

12-17-01

A

Docket No. 3125-4002US1

Express Mail No. EL606933364US



27123

PATENT TRADEMARK OFFICE

↑AFFIX CUSTOMER NO. LABEL ABOVE ↑

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

UTILITY APPLICATION AND FEE TRANSMITTAL §(1.53(b))

JC698 U.S. PTO
11/01/01

JC832 U.S. PTO
10/015729
11/01/01

Commissioner for Patents
Box Patent Application
Washington, D.C. 20231

Sir:

Transmitted herewith for filing is the patent application of

Inventor(s) names and addresses: Keith R. McNally, San Diego, CA; William H. Roof, San Diego, CA; Richard Bergfeld, Chatsworth, CA

For: INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS SYSTEM WITH MENU GENERATION

Enclosed Are:

- 27 page(s) of specification
- 1 page(s) of Abstract
- 20 page(s) of claims
- 6 sheets (Figs. 1-7) of Formal Informal drawings
- 6 page(s) of Declaration and Power of Attorney
- Unsigned
- Newly Executed
- Copy from prior application
- Deletion of inventors including Signed Statement under 37 C.F.R. §1.63(d)(2)

FILED IN 4004

REQUEST AND CERTIFICATION UNDER 35 U.S.C. §122(b)(2)(B)(i) (form PTO/SB/35)

As indicated on the attached Request and Certification, Applicant(s) certify that the invention disclosed in the attached application HAS NOT and WILL NOT be the subject of an application filed in another country, or under a multilateral agreement, that requires publication at eighteen months after filing. Applicant(s) therefore request(s) that the attached application NOT be published under 35 U.S.C. §122(b).

Incorporation by Reference:

The entire disclosure of the prior application, from which a copy of the combined Declaration and Power of Attorney is supplied herein, is considered as being part of the disclosure of the accompanying application and is incorporated herein by reference.

Deletion of Inventors (37 C.F.R. §1.63(d) and §1.33(b))

Signed statement attached deleting inventor(s) named in the prior application serial no. _____, filed _____.

Microfiche Computer Program (Appendix)

page(s) of Sequence Listing

computer readable disk containing Sequence Listing

Statement under 37 C.F.R. §1.821(f) that computer and paper copies of the Sequence Listing are the same

Assignment Papers (assignment cover sheet and assignment documents)

A check in the amount of \$40.00 for recording the Assignment

Charge the Assignment Recordation Fee to Deposit Account No. 13-4500, Order No. _____.

Assignment Papers filed in the parent application Serial No. 09/400,413

Certification of chain of title pursuant to 37 C.F.R. §3.73(b)

Priority is claimed under 35 U.S.C. §119 for:

Application No(s). _____, filed _____, in _____ (country).

Certified Copy of Priority Document(s) [_____]

filed herewith

filed in application Serial No. _____, filed _____.

English translation document(s) [_____]

filed herewith

filed in application Serial No. _____, filed _____.

Priority is claimed under 35 U.S.C. §119(e) for:
Provisional Application No. _____, filed _____.

- Information Disclosure Statement
 - Copy of [_____] cited references
 - PTO Form-1449
 - References cited in parent application Serial No. _____, filed _____.

- Related Case Statement under 37 C.F.R. §1.98(a)(2)(iii)
 - A copy of related pending U.S. Application(s) Serial No(s): _____, filed _____, respectively, is attached hereto.
 - A copy of related pending U.S. Application(s) entitled, _____, filed _____ to inventor(s) _____, respectively, is attached hereto.
 - A copy of each related application(s) was submitted in parent application serial no. _____, filed _____.

- Preliminary Amendment
- Return receipt postcard (MPEP 503)
- This is a continuation divisional continuation-in-part of prior application serial no. 09/400,413, filed September 21, 1999, to which priority under 35 U.S.C. §120 is claimed.
 - Cancel in this application original claims _____ of the parent application before calculating the filing fee. (At least one original independent claim must be retained for filing purposes.)
 - A Preliminary Amendment is enclosed. (Claims added by this Amendment have been properly numbered consecutively beginning with the number following the highest numbered original claim in the prior application).

- The status of the parent application is as follows:
 - A Petition for Extension of Time and a Fee therefor has been or is being filed in the parent application to extend the term for action in the parent application until _____.
 - A copy of the Petition for Extension of Time in the co-pending parent application is attached.
 - No Petition for Extension of Time and Fee therefor are necessary in the co-pending parent application.

- Please abandon the parent application at a time while the parent application is pending or at a time when the petition for extension of time in that application is granted and while this application is pending has been granted a filing date, so as to make this application co-pending.

- Transfer the drawing(s) from the parent application to this application
- Amend the specification by inserting before the first line the sentence:
This is continuation divisional continuation-in-part of co-pending application Serial No. _____, filed _____.

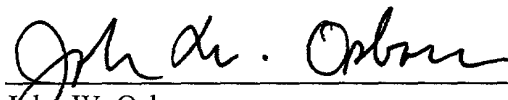
I. CALCULATION OF APPLICATION FEE				
	Number Filed	Number Extra	Rate	Basic Fee \$740.00/370.00
Total Claims*	102- 20 =	82x	\$18.00/ \$9.00	\$ 738.00
Independent Claims	13- 3 =	10x	\$84.00/ \$42.00	\$ 420.00
<input checked="" type="checkbox"/> Multiple Dependent Claims		If marked, add fee of \$280.00 (\$140.00)		\$ 140.00
* Reflects total number of claims for fee purposes, with multiple dependent claims being counted according to 37 C.F.R. §1.75(c)				
TOTAL:				\$ 1668.00

- Small entity status is or has been claimed. Reduced fees under 37 C.F.R. §1.9 (f) paid herewith \$1668.00.
- A check in the amount of \$1668.00 in payment of the application filing fees is attached.
- Charge fee to Deposit Account No. 13-4500, Order No. _____. A DUPLICATE COPY OF THIS SHEET IS ATTACHED.
- The Commissioner is hereby authorized to charge any additional fees which may be required for filing this application pursuant to 37 CFR §1.16, **including all extension of time fees pursuant to 37 C.F.R. § 1.17 for maintaining copendency** with the parent application, or credit any overpayment to Deposit Account No. 13-4500, Order No. 3125-4002US1. A DUPLICATE COPY OF THIS SHEET IS ATTACHED.

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.

Dated: November 1, 2001

By:


John W. Osborne
Registration No. 36,231

Correspondence Address:
MORGAN & FINNEGAN, L.L.P.
345 Park Avenue
New York, NY 10154-0053
(212) 758-4800 Telephone
(212) 751-6849 Facsimile

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

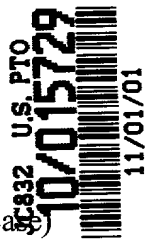
Applicant(s): McNally et al.

Group Art Unit: 2173 (parent case)

Serial No.: Continuation of 09/400,413

Examiner: Cao Nguyen (parent case)

Filed: Herewith



For: INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS SYSTEM WITH MENU GENERATION

EXPRESS MAIL CERTIFICATE

Express Mail Label No.: EL606933364US

Date of Deposit: November 1, 2001

I hereby certify that the following attached paper(s) and/or fee

1. Utility Application and Fee Transmittal Form;
2. Combined Declaration and POA;
3. Preliminary Amendment;
4. Check in the amount of \$1,668.00;
5. Patent Application (Specs. 26 pgs., Claims 20 pgs. Abstract 1 pg.)
6. Formal Drawings (6 sheets - Figs. 1-7)
5. Return Receipt Postcard.

is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. §1.10 on the date indicated above and is addressed to BOX CPA, Commissioner for Patents, Washington, D.C. 20231.

