certain demographic or psychographic characteristics, may be contacted. As will be

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explained, this process may be automatically performed by the advocacy network 2000, such as, for example, by being performed without human intervention.

The advocacy message may explain, for example, the issues involved in an upcoming vote. If desired, the advocacy message can be tailored to a particular user, such as by including the name of the user's representative. This information may be automatically determined based on information stored about the user in a database. That is, the user may not need to provide this information to the advocacy network 2000 in response to an advocacy message. Fig. 17 is another example of such an advocacy advertisement.

The advocacy message may also ask the user to "click on" a button if the user would like to automatically send an e-mail to his or her representative. As is also described above with respect to Figs. 1-12, an "indication" as to whether or not the user clicked on this button can be returned to the advocacy platform 2300 in an event file. For example, a hotspot 2510 in the advocacy message may cause an event to be logged indicating that the user would like to automatically send an e-mail to his or her representative.

The advocacy message may contain the exact text of an e-mail message, and not let users change the e-mail message. Alternatively, the advocacy message may instead let users create their own e-mail messages. As another alternative, the advocacy message may have a "default" e-mail message that can be modified by users.

Based on the event file, the advocacy platform 2300 may automatically generate and send an appropriate e-mail message to the representative 2400, such as the e-mail message 2600 shown in Fig. 16. Note that Fig. 16 may include, for example, a representative's name, the sender's name and home address, and customized information based on demographic information about the sender ("[a]s a mother . . ."). Fig. 18 is another example of an advocacy e-mail message.

The advocacy platform 2300 may do this immediately or in small batches (such as batches of eight times per day). According to another embodiment of the present invention, the advocacy platform 2300 may wait and send a large batch of e-

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mail messages at a particular time, such as the day before a vote. The e-mail message will preferably be "signed" with the user's name and home address (as opposed to only an e-mail address), because many representatives are not interested in anonymous opinions or opinions of people who live outside a particular voting district. The "signing" may be done automatically without requiring user input. Of course, for privacy reasons, such signing may be performed when then user has specifically authorized such an action, such as by clicking on a particular button.

According to another embodiment of the present invention, information about the representative, such as the representative's name and office and/or a message specifically tailored to evoke an appropriate response, may also be automatically included in the e-mail message sent on behalf of the user. Furthermore, the contents of the e-mail message sent to one or more representatives may itself be customized in several ways. It might contain a fixed message to which the user's name and address is appended. Alternatively, the contents of the message itself may be customized based on the user's demographic and psychographic profile or on the input supplied by the user in the response to the advocacy message.

If desired, the advocacy platform 2300 may also send a "cc:" of the message, including contact information such as the user's name, phone number, home address or e-mail address, to the advocacy group. A list of such information may be helpful, for example, if the advocacy group would like to contact users that sent messages about a particular issue or to raise funds. Such a list may also be used to tangibly demonstrate how many users have contacted a representative.

Fig. 14 is a more detailed view of the advocacy platform 2300 shown in FIG. 13. The advocacy platform 2300 includes a server system 2310 to handle the (i) sending of e-mail messages and an advocacy message to users; (ii) receiving event files, including an indication, from users and (iii) sending e-mail messages to one or more representatives.

When an advocacy group decides to use the advocacy network 2000, a processor system 2320 determines which users will receive the message. For example, the processor system 2320 may select:

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all of the e-mail system users;
users that in California's 3rd Congressional District;
users with children under the age of ten;
users with particular hobbies or interests; or
female users between the ages 18 and 25.

Of course, any combination of, for example, geographic, demographic and psychographic criteria can be used, if desired. The processor system 2320 may select users based on, for example, zip codes contained in a user database 2330. The processor system 2320 may also utilize a representative database 2340 to select users based on, for example, which zip codes are in a particular congressional district or which representatives are on a particular committee. This allows automated targeting of users and/or representatives because all of the information required to make such determinations may be available in the user database 2330 and the representative database 2340. Moreover, the processor system 2320 may also access third party databases, such as, for example, public records, including motor vehicle and voter registration databases.

If desired, the advocacy network 2000 may also send a follow-up message to the users 2110, 2120 such as a message stating the outcome of a particular vote, or how a particular representative voted. The advocacy network 2000 may also be configured to generate reports for the advocacy group, such as reports indicating what percentage of users responded to an advocacy message. Such reports may also catagorize this information in terms of the user's geographic, demographic and psychographic characteristics.

According to another embodiment of the present invention, the advocacy platform 2300 may be configured to send a message other than an e-mail message to the representative 2400. For example, the advocacy platform 2300 may be configured to send a facsimile, telephone or written and mailed message to the representative 2400. In the case of a telephone message, the advocacy platform 2300 may cause another platform to dial both a user and a representative and then connect the two parties. According to another embodiment of the present invention,

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the advocacy platform may directly dial both a user and a representative and connect the two parties.

An advocacy message may also, if desired, collect responses to one or more survey questions from a number of users. For example, the advocacy message may contain a list of questions related to an advocacy issue. The user may provide answers to each of the questions (such as by clicking on a selection or entering information), which may then be included in the event file sent back to the server system. Such information may be used to update a user database, forwarded to the advocacy group (perhaps along with contact information related to the user) and/or used to automatically select further messages for that user. The idea of collecting survey information may also be used to gather contact information, such as user names, phone numbers, home addresses and e-mail address, similar to using a "cc:" message as described above with respect to the advocacy platform 2300.

While the present invention has been particularly shown and described with reference to preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention.

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What Is Claimed Is:

1. A method of operating an advocacy network, comprising the steps of:

accessing a user database, the user database comprising information about users and information identifying a representative associated with each user;

automatically selecting a user based on information in the user database; and

sending an advocacy message to the selected user through a first communication network.

2. The method of claim 1, wherein the information about users comprises at least one of geographic, demographic and psychographic information.

3. The method of claim 1, wherein each representative is associated with a geographic area and the information identifying the elected representative comprises information associated with a home address of the selected user.

4. The method of claim 1, wherein said step of selecting comprises automatically selecting a user based on both the information about users and the information identifying a representative associated with each user.

5. The method of claim 1, wherein the advocacy message comprises a message associated with an e-mail system.

6. The method of claim 1, wherein the advocacy message is sent to the selected user through a first communication network and is displayed to the selected user when the selected user is off-line with respect to the first communication network.

7. The method of claim 1, wherein the advocacy message comprises at least one of a text, an audio, a graphical and a multimedia message.

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8. The method of claim 1, wherein the advocacy message includes a portion allowing the selected user to generate an indication, and further comprising the steps of:

receiving the indication from the selected user; and

sending a response message to the representative associated with the selected user, including information about the selected user, based on the received indication.

9. The method of claim 8, wherein the information about the selected user sent in the response message comprises a home address of the selected user.

10. The method of claim 8, wherein the response message comprises one of an e-mail message, a facsimile message, a printed letter and a telephone call.

11. The method of claim 8, wherein said response message is sent at a pre-determined time along with response messages associated with other users.

12. The method of claim 8, wherein the response message is sent through a second communication network.

13. The method of claim 12, wherein one of the first and second communication networks comprise one of the Internet and a Public Switched Telephone Network.

14. The method of claim 8, wherein the response message comprises a telephone call and comprising the further steps of:

placing a telephone call to a first telephone number associated with the selected user;

placing a telephone call to a second telephone number associated with the representative associated with the selected user; and

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connecting the selected user with the representative associated with the selected user.

15. The method of claim 1, comprising the further steps of:

asking the selected user for permission to provide contact information to an advocacy party; and

automatically providing contact information associated with the selected user to the advocacy party.

16. The method of claim 1, wherein the advocacy message includes at least one survey question, and comprising the further steps of:

receiving an answer to the survey question from the selected user; and

compiling a plurality of received answers from a plurality of selected users.

17. The method of claim 8, wherein the response message comprises one of: pre-determined response message that cannot be altered by the selected user; a pre-determined response message that can be altered by the selected user; and a user generated response message.

18. The method of claim 8, comprising the further step of:

sending a follow-up message to the selected user.

19. The method of claim 8, comprising the further step of:

generating a report, including information about the indication, for an advocacy group.

20. The method of claim 1, wherein said step of selecting automatically selects a plurality of users form the user database.

21. The method of claim 1, wherein said step of selecting is performed by

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one of (1) comparing information a user with information about a plurality of representatives and; and (2) comparing information about a representative with information about a plurality of users.

22. The method of claim 1, wherein the advocacy messages contains information associated with the representative.

23. An apparatus for using an advocacy network, comprising:

a user database configured to store information about users and information identifying a representative associated with each user;

a processor coupled to said user database, said processor being configured to (a) access the user database, (b) select a user based on information in the user database and (c)

generate an advocacy message to the selected user; and

a communications interface coupled to said processor and configured to send the generated advocacy message through a communication network.

24. The apparatus of claim 23, wherein the information about users comprises at least one of geographic, demographic and psychographic information.

25. The apparatus of claim 23, wherein each representative is associated with a geographic area and the information identifying the elected representative comprises information associated with a home address of the selected user.

26. The apparatus of claim 23, wherein said processor is further configured to automatically select a user based on both the information about users and the information identifying a representative associated with each user.

27. The apparatus of claim 23, wherein the advocacy message comprises a message associated with an e-mail system.

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28. The apparatus of claim 23, wherein the advocacy message is sent to the selected user through a first communication network and is displayed to the selected user when the selected user is off-line with respect to the first communication network.

29. The apparatus of claim 23, wherein the advocacy message comprises at least one of a text, an audio, a graphical and a multimedia message.

30. The apparatus of claim 23, wherein the advocacy message includes a portion allowing the selected user to generate an indication, and wherein said processor is further configured to receive the indication from the selected user and send a response message to the representative associated with the selected user, including information about the selected user, based on the received indication.

31. The apparatus of claim 30, wherein the information about the selected user sent in the response message comprises a home address of the selected user.

32. The apparatus of claim 30, wherein the response message comprises one of an e-mail message, a facsimile message, a printed letter and a telephone call.

33. The apparatus of claim 30, wherein the response message is sent at a pre-determined time along with response messages associated with other users.

34. The apparatus of claim 30, wherein the response message comprises a telephone call automatically established between the representative and the selected user.

35. The apparatus of claim 23, wherein the advocacy messages contains information associated with the representative.

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36. An apparatus for using an advocacy network, comprising:

means for accessing a user database, the user database comprising information about users and information identifying a representative associated with each user;

means for automatically selecting a user based on information in the user database; and

means for sending an advocacy message to the selected user through a first communication network.

37. The apparatus of claim 36, wherein the information about users comprises at least one of geographic, demographic and psychographic information.

38. The apparatus of claim 36, wherein each representative is associated with a geographic area and the information identifying the elected representative comprises information associated with a home address of the selected user.

39. The apparatus of claim 38, wherein said means for selecting is further configured to automatically select a user based on both the information about users and the information identifying a representative associated with each user.

40. The apparatus of claim 36, wherein the advocacy message comprises a message associated with an e-mail system.

41. The apparatus of claim 36, wherein the advocacy message is sent to the selected user through a first communication network and is displayed to the selected user when the selected user is off-line with respect to the first communication network.

42. The apparatus of claim 36, wherein the advocacy message comprises at

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least one of a text, an audio, a graphical and a multimedia message.

43. The apparatus of claim 36, wherein the advocacy message includes a portion allowing the selected user to generate an indication, and wherein said processor is further configured to receive the indication from the selected user and send a response message to the representative associated with the selected user, including information about the selected user, based on the received indication.

44. The apparatus of claim 43, wherein the information about the selected user sent in the response message comprises a home address of the selected user.

45. The apparatus of claim 43, wherein the response message comprises one of an e-mail message, a facsimile message, a printed letter and a telephone call.

46. The apparatus of claim 43, wherein the response message is sent at a pre-determined time along with response messages associated with other users.

47. The apparatus of claim 43, wherein the response message comprises a telephone call automatically established between the representative and the selected user.

48. The apparatus of claim 36, wherein the advocacy messages contains information associated with the representative.

49. An article of manufacture comprising a computer-readable medium having stored thereon instructions adapted to be executed by a processor, the instructions which, when executed, define a series of steps for using an advocacy network, said steps comprising:

accessing a user database, the user database comprising information about users and information identifying a representative associated with each user;

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automatically selecting a user based on information in the user database; and

sending an advocacy message to the selected user through a first communication network.

50. The article of manufacture of claim 49, wherein the information about users comprises at least one of geographic, demographic and psychographic information.

51. The article of manufacture of claim 49, wherein each representative is associated with a geographic area and the information identifying the elected representative comprises information associated with a home address of the selected user.

52. The article of manufacture of claim 51, wherein said means for selecting is further configured to automatically select a user based on both the information about users and the information identifying a representative associated with each user.

53. The article of manufacture of claim 49, wherein the advocacy message comprises a message associated with an e-mail system.

54. The article of manufacture of claim 49, wherein the advocacy message is sent to the selected user through a first communication network and is displayed to the selected user when the selected user is off-line with respect to the first communication network.

55. The article of manufacture of claim 49, wherein the advocacy message comprises at least one of a text, an audio, a graphical and a multimedia message.

56. The article of manufacture of claim 49, wherein the advocacy message

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includes a portion allowing the selected user to generate an indication, and wherein said processor is further configured to receive the indication from the selected user and send a response message to the representative associated with the selected user, including information about the selected user, based on the received indication.

57. The article of manufacture of claim 56, wherein the information about the selected user sent in the response message comprises a home address of the selected user.

58. The article of manufacture of claim 56, wherein the response message comprises one of an e-mail message, a facsimile message, a printed letter and a telephone call.

59. The article of manufacture of claim 56, wherein the response message is sent at a pre-determined time along with response messages associated with other users.

60. The article of manufacture of claim 56, wherein the response message comprises a telephone call automatically established between the representative and the selected user.

61. The article of manufacture of claim 49, wherein the advocacy messages contains information associated with the representative.

62. A method of operating an advocacy network, comprising the steps of:

sending an advocacy message to a user, including a portion allowing the user to generate an indication, through a first communication network;

receiving the indication from the user; and

sending, based on the received indication, a response message to a representative associated with the user, the response message including information

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about the user.

63. A method of operating an advocacy network, comprising the steps of:

accessing a user database, the user database comprising a home address associated with each user and information identifying a representative associated with each user;

automatically selecting a user based on both the information about the selected user and the information identifying a representative associated with the selected user;

sending an advocacy message to the selected user, advocacy message being associated with an e-mail and including a portion allowing the selected user to generate an indication;

receiving the indication from the selected user; and

automatically sending a response message to the representative associated with the selected user, including the home address of the selected user, based on the received indication.

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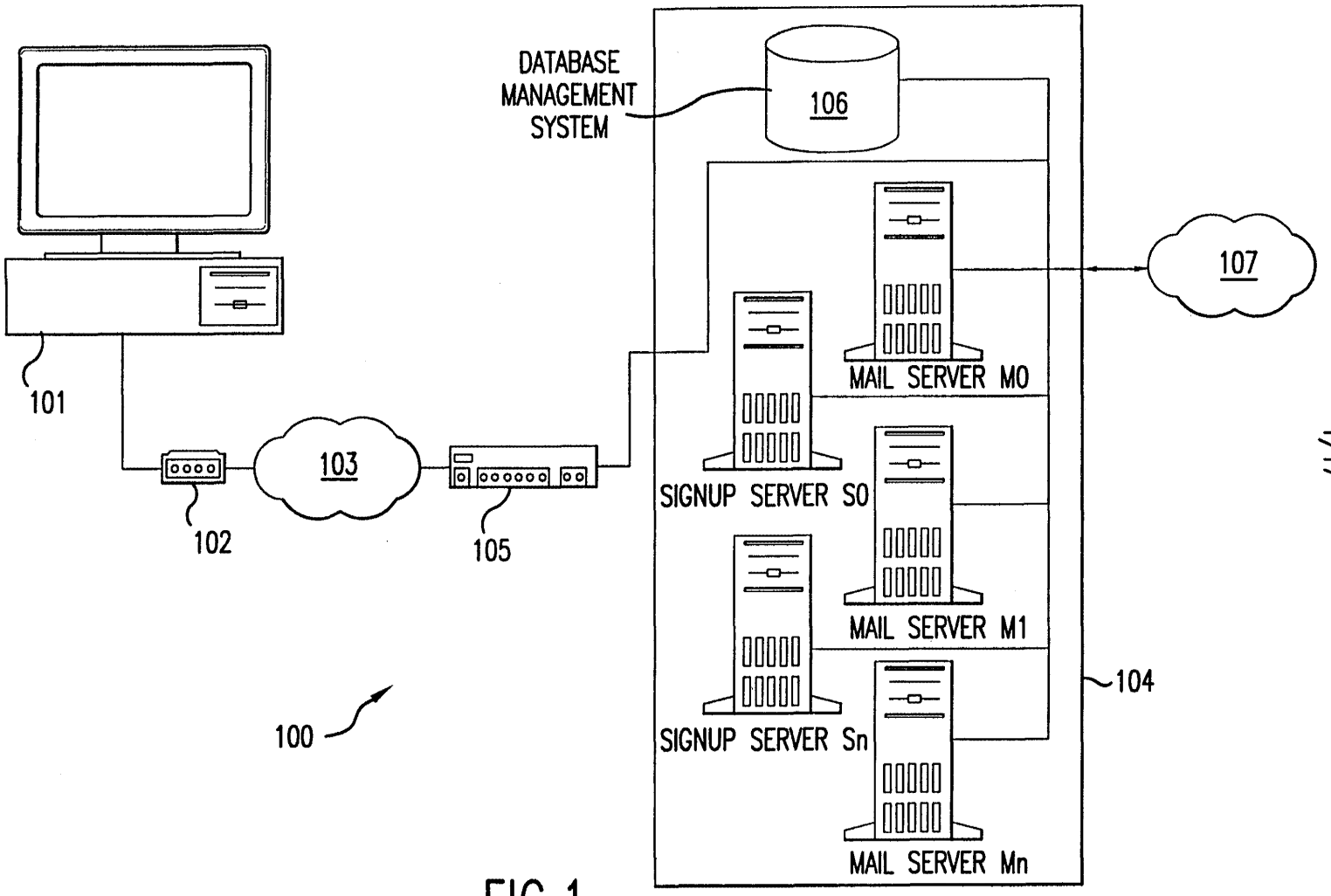


FIG.1

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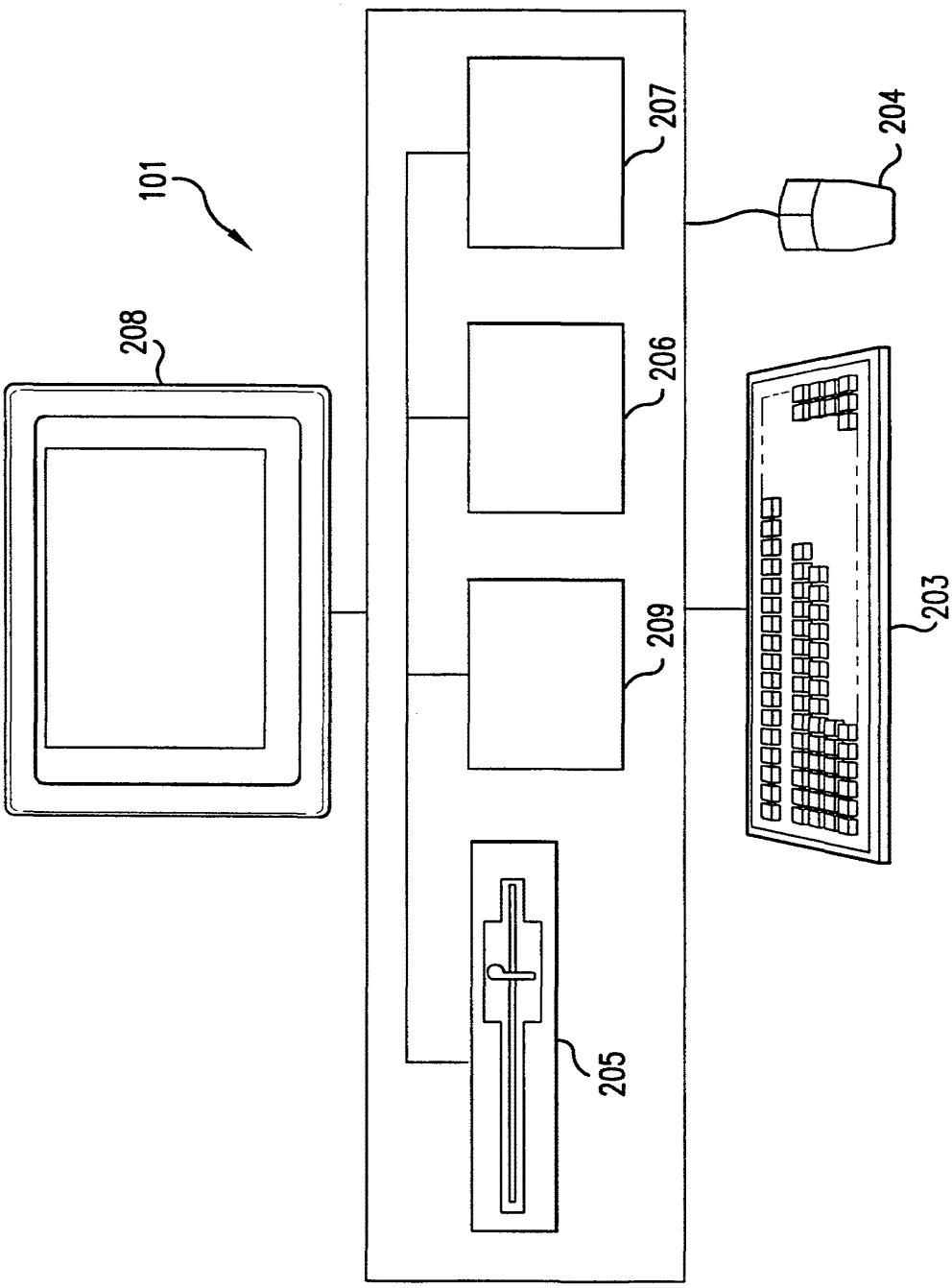