Jesus Raul Remedios

(Typed or printed name of person mailing papers(s) and/or fee)

(Signature of person mailing paper(s) and/or fee)

Correspondence Address:

MORGAN & FINNEGAN, L.L.P.
345 Park Avenue
New York, NY 10154-0053
(212) 758-4800 Telephone
(212) 751-6849 Facsimile

OFFICE "SECRET"

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: McNally et al. **GROUP ART UNIT:**2173 (parent case)

SERIAL NO.: Continuation of 09/400,413 **EXAMINER:** Cao Nguyen (parent case)

FILED: HEREWITH

FOR: INFORMATION MANAGEMENT AND SYNCHRONOUS
COMMUNICATIONS SYSTEM WITH MENU GENERATION

COMMISSIONER FOR PATENTS
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Responsive to the Final Rejection in the Parent Case dated May 22, 2001, Applicants respectfully request reconsideration in view of the amendment and following remarks. No fees are believed due. However, in the event that any fees are necessitated by this response, the Commissioner is hereby authorized to charge our Deposit Account 13-4500, Order No. 3125-4002US1.

IN THE CLAIMS

Please add new claim 93 as follows.

93. (new) The information management and synchronous communication system of claim 45 wherein a non-simultaneous protocol is used to acknowledge receipt of the data at the valet parking base station.

REMARKS

I. Status of the Claims

Claims 1-92 are pending in this application, with claim 93 being added by this Amendment.

Claims identical to claims 1-19, 20-28, and 35-39 were rejected in the parent case under 35 U.S.C. 102(e) as being anticipated by Cupps et al. In the parent case these

claims were identified by numbers 1-19, 31-39, and 50-54 respectively. This Amendment will refer to the claims by their new numbers.

Claims identical to claims 29-34 and 40-41 were rejected in the parent case under 35 U.S.C. 103(a) as being unpatentable over Cupps in view of Behr. In the parent case these claims were identified by numbers 44-49 and 56-57 respectively. This Amendment will refer to the claims by their new numbers.

Of the pending claims for which identical claims were rejected in the parent application, claims 1, 12, 20, 29, 32, and 33 are independent.

II. Rejections Under 35 U.S.C. 102(e)

In the parent application the Examiner rejected claims identical to independent claims 1, 12, and 20 under 35 U.S.C. 102(e) as being anticipated by Cupps et al.

With regard to claims identical to independent claims 1, 12, and 20 of the present application, the Examiner argues that at lines 35-65 of column 9 and in figs. 2 and 3a-3f, Cupps discloses information synchronization involving a second or modified menu. However Applicants respectfully disagree.

The first section cited by the examiner, column 9 lines 35-65, fails to disclose information synchronization involving a second or modified menu, nor any other sort of information synchronization. This section instead discloses a customer providing to an online ordering machine registration information, location information, time of day information, and an indication of the type of service sought (e.g., takeout or delivery).

The second section cited by the examiner, Fig. 2, is a system overview showing an online ordering machine component, a client machine component connected to the online ordering machine via a network, and telephone and fax components connected to the online ordering machine via standard telephone lines. Also shown are various elements of the online ordering machine and the client machine. However, nowhere in the figure or its corresponding disclosure is there any indication of synchronization involving a second or

modified menu. More generally, there is no disclosure of information synchronization occurring between any components of the system, nor is there disclosure of any other sort of information synchronization.

The third section cited by the examiner, Figs. 3a-3f, fails to disclose synchronization involving a second or modified menu and instead discloses the “schema” – that is the organization and structure – of the order database 128 (see Cupps, Col. 5 Ln. 21). Nowhere in the figures or in the corresponding disclosure is there even any indication that the order database is involved in any sort of information synchronization. In fact, there is no disclosure of any sort of information synchronization in this section.

Furthermore, the remainder of the Cupps disclosure also fails to disclose synchronization involving a second or modified menu, nor any other sort of information synchronization.

Accordingly, Cupps fails to disclose at least the aspect of independent claim 1 wherein:

“... data comprising the second menu is synchronized between the data storage device connected to the central processing unit and at least one other computing device ...”
(emphasis added)

Similarly, Cupps also fails to disclose at least the aspect of independent claim 12 wherein:

“ ... data comprising the modified menu is synchronized between the data storage device and at least one other computing device...”
(emphasis added)

Furthermore, Cupps fails to disclose at least the aspect of independent claim 26 wherein:

“ ... synchronizing the data comprising the second menu between the storage device and at least one other data storage medium, wherein the other data storage medium is connected to or is part of a different computing device...”

(emphasis added)

The disclosure of the present invention explains that according to the claimed synchronization there is, for example:

“ ... fast synchronization between a central database and multiple handheld devices, synchronization and communication between a Web server and multiple handheld devices, a well-defined API that enables third parties such as POS companies, affinity program companies and internet content providers to fully integrate with computerized hospitality applications, real-time communication over the internet with direct connections or regular modem dialup connections and support for batch processing that can be done periodically throughout the day to keep multiple sites in synch with the central database.”

(see disclosure, p. 7 ln. 21 – p. 8 ln. 4; emphasis added)

As another example, the disclosure of the present invention notes that according to such synchronization:

“ ... a reservation made online can be automatically communicated to the backoffice server and then synchronized with all the wireless handheld devices wirelessly. Similarly, changes made on any of the wireless handheld devices are reflected instantaneously on the backoffice server Web pages and the other handheld devices.”

(see disclosure, p. 8 ln. 13-16; emphasis added)

In light of the above, Applicants submit that independent claims 1, 12, and 20 are in condition for allowance. As claims 2-11, 13-19, 21-28, 35-39, 49-68, and 84-92 depend therefrom, these claims, for at least the above-identified reasons, are also thought to be allowable.

III. Rejections Under 35 U.S.C. 103(a)

In the parent application the Examiner rejected claims identical to independent claims 29, 32, and 33 under 35 U.S.C. 102(e) as being unpatentable over Cupps in view of Behr.

As explained above, Cupps fails to disclose any sort of information synchronization. Furthermore, Applicants find no disclosure in Behr of any sort of information synchronization, nor does the Examiner provide any reference to such disclosure in Behr .

Applicants therefore submit that Cups and Behr, alone or in combination, fail to disclose, teach, or suggest at least the aspect of independent claim 29 wherein:

"... applications or data are synchronized wirelessly between the central database and at least one wireless handheld computing device and wherein the applications program interface and communications control module establish a seamless link between the data in the central database and the data on the wireless handheld computing device.." (emphasis added)

Similarly, Cups and Behr, alone or in combination, fail to disclose, teach, or suggest at least the aspect of independent claim 32 wherein:

"... hospitality applications or data are synchronized between the central database, at least one wireless computing device and at least one wireless paging or beeper device and wherein messaging to the wireless paging or beeper device is enabled directly from the operator interface of the wireless computing device." (emphasis added)

Furthermore, Cups and Behr, alone or in combination, fail to disclose, teach, or suggest at least the aspect of independent claim 33 wherein:

"... applications or data are synchronized between the central database and the second storage medium and wherein the applications program interface and communications control module establish a seamless link between the data in

the central database and the data on the second storage medium.”
(emphasis added)

The Examiner also states:

“Behr teaches wireless handheld computing device on which hospitality application (see col. 14, lines 1-57).”

Applicants respectfully disagree. Behr discloses “a method of providing route guidance information and other information from a base unit to a mobile unit in response to a request from the mobile unit” (see Behr, Col. 4 Ln. 28-31). Behr explains that the mobile unit sends the request for route guidance as a “query message 120” including a “destination field 144” and a “destination type field 146”, and, for example, that the “destination type field 146 may be ‘restaurant’, and the destination field 144 may be ‘McDonald’s’” (see Behr, Col. 14 Ln. 37-44). Behr also discloses that other specifiable destinations include “airport[s]” and “museum[s]” (see Behr, Col. 14 Ln. 42).

However, Applicants submit that simply stating that a mobile unit may request from a navigation system directions to a restaurant does not constitute disclosure of a hospitality software application. As known in the art, a hospitality software application is, for example, a piece of software used to provide operational solutions in hospitality industries such as restaurants and hotels concerning, for example, food ordering, menus, wait-lists and reservations. Accordingly, Applicants submit that Behr fails to teach a “wireless handheld computing device on which hospitality application” as suggested by the Examiner.

In light of at least the above, Applicants submit that independent claims 29, 32, and 33 are in condition for allowance. As claims 30, 31, 34, 40-48, and 93 depend therefrom, these claims, for at least the above-identified reasons, are also thought to be allowable.

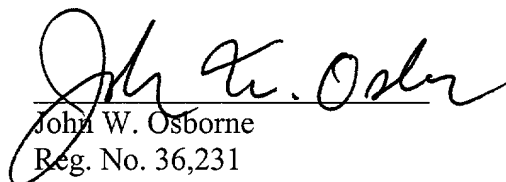
IV. Conclusion and Authorization

Applicants believe that all pending claims are allowable over the cited art.

The Commissioner is hereby authorized to charge any additional fees which may be required for this amendment, or credit any overpayment to Deposit Account No. 13-4500, Order No. 3125-4002. **A DUPLICATE OF THIS DOCUMENT IS ATTACHED.**

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Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.


John W. Osborne
Reg. No. 36,231

November 1, 2001
MORGAN & FINNEGAN, L.L.P.
345 Park Avenue
New York, NY 10154
(212)758-4800 / (212)751-6849 (facsimile)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: McNally et al. **GROUP ART UNIT:**2173 (parent case)
SERIAL NO.: Continuation of 09/400,413 **EXAMINER:** Cao Nguyen (parent case)
FILED: HEREWITH
FOR: INFORMATION MANAGEMENT AND SYNCHRONOUS
COMMUNICATIONS SYSTEM WITH MENU GENERATION

COMMISSIONER FOR PATENTS
Washington, D.C. 20231

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TOP SECRET

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FOOTNOTES

(emphasis added)

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Applicants therefore submit that Cupps and Behr, alone or in combination, fail to disclose, teach, or suggest at least the aspect of independent claim 29 wherein:

"... applications or data are synchronized wirelessly between the central database and at least one wireless handheld computing device and wherein the applications program interface and communications control module establish a seamless link between the data in the central database and the data on the wireless handheld computing device.." (emphasis added)

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However, Applicants submit that simply stating that a mobile unit may request from a navigation system directions to a restaurant does not constitute disclosure of a hospitality software application. As known in the art, a hospitality software application is, for example, a piece of software used to provide operational solutions in hospitality industries such as restaurants and hotels concerning, for example, food ordering, menus, wait-lists and reservations. Accordingly, Applicants submit that Behr fails to teach a “wireless handheld computing device on which hospitality application” as suggested by the Examiner.

In light of at least the above, Applicants submit that independent claims 29, 32, and 33 are in condition for allowance. As claims 30, 31, 34, 40-48, and 93 depend therefrom, these claims, for at least the above-identified reasons, are also thought to be allowable.

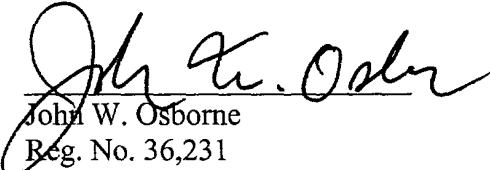
IV. Conclusion and Authorization

Applicants believe that all pending claims are allowable over the cited art.

The Commissioner is hereby authorized to charge any additional fees which may be required for this amendment, or credit any overpayment to Deposit Account No. 13-4500, Order No. 3125-4002. **A DUPLICATE OF THIS DOCUMENT IS ATTACHED.**

In the event that an extension of time is required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No. 13-4500, Order No. 3125-4002US1. **A DUPLICATE OF THIS DOCUMENT IS ATTACHED.**

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.


John W. Osborne
Reg. No. 36,231

November 1, 2001
MORGAN & FINNEGAN, L.L.P.
345 Park Avenue
New York, NY 10154
(212)758-4800 / (212)751-6849 (facsimile)

FOR FILING

1

UNITED STATES PATENT APPLICATION

2

For:

3

**INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS
SYSTEM WITH MENU GENERATION**

4

5

6

7

Inventors:

8

Keith R. McNALLY

9

WILLIAM H. ROOF

10

RICHARD BERGFELD

TOP SECRET

1 UNITED STATES PATENT APPLICATION

2
3 **OF: KEITH R. McNALLY**
4 **WILLIAM H. ROOF**
5 **RICHARD BERGFELD**
6

7
8 **FOR: INFORMATION MANAGEMENT AND SYNCHRONOUS**
9 **COMMUNICATIONS SYSTEM WITH MENU**
10 **GENERATION**
11

12 The present application is a continuation of application Serial No. 09/400,413,
13 filed September 21, 1999. The contents of application Serial No. 09/400,413 are incorporated
14 herein by reference.

15 FIELD OF THE INVENTION

16 This invention relates to an information management and synchronous
17 communications system and method for generation of computerized menus for restaurants and
18 other applications with specialized display and synchronous communications requirements
19 related to, for example, the use of equipment or software with non-PC-standard graphical
20 formats, display sizes and/or applications for use in remote data entry, information management
21 and synchronous communication between host computer, digital input device or remote pager
22 via standard hardwired connection, the internet, a wireless link, smart phone or the like.

23 BACKGROUND OF THE INVENTION

24 While computers have dramatically altered many aspects of modern life, pen and
25 paper have prevailed in the hospitality industry, e.g., for restaurant ordering, reservations and
26 wait-list management, because of their simplicity, ease of training and operational speed. For
27 example, ordering prepared foods has historically been done verbally, either directly to a waiter

1 or over the telephone, whereupon the placed order is recorded on paper by the recipient or
2 instantly filled.

3 Although not previously adapted for wide-scale use in the hospitality industry,
4 various forms of digital wireless communication devices are in common use, e.g., digital
5 wireless messengers and pagers. Also in common use are portable laptop and handheld devices.
6 However, user-friendly information management and communication capability not requiring
7 extensive computer expertise has not heretofore been available for use in everyday life such as
8 for restaurant ordering, reservations and wait-list management. Hundreds of millions of dollars
9 have been spent on personal digital assistant (“PDA”) development seeking to produce a small,
10 light-weight and inexpensive device that could be adapted to such uses; yet none have yielded a
11 satisfactory solution.