FIG.2

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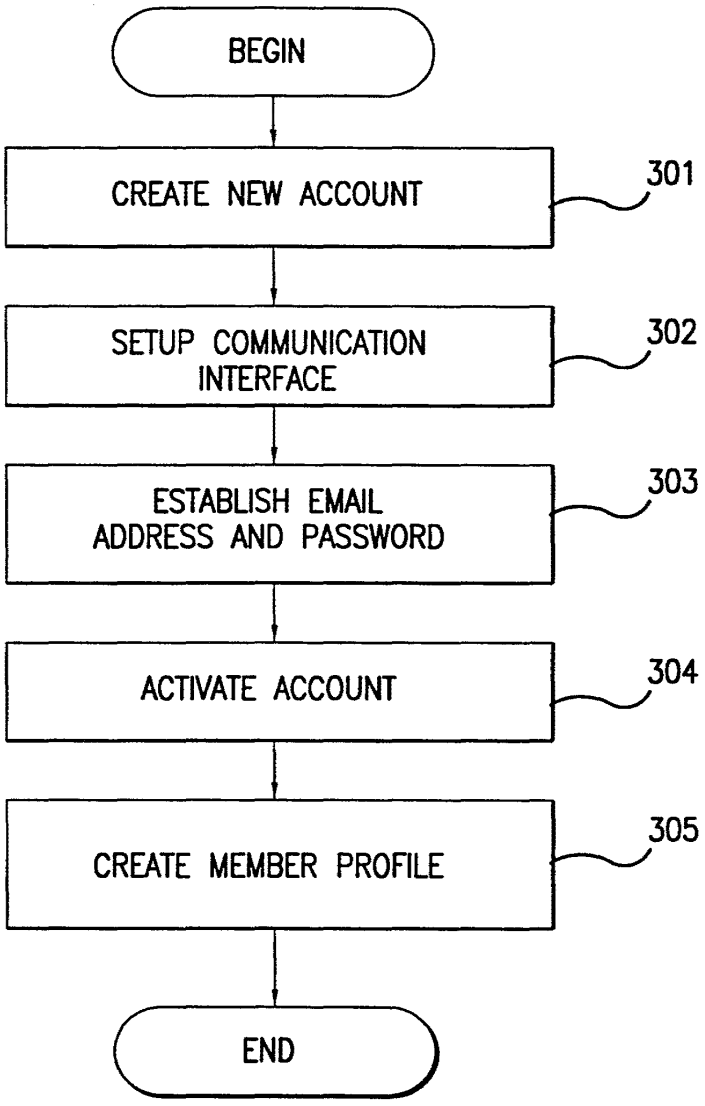


FIG.3

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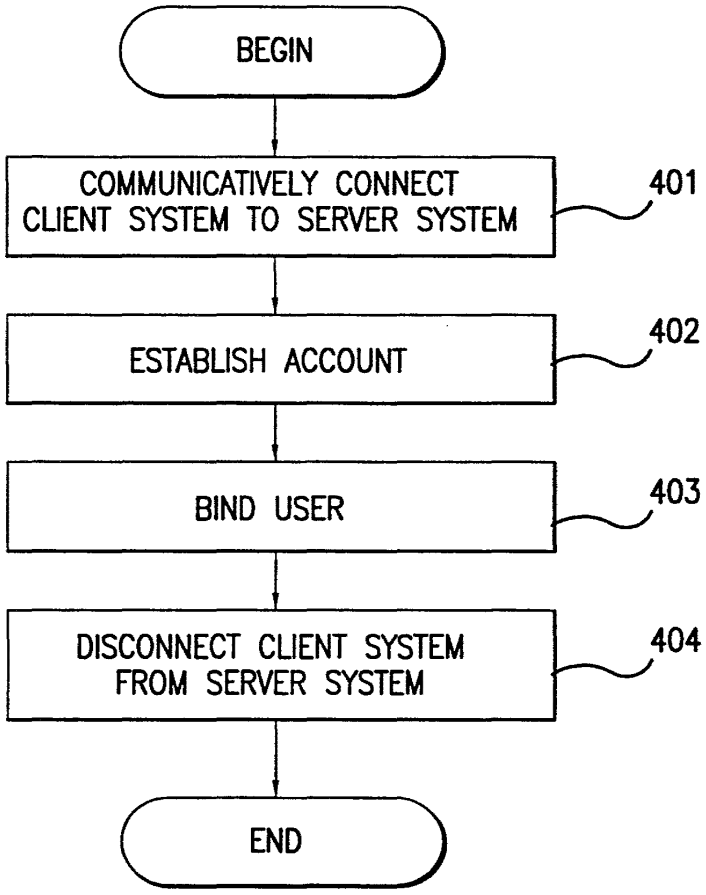


FIG.4

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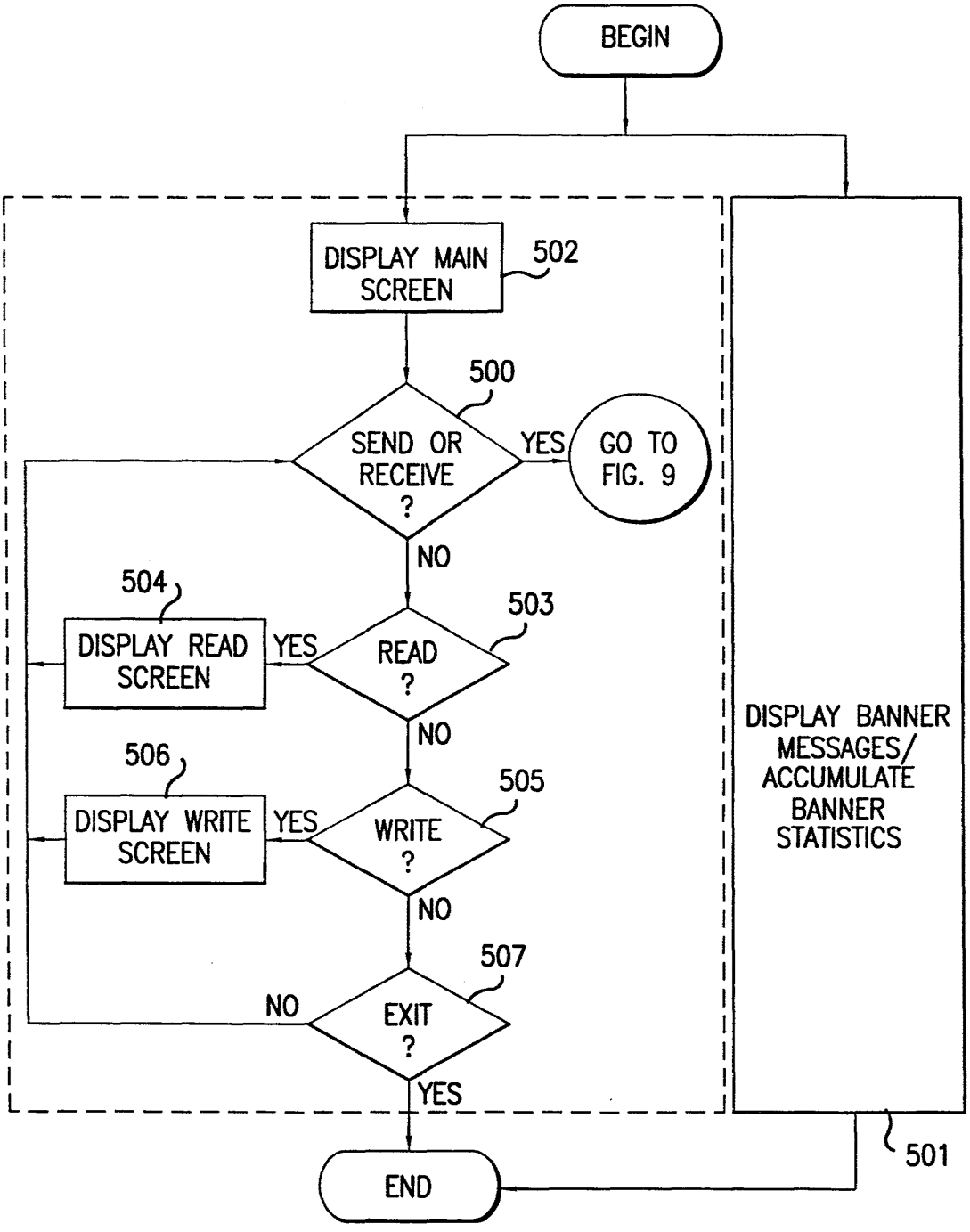


FIG.5

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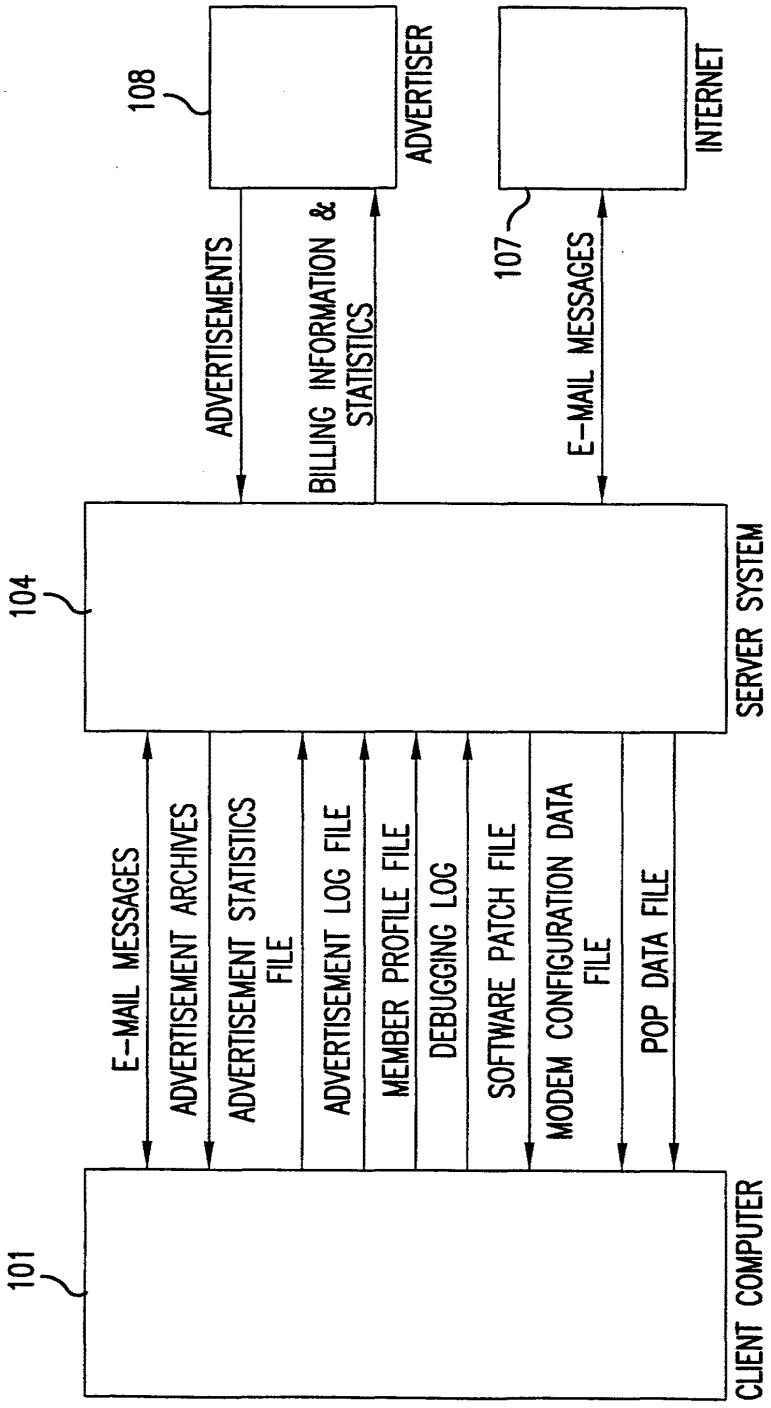


FIG.6

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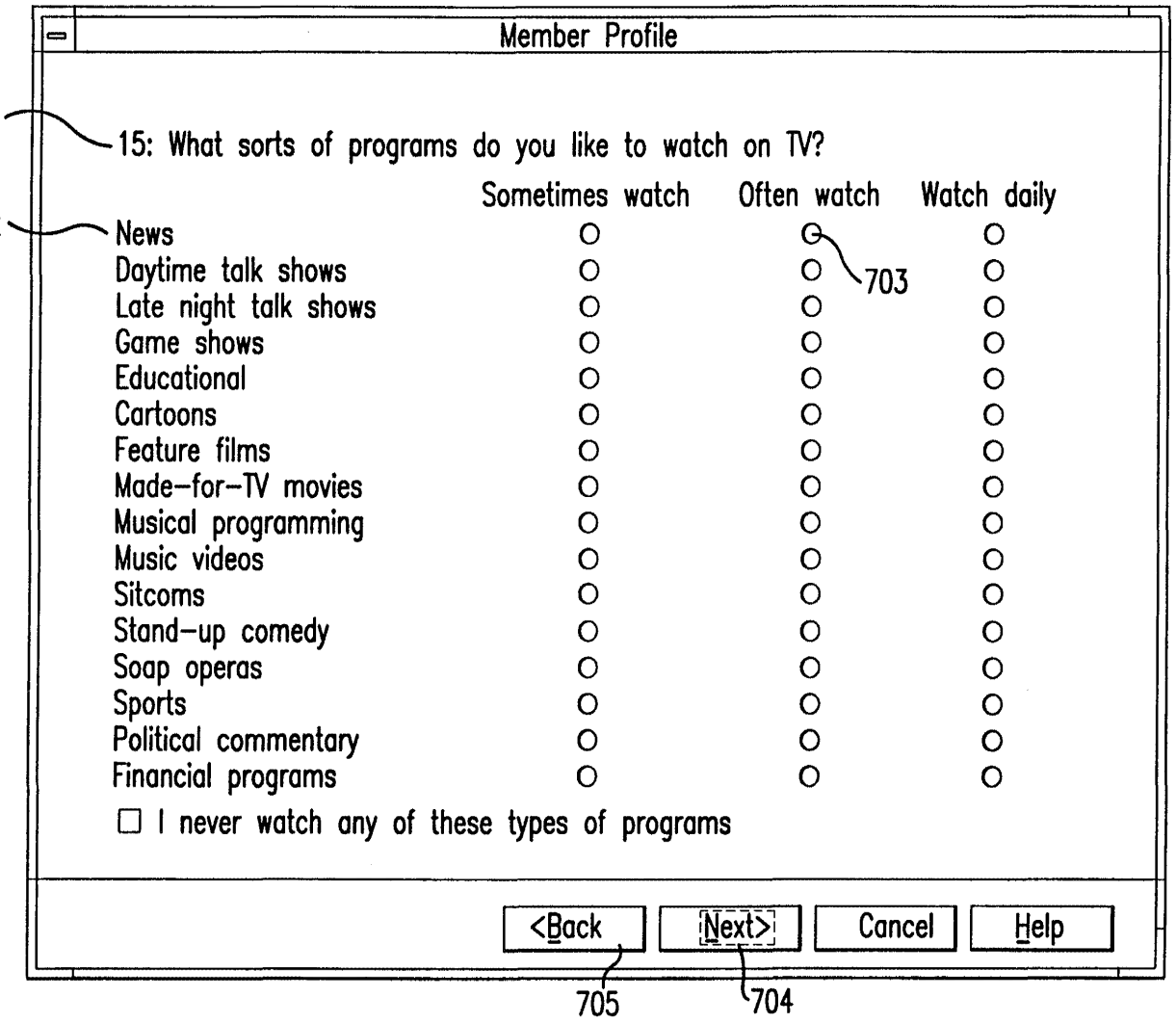


FIG.7

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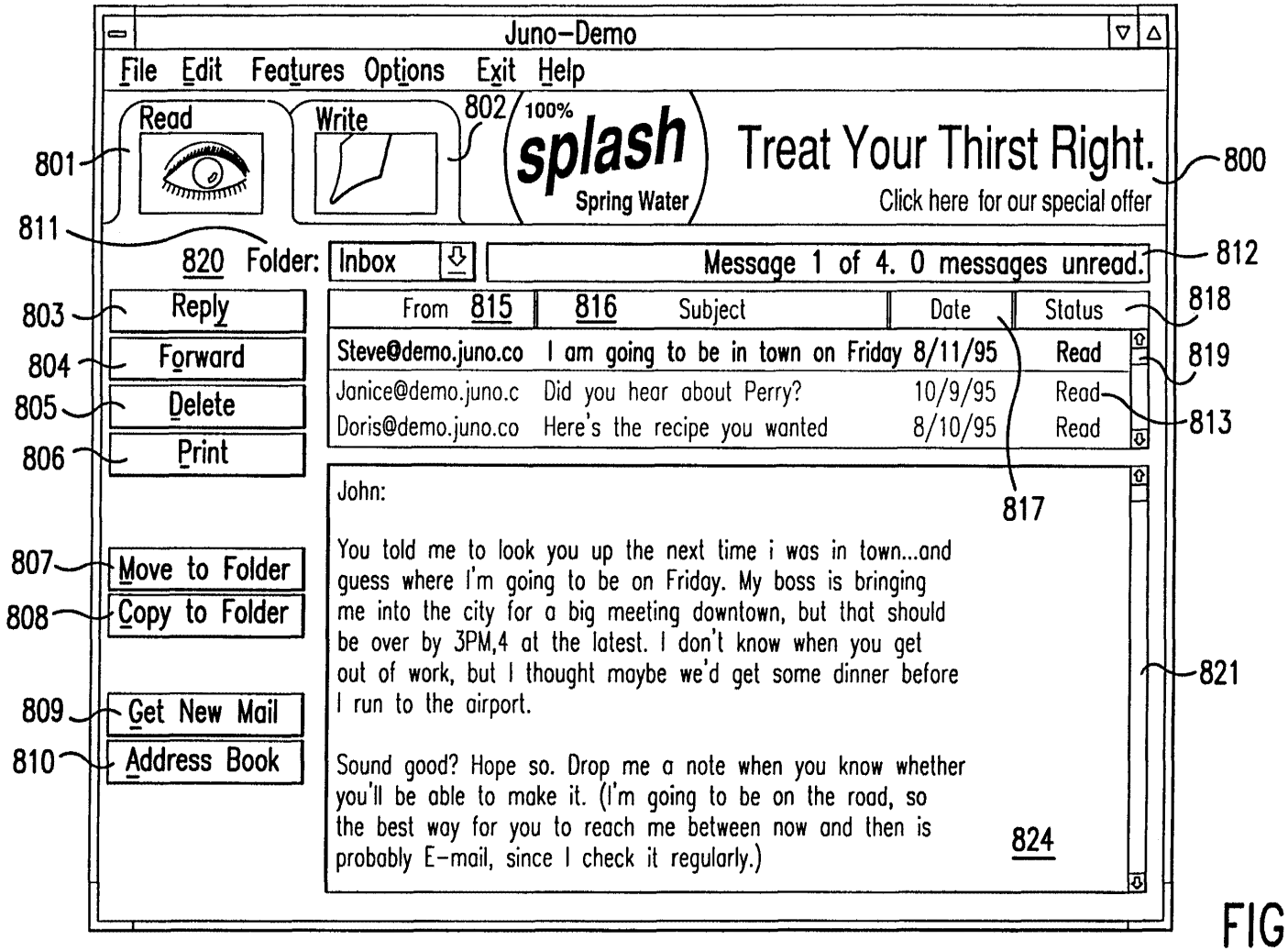


FIG.8

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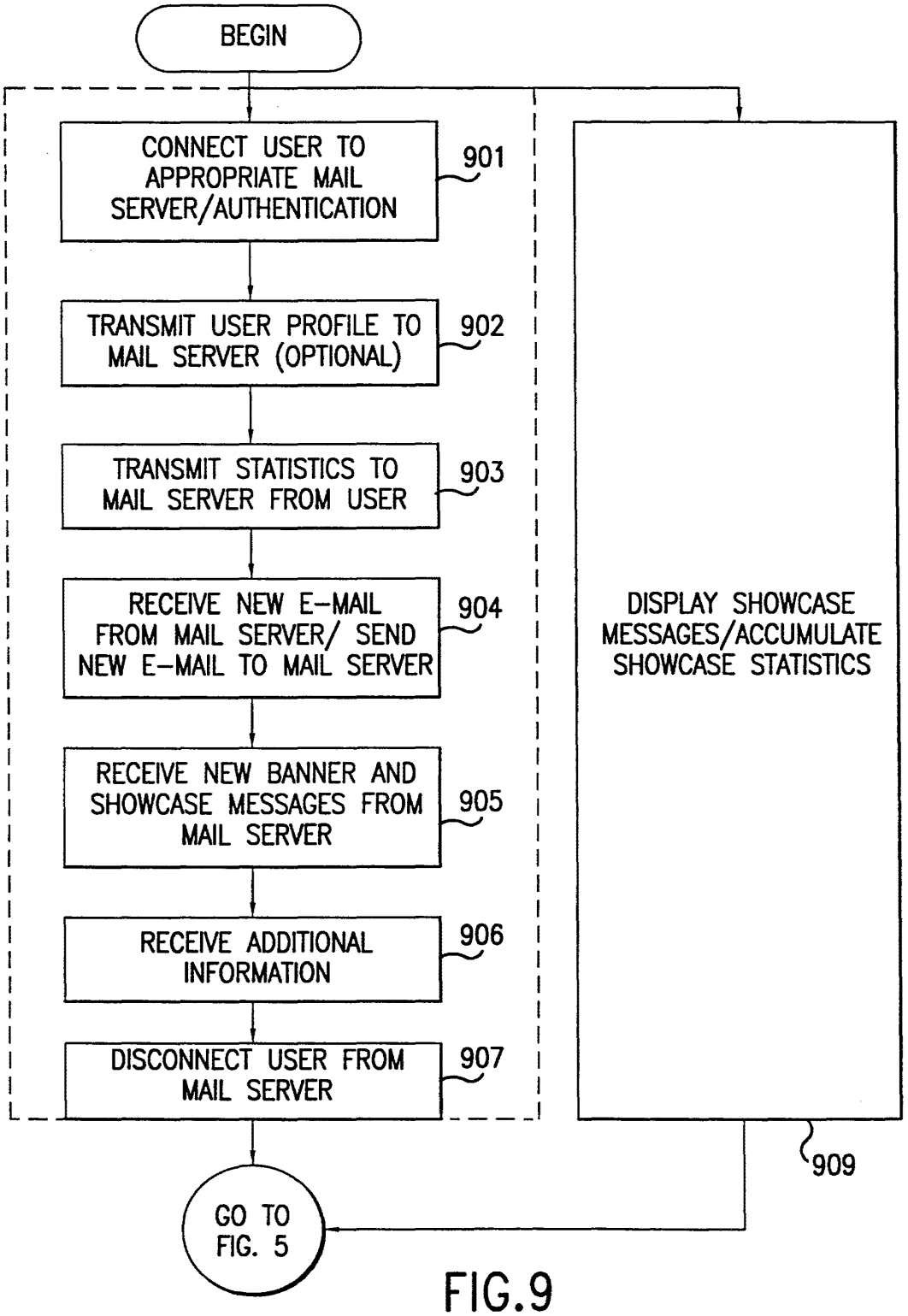