12 One of the inherent shortcomings of PDA type devices is that, as they strive for
13 small size, low weight and low cost, they must compromise the size and clarity of the operator
14 display medium interface itself, which in most cases is one of a variety of LCD (liquid crystal
15 display) type devices. As the size of the display shrinks, the amount of information that may be
16 displayed at any one point or time is commensurately decreased, typically requiring multiple
17 screens and displays to display information to the operator. This reduces the overall utility of the
18 device. Additionally, the smaller display and keyboard results in a non-optimal operator
19 interface, which slows down operation and is thus unacceptable for the time criticality of
20 ordering, reservation and wait-list management and other similar applications. This necessitates
21 many design compromises which in the aggregate have resulted in limited acceptance of PDA
22 type devices in the restaurant and hospitality fields.

1 Many of the negatives prevalent in earlier devices have been eliminated, but, to
2 date, there is still no integrated solution to the ordering/waitlist/reservation problem discussed
3 above. With the advent of the Palm[®] and other handheld wireless devices, however, the efforts
4 to make such devices ubiquitous have begun to bear fruit at least in some areas, e.g., personal
5 calendars. However, substantial use of such devices in the restaurant and hospitality context has
6 not occurred to date. As discussed above, at least one of the reasons PDAs have not been
7 quickly assimilated into the restaurant and hospitality industries is that their small display sizes
8 are not readily amenable to display of menus as they are commonly printed on paper or displayed
9 on, e.g., large, color desktop computer screens. Another reason is that software for fully
10 realizing the potential for wireless handheld computing devices has not previously been
11 available. Such features would include fast and automatic synchronization between a central
12 database and multiple handheld devices, synchronization and communication between a World
13 Wide Web (“Web”) server and multiple handheld devices, a well-defined application program
14 interface (“API”) that enables third parties such as point of sale (“POS”) companies, affinity
15 program companies and internet content providers to fully integrate with computerized
16 hospitality applications, real-time communication over the internet with direct connections or
17 regular modem dialup connections and support for batch processing that can be done periodically
18 throughout the day to keep multiple sites in synch with the central database. A single point of
19 entry for all hospitality applications to communicate with one another wirelessly has also
20 previously been unavailable. Such a single point of entry would work to keep all wireless
21 handheld devices and linked Web sites in synch with the backoffice server (central database) so
22 that the different components are in equilibrium at any given time and an overall consistency is
23 achieved. For example, a reservation made online would be automatically communicated to the

T. O. F. " E. C. F. O. U. R. "

1 backoffice server and then synchronized with all the wireless handheld devices wirelessly.
2 Similarly, changes made on any of the wireless handheld devices would be reflected
3 instantaneously on the backoffice server, Web pages and the other handheld devices.

4 For the foregoing reasons, paper-based ordering, waitlist and reservations
5 management have persisted in the face of widespread computerization in practically all areas of
6 commerce. At most, computerization of these functions has been largely limited to fixed
7 computer solutions, i.e., desktop or mainframe, because of the problems heretofore faced in
8 configuring wireless handheld devices and maintaining database synchronization for such
9 applications. Specifically, the unavailability of any simple technique for creating restaurant
10 menus and the like for use in a limited display area wireless handheld device or that is
11 compatible with ordering over the internet has prevented widespread adoption of
12 computerization in the hospitality industry. Without a viable solution for this problem,
13 organizations have not made the efforts or investments to establish automated interfaces to
14 handheld and Web site menus and ordering options.

15 A principal object of the present invention is to provide an improved information
16 management and synchronous communications system and method which facilitates user-
17 friendly and efficient generation of computerized menus for restaurants and other applications
18 that utilize equipment with non-PC-standard graphical formats, display sizes and/or applications.

19 A further object of the present invention is to provide an improved information
20 management and synchronous communications system and method which provides for entry,
21 management and communication of information from the operator as well as to and from another
22 computer, Web page menu, remote digital device using a standard hardwired connection, the
23 internet or a wireless link.

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The menu generation approach of the present invention has many advantages over previous approaches in solving the problem of converting paper-based menus or Windows® PC-based menu screens to small PDA-sized displays and Web pages. In one embodiment, the present invention is a software tool for building a menu, optimizing the process of how the menu can be downloaded to either a handheld device or Web page, and making manual or automatic modifications to the menu after initial creation.

The use of wireless handheld devices in the restaurant and hospitality industry is becoming increasingly pervasive as restaurant owners and managers become more aware of the benefits. With the proper wireless handheld system in place, restaurants can experience increased table turns from improved server productivity and shorter order taking and check paying times. Restaurants and POS companies seeking to provide a wireless handheld interface to their desktop-based POS systems or a Web page equivalent face several challenges. These challenges include building a menu using their existing database and transferring the menu onto handheld devices or Web pages that will interface with servers wirelessly or to restaurants/customers over the internet. The menu generation approach of the present invention is the first coherent solution available to accomplish these objectives easily and allows one development effort to produce both the handheld and Web page formats, link them with the existing POS systems, and thus provides a way to turn a complicated, time-consuming task into a simple process.

The information management and synchronous communications system of the present invention features include fast synchronization between a central database and multiple handheld devices, synchronization and communication between a Web server and multiple handheld devices, a well-defined API that enables third parties such as POS companies, affinity

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1 program companies and internet content providers to fully integrate with computerized
2 hospitality applications, real-time communication over the internet with direct connections or
3 regular modem dialup connections and support for batch processing that can be done periodically
4 throughout the day to keep multiple sites in synch with the central database.

5 The communication module also provides a single point of entry for all hospitality
6 applications, e.g., reservations, frequent customer ticketing, wait lists, etc. to communicate with
7 one another wirelessly and over the Web. This communication module is a layer that sits on top
8 of any communication protocol and acts as an interface between hospitality applications and the
9 communication protocol and can be easily updated to work with a new communication protocol
10 without modifying the core hospitality applications. A single point of entry works to keep all
11 wireless handheld devices and linked web sites in synch with the backoffice server applications
12 so that the different components are in equilibrium at any given time and an overall consistency
13 is achieved. For example, a reservation made online can be automatically communicated to the
14 backoffice server and then synchronized with all the wireless handheld devices wirelessly.
15 Similarly, changes made on any of the wireless handheld devices are reflected instantaneously on
16 the backoffice server Web pages and the other handheld devices.

17 **BRIEF DESCRIPTION OF THE DRAWINGS**

18 The foregoing features and advantages of the present invention can be appreciated
19 more fully from the following description, with references to the accompanying drawings in
20 which:

21 FIG. 1 is a schematic representation of a window displayed on a computer display
22 screen which shows a hierarchical tree menu, modifier window and sub-modifier window in
23 conformity with a preferred embodiment of the present invention.

TOP OF PAGE

1 FIG. 2 is a schematic representation of a modifier dialog box in conformity with a
2 preferred embodiment of the present invention.

3 FIG. 3 is a schematic representation of a menu category dialog box in conformity
4 with a preferred embodiment of the present invention.

5 FIG. 4 is a schematic representation of a menu item dialog box in conformity with
6 a preferred embodiment of the present invention.

7 FIG. 5 is a schematic representation of a display customization dialog box in
8 conformity with a preferred embodiment of the present invention.

9 FIG. 6 is a schematic representation of a communications control window in
10 conformity with a preferred embodiment of the present invention.

11 FIG. 7 is a schematic representation of a point of sale interface on a wireless
12 handheld device for use in displaying page menus created in conformity with a preferred
13 embodiment of the present invention.