FIG.9

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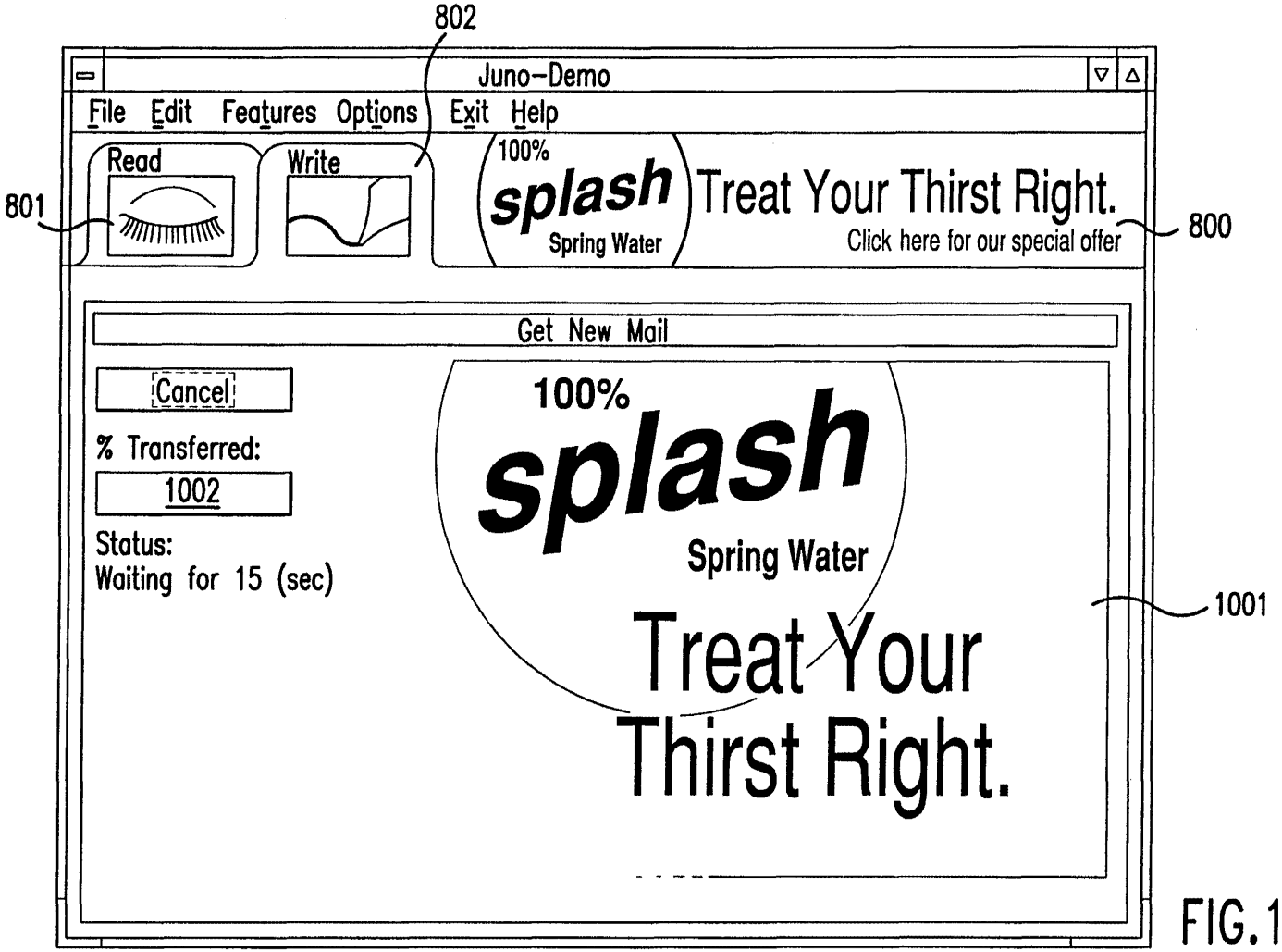


FIG.10

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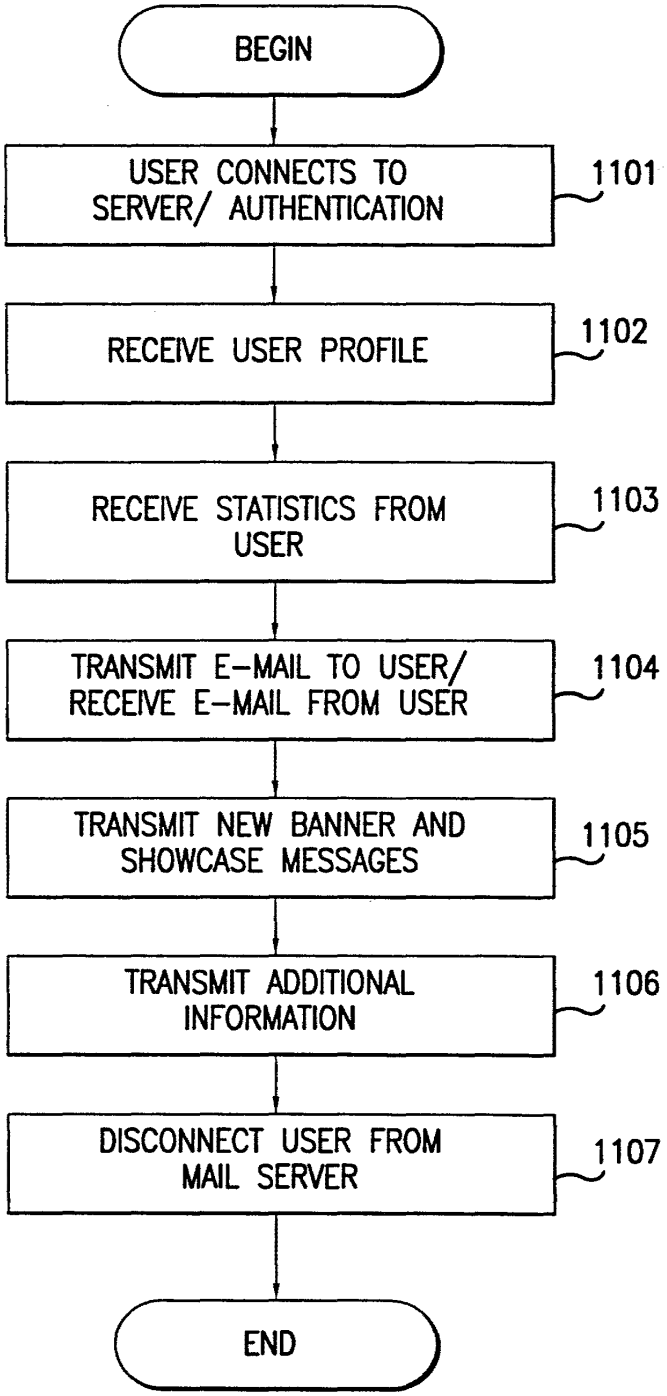


FIG.11

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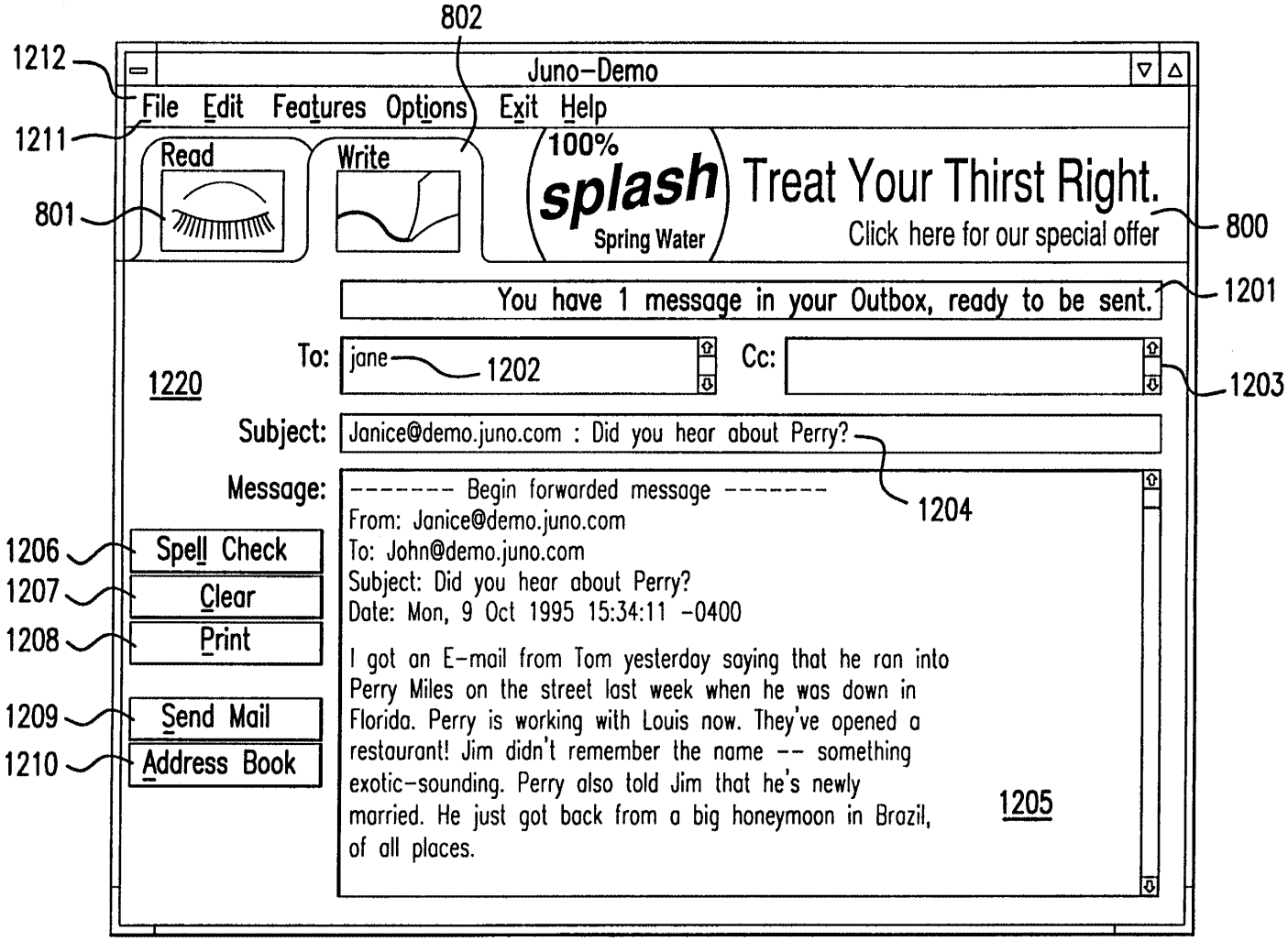


FIG.12

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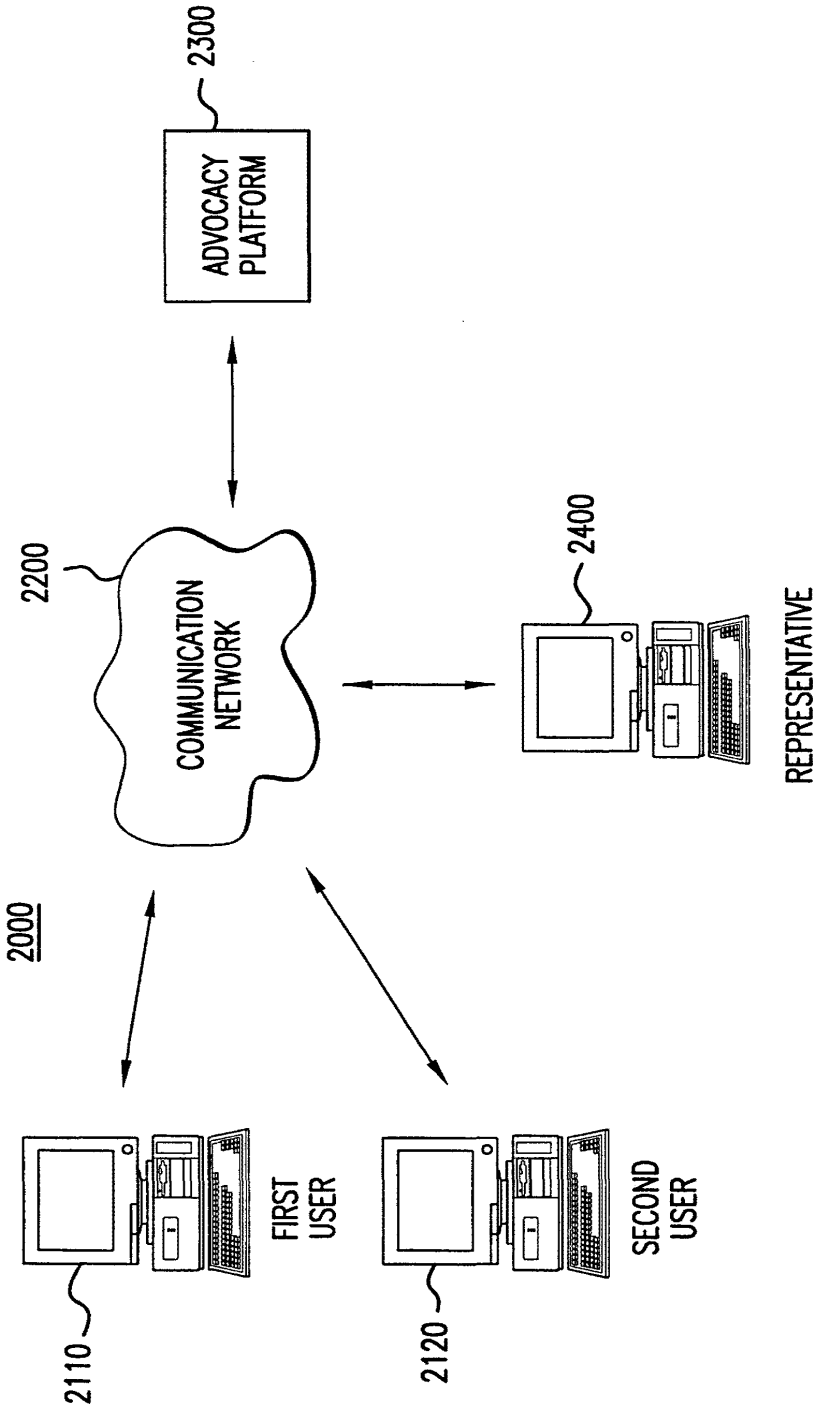


FIG.13

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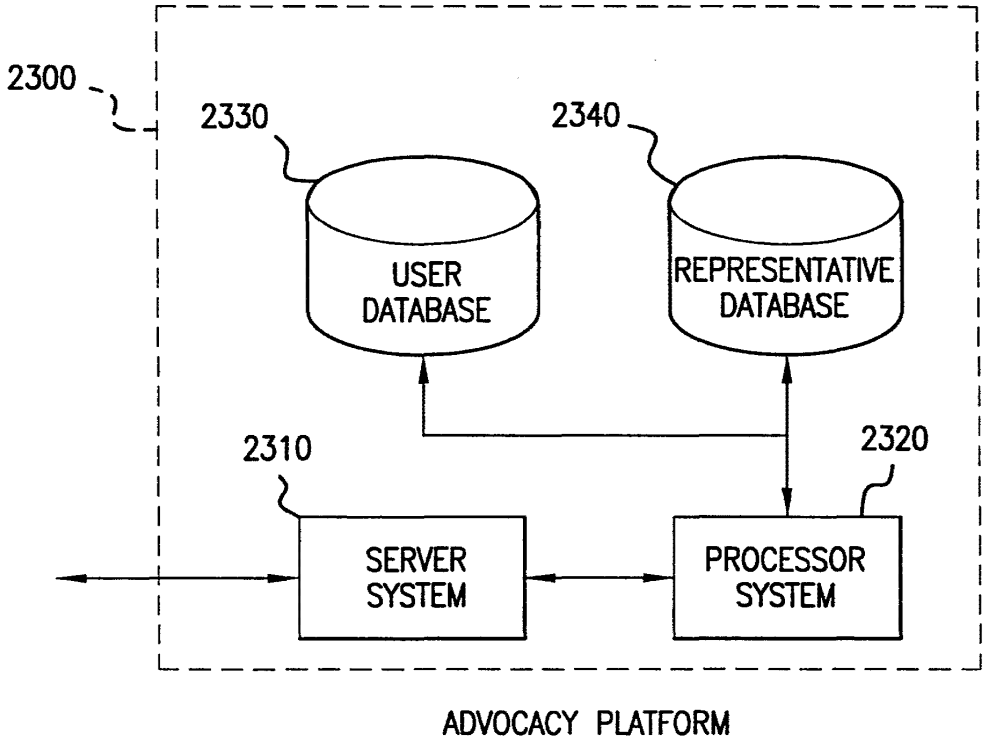


FIG.14

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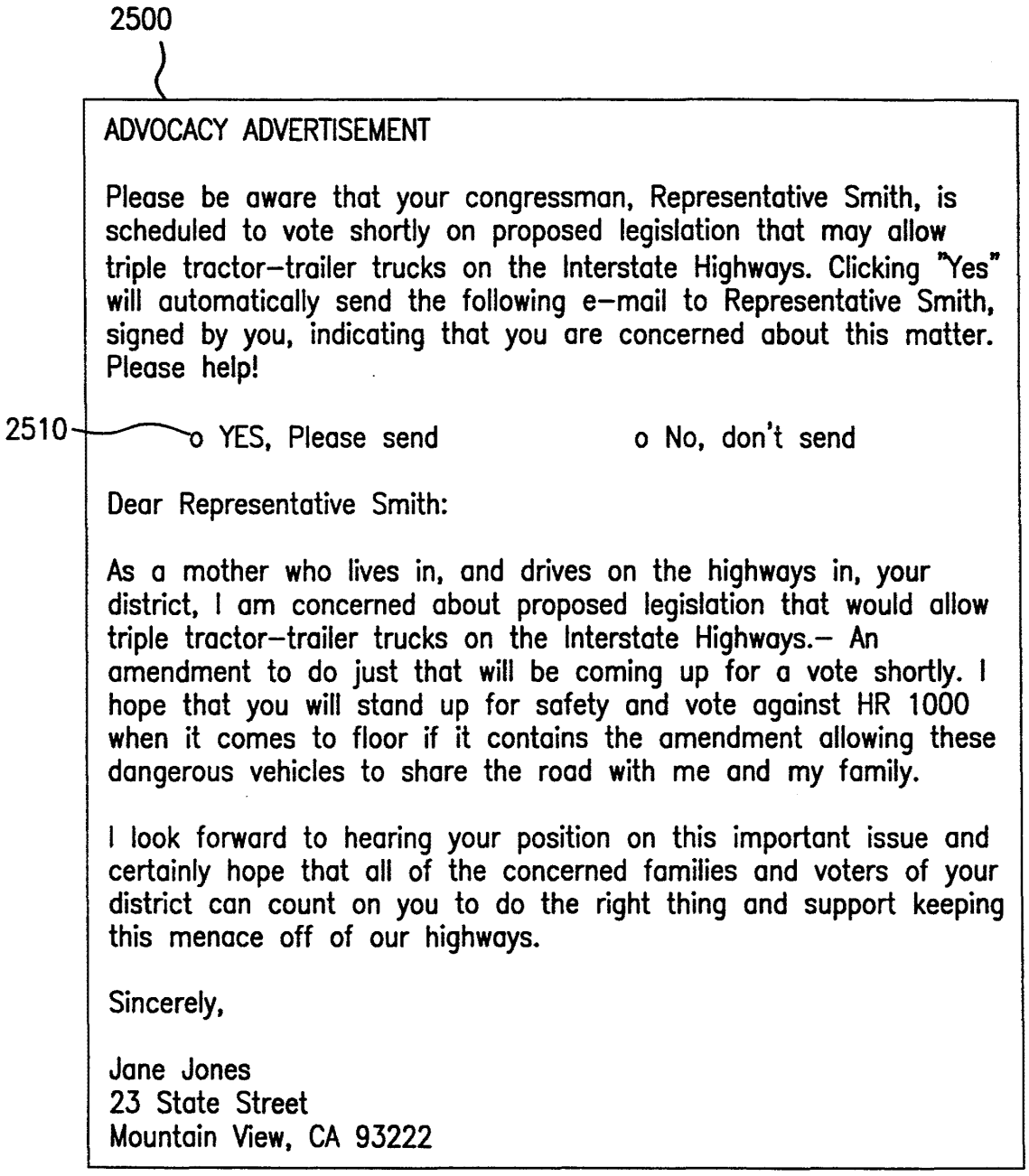


FIG.15

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2600

Dear Representative Smith:

As a mother who lives in, and drives on the highways in, your district, I am concerned about proposed legislation that would allow triple tractor-trailer trucks on the Interstate Highways. An amendment to do just that will be coming up for a vote shortly. I hope that you will stand up for safety and vote against HR 1000 when it comes to floor if it contains the amendment allowing these dangerous vehicles to share the road with me and my family.

I look forward to hearing your position on this important issue and certainly hope that all of the concerned families and voters of your district can count on you to do the right thing and support keeping this menace off of our highways.

Sincerely,
Jane Jones
23 State Street FIG. 16
Mountain View, CA 93222

FIG.16

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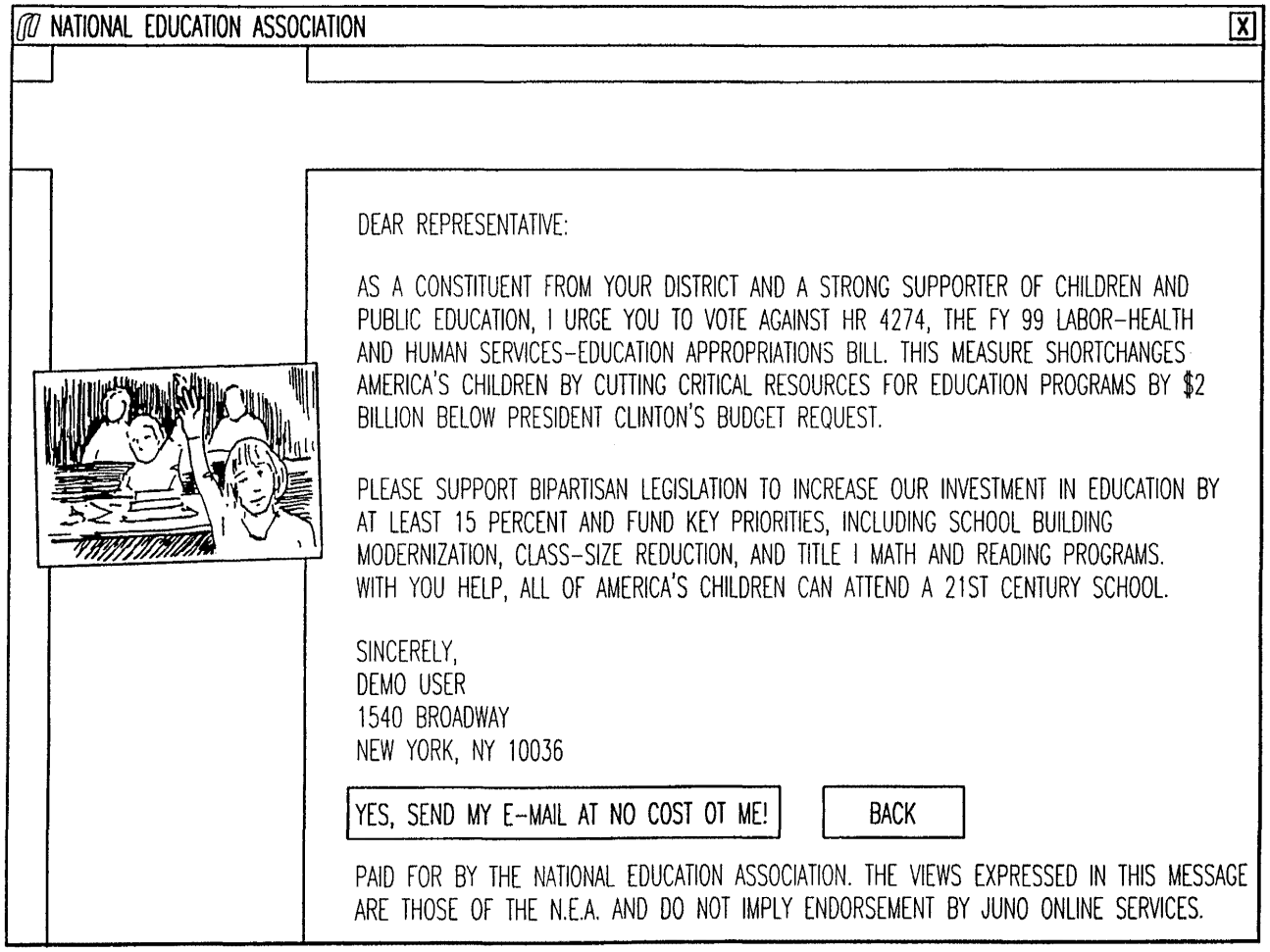


FIG.17

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/23213

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : G06F 13/00
US CL : 709/207

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 709/200, 203, 204, 206, 207, 217, 218, 227, 232, 238,

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WEST search terms: advocacy and (e-mail$ or email$ or (e near1 mail$))

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,809,242 A (SHAW et al.) 15 September 1998, Abstract, figures 1-12, col. 3 (line 6-et seq.).	1-63
A	US 5,721,827 A (LOGAN et al.) 24 Feburary 1998, Abstract, figures 1-7, col. 1 (line 39-et seq.).	1-63
A	US 5,740,549 A (REILLY et al.) 14 April 1998, Abstract, figures 1-12, col. 2 (line 60-et seq.).	1-63

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"B"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 23 DECEMBER 1999	Date of mailing of the international search report 10 FEB 2000
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer ROBERT B. HARRELL Telephone No. (703) 305-9692

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(72) Inventors; and
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(74) Agents: **MALLIE, Michael, J.** et al.; Blakely, Sokoloff, Taylor & Zafman LLP, 7th floor, 12400 Wilshire Boulevard, Los Angeles, CA 90025 (US).

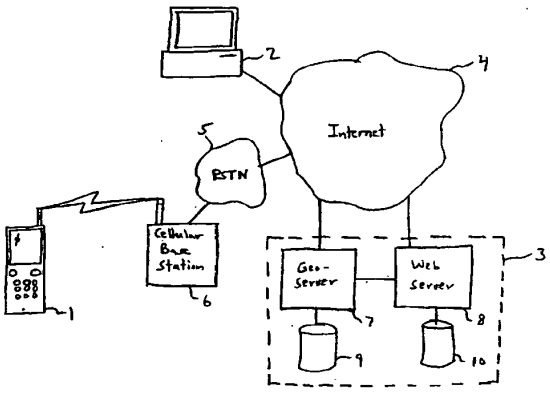
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND APPARATUS FOR PROVIDING LOCATION-DEPENDENT SERVICES TO MOBILE USERS



(57) Abstract: A method and apparatus for allowing a mobile processing device, such as a cellular telephone, notebook computer, automobile navigation system, PDA, PIM, etc., to access location-or time-dependent information maintained by a central server. At the server, a signal transmitted from the mobile device is received. The signal represents a user input applied at the mobile device and specifying an item in a database of the mobile device, such as a contact list. A signal corresponding to the selected item is transmitted by the mobile device to the server. The server computes location-or time-dependent information based on the signal and geocoded data in the server system. The location-or time-dependent information may comprise a geographic location, which may include a solution of a geographic proximity search, or information for assisting a driver in navigating an automobile. The geocoded data may be generated dynamically in response to the query from the mobile device.

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Method and Apparatus for Providing Location-Dependent Services to Mobile Users

This application claims the benefit of Provisional U.S. Patent application no. 60/148,849, filed on August 12, 1999.

FIELD OF THE INVENTION

The present invention pertains to the field of mobile information services. More particularly, the present invention relates to providing navigation information and other services to the user of a mobile processing device.

BACKGROUND OF THE INVENTION

Automobile on-board navigation systems are becoming increasingly more popular. Such systems are commonly available as an option in many models and are now standard components in some higher-end models. The navigation system generally allows the driver to enter a desired destination. The system then computes a route from the current location of the vehicle to the destination, and then tracks the vehicle's progress along the route while guiding the driver with audible or visual navigation instructions, a graphical map display, or a combination thereof. Computer software has also been developed to enable a conventional personal computer (PC) to perform similar navigation functions, including route calculation. A laptop (notebook) PC equipped with such software and a mobile positioning device, such as a Global Positioning System (GPS) receiver, may be used to track a user's progress along the computed route. Recently, there been interest in incorporating navigation capabilities such as these into other types of mobile devices, such as cellular telephones ("cell phones"), personal digital assistants (PDAs), personal information managers (PIMs), and other devices.

Existing navigation systems such as those mentioned above have certain

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disadvantages. For example, the automobile-based navigation systems are typically based on dedicated hardware and/or software and are therefore not usable for other applications. In addition, existing navigation systems are very limited in the type and amount of data they can utilize to provide navigation information to the user. Also, such systems generally require the user to select a desired destination before computing a route or providing navigation instructions. However, the selection of the destination can be inconvenient and tedious. In particular, the user is often required to either enter a specific street address or select the destination from a predetermined list provided by the navigation system. This may be inconvenient if the user does not know the address of the destination and the destination does not appear on the predetermined list. Furthermore, even if the user does know the address of destination, certain users dislike the process of manually entering that information. In addition, existing navigation systems generally provide only limited types of information to the user.

SUMMARY OF THE INVENTION

The present invention includes a method and apparatus for providing location- or time-dependent data to a remote processing device, which may be a mobile device. The mobile device may be, for example, a cellular telephone, an automobile on-board navigation system, or a hand-held computing device, such as a PDA, PIM, or the like. Among other advantages, the invention allows the user of the remote processing device to quickly and easily request and receive maps, route solutions, and point in interest (POI) search solutions, without requiring the user to know or to input detailed origin or destination information. Further, solutions provided to the user may be generated based on data compiled from numerous different sources.

In one embodiment, the apparatus comprises a data indexer and a geocoder. The data indexer receives geographic data and indexes the geographic data to spatial coordinates to generate indexed data. The geocoder responds to a

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user query from the remote processing device to determine a set of coordinates from the indexed data based on a received index item, and outputs the set of coordinates for transmission to the remote processing device. The apparatus may also be used to search for a point of interest from the indexed data based on a user query including a distance value and an origin, and to output the point of interest for transmission to the remote processing device. The apparatus may further include a route generator which generates a route between two locations in response to a user query from the remote processing device, using the indexed data.

Another aspect of the present invention is a method and apparatus for allowing a mobile device to access location-dependent information maintained by a remote server system. At the server system, a signal transmitted from the mobile device is received. The signal represents a user input applied at the mobile device to select an item in a database. The server system is used to compute location-dependent information based on the signal and geocoded data in the server system. The location-dependent information may comprise information specifying a geographic location, which may include or represent a solution of a geographic proximity search, or information for assisting a driver in navigating an automobile. The geocoded data may be generated dynamically by the server system in response to receiving the signal from the processing device. A signal representing the location-dependent information is then transmitted to a remote recipient, which may be the originating mobile device or some other processing device, which need not be a mobile device. The recipient of the signal transmitted from the server system may be automatically and dynamically determined at the server system, and this transmission may be performed asynchronously.

The server system may maintain a unique code for each of multiple mobile devices. User-specific information in the server system may also be maintained in the server system. This information may be accessed by the server system in response to receiving the signal representing from the mobile device, which may include the unique code of the mobile device, such that the computed location-dependent information is tailored to a particular user or device. Accordingly, the

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computation of location-dependent data in the server system may include the cross-referencing of time and/or location dependent information with user information.

Data stored in the mobile device may be updated from the server system. Such updating may be accomplished by receiving a signal at the server system representing an input from a user of the remote mobile device. Based on the signal, an update signal may be asynchronously transmitted from the server system to the mobile device to automatically update data stored in the mobile device.

Yet another aspect of the present invention is a method and apparatus for maintaining map data at the server system. The method represents a geocoding process, which in one embodiment includes inputting to the server system a user-provided database maintained by the remote processing device. The database includes multiple data entries. Each of the data entries is then linked to the map data to form a set of geocoded data. The linking may be performed automatically by the server system, or manually by an operator. The geocoded data is maintained at the server system for use by a remote processing device, such as noted above. The geocoding process may be performed dynamically in response to a query from a remote mobile computing device.

Other features of the present invention will be apparent from the accompanying drawings and from the detailed description which follows.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is illustrated by way of example and not limitation in the figures of the accompanying drawings, in which like references indicate similar elements and in which:

Figure 1 illustrates a network configuration in which a mobile device can be used to access location- or time-dependent information in a server system.

Figure 2 is a block diagram of a computer system.

Figure 3 illustrates the software and data components of a mobile client

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device and the server system.

Figure 4 illustrates the components of the location server and the geocoding and routing indexer of the server system.

Figure 5 is a flow diagram illustrating a geocoding process that may be implemented by the server system.

Figure 6 is a flow diagram illustrating a point of interest (POI) lookup process that may be implemented in a client device.

Figure 7 is a flow diagram illustrating a route calculation process that may be implemented in a client device.

Figure 8 is a flow diagram illustrating a process that may be implemented in the server system for responding to a query from a remote client device.

Figure 9 is a flow diagram illustrating a process for performing a POI search or a route calculation based on a user profile.

Figure 10 is a flow diagram illustrating a process that may be implemented in the server system to determine an appropriate recipient device for transmission.

Figure 11 is a flow diagram illustrating an operator-assisted POI lookup process.

DETAILED DESCRIPTION

A method and apparatus for providing navigation assistance and other services to a user of a mobile processing device are described. The method and apparatus include a technique for providing location- or time-dependent services to users of mobile devices. Applications and business models may include, for example, location- and time-dependent notifications ("geo broadcast"), directed advertising ("geo mail"), or preference and profile management ("geo behavior").

The user of a mobile processing device, such as a cellular telephone, PDA, PIM, notebook computer, or the like, has communication capability with a server. The communication can be verbal (e.g., via a telephone connection) or digital (via a computer network, such as the Internet). The server has access to records that are created by the user, then replicated and enhanced (extended) by a server

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process and/or user entry. Specifically, the user creates a profile of entities. Examples of such a profile are a 'phone book' (contact list) stored on a cell phone and a 'preferred destination list' stored on a mobile navigation device. The profile contains labeled entities, for example, a person's name and corresponding data such as the person's phone number at home, phone number at the office, and/or mobile phone number (for a cellular telephone). For a mobile navigation device, an entry may be a location entered by address or a location entered by point-and-click at a map displayed by the device. The list is replicated on the server through a conventional download and synchronization process. The list is then enhanced, or extended, through automated processes, user entry, or both. The processes are referred to herein as indexing and 'geocoding'. When the user accesses the server through a digital interface, the list is synchronized to reflect the most-recently edited records.

As an example, assume that a cell phone user has created a list, stored in the cell phone, in the format {Name {location labels:phone numbers} }, such as:

Joe {home 555-1234, mobile 555-5678, office 555-3456}
Mike {home 555-4321, mobile 555-8765, office 555-6543}
etc.

The list is then digitally or manually replicated onto the server. Mechanisms such as Bluetooth or Starfish or SIM100 may be utilized, or a World Wide Web ("Web") access page may be used for manual replication. The server process then "geocodes" the entries (associates each entry with a set of latitude/longitude coordinates) using, for example, any of the following methods:

1) An index to a complete address set, such as a GDT database, or a complete phone number set, such as InfoUSA or LSIP, is used to create address entries using phone numbers;

2) the user key enters the address data for each record through a Web access engine;

3) the user takes advantage of his complete database as maintained by a

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conventional database application, such as Filemaker Pro or another similar application, for the server to create the index; or

4) the user provides the data to an operator of the server service via voice phone call, and the service enters the data.

The user can then access geocoded data through a Web site. The position of the entries can be overlaid on a detailed map as icons definable by the user. The user can edit the data, creating qualities and preferences. The user can also enter data into a private area that is only accessible to the user through password protection. In some embodiments, the data may be set up to be inaccessible to the service operator.

The user can then make sophisticated queries to the service from the mobile device. For example, the user can scroll through the phone number list on his cell phone, select a person at a location (such as "Mike:Office") and a type of query, such as "Restaurant:Nearest" (nearest restaurant). The cell phone (or whatever type of mobile device is being used) then transmits a corresponding query signal to the server. In response, the mobile device receives a proximity search solution from the server. This solution may contain, in the above example, a list of restaurants near the selected entry, which may be sorted by direct distance or driving distance. The list may also contain value-added data, such as phone number, cuisine type, and rating. The value added data may be selected by the server based upon a stored user profile for that particular user.

The user can also request, from the mobile device, maps, driving directions or other route information from one location to another. If the mobile device is location-sensitive (such as a GPS-enhanced device), the mobile device can be used to calculate the origin for the search. Otherwise, the user can select the entry in his contact list to which he is nearest. The server service then provides verbal, graphical or textual directions (depending on the capabilities of the mobile device).

Thus, a user of a mobile device can quickly and easily obtain a variety of types of time- or location-dependent information from the mobile device. The information is generated at the server based on a comprehensive set of databases

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derived from a variety of sources and is delivered to the mobile device in a form appropriate for that device. The user can access and edit portions of the databases via a conventional World Wide Web site to personalize the data.

Refer now to Figure 1, which illustrates a network configuration in which a mobile device 1 (shown as a cell phone) can be used to obtain location- or time-dependent information from a central server system 3, as described above. The mobile device 1 has a radio frequency (RF) to communication link with a cellular base station 6. The base station 6 is coupled to a public switched telephone network (PSTN) 5, and is further coupled to the Internet 4 via the PSTN 5. Also coupled to the Internet 4 is the server system 3, which provides the location- and time-dependent services described above. The server system 3 includes a geo-server 7 coupled to the Internet 4, and a Web server 8 coupled to the Internet 4 and to the geo-server 7. The server system 3 also includes a database 9 coupled to the geo-server 7 and database 10 coupled to the Web server 8. Also coupled to the Internet 4 may be a PC 2 operated by the user of the mobile device 1 (the customer). Of course, there may actually be multiple mobile device 1 and multiple PCs 2 in the network, associated with multiple users, although only one of each is shown to simplify description.

The Web server 8 provides the user with access to personal profile information (i.e. preferences, etc.), which is stored in database 10, and contact information which is stored in database 9. The user may access such information using the PC 2. The geo- server 7 provides the location- and time-dependent services described above, including indexing, geocoding, and route calculation, as described further below. Among other functions, three important functions of the geo- server 7 are: 1) returning spatial coordinates (latitude/longitude) to mobile devices 1 in response to contact-string queries; 2) providing solutions to POI proximity queries (i.e., a list of nearby POIs) from mobile devices; and 3) providing route information and/or maps to mobile devices.

Note that the geo-server 7 and the Web server 8 each may be implemented as one or more individual computer systems in communication with each other. Alternatively, geo-server 7 and Web server 8 may be implemented together as a

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single computer system. Similarly, although databases 9 and 10 are illustrated as separate databases, the data contained therein may actually be stored in a single database, or in any number of separate databases.

Figure 2 is a block diagram of a computer system, which is representative of any or all of the processing systems shown in Figure 1, such the PC 2, the geo-server 7, and the Web server 8. Note that Figure 2 is a high-level conceptual representation and is not intended to specify any one particular architectural arrangement. As shown, the computer system includes a central processing unit (CPU) 20, read-only memory (ROM) 21, random access memory (RAM) 22, each connected to a bus system 29. The bus system 29 may include one or more physical buses connected to each other through various bridges, controllers and/or adapters, such as are well-known in the art. For example, the bus system 29 may include a "system bus" that is connected through an adapter to one or more expansion buses, such as a Peripheral Component Interconnect (PCI) bus or the like.

Also coupled to the bus system 29 are a mass storage device 23 and various input devices 24, 25, various output devices 26, 27, and a communication device 28. The input devices 24, 25 may include, for example, one or more of: a keyboard, a pointing device, a touch-sensitive screen, a speech recognition subsystem, etc. the output devices may include, for example, display device and audio speakers. Mass storage device 23 may include any suitable device or devices for storing large volumes of data in a non-volatile manner, such as a magnetic disk or tape, magneto-optical (MO) storage device, or any of various types of Digital Versatile Disk (DVD) or compact disk (CD-x) storage.

The communication device 28 may be any device suitable for or enabling the computer system 1 to communicate data with a remote processing system over a data link, such as a conventional telephone modem, a cable modem, an Integrated Services Digital Network (ISDN) adapter, a Digital Subscriber Line (xDSL) adapter, a network interface card (NIC), a Ethernet adapter, or the like.

Figure 3 illustrates the software and data components of a mobile device 1 and the server system 3, according to at least one embodiment. As shown, the

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mobile device includes a database 31 of personal contacts, which may be stored in the format described above, i.e., {Name {location labels:phone numbers} }. The mobile device 1 further includes a data manager 32 for enabling the user to access the stored data via a Graphical User Interface (GUI) of the mobile device 1, and a geo- client 33 operatively coupled to the data manager 32, for providing the client-side functionality described above (i.e., formulation and transmission of queries, etc.). The mobile device 1 further includes appropriate communication software 34 operatively coupled to the geo- client 33, for enabling the mobile device 1 to communicate with remote devices, such as other cell phones and the server system 3.

The server system 3 also includes appropriate communications software 46 for enabling it to communicate with other, remote devices, such as the mobile device 1 and/or the PC 2. Coupled to the communication software 46 is a location server module 45, which provides much of the core functionality of the server system 3 described above, including geocoding, POI lookup functions, and route calculation. The location server 45 may be implemented as an application program interface (API). The server system 3 further includes a Cell Storage Format (CSF) compiler 37, a number N of CSF databases 38-1 through 38-N, a data parser 39, a geocoding and routing indexer 40, a POI indexer 41, and databases 42, 43 and 44.

Map data supplied by N vendors are stored in databases 35-1 through 35-N, respectively. The map data of each vendor includes spatial data describing roads, streets, highways, freeways, etc., and political boundaries. The map data of each vendor further includes text data labeling the elements of spatial data. In addition to the map data, POI data supplied by a number M of different vendors are stored in databases 36-1 through 36-M. The POI data may include, for example, data on the locations of restaurants, parks, airports, hospitals, gas stations, or any other locations of interest.