14 **DETAILED DESCRIPTION OF THE INVENTION**

15 Most personal computers today run under an operating system that provides a
16 graphical user interface (“GUI”) for accessing user applications. A GUI is used in the preferred
17 embodiment of the present invention. Through an interface of windows, pull-down menus, and
18 toolbars, GUI operating systems have simplified PCs and have rendered computer technology
19 more user friendly by eliminating the need to memorize keyboard entry sequences. In addition,
20 GUIs allow users to manipulate their data as they would physical entities. For example, a
21 window can represent a file and the contents of the window can represent the records of the file.
22 The window can be opened, closed, or set aside on a desktop as if it were an actual object. The
23 records of the file can be created, deleted, modified and arranged in a drag-and-drop fashion as if

1 various system and application programs and data used within the workstation, modem, display
 2 screen, keyboard, mouse and optional removable storage devices such as floppy drive or a CD
 3 ROM drive. The workstation hardware is configured by software including an operating system,
 4 e.g., Windows[®] 95, 98, NT or CE, networking software (including internet browsing software)
 5 and application software components. The preferred embodiment also encompasses a typical file
 6 server platform including hardware such as a CPU, e.g., Pentium[®] microprocessor, RAM, ROM,
 7 hard drive, modem, and optional removable storage devices, e.g., floppy or CD ROM drive. The
 8 server hardware is configured by software including an operating system, e.g., Windows[®] 95, 98,
 9 NT or CE, networking software (including Web server software) and database software.

10 A computer workstation for use in the preferred embodiment also includes a GUI.
 11 As is conventional, the GUI is configured to present a graphical display on the display screen
 12 arranged to resemble a single desktop. Execution of an application program involves one or
 13 more user interface objects represented by windows and icons. Typically, there may be several
 14 windows and icons simultaneously present on the desktop and displaying information that is
 15 generated by different applications.

16 The window environment is generally part of the operating system software that
 17 includes a collection of utility programs for controlling the operation of the computer system.
 18 The computer system, in turn, interacts with application programs to provide higher level
 19 functionality, including a direct interface with the user. Specifically, the application programs
 20 make use of operating system functions by issuing task commands to the operating system which
 21 then performs the requested task. For example, an application program may request that the
 22 operating system display certain information on a window for presentation to the user.

1 An aspect of the preferred embodiment of the information management and
2 communications system of the invention is shown in FIG. 1. FIG. 1 shows an example of the
3 GUI provided by the operating system of the preferred embodiment of the present invention.
4 With reference to FIG. 1, the preferred embodiment includes an intuitive GUI 1 from which to
5 build a menu on a desktop or other computer. A hierarchical tree structure 2 is used to show the
6 different relationships between the menu categories 3 (e.g., soups, salads, appetizers, entrees,
7 deserts, etc.), menu items 4 (e.g., green salad, chicken caesar salad, etc.), menu modifiers 5 (e.g.,
8 dressing, meat temperature, condiments, etc.) and menu sub-modifiers 6 (e.g., Italian, French,
9 ranch, bleu cheese, etc.).

10 The procedure followed in configuring a menu on the desktop PC and then
11 downloading the menu configuration onto the POS interface on the handheld device in
12 conformance with the preferred embodiment is as follows.

13 The menu configuration application is launched by clicking on the appropriate
14 icon on the desktop display screen. FIG. 1 will then be displayed. There are three windows on
15 the screen shown in FIG. 1. The left window is the menu tree 7, also called the tree view. The
16 top right window is the Modifiers window 8 and the bottom right window is the Sub-Modifiers
17 window 9. The Sub-Modifiers window lists the sub-modifiers that correspond to the modifier
18 that is selected. The views on the right are referred to as list views. There are several ways of
19 invoking a command, including using the menu options; using the context menu (right mouse
20 click); using the keyboard or using the toolbar icons. For example, if it is desired to add a
21 category to the menu, the following four options are available: (1) clicking on Edit, Add
22 Category; (2) right mouse clicking on Menu, then clicking on Add Category; (3) highlighting
23 Menu, then typing Ctrl + T or (4) clicking on the Add Category icon on the toolbar. To add an

1 item to a category, the following options are available: (1) highlighting the category to which it
 2 is desired to add an item and then clicking on Edit > Add Item; (2) right mouse clicking on the
 3 desired category and then clicking on Add Item; (3) highlighting the desired category, then
 4 typing Ctrl + N or (4) clicking on the Add icon on the toolbar.

5 When building a menu, it should be kept in mind that the menu items are stored
 6 using a tree metaphor similar to how files are stored on a PC with folders and subfolders. The
 7 menu structure is similar to the Windows® File Explorer in the way the items are organized
 8 hierarchically. Below is an example of how an item may be configured:

```

  9      Menu
 10      >>  Entrees
 11          >>  Red Meat
 12              >>  NY Strip
 13                  >>  Vegetables
 14                      >>  Tomato
 15                      >>  Lettuce
 16                      Meat Temperature
 17                      >>  Medium Rare
  
```

18
 19 In the above example, Menu is the root. Entrees is a menu category. Red Meat is an Entree
 20 category. NY Strip is a modifier. Vegetable is a modifier. Meat Temperature is a modifier.
 21 Medium Rare is a sub-modifier of Meat Temperature.

22 The steps taken in building a menu are as follows:

- 23 1. Add Modifiers;
- 24 2. Add Sub-Modifiers and link them to the Modifiers;
- 25 3. Create Menu categories;
- 26 4. Add menu items to the categories;
- 27 5. Assign Modifiers to the menu items;
- 28 6. Preview the menu on the POS emulator on the desktop PC;
- 29 7. Download the menu database to the handheld device.

30

To add modifiers, a user clicks on the inside of the Modifiers window, then (1) clicks on Edit>Add Modifier; (2) Presses Ctrl + N; (3) right mouse clicks in the Modifiers window, then clicks on Add Modifiers or (4) clicks on the Add icon from the toolbar. If a menu is being built from scratch, the procedure is to enter the Long Name, Short Name, Code and Price in the Modifier dialog box 10 shown in FIG. 2. The Long Name is the full descriptive name of the item. The Short Name is the abbreviated name that will be displayed on the handheld device. The Code is the numeric or alphanumeric code for the item. If there is an existing database, the existing database can be browsed and menu items retrieved from the database. Clicking on the Browse button will bring up the existing database of menu items. The item to be added is then selected and "OK" is clicked. The fields will then be filled with the information from the database. Clicking on OK again will add the item as a modifier. To delete a modifier, the modifier is selected and the Delete key pressed on the keyboard. To edit a modifier, either the modifier is double clicked or the Enter key is pressed.

Sub-modifiers represent the last level of modifiers that can be assigned to a menu tree. To add sub-modifiers, the modifier to which sub-modifiers are to be assigned is selected. Then, the focus is set on the sub-modifier window by clicking inside the Sub-Modifier window as follows: (1) clicking on Edit>Add Sub-Modifier; (2) pressing Ctrl + N; (3) right mouse clicking in the Sub-Modifiers window, then clicking on Add Sub-Modifiers or (4) clicking on the Add icon from the toolbar. If a menu is being built from scratch, the procedure is to enter the Long Name, Short Name, Code and Price in a Sub-Modifier dialog box similar to the Modifier dialog box shown in FIG. 2. As with modifiers, the Long Name is the full descriptive name of the item. The Short Name is the abbreviated name that will be displayed on the handheld device. The Code is the numeric or alphanumeric code for the item. As before, if there is an existing

1 database, the existing database can be browsed and menu items retrieved from the database.
2 Clicking on the Browse button will bring up the existing database of menu items. The item to be
3 added is then selected and OK clicked. The fields will then be filled with the information from
4 the database. Clicking on OK again will add the item as a sub-modifier. To delete a sub-
5 modifier, the sub-modifier is selected and the Delete key depressed on the keyboard. To edit a
6 sub-modifier, either the sub-modifier is double clicked or the Enter key is pressed.