The map data stored in databases 35-1 through 35-N is vendor-specific; for example, such data may be stored in any of a number of well-known formats, such as Geographic Data Format (GDF) or formats proprietary to the vendor.

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Accordingly, the CSF compiler 37 receives the map data from the N vendors, which is likely to have various different formats, and reformats the data into a common format, referred to herein as CSF. CSF represents the map data using a multi-level matrix of rectangular cells. The details of the CSF are not germane for purposes of understanding of the present invention. The re-formatted data is stored in CSF databases 38-1 through 38-N.

Data parser 39 receives the reformatted map data from databases 38-1 through 38-N as well as the POI data from databases 36-1 from 36-M and parses the data into recognizable fields (e.g., name, address, phone number, etc.). The parser 39 also parses information received in queries from the mobile device 1. Parsed map data may be stored in database 42 as display data, which may be used by the server system 3 to provide a World Wide Web graphical map interface, as noted above. Parsed data from databases 38-1 through 38-N or databases 36-1 through 36-M are also provided to the geocoding and routing indexer 40.

The geocoding and routing indexer 40 indexes the parsed map data to allow it to be searched by name (e.g., "Oakland Hilton Hotel") or by phone number. The indexed map data is then stored in the geocoding and routing indexed database 43. Similarly, POI indexer 41 indexes the parsed POI data to allow it to be searched by POI category (e.g., ATM, airport, etc.) and stores the indexed data in POI indexed database 44. The data in the databases 42, 43, and 44 are all accessed by the location server 45 to provide geocoding, POI lookup, route calculation, and other functions.

Figure 4 illustrates the components of the location server 45 and the geocoding and routing indexer 40, according to one embodiment. As shown, the indexer 40 includes a spatial data indexer 51 and a text data indexer 52, each of which receives parsed data from the data parser 39. The spatial data indexer 51 indexes any spatial map data, while the text data indexer 52 indexes textual map data, such as labels. The location server 45 includes a route generator 53 and a geocoder 54. The route generator 53 uses the indexed spatial data generated by the spatial data indexer 51 to compute routes between selected points of origin and destination in response to a query from a mobile device 1. Such route

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generation devices are well-known in the art and therefore need not be described further herein. The geocoder 54 uses indexed text data generated by the text data indexer 52 to determine spatial coordinates (latitude and longitude) associated with a given text field, in response to a query from the mobile device 1.

As noted above, geocoding is the process of returning spatial coordinates (latitude and longitude) given an input string. Geocoding is one service provided by the server system 3 to mobile devices 1. The server system 3 may perform geocoding in either batch mode or dynamic mode. Batch geocoding may be performed in response to the mobile device 1 being synchronized with the server system 3, or when the user enters personal contact information from his PC 2 via his personal Web page (as maintained by the Web server 8; see Figure 1). Alternatively, the server system 3 may perform geocoding dynamically, i.e., in response to a query received from the mobile device 1. Dynamic geocoding is performed if the information in the query (i.e., name, phone number, etc.) has not been geocoded (associated with spatial coordinates) prior to the query.

Refer now to Figure 5, which shows a geocoding process that may be implemented by the geocoder 54. The process of Figure 5 is applicable to both batch geocoding and dynamic geocoding. At 501, the server system 3 receives a contact string. Of course, more than one string may be received, however, only one is assumed here to facilitate description. The contact string may be received from the mobile device 1 during synchronization or during a user query; alternatively, the string may be received from the PC 2 and Web server 8 in response to manual input from the user or from an operator. At 502, the input string is parsed into recognizable fields (i.e., address, street name, city, state, zip code, phone number, etc.) by the data parser 39 (Figure 3). At 503, it is determined whether spatial coordinates (latitude/longitude) for the name field of the contact string are stored in the central address book. The central address book is a subset of the geocoding and routing indexed database 43 (Figure 3). If coordinates are found in the central address book for the name field, the process continues from 506, as described below. If coordinates are not found for the name field, then at 504 an attempt is made to determine the spatial coordinates based on other fields

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in the contact string, such as the address or phone number. This may be accomplished by, for example, performing a reverse look-up, by phone number, address, etc., in a database that includes spatial coordinates; such databases are commercially available. If the operation at 504 was unsuccessful, then at 509 a fail message is transmitted to the appropriate recipient device (which is not necessarily the device which submitted the query). If 504 was successful, and if the server system 3 was responding to a query from the mobile device (506), then at 507, the coordinates are transmitted to be appropriate recipient device (which, again, need not be the device which submitted the query)--this is the case of dynamic geocoding. If the server system 3 is not responding to a query (in the case of batch mode geocoding), then at 510, the server system 3 transmits a confirmation that the string has been successfully geocoded to the appropriate recipient device. Note that for purposes of batch geocoding, real-time location and/or traffic information may be used. Optionally, the server system 3 also transmits to the recipient device an index value corresponding to the input string, which a mobile device 1 can later use to represent the string during a query transmitted to the server system 3. Following 507, 509 or 510, if all input contacts strings have been geocoded, then the process ends; otherwise, the next contact string is input at 501, and the above process repeats.

As noted above, another service provided by the server system 3 is to provide the user of a mobile device 1 with a list of POIs that are in proximity to a selected point of origin, in response to an associated query. The point of origin may be the mobile device itself or an entry selected from the user's list of contacts stored in the mobile device 1. This process is referred to as POI lookup. Figure 6 is a flow diagram illustrating a point of interest (POI) lookup process that may be implemented in a client device, such as the mobile device 1. The routine of Figure 6 may be implemented by the geo-client module 33, in cooperation with the data manager 32 and communication software 34.

At 601, the user of the mobile device 1 enters an input selecting POI proximity query as the desired action. In response, at 602 the mobile device 1 establishes a point of origin for the POI proximity query. If the mobile device 1

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has an internal positioning device, such as a GPS receiver, then such positioning device may be used to establish the spatial coordinates of the origin. Otherwise, the origin may be established by submitting a contact string lookup query to the server system 3 or by making a voice query to an operator of the server system 3. In the case of a contact string lookup, the mobile device 1 sends a query to the server system 3 using a selected item from the user's contact list in the mobile device 1. The query is then processed by the server system 3 in the manner described in Figure 5, resulting in spatial coordinates of the origin being returned to the mobile device 1.

After the origin is established, the coordinates of the origin are stored locally at 603, and at 604,the user enters an input selecting the desired type of POI, e.g., restaurant, airport, gas station, etc. At 605, the user selects a radius about the point of origin, defining an area within which he wishes POIs of the selected type to be identified. At 606, the mobile device 1 transmits a query to the server system 3, including the selected origin, POI type, radius, and a unique device code identifying the mobile device 1. The server system 3 then identifies any POIs within the specified radius of the selected origin, based on the coordinates of the origin. If at least one POI meets the criteria (607), then a list of POIs meeting the search criteria is returned to the mobile device 1 by the server system 3. If no POI meets the criteria, then (at the user's option) the procedure repeats from 605, in which the user selects a new, larger radius for the POI search. If the query was successful, then at 608 the user may select an item from the return list and initiate any of several available functions. The user may, for example, initiate a phone call from the selected POI, get directions to the selected POI, or update his personal database with the selected POI. Thus, at 609 the user is given the option of updating his personal database maintained in the server system 3 based on the item selected in the returned list. For example, the user may wish to identify the selected item as a "favorite" POI in his personal map database. If the user elects this option, then at 610 the selected item is stored locally in the mobile device 1 and propagated to the server system 3 at the next synchronization with the server system 3. The results of the action (e.g., "successful" or "unsuccessful") are then

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displayed by the mobile device 1 to the user at 611.

Figure 11 illustrates a process that may be performed by an operator of the server system 3 in connection with performing an operator-assisted POI lookup (see Figure 6, 602). At 1101, it is determined whether the user is calling for registered phone number. If not, at 1109 the operator asks the user to provide the phone number of any nearby registered telephone. Next, at 1102 the operator obtains the user's Personal Identification Number (PIN). The operator's then obtains the desired POI type from the user at 1103, and that 1104 is determined whether the users location is known from the signal received from the mobile device which the user is using (such as when the mobile device has an internal positioning device). If the location is known, then the operator initiates the geocode process for the specified POI type and origin at 1105. If the origin is not known, then the operator determines at 1110 whether the user wishes to select the origin from his personal Web page maintained by the Web server 8. If so, the geocode process is initiated 1105. Otherwise, the operator verbally obtains the origin from the user at 1111. Following the geocode process at 1105, the operator determines at 1106 whether the user wishes his personal Web page to be updated with any POIs found in the geocode process. If so, the operator updates the users Web page 1107. If not, or following 1107, the operator transmits results to the user at 1108 using an appropriate mode, i.e., verbally via telephone, or electronically to the mobile device 1.

Another service provided by the server system 3 is to provide a best route solution in response to queries from mobile devices 1. Figure 7 illustrates a process that may be performed in a mobile device 1 to obtain a route calculation from the server system 3. At 701, the user enters an input at mobile device 1 selecting route calculation as the desired action. If (702) the user wishes to select the origin and destination from local data within the mobile device 1 (i.e., using an internal positioning device or a contact string query), then at 703, the origin is established using such technique. Otherwise the user contacts an operator of the server system 3 by voice and, at 708, the operator receives the origin and destination from the user. The operator enters the origin and destination data into

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the server system 3, which computes the best route. At 707, the user receives the best route in an appropriate communication mode, depending on the capability of the mobile device 1. For example, the best route may be received verbally from the operator (by telephone), or in text and/or graphics generated by the mobile device 1 from a signal transmitted from the server system 3.

If operator assistance is not required or desired (702), the origin is established from an internal positioning device or contact string query, as appropriate. In that case, at 704 the coordinates of the origin are stored, and at 705 the destination is established by submitting a contact list query to the server system 3. At 706, the coordinates of the destination are stored, and at 707, the best route information is received by the user in an appropriate communication mode, as described above.

Figure 8 illustrates a process that may be implemented in the server system 3 to respond to a query from a mobile device 1. When the server system 3 receives a contact string query from a mobile device 1, the query may include the complete contact string (e.g., "Ginny:Office"), or the query may instead include a representative index value in place of the complete contact string. The index value may have been previously received from the server system 3 when the corresponding contact string was geocoded (see Figure 5, block 511). Accordingly, at 801, a query is received which includes a contact string or an index value representing a contact string. If the query contains an index value, then corresponding spatial coordinates are already stored in the central address book; accordingly, at 808 the coordinates are found in the central address book and transmitted to the appropriate recipient device at 807. If the query includes a complete contact string (802), then at 803, the contact string is parsed into recognizable fields. At 804, it is determined whether spatial coordinates are stored in the central address book for any field of the query. If so, the coordinates are transmitted to the recipient device at 807. If not, then at 805 an attempt is made to determine the spatial coordinates based on, for example, the address or phone number fields of the query. If a user profile is available for this user, it is also accessed at 805. If the attempt to determine spatial coordinates is successful (806),

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then the coordinates are transmitted to the recipient device at 807. Otherwise, a fail message is transmitted to the recipient device at 809.

As noted above, the server system 3 may maintain personal profiles for the users of mobile devices 1 (user profiles). A user profile may be accessed in response to a POI lookup or route calculation query from a mobile device 1 to provide the user with information that is more meaningful to that user, i.e., information that is customized for the requesting user. For example, a user profile may include a list of preferences to be used for route calculation, such as "avoid freeways" or "always use shortest time route", or a list of favorite POIs, such as favorite restaurants. Accordingly, the server system 3 may maintain a list of unique device codes, each corresponding to a particular mobile device 1 and/or a particular user. Each mobile device 1 may transmit its unique device code with any query it transmits to the server system 3. Accordingly, the server system 3 can use the received device code to identify and use the appropriate user profile when responding to the query.

Figure 9 illustrates a process that may be implemented by the server system 3 to perform a POI search or a route calculation using a user profile. At 901, it is determined whether the selected action is a POI lookup or a route calculation. If the selected action is a POI lookup, then at 902 a POI query is received containing an origin, POI type, radius, and the unique device code of the requesting device. At 903 it is determined the server system 3 has a user profile corresponding to the received device code. It may be assumed, for this purpose, that the user of the device is the registered user. If a user profile is available for this device code, then at 904 the server system 3 performs a POI search based on the user profile, and the received origin, POI type, and radius. Otherwise, at 905, the search is performed based on that same data, excluding the user profile. Similarly, if the selected action is a route calculation (901), then at 906 a query is received containing an origin, a destination, and a unique device code for the requesting device. At 907 it is determined whether a user profile is available based on the device code. If so, the route is computed based upon the user profile, the origin, and the destination at 908. Otherwise, at 909 the route is computed based upon the same data, except

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the user profile.

A query transmitted from a mobile device 1 to the server system 3 may specify a recipient device for the response that is not the querying device. For example, the user may wish to transmit a route calculation query from his cell phone, but desires that the route solution be transmitted to his automobile navigation system. The user may, for example, program the recipient device into the mobile device 1 prior to making the query. Accordingly, the server system 3 is configured to identify such a recipient code and to appropriately select the recipient device for the response, based on such code. The server system 3 may use its above-mentioned database of device codes for this purpose, or it may maintain a separate database of recipient device codes.

Figure 10 illustrates a process that may be implemented by the server system 3 to select the recipient device. At 1001, it is determined whether the currently received query contains a recipient code indicating a destination other than the transmitting device. If so, the server system 3 performs a simple lookup at 1002 to identify the recipient device based on the code. Otherwise, at 1003, the recipient device is determined to be the device which transmitted the query.

Note that a response by the server system 3 to a query may be transmitted to the recipient device asynchronously with respect to the query. That is, there is no time limit between a query and the associated response. Hence, the response may occur much later than the query, if necessary, and as already noted, the response may go to a recipient device other than the querying device. Hence, if the server system 3 is unsuccessful in contacting the intended recipient device to send the response (such as when the intended recipient device is turned off), the server system 3 may continue to attempt to respond until successful. Alternatively, the server system 3 may select an alternate recipient device, which may be specified in a user profile.

Thus, a method and apparatus for providing navigation assistance and other services to a user of a mobile processing device have been described. Although the present invention has been described with reference to specific exemplary embodiments, it will be evident that various modifications and changes

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may be made to these embodiments without departing from the broader spirit and scope of the invention as set forth in the claims. Accordingly, the specification and drawings are to be regarded in an illustrative sense rather than a restrictive sense.

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CLAIMS

What is claimed is:

1. A method of allowing a mobile device to access location-dependent information, the method comprising:

receiving, at a server system, a signal transmitted from a remote mobile device, the signal representing a user input applied at the mobile device to select an item in a database;

using the server system to compute location-dependent information based on the signal and geocoded data in the server system; and

transmitting a signal representing the location-dependent information to a remote recipient.

2. A method as recited in claim 1, wherein the processing device is a mobile computing device.

3. A method as recited in claim 1, wherein the location-dependent information comprises information specifying a geographic location.

4. A method as recited in claim 1, wherein the location-dependent information comprises a solution of a geographic proximity search.

5. A method as recited in claim 1, wherein the location-dependent information comprises guidance information for assisting a person in navigating.

6. A method as recited in claim 1, further comprising accessing user-specific information in the server system in response to receiving the signal representing the index item, such that the computed location-dependent information is tailored to a particular user.

7. A method as recited in claim 1, further comprising automatically

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determining the remote recipient at the server system prior to said transmitting the location-dependent information.

8. A method as recited in claim 7, wherein the remote recipient is a device other than the mobile device.

9. A method as recited in claim 7, wherein the remote recipient is the mobile device.

10. A method as recited in claim 7, wherein said automatically determining the remote recipient comprises determining the remote recipient based on a personal profile of a user.

11. A method as recited in claim 1, wherein said transmitting the signal representing the location-dependent information to the remote recipient comprises asynchronously transmitting the signal representing the location-dependent information to the remote recipient.

12. A method as recited in claim 1, further comprising:

receiving a user input; and

asynchronously transmitting a signal from the server system to the mobile device to automatically update data stored in the mobile device, based on the user input.

13. A method as recited in claim 1, wherein the mobile device is a hand-held computing device.

14. A method as recited in claim 1, wherein the mobile device is a cellular telephone.

15. A method as recited in claim 1, wherein the mobile device is an automobile

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on-board navigation assistance device.

16. A method as recited in claim 1, further comprising generating the geocoded data dynamically at the server system in response to receiving the index value from the mobile device.

17. A method of accessing a remote database from a processing device, the method comprising:

inputting a user input at the processing device, the user input specifying an item in a database in the processing device;

transmitting a signal representing the item from the processing device to a remote server system, the remote server system maintaining geocoded data; and

receiving from the server system a signal representing location-dependent data, the location-dependent data computed by the server system based on the signal and geocoded data.

18. A method of operating a server system, the method comprising:

receiving at the server system a signal transmitted from a remote processing device, the signal representing a user input applied at the mobile device, the user input specifying an item in a database;

computing location-dependent data that is specific to a particular user in response to receiving the signal representing the index item, based on the index item and geocoded data in the server system; and

transmitting a signal representing the location-dependent data to a remote recipient.

19. A method as recited in claim 18, wherein said computing location-dependent data comprises cross-referencing time and/or location dependent information with user information.

20. A method as recited in claim 18, wherein said index item is an item stored in a

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database in the remote processing device.

21. A method as recited in claim 18, wherein the remote processing device is a mobile computing device.

22. A method of allowing any of a plurality of mobile devices to access a remote database, the method comprising:

maintaining geocoded data at a centralized server system;

maintaining a unique code for each of the plurality of mobile devices;

receiving, at the centralized server system, a signal transmitted from one of the mobile devices, the signal representing a database item selected by a user input at said one of the mobile devices and further representing the unique code for said one of the mobile devices;

computing location-dependent data that is customized for said one of the mobile devices in response to receiving the signal based on the unique code, the database item, and the geocoded data; and

transmitting a signal representing the location-dependent data to a remote recipient.

23. A method as recited in claim 22, wherein said computing location-dependent data comprises cross-referencing time and/or location dependent information with user information.

24. A method as recited in claim 23, further comprising:

receiving a user input; and

asynchronously transmitting a signal from the server system to the mobile device to automatically update data stored in the mobile device, based on the user input.

25. A method of maintaining a server system for providing location-dependent data to a remote processing device, the method comprising:

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maintaining map data at the server system;

inputting to the server system a user-provided database maintained by the remote processing device, the database including a plurality of data entries; and

linking each of the data entries to the map data to form a set of geocoded data, the geocoded data maintained at the server system for use by the remote processing device.

26. A method as recited in claim 25, wherein said linking comprises associating each of the data entries with a specific geographic location represented in the map data.

27. A method as recited in claim 25, wherein the user-provided database comprises personal contact information of a user.

28. A method as recited in claim 25, wherein the user-provided database comprises a set of selectable destinations for a navigation device.

29. A method as recited in claim 25, wherein the remote processing device is a mobile computing device.

30. A method as recited in claim 25, wherein said linking comprises the server system linking each of the data entries to the map data automatically to form the set of geocoded data.

31. A method as recited in claim 25, wherein said linking comprises manually linking each of the data entries to the map data to form the set of geocoded data.

32. A method as recited in claim 25, further comprising:

maintaining the geocoded data at the server system;

receiving, at the server system, a signal transmitted from the mobile device, the signal representing an index item corresponding to a user selection applied at

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the remote processing system device;

in response to the signal, using the server system to compute location-dependent data based on the geocoded data and the index item; and

transmitting a signal representing the location-dependent data to a remote recipient.

33. A method as recited in claim 25, further comprising:

providing a user interface for allowing a user to access the geocoded data from a second remote processing system;

receiving a user input from the second remote processing system via the user interface, the user input for editing the geocoded data; and

updating the geocoded data according to the user input.

34. A method as recited in claim 25, wherein the user interface comprises a hypermedia –based Internet interface.

35. A method of maintaining a server system for providing location-dependent data to any of a plurality of remote mobile devices, the method comprising:

maintaining map data at the server system;

inputting to the server system, for each of said plurality of mobile devices, a user-provided database maintained by said mobile device, each said database including a plurality of data entries; and

linking each of the data entries of each said database to the map data to form a separate set of geocoded data for each of said plurality of mobile devices, each said set of geocoded data maintained at the server system for use by the corresponding one of the mobile devices.

36. A method as recited in claim 35, further comprising:

providing a user interface for allowing a user to access one of the sets of geocoded data from a remote processing system;

receiving a user input from the remote processing system via the user

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interface, the user input for editing said one of the sets of geocoded data; and

updating said one of the sets of geocoded data according to the user input.

37. A method as recited in claim 35, wherein the user interface comprises a hypermedia-based Internet interface.

38. A method as recited in claim 35, wherein said linking comprises the server system automatically linking each of the data entries to the map data to form the set of geocoded data.

39. A method as recited in claim 35, wherein said linking comprises manually linking each of the data entries to the map data to form the set of geocoded data.

40. A method as recited in claim 35, further comprising:

receiving a user input directed to the geocoded data for one of the mobile devices; and

in response to the user input, transmitting the geocoded data for said one of the mobile devices to another of the mobile devices.

41. A method of operating a server system for providing location-dependent data to a remote processing device, the method comprising:

maintaining map data at the server system;

inputting to the server system a user-provided database including a plurality of data entries;

receiving a query from the remote processing device;

in response to the query, dynamically linking one of the data entries to a subset of the map data to form geocoded data;

using the geocoded data to generate a response to the query; and

transmitting the response to the query to the remote processing device.

42. An apparatus for providing location-dependent data to a remote processing

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device, the apparatus comprising:

a data indexer configured to receive geographic data and to index the geographic data to spatial coordinates to generate indexed data; and

a geocoder configured to respond to a user query from the remote processing device to determine a set of coordinates from the indexed data based on a received index item, and to output the set of coordinates for transmission to the remote processing device.