7 Menu categories are created from the root. Some examples of categories are
8 Appetizers, Soups, Salads, Entrees, Desserts, etc. The first step is to click on Menu in the menu
9 tree window. Categories are added by (1) clicking on the Add Category icon from the toolbar;
10 (2) clicking on Edit > Add Category or (3) pressing Ctrl + T. As shown in FIG. 3, Menu
11 Category dialog box 11 then appears in which to enter the Long and Short names for the menu
12 category.

13 To add menu items to categories, the menu category which is being built is
14 clicked. For example, if items are being added to Appetizers, the Appetizers branch is clicked
15 on. Then the Edit > Add Item is clicked on or Ctrl + N pressed. As before, if a menu is being
16 built from scratch, the procedure is to enter the Long Name, Short Name, Code, Prep Time,
17 Recipe and Price into the Menu Item dialog box 12 shown in FIG. 4. The Long Name is the full
18 descriptive name of the item. The Short Name is the abbreviated name that will be displayed on
19 the handheld device. The Code is the numeric or alphanumeric code for the item. Prep Time is
20 the time it takes to prepare the meal and Recipe would include preparation methods and
21 ingredients that are used in the preparation of the item. If there is an existing database, the
22 existing database can be browsed and menu items retrieved from the database. Clicking on the
23 Browse button will bring up the existing database of menu items. The item to be added is then

1 selected and OK is clicked. The fields will then be filled with the information from the database.
 2 Clicking on OK again will add the item to the category.

3 Once the menu items have been entered, it may be desired to assign some
 4 modifiers to the menu items. For example, it may be desired to assign meat temperature to a
 5 steak order. To accomplish this, first the modifier to be assigned is selected, then the menu item
 6 on the tree view that is to be assigned the modifier is clicked on and then Edit > Assign Modifier
 7 is clicked on. Or, the modifier can simply be dragged and dropped onto the menu item to link
 8 them. A dialog box is then displayed asking if this modifier is a required modifier. If it is a
 9 required modifier, the display icon will be red but if it is a non-required modifier the display icon
 10 will be green. As many modifiers as are applicable can be assigned. If any changes are made to
 11 the modifiers, those changes will be automatically reflected throughout the menu tree.

12 Once the modifiers have been entered, it may be desired to assign sub-modifiers
 13 to the modifiers items. For example, it may be desired to add Honey Mustard as a sub-modifier
 14 to Dressing. To accomplish this, first the modifier to be assigned a sub-modifier is selected, then
 15 the sub-modifier window is clicked on, then Edit > Add Sub Modifier is clicked on, Ctrl+N
 16 entered or the Add icon from the toolbar is clicked on. Or, the sub-modifier can simply be
 17 dragged and dropped onto the modifier to link them.

18 When the menu has been completely configured, it can be previewed on a POS
 19 emulator on the desktop to verify that the menu is correctly configured before downloading it to
 20 the handheld device. To preview, File > Preview Database is clicked on or the Preview Database
 21 icon from the toolbar is clicked on. The handheld POS emulator on the desktop can then be run.
 22 If the configuration is deemed acceptable, the handheld device is connected to the desktop PC to
 23 ensure that a connection has been established; the POS application on the handheld device is

1 exited and File > Download Database is clicked on or the Download Database icon from the
 2 toolbar is clicked on. If there is an existing menu database on the handheld device, the system
 3 will ask if the existing database should be replaced. Yes is clicked if existing database
 4 replacement is desired.

5 A database function enables the creation of, e.g., a breakfast menu, lunch menu
 6 and dinner menu and downloading them to a handheld device. Functions available are (1)
 7 creating a new database; (2) opening an existing database; (3) saving a database under a different
 8 name. To access these functions, File is clicked on the menu bar.

9 The preferred embodiment encompasses customized layout, views and fonts. To
 10 set the focus on the view it is desired to change, click inside the desired window. The main
 11 customizing dialog box is accessed by clicking on View > Customize View. A dialog box 13, as
 12 shown in FIG. 5, will be displayed including tabs that allow the following options: selection of
 13 Columns to display in the list view by choosing and arranging the fields to display in the
 14 Modifiers and Sub-Modifiers windows; formatting Columns by specifying the column widths
 15 and justification; selecting Filter allows restricting the list to display only the items that meet
 16 certain criteria. For example, display of modifiers with codes between 500 and 550. Selecting
 17 Sort allows sorting the modifiers or sub-modifiers according to any of the available fields such as
 18 Name, Code or Price. Selecting Style facilitates choice of font type, style, size, etc. To change
 19 the font in a particular window, click on View > Fonts or right mouse click in the desired
 20 window and then click on Fonts. To change the size of the windows, drag the borders of the
 21 windows to expand or contract the size of the windows. To change the column widths, simply
 22 drag the edge of the column headers to increase or decrease the column widths.

1 A communications control program monitors and routes all communications to
 2 the appropriate devices. It continuously monitors the wireless network access point and all other
 3 devices connected to the network such as pagers, remote devices, internet Web links and POS
 4 software. Any message received is decoded by the software, and then routed to the appropriate
 5 device. No user action is needed during operation of the software once the application has been
 6 launched. To launch the communications control module, a Wireless Traffic icon is clicked on
 7 the desktop PC. When the program loads, the screen shown in FIG. 6 appears. Messages
 8 received are logged in the window 14 shown in FIG. 6 with a time stamp. The messages are also
 9 logged to a file on the hard drive. This provides a mechanism to monitor all traffic across the
 10 network (possibly useful for troubleshooting, or maintenance, but not necessary for normal
 11 operation). The program may be minimized so the screen is not displayed on the desktop, but it
 12 must be running for proper communications to exist between all devices on the network.

13 As stated, the preferred embodiment of the present invention includes the use of
 14 and compatibility with GUI technology. A drag-and-drop approach is used for organizing the
 15 tree structure 2 in the generated menu. Drag-and-drop is also used for assigning modifiers
 16 (modifiers can be dragged from the modifiers window 5 and dropped onto the menu item 4 for
 17 assignment). In-cell editing results in fast editing of items in building the menus. Customizable
 18 fonts enable users to change font types, style and size. Customizable layouts enable users to
 19 resize windows, change icons and display preferences. The inventive approach provides for
 20 fully persistent storage between sessions, even if a session is improperly or abruptly terminated.
 21 Font and the tree state (i.e., which nodes are expanded/collapsed) are stored between sessions.
 22 Layout for modifiers and sub-modifiers list views (filter, columns, formatting, font, etc.) are
 23 stored between sessions. The last database used is likewise stored between sessions. Splitter

TOP SECRET

1 views allow the user to see different views at the same time. Each view is displayed on its own
2 section of the screen. Views can be resized via the keyboard or a mouse by simply dragging the
3 splitter in the middle.

4 An automated function is provided to import existing POS databases into the
5 inventive menu generation system and, as discussed above with respect to the detailed example
6 of how to use the preferred embodiment, an automated download procedure is provided to
7 transfer the desktop database onto a handheld device and/or Web page. Also as discussed, the
8 preferred embodiment facilitates preview of the handheld device or Web page version of the
9 POS menu on the desktop before downloading and configuration. Customizable desktop menu
10 generation is contemplated, as discussed above, in the form of customizable fonts, columns,
11 layouts, etc. The inventive approach also includes templates for common modifiers that can be
12 assigned to similar menu items. The preferred embodiment also supports multiple databases,
13 thus providing for the creation and storing of different menu databases on handheld devices such
14 as breakfast, lunch or dinner menus. The user can then select the appropriate database to reflect
15 the time of day.

16 FIG. 7 is a schematic representation of a point of sale interface 15 for use in
17 displaying a page-type menu 16 created using the inventive menu generation approach. As can
18 be seen from FIG. 7, the page menu is displayed in a catalogue-like point-and-click format
19 whereas the master menu, FIG. 1, is displayed as a hierarchical tree structure. Thus, a person
20 with little expertise can “page through” to complete a transaction with the POS interface and
21 avoid having to review the entire menu of FIG. 1 to place an order. A PDA or Web page format
22 could appear like FIG. 7 or the display could be configured for particular requirements since
23 fully customizable menu generation and display are contemplated.

1 The POS interface on the handheld device supports pricing in the database or
2 querying prices from the POS server. The POS device also can be customized with respect to
3 “look and feel” for the particular version. As can be seen in FIG. 7, the POS interface provides
4 for billing, status and payment with respect to orders. A myriad of options can be provided
5 depending on the application.

6 Advanced database functions are provided in the preferred embodiment of the
7 invention, including an automated download process onto handheld devices and/or Web sites. In
8 the preferred embodiment, the menu generation system of the present invention uses an API
9 called ActiveX Data Objects (“ADO”) for database access. ADO is useful in a variety of
10 settings. It is built on top of OLE DB and can be used to talk to databases and, in the future, any
11 data source with any OLE DB driver. Advanced querying is supported. The database can be
12 queried on virtually all fields. Queries can be built using SQL syntax for experienced users or
13 can be created using a query builder which guides users through the creating process. Advanced
14 error handling is supported. Errors occurring at run time can be trapped. A descriptive message
15 is displayed to alert the user and provide error information. However, the application does not
16 terminate when the errors happen. The source code is easy to maintain and modify, thus
17 allowing for on time delivery of customized versions of the software. The advanced database
18 functions produce well-designed databases that accommodate growth and scalability

19 The inventive menu generation approach provides a solution for the pervasive
20 connectivity and computerization needs of the restaurant and related markets. The inventive
21 solution includes automatic database management and synchronization, PDA and handheld
22 wireless operating system integration and optimization, wireless communications and internet
23 connectivity, user interface design, and graphics design.

In the preferred embodiment, the menu generation approach of the present invention uses Windows CE[®] as the operating system for the handheld devices. Windows CE[®] provides the benefits of a familiar Windows 95/98/NT[®] look and feel, built-in synchronization between handheld devices, internet and desktop infrastructure, compatibility with Microsoft Exchange[®], Microsoft Office 9[®] and TCP/IP quick access to information with instant-on feature.

Windows CE[®] provides a basic set of database and communication tools for developer use. However, interfacing with these tools to provide application specific results can be a complex task. In addition to the menu generation described above, a set of software libraries described herein in conformance with the present invention not only enhances the basic Windows CE[®] functionality by adding new features but also maximizes the full potential of wireless handheld computing devices. Such features include fast synchronization between a central database and multiple handheld devices, synchronization and communication between a Web server and multiple handheld devices, a well-defined API that enables third parties such as POS companies, affinity program companies and internet content providers to fully integrate with computerized hospitality applications, real-time communication over the internet with direct connections or regular modem dialup connections and support for batch processing that can be done periodically throughout the day to keep multiple sites in synch with the central database.

The synchronous communications control module discussed above provides a single point of entry for all hospitality applications to communicate with one another wirelessly or over the Web. This communications module is a layer that sits on top of any communication protocol and acts as an interface between hospitality applications and the communication protocol. This layer can be easily updated to work with a new communication protocol without having to modify the core hospitality applications. The single point of entry works to keep all

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1 wireless handheld devices and linked Web sites in synch with the backoffice server (central
2 database) so that the different components are in equilibrium at any given time and an overall
3 consistency is achieved. For example, a reservation made online is automatically communicated
4 to the backoffice server which then synchronizes with all the wireless handheld devices
5 wirelessly. Similarly, changes made on any of the wireless handheld devices will be reflected
6 instantaneously on the backoffice server and the other handheld devices.

7 The software applications for performing the functions falling within the
8 described invention can be written in any commonly used computer language. The discrete
9 programming steps are commonly known and thus programming details are not necessary to a
10 full description of the invention.

11 A simple point-to-point wireless capability is contemplated which permits simple
12 digital messages to be sent from the wireless handheld devices to a receiver in a beeper and/or
13 valet parking base-station. The POS interface of FIG. 7 is representative of the display on a
14 typical wireless device used in conformity with the invention. A simple protocol is used to
15 acknowledge receipt of the message and thus simultaneous communication is not necessary,
16 which reduces the cost of the wireless link. The range of the wireless link is determined by the
17 characteristics of the radio transceiver. Adding a wireless link allows paging of beeper equipped
18 customers directly from the operator interface on the wireless handheld devices and
19 communication to and from various input/output transmitters and receivers to update the status
20 of the order, reservation or other information and thus further reduce the workload on the
21 operator and enable operations to proceed much faster. This link could also be hardwired or
22 otherwise implemented using any two-way messaging transport.

FOOTNOTES

1 A further aspect of the invention is the use of the menus generated in accordance
2 with the described technique to place orders from wireless remote handheld devices or from
3 remote locations through the internet. The World Wide Web is a distributed hypermedia
4 computer system that uses the internet to facilitate global hypermedia communication using
5 specified protocols. One such protocol is the Hypertext Transfer Protocol (“HTTP”), which
6 facilitates communication of hypertext. Hypertext is the combination of information and links to
7 other information. In the context of the Web, hypertext is defined by the Hypertext Mark-up
8 Language (“HTML”). The links or hyperlinks in a HTML document reference the locations of
9 resources on the Web, such as other HTML documents. Another language used in creating
10 documents for use on the Worldwide Web, to display on computer screens, or to create speech
11 style sheets for use in, e.g., telephones, is the Extensible Mark-Up Language (“XML”). XML is
12 a “metalanguage”, i.e., a language for describing languages which was developed to eliminate
13 the restrictions of HTML.

14 The Web is a client-server system. The HTML documents are stored on Web
15 server computers, typically in a hierarchical fashion with the root document being referred to as
16 the home page. The client specifies a HTML document or other source on the server by
17 transmitting a Uniform Resource Locator (“URL”) which specifies the protocol to use, e.g.,
18 HTTP, the path to the server directory in which the resource is located, and filename of the
19 resource. Users retrieve the documents via client computers. The software running on the user’s
20 client computer that enables the user to view HTML documents on the computer’s video monitor
21 and enter selections using the computer’s keyboard and mouse is known as a browser. The
22 browser typically includes a window in which the user may type a URL. A user may cause a
23 URL to be transmitted by typing it in the designated window on the browser or by maneuvering

1 the cursor to a position on the displayed document that corresponds to a hyperlink to a resource
 2 and actuating the mouse button. The latter method is commonly referred to simply as “clicking
 3 on the hot-spot” or “clicking on the hyperlink”. The hyperlink methodology is contemplated for
 4 use in accordance with the preferred embodiment to transmit orders via the internet.