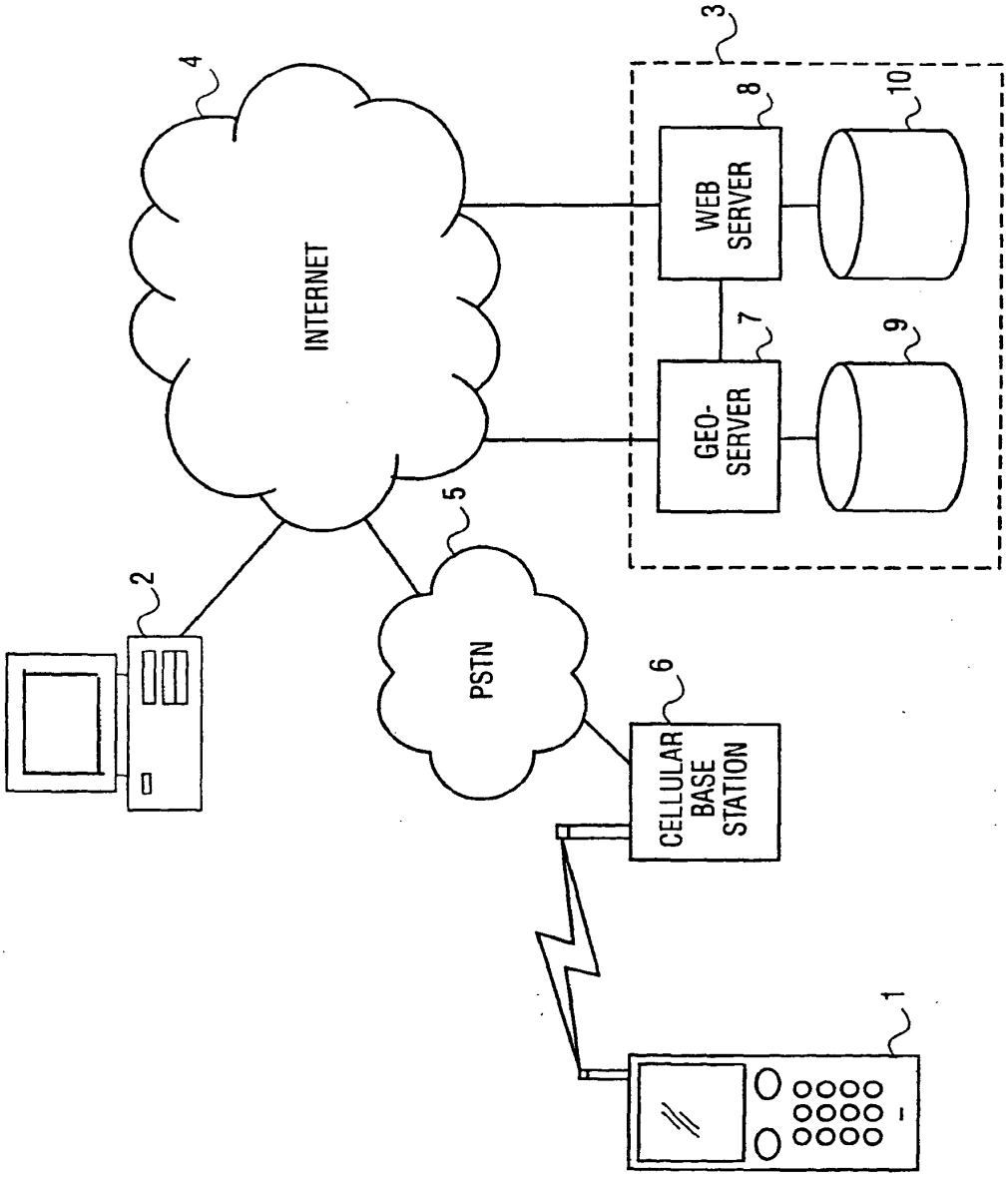
43. An apparatus as recited in claim 42, further comprising a route generator configured to generate a route between two locations in response to a user query from the remote processing device, using the indexed data.

44. An apparatus as recited in claim 42, wherein the geocoder is configured to search for a point of interest from the indexed data based on a user query including a distance value and an origin, and to output the point of interest for transmission to the remote processing device.

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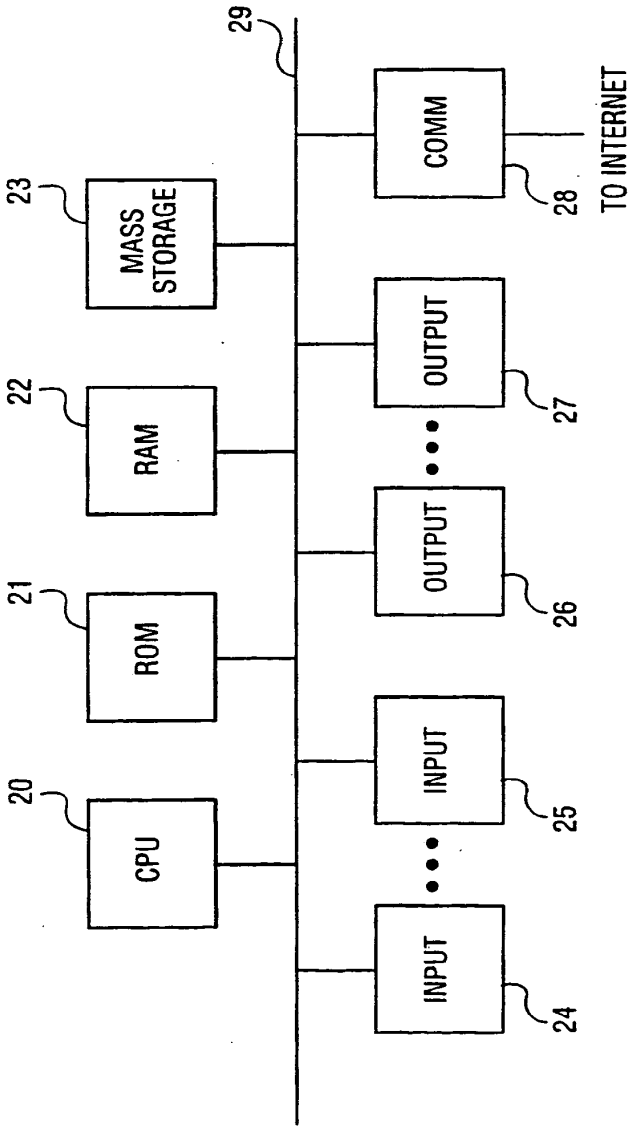
FIG. 1



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FIG. 2



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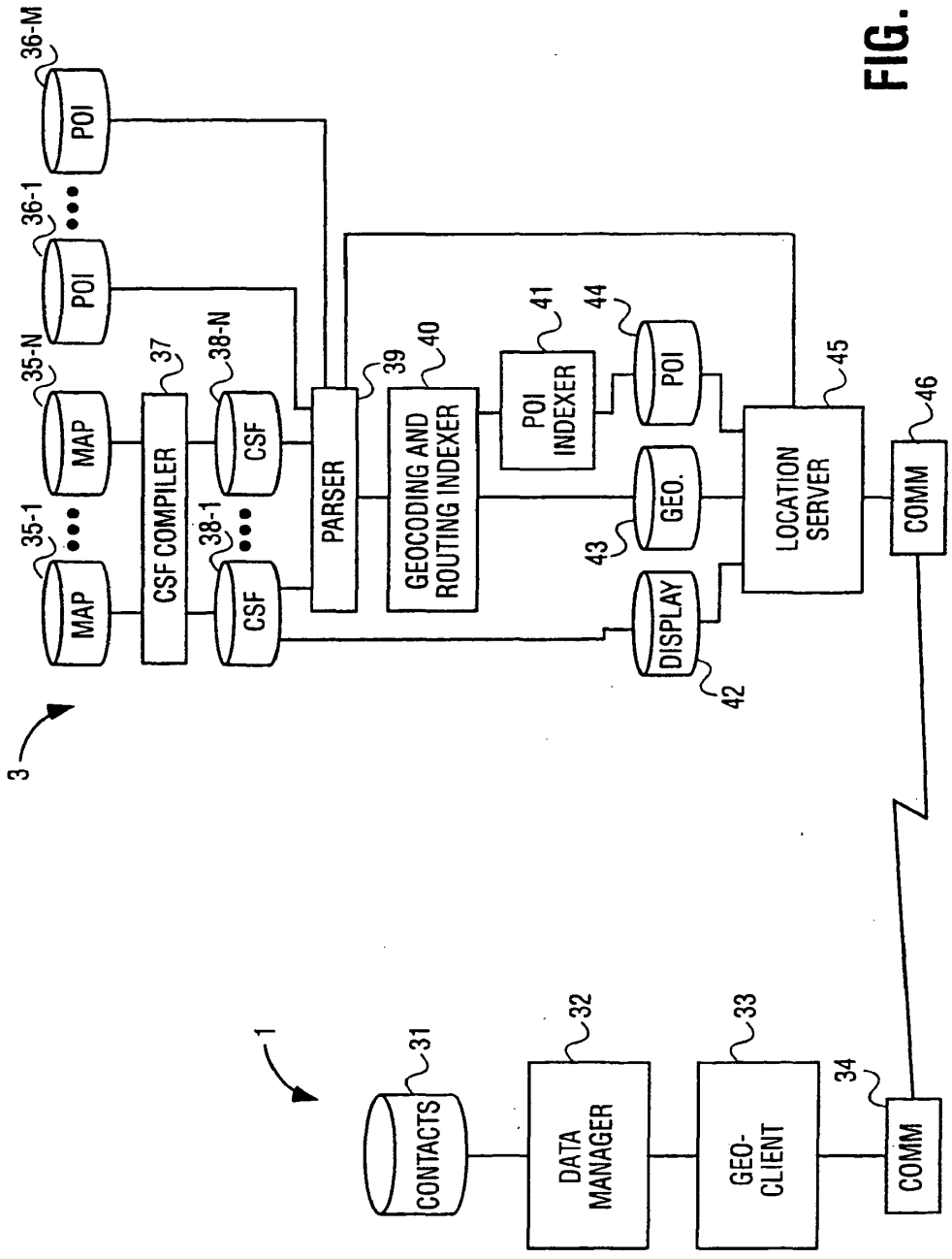


FIG. 3

XOCID: <WO___0113069A1_I_>

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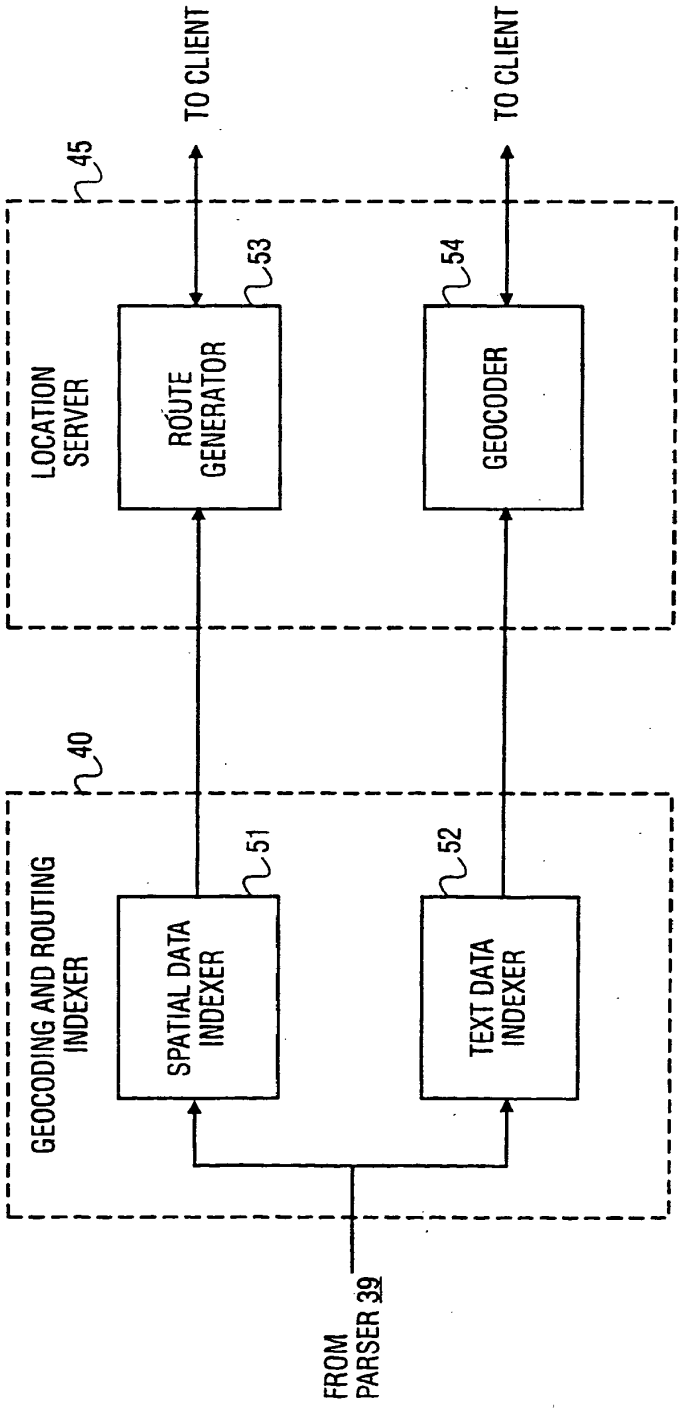


FIG. 4

OCID: <WO___0113069A1_I_>

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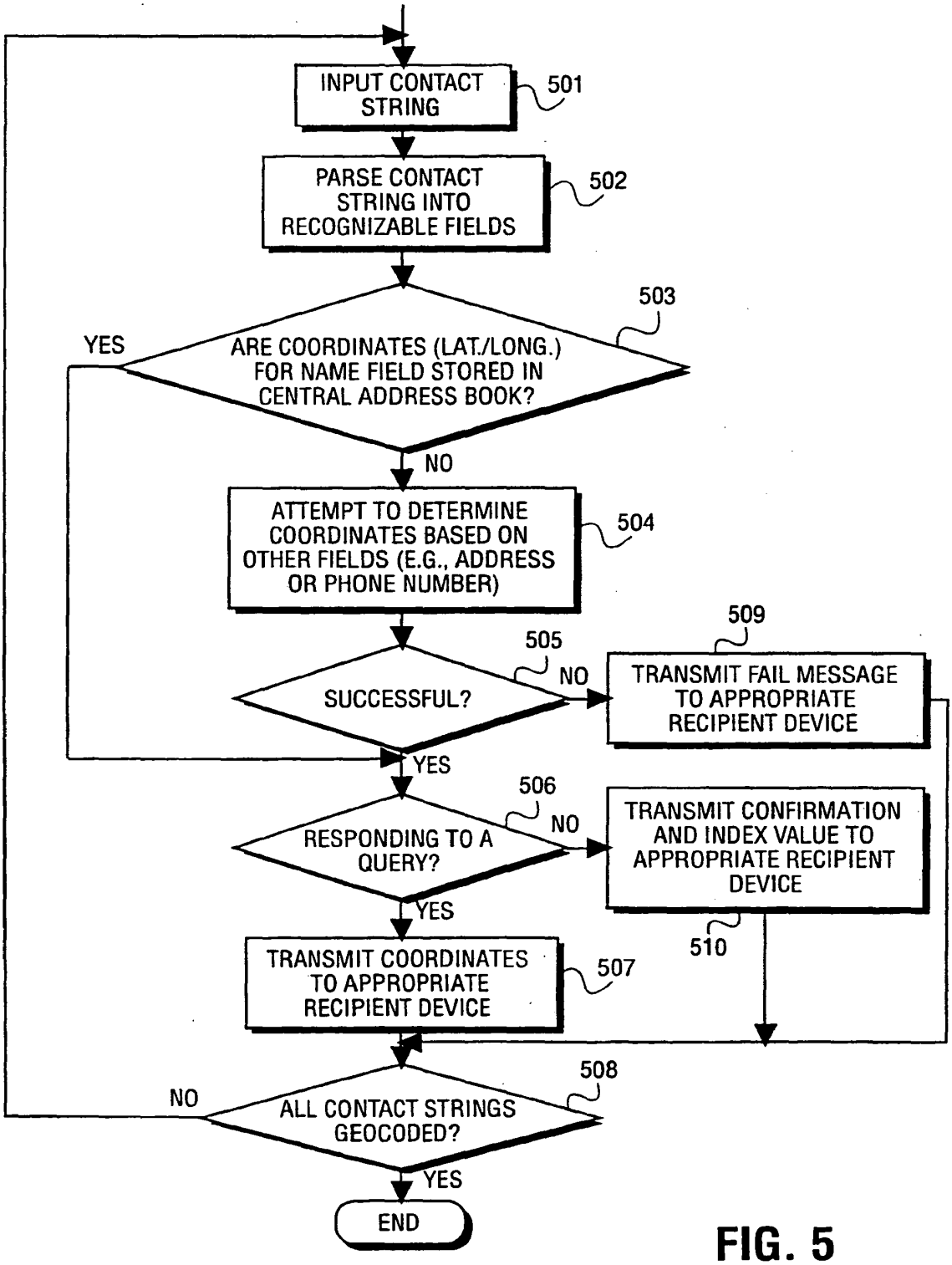


FIG. 5

XOCID: <WO___0113069A1_I_>

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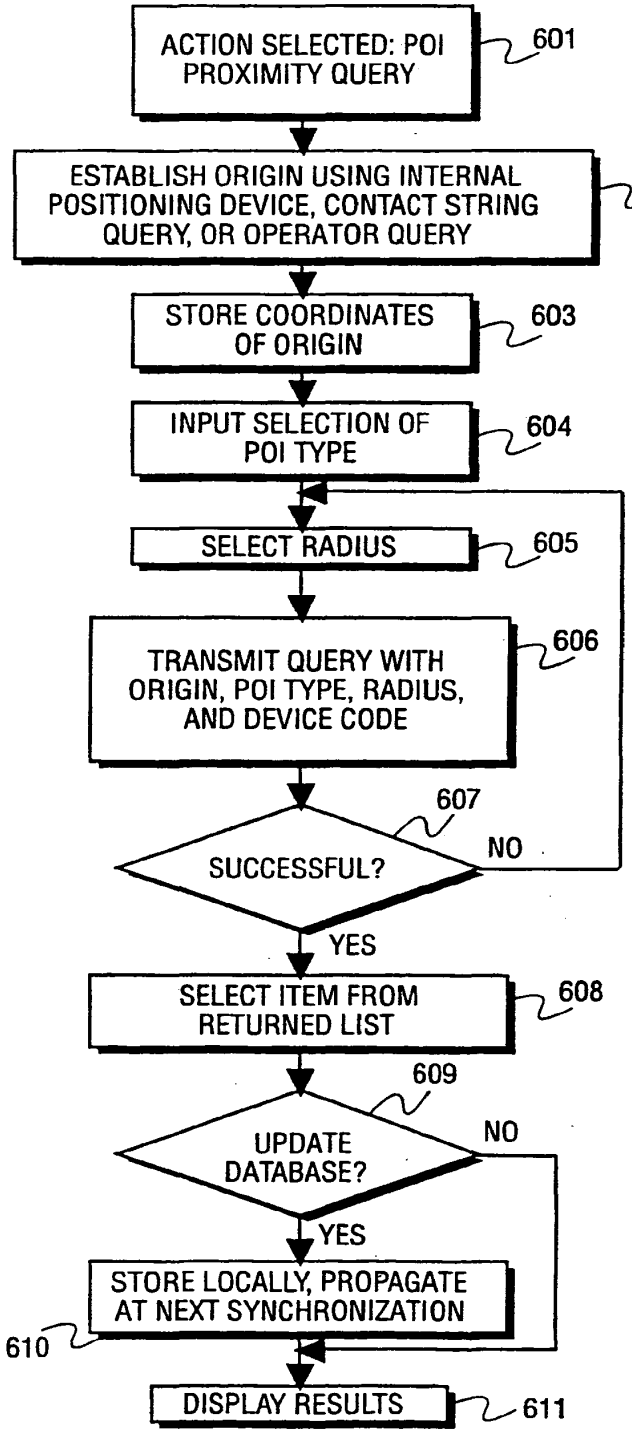


FIG. 6

OCID: <WO___0113069A1_I_>

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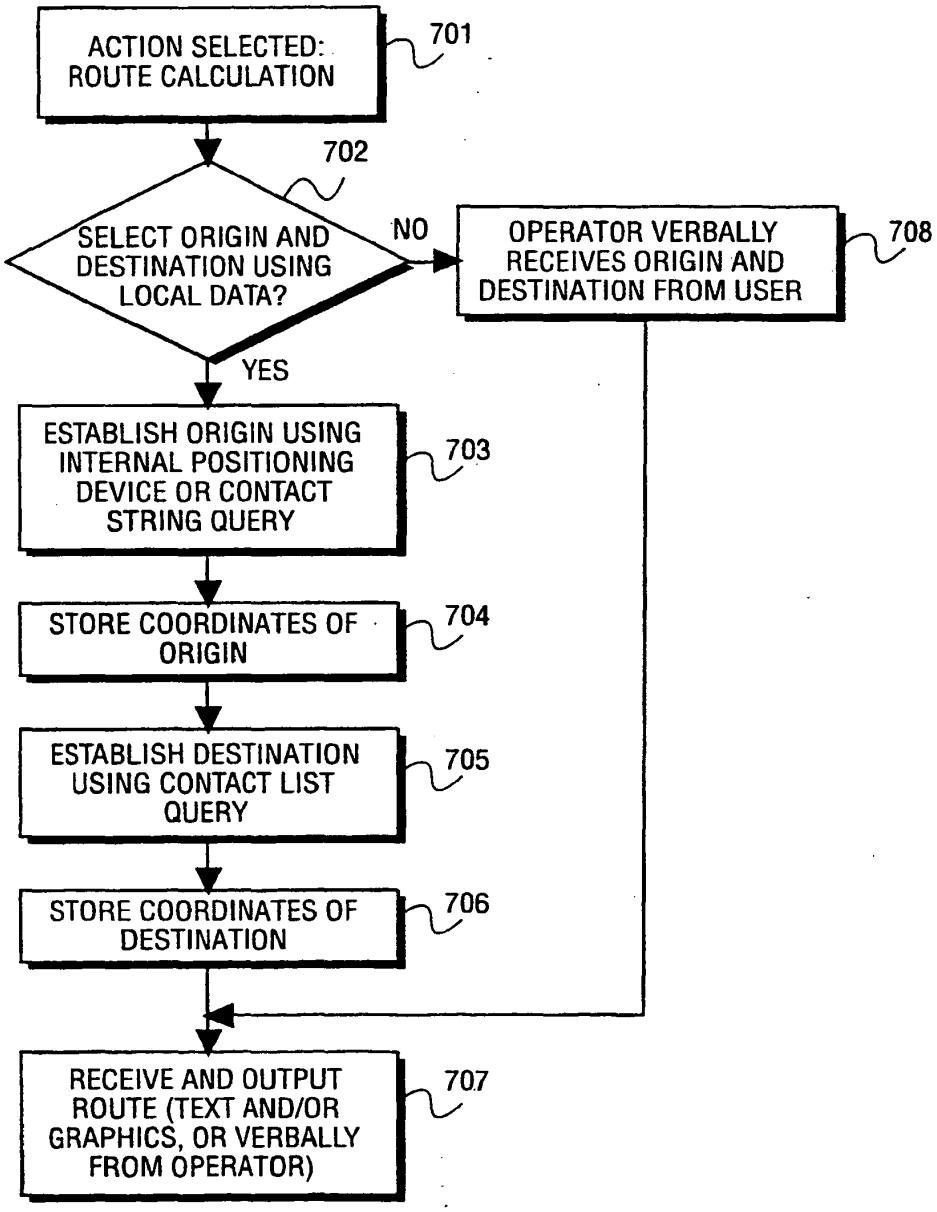


FIG. 7

)OCID: <WO___0113069A1_I_>

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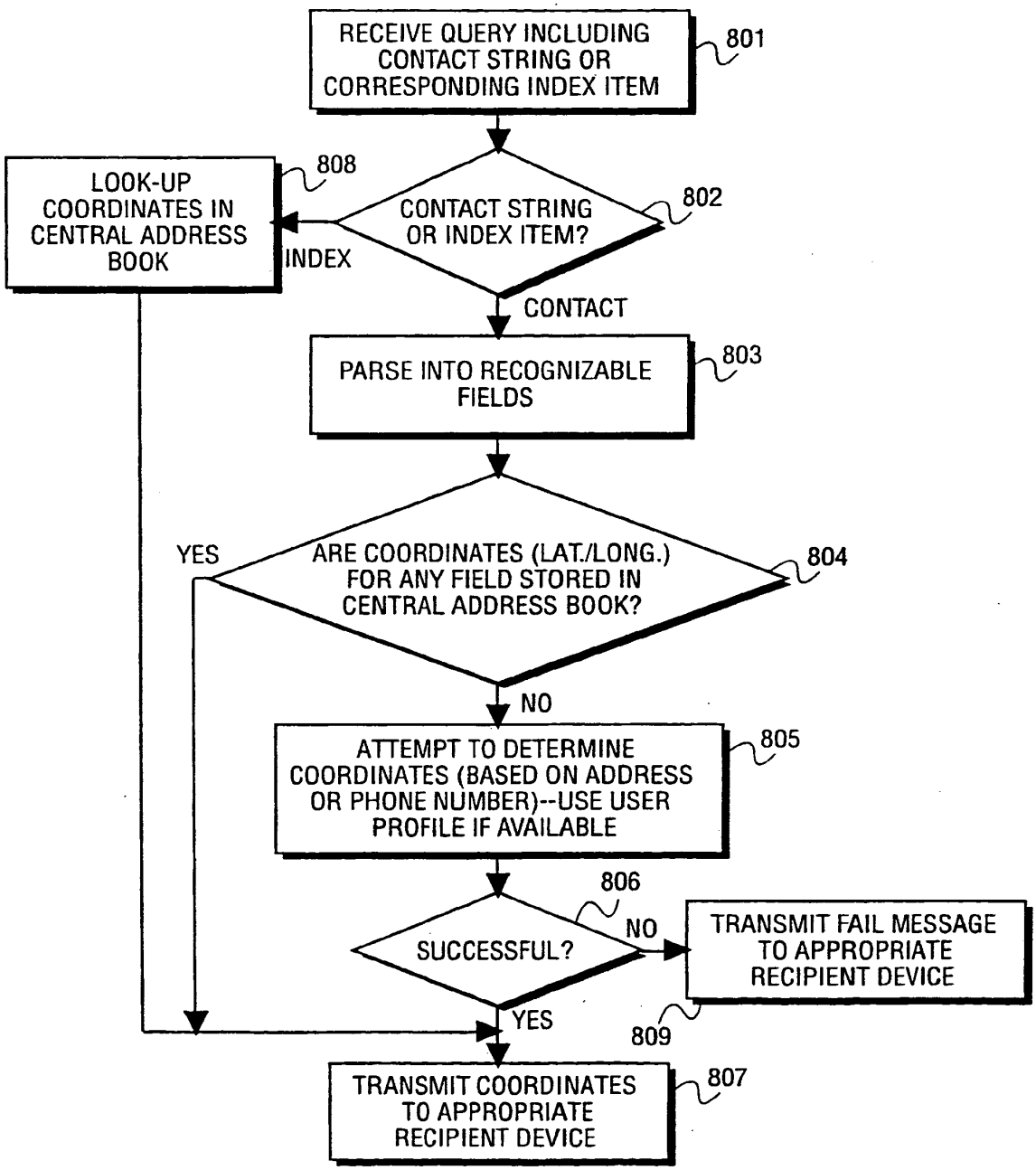


FIG. 8

XOCID: <WO___0113069A1_I_>

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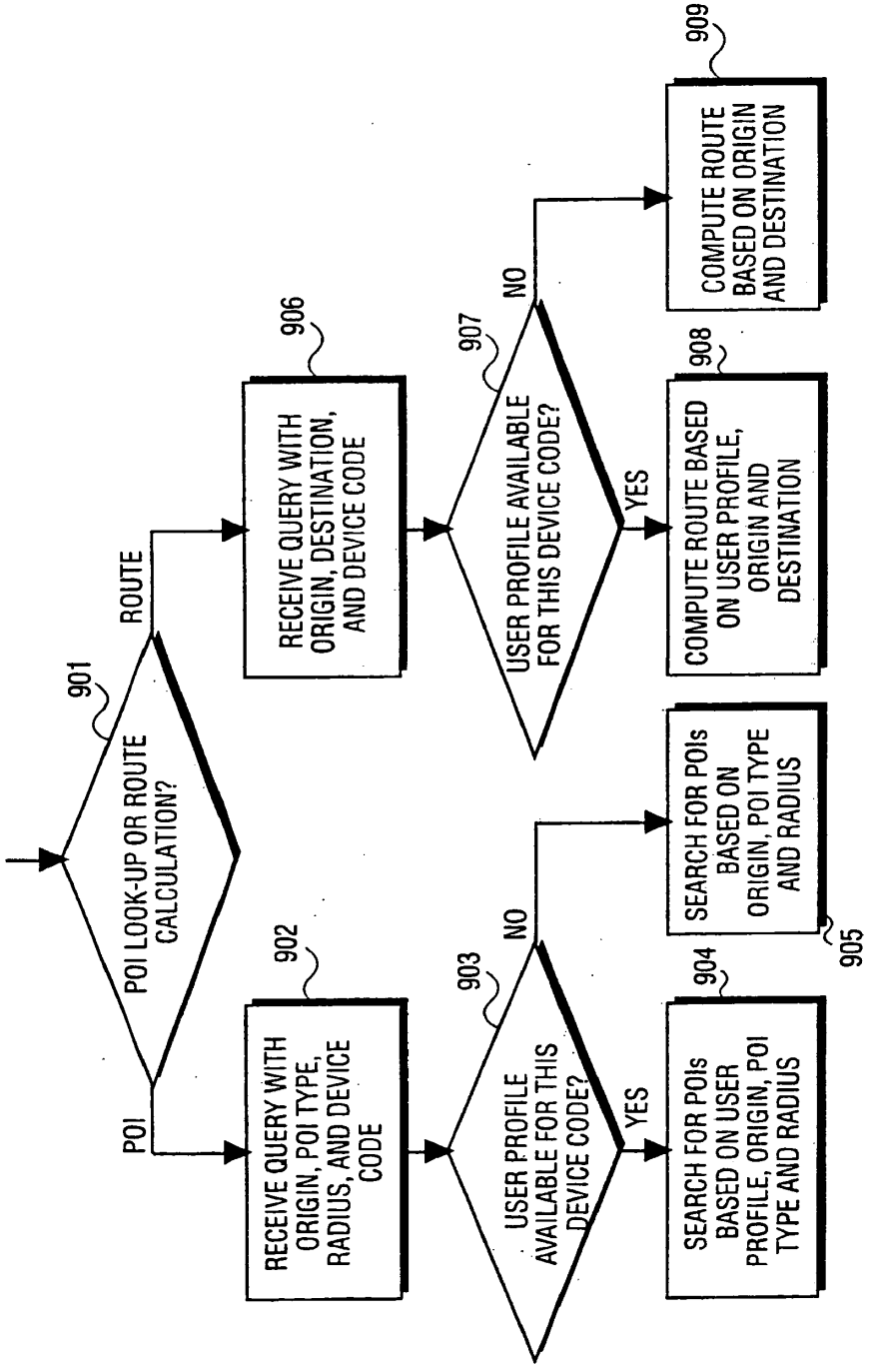


FIG. 9

)OCID: <WO___0113069A1_I_>

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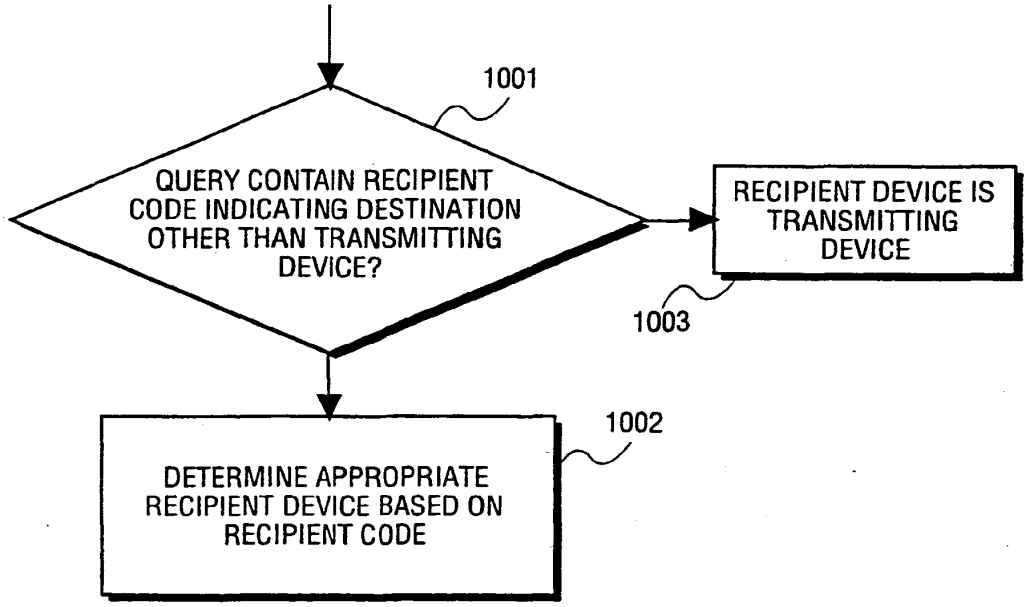


FIG. 10

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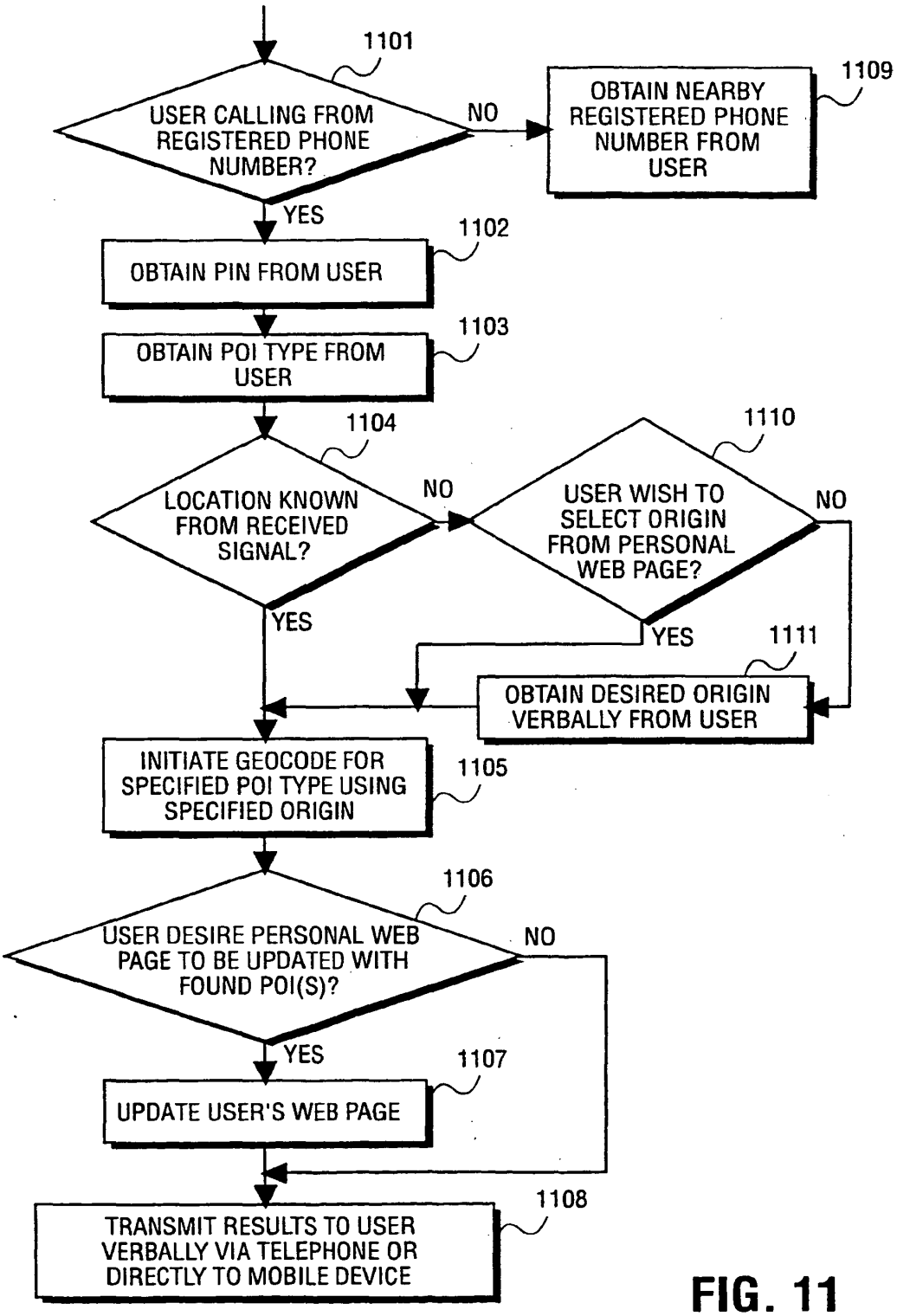


FIG. 11

DOCID: <WO___0113069A1_I_>

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INTERNATIONAL SEARCH REPORT

Int. ional Application No
PCT/US 00/22058

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G01C21/36

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04Q G01C G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FUJINO N ET AL: "MOBILE INFORMATION SERVICE BASED ON MULTI-AGENT ARCHITECTURE" , IEICE TRANSACTIONS ON COMMUNICATIONS,JP,INSTITUTE OF ELECTRONICS INFORMATION AND COMM. ENG. TOKYO, VOL. E80-B, NR. 10, PAGE(S) 1401-1406 XP000734533 ISSN: 0916-8516 the whole document ---	1-44
X	DE 43 00 927 A (KANG ANDREE DIPL ING) 21 July 1994 (1994-07-21) column 3, line 54 - line 64 column 4, line 16 - line 26 column 5, line 12 - line 29 figure 4 ---	1-44
	-/--	

[X] Further documents are listed in the continuation of box C.

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Date of the actual completion of the international search	Date of mailing of the international search report
21 November 2000	04/12/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Kampouris, A

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INTERNATIONAL SEARCH REPORT

Int. .ional Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 32076 A (KONINKL PHILIPS ELECTRONICS NV ;PHILIPS NORDEN AB (SE)) 23 July 1998 (1998-07-23) page 1, line 6 - line 11 page 2, line 3 -page 3, line 20 page 4, line 3 - line 7 page 6, line 31 -page 7, line 1 page 7, line 24 -page 8, line 1 ---	1-44
X	US 5 875 412 A (SULICH JANUSZ S ET AL) 23 February 1999 (1999-02-23) column 2, line 52 -column 3, line 8 column 4, line 45 - line 52 -----	1-44

1

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Int. ional Application No
PCT/US 00/22058

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 4300927 A	21-07-1994	NONE	
WO 9832076 A	23-07-1998	US 6076166 A	13-06-2000
		EP 0898748 A	03-03-1999
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		JP 2000505197 T	25-04-2000
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		AU 3141795 A	04-03-1996
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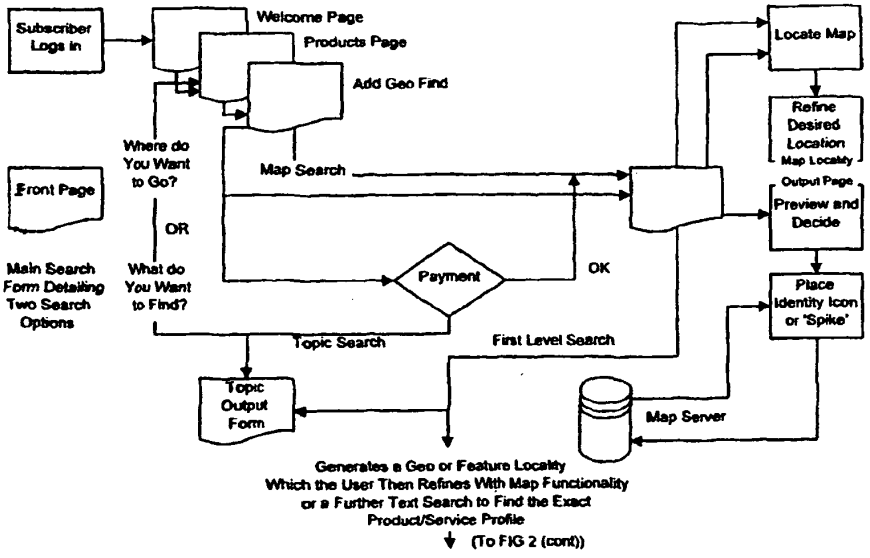
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

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Published:
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ON-LINE GEOGRAPHICAL DIRECTORY



(57) Abstract: A method of categorising businesses, organizations and individuals in order to facilitate geographically-based searching over the Internet, includes the steps of: (a) registering in a database the names of businesses, organizations and/or individuals; (b) for each name entry, registering a geographical location identifier; and (c) for each name entry, optionally registering further information such as address, telephone number, and information about the goods or services offered by the business, organization or individual; wherein each geographical location identifier indicates the precise geographical location at which the business, organization or individual is located.

WO 01/65426 A1

XOCID: <WO___0165426A1_I_>

ON-LINE GEOGRAPHICAL DIRECTORY

Field of Invention

This invention relates to an on-line geographical or spatial directory. It also relates particularly but not exclusively to a method of categorising items in order to facilitate information retrieval. It further relates particularly but not exclusively to a method and system for indexing information so that Internet users may locate relevant information according to geographical or spatial location. It also relates particularly but not exclusively to a method and system of delivering geographically based advertising over the Internet.

Background of the Invention

Over the past decade, the Internet has become a source of a vast amount of information. Unfortunately, there is no agreed method of indexing or categorisation, so that it is very difficult to identify and locate most of the information which may be relevant to a particular query. Two of the most common ways of locating relevant information on the Internet are to locate a URL in a printed publication or television advertisement and to enter it into a web browser to "visit" the URL and obtain the desired information, or to use one of the many Internet search engines.

The Internet search engines typically maintain indices based on key words which appear on web pages. When some key words are typed into a search engine, the search engine produces a list of hypertext links to documents having those key words. This is a good way of finding some general information on a particular subject, but it is not an effective way of finding all relevant information.

There are advantages and disadvantages to doing business on the Internet. One advantage is that the Internet provides rapid and inexpensive access to an enormous number of different potential customers. This is particularly useful when a business involves selling items such as books or CDs, which have

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universal appeal and are non-perishable and relatively inexpensive to ship to anywhere in the world. A disadvantage is that the Internet is less suitable for businesses which have a more local customer base, because it does not provide easy ways of targeting local customers. Similarly, many customers have difficulty in identifying Internet businesses are within their geographical location. For example, a pizza shop might have a customer base located exclusively within a 5 km radius, but an Internet search on "pizza shops" might bring up thousands of such shops from all round the world, so that shops in the relevant geographical location are lost amongst the large number of irrelevant ones.

Indeed, the majority of businesses and organizations have a geographically defined constituency, and are not therefore inherently suited to the presently available Internet search engines. Some search engines such as Altavista allow a search to be confined to a particular country, and Yahoo goes further, allowing a search to be restricted according to country, state and city. However, in many cases, a restriction to a particular city is still not enough. In the case of a pizza shop, a list of all pizza shops in a particular city would still contain far too many shops which were not within a 5 km radius of the potential customer.

One way for a person to attempt to overcome this problem when using an Internet search engine is to use the locality of the particular business as a key word. Thus, the person might type "Pizza Shop Preston" into the search engine. However, this is still unsatisfactory because all relevant pizza shops may not have used the locality name "Preston" as a key word on their Internet web sites, and relevant shops in neighbouring locations will not be located. Further, there may be multiple localities throughout the world with the same locality name. For example, there are approximately thirty eight localities which have the name "Preston" in the United States.

An attempt has been made to address this problem in US Patent 5,930,474, which relates to an Internet organiser for accessing geographically and topically based information. The organiser disclosed in that patent essentially requires the breaking down of a city into various localities, and the compilation of "locality

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guides" for the localities, with each business being listed in a particular locality guide. This is useful to some extent, in a similar manner to a neighbourhood telephone directory. However, it still has numerous shortcomings. It fails to distinguish between different types of goods and services for which different locality sizes are appropriate. For example, a person may only be prepared to travel up to 2 km to do the daily grocery shopping, but may be prepared to travel up to 20 km to purchase an item of furniture. A builder of a major project might be happy to have pre-mixed concrete delivered within a maximum of 20 km due to the perishable nature of the product. On the other hand prefabricated steelwork can be transported hundreds of kilometres without deterioration and without a major cost disadvantage. Further, a business classified as being just within the borders of a particular locality may by that classification miss out on business which it might otherwise have gained from a nearby customer who is classified as residing just within the border of an adjoining locality.

An object of the present invention is to overcome of alleviate one or more of the problems present in the prior art.

Summary of the Invention

According to a first aspect of the present invention, there is provided a method of categorising businesses, organizations and individuals in order to facilitate geographically-based searching over the Internet, including the steps of:

(a) registering in a database the names of businesses, organizations and/or individuals;

(b) for each name entry, registering a geographical location identifier; and

(c) for each name entry, optionally registering further information such as address, telephone number, and information about the goods or services offered by the business, organization or individual;

wherein each geographical location identifier indicates the precise geographical location at which the business, organization or individual is located.

The geographical location identifier may be any suitable type of identifier. In one suitable arrangement, each geographical location identifier corresponds to:

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(i) a precise point of latitude and longitude where the business, organization or individual in question occupies a small area of land, or

(ii) an area of points of latitude and longitude where the business, organization or individual occupies a larger amount of land.

In a particularly preferred arrangement, the database operates in conjunction with a secondary database of known street addresses and geographical co-ordinates such that, when a new name is entered in the database, a geographical location identifier is provided for that name by entering a street address for the name, which the secondary database can use to provide geographical co-ordinates for the name.

In a preferred arrangement, there are numerous databases at a number of Internet sites located in different countries or regions, each of the Internet sites containing information relevant to businesses, organizations and/or individuals in its country or region.

According to a second aspect of the invention, there is provided an Internet site for facilitating geographically-based searching over the Internet, including:

(a) a database having the names of businesses, organizations and/or individuals;

(b) the database further having a geographical location identifier for each name entry;

wherein each geographical location identifier indicates the precise geographical location at which the business, organization or individual is located.

In one arrangement, each geographical location identifier corresponds to:

(i) a precise point of latitude and longitude where the business, organization or individual in question occupies a small area of land, or

(ii) an area of points of latitude and longitude where the business, organization or individual occupies a larger amount of land.

In another arrangement, the database operates in conjunction with a secondary database of known street addresses and geographical co-ordinates such that,

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when a new name is entered in the database, a geographical location identifier is provided for that name by entering a street address for the name, which the secondary database can use to provide geographical co-ordinates for the name.

The Internet site preferably further includes a search engine which allows an Internet user to conduct a search of the database to find all entries matching user-specified criteria located within a user-specified distance from a user-specified point. Thus, for example, a person can use the search engine to locate all grocery stores within a 2 km radius of his or her house, or to locate all furniture stores within a 20 km radius. As a further example, a person visiting an unfamiliar city might use the system to locate the closest hotel to a particular place of business.

It will readily be appreciated that the system can be used for almost any type of geographical or spatial searching and accordingly the invention is not limited to those so far listed. The system may search from any point within any pre-determined distance. For example, the system may search within a specified distance of a particular object such as a road or coastline. The system may also search by drawing an area on the map, preferably with a mouse, and searching that area. Another alternative method of searching is by nominating various points and searching the area contained within those points, these points may be defined by particular objects such as roads.

If the Internet site is programmed with various different types of geographical boundaries such as council boundaries, postal area boundaries and electoral district boundaries, and different geographical features such as streets, shopping centres and public facilities, a user can perform numerous different types of searches such as:

"Find all the scout halls in the municipality of X"

"Find the nearest Post Office"

"Find all the cake shops in X Street"

"Find all the shops that sell X brand shoes in Y shopping centre"

There are numerous different ways in which the method and database system of the invention can be used to generate revenue. Businesses and

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organizations can make a payment in order to be listed in the database. Persons undertaking a search can be charged a fee for the search. Alternatively, revenue can be generated through advertising on the search engine site and on search results pages. In order to increase the effectiveness of advertising, the subject matter of advertisements can be varied to accord with the subject matter of searches being made.

According to a third aspect of the invention, there is provided a method of categorising items in order to facilitate information retrieval, including the steps of:

(a) registering in a database the identity of the item;

(b) for each entity, optionally registering further information about the item; and

(c) registering in the database a spatial co-ordinate identifier corresponding to the location of each item wherein each spatial co-ordinate indicates the precise spatial location identifier of the entity at which the item is located.

Preferably, the item in question is defined by co-ordinates specified relative to each one of three dimensions. Alternatively, the item in question may be defined by an area of spatial co-ordinates, each spatial co-ordinate being specified as relative to each one of three dimensions. In a further alternative, the item in question can be defined by a volume of spatial co-ordinates, each spatial co-ordinate being specified as relative to each one of three dimensions.

According to the Invention in a fourth aspect there is provided a method of delivering geographically based advertising over the Internet, including the steps of:

(a) registering in a database one or more goods or services being offered by one or more advertisers;

(b) for each good or service offered by the advertiser, registering an advertiser geographical area indicating the area in which the advertiser wishes to receive customers;

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(c) determining an Internet user geographical location identifier, being the precise geographical location of the Internet user;

(d) displaying to the Internet user an advertisement, the advertisement displayed being selected from one or more advertisements for goods or services wherein the geographical location of the Internet user is within the advertiser geographical area corresponding to one or more of the goods or services presented in the advertisement.

Preferably, the advertiser geographical area is specified by precise points of latitude and longitude. The Internet use geographical location identifier may also be specified by a precise point of latitude and longitude.

The Internet user may also supply information including their Internet user geographical location identifier. Alternatively, the party presenting the advertisement may track the Internet user to determine their geographical location and target advertising accordingly.

Brief Description of Drawings

The invention will hereinafter be described in greater detail with reference to the attached drawings which show an example form of the invention. It is to be understood that the particularity of those drawings does not supersede the generality of the preceding description of the invention.

Figure 1 is a flowchart of the process of registering a business, organization or individual (a "subscriber") in the database.

Figure 2 is a flowchart of the search process, in which a person searches the database system according to an embodiment of the present invention.

Detailed Description

An overview of a system according to an embodiment of the invention can be gained by working through the subscriber registration process illustrated in

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Figure 1. Firstly, a subscriber chooses to register, and agrees to the terms and conditions. The subscriber is then prompted to enter contact details including items such as company name, contact name, subscriber ID, email address, phone, URL, contact email, nature of business, products and services, economic region, and subscriber references. The subscriber then chooses a login name, passes through a payment process, and logs into a "subscriber's profile page".

The subscriber then creates a profile from a template. The subscriber's profile includes the following elements which can be seen by "visitors":

- Locations for the presentation of logos, drawings or photos
- Information that is vital for the business such as name, address, phone, fax, email, etc.
- Click points that open sub files of information of importance to the business such as products and services; the sub files may contain text or images
- A click point to show the business location on the mapping system
- A facility to leave a message for the subscriber
- A facility to leave an email message
- Other information
- A click point or clickpoints to obtain further information (via hot links)

An Internet user who is examining a subscriber's profile can click on a mapping icon, and the mapping system will bring up the relevant map at the lowest perspective and display the "spike" (the precise location of the subscriber's business). From there the user can pan, scroll or more to a higher elevation.

The user can also search by:

(a) selecting a point and then specifying a distance from that point for that search together with the subject of the search;

(b) selecting any object (for example, a road, river or feature) and nominating a distance from it together with the subject of the search;

(c) drawing an area on the map and searching in that area; or

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(d) nominating a series of features, such as roads, railways lines and coastlines, which enclose an area and accordingly searching within the enclosed area.

In response to a search, the system produces a list of successes which can be opened by clicking on them.

- A subscriber may have more than one profile. The subscriber accesses and edits these profiles from a "subscriber's home page", which is a web page at which the subscriber may choose to: Change the password
- Amend the display on the subscriber's profile "frontside" (the part which can be seen by "visitors")
- Locate or relocate the business on the mapping system
- Establish or change search criteria
- Purchase and establish a banner ad on a screen of mapping information
- Purchase and establish a classified ad
- Request information from the library section of the site
- Request future information from the magazine section of the site
- Read information found by library/magazine sections
- Receive messages from visitors; turn feature on and off
- Receive and send email

As part of entering a subscriber profile, the subscriber clicks on an icon which relates to locating the subscriber's "spike" on a map. This icon produces an address template which brings up the appropriate address on the mapping system, and the subscriber has an opportunity to move the "spike" to the exact desired location or relocate the "spike" for any reason.

The "subscriber's home page" and the "subscriber's profile page" are just two elements of a "super site", which includes a number of profiles relating to a particular type of industry. There are a number of super sites, each relating to a different industry. By way of example, one super site may relate to tourism. The elements of a super site include a front page, an about us/products/services page, a search page, a map output page, a refine search page, subscriber's

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home pages, subscriber's profile pages, a classifieds section, a magazine section, payment pages and administration pages.

The front page of a super site includes a welcome message, feature items, what's new items and links to all sections of the super site. The search page includes the fields: street number, street name, suburb, state, product/service input box, postcode and distance. Subscribers may enter various searchable words descriptive of their businesses, and users can conduct searches using these key words. Thus, for example, in the tourism super site a subscriber who operates a restaurant may choose to use such key words in relation to their businesses as "restaurant", the restaurant name, "a la carte", "French cuisine", "Diners Club" and "open 7 days".

The map output page includes an initial map image, radial/perspective functionality, proximity input boxes, directional buttons (panning, re-centring), a refine search button, and a search again button. The refine search page enables a user to "drill down" on a street address, change the radial proximity parameters, change the zoom factor, conduct feature searches (e.g. where is the nearest?), and pan or re-centre the map. The map output page also allows a user to click on any point and search within any distance. This allows the user to click on any object and search with a pre-determined distance by clicking on an object and choosing to search within any distance of the object. Alternatively the user can mark out the nominated area to search or nominate a series of features that define an area.

The different super sites are combined into an overall website, which may be distributed across multiple servers and multiple geographical locations and URLs. Each super site preferably relates to a different industry. These can be classified in any suitable way. One suitable classification system which has been devised for use with an embodiment of the invention is as follows:

- Automotive
- Building and Construction
- Communications and Information Technology
- Culture and Recreation

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- Education
- Emergency Services and Defence
- Energy
- Food and Beverages
- Government
- Health
- Infrastructure
- Law
- Manufacturing
- Money
- Primary Production
- Real Estate
- Retailing
- Services
- Science and Technology
- Tourism
- Transport, Distribution and Storage

There will of course be overlap between different super sites, and some businesses may be registered in more than one super site. A suitable breakdown of the world's geographical regions is as follows:

- Canada and Alaska
- USA
- Mexico
- Central America/Caribbean
- Northern Latin America
- Brazil
- Southern Latin America
- Pacific Islands
- Australia
- Indonesian Archipelago
- South East Asia
- Indochina

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- Far Eastern Asia
- Korean Peninsula
- Japan
- Russia
- Southern Africa
- Central Africa
- North Africa
- Middle East
- Persia and Western Asia
- Indian Subcontinent
- Scandinavia
- Eastern Europe
- Asia Minor and the Caucasus
- Greece and the Balkans
- Italy
- Iberian Peninsula
- France
- British Isles
- The Low Countries
- Germany
- Central Europe

In a preferred implementation, each of the above regions has an Internet site according to the invention (a "Super Site"), including super sites for each of the 21 industry groups identified previously.

The components of the overall website include the super sites, a master configuration module, an administration module, a reporting module, a notification module, a payment module, a map server, and one or more databases.

The master configuration module represents the top layer of the web site configuration. It includes tools for configuring the other modules. The

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administration module enables an administrator to: configure a new super site, configure a new customer, grant permissions, configure a new template, configure a new product, configure a new report, configure a new content section, associate a graphics suite by coding image names with a super site code, publish a super site, configure security roles and levels, and view and edit records.

The reporting module allows configuration of reports. Within a super site, this includes reports of subscribers, transactions, products, banners served, classifieds served, and search results.

The notification module enables notification messages to be sent to customers to alert them to such things as due dates for payment of renewals on products. The payment module enables subscribers to pay fees using a credit card number.

The map server graphically displays the positions of selected businesses on a map. The map displays suburb and street information with icons indicating the position of the selected businesses. The map server enables searching by state, suburb, street, region, zipcode or by using a user-defined distance. This user-defined distance can be the radius from any user-defined geographical point, defined by a user drawn area or defined by nominating a series of features which create the area. Each subscriber profile is entitled to have a location marker, indicating to the map server the precise geographical location of the subscriber's business.

The website includes one or more databases which store information about the products, subscribers, transactions and content. The product database includes product tables, profile tables, banners, classifieds, and magazines. The subscriber database includes subscriber details, associated tables with products and transactions, and location-coded details. The transaction database is a repository for all transactional records, with the possible exception of financial transactions if such transactions are conducted through a third-party

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secure payment service. The content database includes magazine content, banner ad content, profile content and classified content.

The use of the invention in relation to Internet advertising allows advertising and in particular banner advertising to be targeted to the geographical location of the particular Internet user. The advertiser can track the user to identify their geographical location or alternatively the user may submit their geographical information. This will allow the Internet user to receive advertising which is directly relevant to his geographical area.

The advertiser may specify the exact geographical boundaries to which they wish their Internet advertising to be directed. This has the advantage of making Internet advertising available to small businesses that have a localised customer base. Advertisers can target as broadly as the whole nation or as accurately as the local neighbourhood (to less than a square km) making Internet advertising to these small local advertisers for the first time.

The invention also enables advertisers to target different advertising campaigns to different geographical regions.

Generally, the Invention can be used to locate relevant internet files of information according to either geographical or spatial location.

It is to be understood that various additions, alterations and/or modifications may be made to the parts previously described without departing from the ambit of the invention.

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Claims:

1. A method of categorising businesses, organizations and individuals in order to facilitate geographically-based searching over the Internet, including the steps of:

(a) registering in a database the names of businesses, organizations and/or individuals;

(b) for each name entry, registering a geographical location identifier; and

(c) for each name entry, optionally registering further information such as address, telephone number, and information about the goods or services offered by the business, organization or individual;

wherein each geographical location identifier indicates the precise geographical location at which the business, organization or individual is located.

2. A method according to claim 1 wherein each geographical location identifier corresponds to:

(i) a precise point of latitude and longitude where the business, organization or individual in question occupies a small area of land, or

(ii) an area of points of latitude and longitude where the business, organization or individual occupies a larger amount of land.

3. A method according to any preceding claim wherein the database operates in conjunction with a secondary database of known street addresses and geographical co-ordinates such that, when a new name is entered in the database, a geographical location identifier is provided for that name by entering a street address for the name, which the secondary database can use to provide geographical co-ordinates for the name.

4. A method according to claim 3 wherein there are numerous databases at a number of Internet sites located in different countries or regions, each of the Internet sites containing information relevant to businesses, organizations and/or individuals in its country or region.

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5. An Internet site for facilitating geographically-based searching over the Internet, including:

(a) a database having the names of businesses, organizations and/or individuals;

(b) the database further having a geographical location identifier for each name entry;

wherein each geographical location identifier indicates the precise geographical location at which the business, organization or individual is located.

6. An Internet site according to claim 5 wherein each geographical location identifier corresponds to:

(i) a precise point of latitude and longitude where the business, organization or individual in question occupies a small area of land, or

(ii) an area of points of latitude and longitude where the business, organization or individual occupies a larger amount of land.

7. An Internet site according to claim 5 wherein the database operates in conjunction with a secondary database of known street addresses and geographical co-ordinates such that, when a new name is entered in the database, a geographical location identifier is provided for that name by entering a street address for the name, which the secondary database can use to provide geographical co-ordinates for the name.

8. An Internet site according to claim 5 further including a search engine which allows an Internet user to conduct a search of the database to find all entries matching user-specified criteria located within a user-specified distance from a user-specified point.

9. A method of categorising items in order to facilitate information retrieval, including the steps of:

(a) registering in a database the identity of the item;

(b) for each entity, optionally registering further information about the item; and

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(c) registering in the database a spatial co-ordinate identifier corresponding to the location of each item wherein each spatial co-ordinate indicates the precise spatial location identifier of the entity at which the item is located.

10. A method according to claim 9 wherein when the item in question is defined by co-ordinates specified relative to each one of three dimensions.

11. A method according to claim 9 wherein when the item in question is defined by an area of spatial co-ordinates, each spatial co-ordinate being specified as relative to each one of three dimensions.

12. A method according to claim 9 wherein the item in question is defined by a volume of spatial co-ordinates, each spatial co-ordinate being specified as relative to each one of three dimensions.

13. A method of delivering geographically based advertising over the Internet, including the steps of:

(a) registering in a database one or more goods or services being offered by one or more advertisers;

(b) for each good or service offered by the advertiser, registering an advertiser geographical area indicating the area in which the advertiser wishes to receive customers;

(c) determining an Internet user geographical location identifier, being the precise geographical location of the Internet user;

(d) displaying to the Internet user an advertisement, the advertisement displayed being selected from one or more advertisements for goods or services wherein the geographical location of the Internet user is within the advertiser geographical area corresponding to one or more of the goods or services presented in the advertisement.

14. A method according to claim 13 wherein the advertiser geographical area is specified by precise points of latitude and longitude.

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15. A method according to claim 13 or 14 wherein the Internet use geographical location identifier is specified by a precise point of latitude and longitude.

16. A method according to any one of claim 13 to 15 wherein the Internet user supplies information including their Internet user geographical location identifier.

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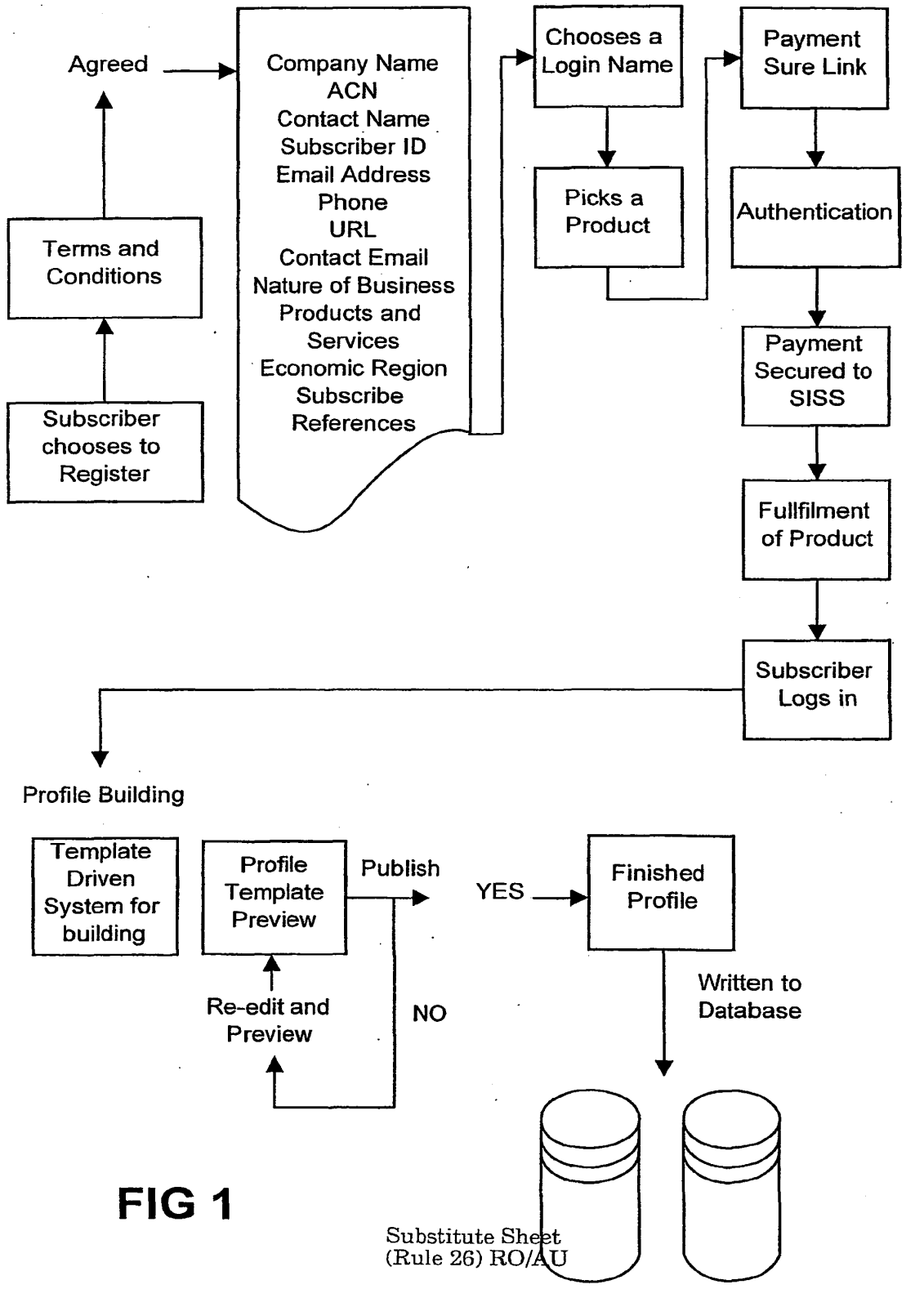


FIG 1

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