5 Web server application software exists that enables a user to shop for and order
 6 merchandise. Such systems are sometimes referred to as electronic merchandising systems or
 7 virtual storefronts. Systems that enable a user to choose among several retailers’ goods are
 8 sometimes referred to as electronic malls. An electronic retailer’s or electronic mall operator’s
 9 Web server provides HTML forms that include images and descriptions of merchandise. The
 10 user may conventionally search for an item by entering a key word search query in a box on a
 11 form. When a user selects an item, the server may provide a linked form that describes that item
 12 in further detail. The user may also conventionally enter ordering information into boxes on the
 13 form, such as the type and quantity of the item desired. The information entered by the user is
 14 transmitted to the server. The user may select multiple items in this manner and then enter a
 15 credit card number to pay for the purchases. The retailer processes the transaction and ships the
 16 order to the customer. As can be appreciated, ordering merchandise can also be done from
 17 menus. The generation of menus of items or merchandise for sale over the internet is readily
 18 accomplished by the menu generation approach of the present invention.

19 Searching for items that the user is interested in purchasing is insufficient in prior
 20 merchandising systems. Database management programs use index searching to facilitate rapid
 21 searching of large amounts of data. The creator of the database may instruct the program to use
 22 specified fields in the database as indexed or key fields. The program locates all terms in the
 23 database that appear in the indexed fields and stores them in an index table. Each entry in the

1 index table includes a term and corresponding pointer to the location in the database where the
2 term is found. If a user initiates a search for a term that is present in the index table, the program
3 can locate the instances of that term in the database with exceptional speed. Users who are
4 familiar with the particular database they are searching will generally know which fields are
5 indexed and will know the format of the data in those fields. For example, a user of a database
6 containing the inventory of a bookstore may know that users can search for the names of authors
7 of books and that a user who wishes to do so should enter the author's last name first. A user
8 having such knowledge will therefore be able to search efficiently. Users of electronic
9 merchandising systems, however, are generally end-consumers who have no knowledge of a
10 merchant's database. If, as is very likely, such a user initiates a search for a term that is not
11 present in the index table, the program must sequentially search through all records in the
12 database. Sequential records are typically linked by pointers. Using pointers in this manner is
13 very demanding on server resources, resulting not only in an exceptionally slow search, but also
14 creating a bottleneck for other processes that the server may be executing. The menu generation
15 approach of the present invention can be used to create customized menus from a database that
16 includes every item of merchandise the vendor has for sale. In this manner, customers can scan
17 the generated menu much more readily than they could view the entire database and the
18 necessity of having familiarity with the database is eliminated as well, reducing the need for
19 resource intensive pointers.

20 While the preferred embodiment of the invention is for the generation of
21 restaurant menus and the like, the broad scope of the invention is far greater. For example,
22 menus generated in accordance with the invention can be used in the desktop computing
23 environment in association with the operating system or application programs. One such use is

1 to facilitate the creation of user personalized file structures for general desktop use. Another use
 2 is to facilitate the location of customized menus from master menus for use in association with
 3 application software to make the execution of the application software more efficient by, e.g.,
 4 eliminating the necessity of querying or checking every tree branch in the master menu file
 5 structure in response to user input or other criteria and to create handheld/PDA compatible
 6 versions of the software.

7 While the preferred embodiment of the invention includes the selection of items
 8 from a master menu wherein the master menu is displayed using a graphical user interface, it is
 9 to be appreciated that any means for displaying the master menu to the user and generating
 10 another menu in response to and comprised of the selections made is encompassed by the
 11 contemplated invention. The invention encompasses the selection of nontextual symbols,
 12 characters, icons and the like, in addition to text, from a hierarchical tree menu or the like for
 13 generation of another menu comprised of such items.

14 It is also within the scope of the invention to generate menus automatically in
 15 response to predetermined criteria. For example, in the restaurant menu generation embodiment,
 16 a modified menu can be generated to comply with a particular specification or group of criteria
 17 such as, e.g., “dinner”, “low cholesterol”, “low fat”, “fish”, “chicken”, or “vegetarian”. In this
 18 embodiment, only items from the master menu that satisfy specified parameters will be included
 19 in the generated menu. The selection process could involve selection of master menu items
 20 based on tags or identifiers associated with the items or by checking every master menu item
 21 against a dictionary of items acceptable for inclusion in the modified menu. It should also be
 22 appreciated that the invention encompasses any combination of automatic and manual user
 23 selection of the items comprising the generated menu. For example, a user might specify criteria

1 which would further control automatic selection or the user could manually select some items
2 with automatic selection of others. The menu generation aspect of the invention is equally
3 applicable to table-based, drive-thru, internet, telephone, wireless or other modes of customer
4 order entry, as is the synchronous communications aspect of the invention.

5 The inventive concept encompasses the generation of a menu in any context
6 known to those skilled in the art where an objective is to facilitate display of the menu so as to
7 enable selection of items from that menu. The restaurant menu generation embodiment is but
8 one example of a use for the inventive concept. Likewise, displaying menus generated in
9 accordance with the invention on PDAs and Web pages to facilitate remote ordering are but a
10 few examples of ways in which such a menu might be used in practice. Any display and
11 transmission means known to those skilled in the art is equally usable with respect to menus
12 generated in accordance with the claimed invention.

13 In the more general situation, menus can be generated in accordance with the
14 present invention in a variety of situations. For example, the usable file structure for a particular
15 data processing application can be dictated by the user or an application program prior to or
16 during the execution of the application program. Efficiencies with respect to computational
17 speed and equipment, e.g., storage and processor, usage can thus be achieved along with the
18 facilitation of display of the generated menu.

19 While the best mode for carrying out the preferred embodiment of the invention
20 has been illustrated and described in detail, those familiar with the art to which the invention
21 relates will recognize various alternative designs and embodiments which fall within the spirit of
22 practicing the invention. The appended claims are intended to cover all those changes and
23 modifications falling within the true spirit and scope of the present invention.

CONFIDENTIAL

1 That which is claimed is:

2 1. An information management and synchronous communications system for
3 generating menus comprising:

- 4 **a.** a central processing unit,
- 5 **b.** a data storage device connected to said central
6 processing unit,
- 7 **c.** an operating system including a graphical user
8 interface,
- 9 **d.** a first menu stored on said data storage device,
- 10 **e.** application software for generating a second menu
11 from said first menu,

12 wherein the application software facilitates the generation of the second menu by
13 allowing selection of items from the first menu, addition of items to the second menu and
14 assignment of parameters to items in the second menu using the graphical user interface of said
15 operating system and wherein data comprising the second menu is synchronized between the
16 data storage device connected to the central processing unit and at least one other computing
17 device.

18 2. An information management and synchronous communications system in
19 accordance with claim 1, wherein the second menu is a restaurant menu.

20 3. An information management and synchronous communications system in
21 accordance with claim 1, wherein the second menu is capable of being displayed on the display
22 screen of a wireless computing device.

23 4. An information management and synchronous communications system in
24 accordance with claim 3, wherein selections from the second menu are capable of being
25 transmitted to a receiving computer by wireless link.

1 5. An information management and synchronous communications system in
2 accordance with claim 1, wherein the second menu is capable of being displayed on display
3 screens of computers in a network.

4 6. An information management and synchronous communications system in
5 accordance with claim 5, wherein the computer network is the internet.

6 7. An information management and synchronous communications system in
7 accordance with claim 3, wherein selections from the second menu are capable of being
8 transmitted to a receiving computer via the internet.

9 8. An information management and synchronous communications system in
10 accordance with claim 1, wherein the second menu is created in conformity with hypertext
11 markup language or extensible markup language.

12 9. An information management and synchronous communications system in
13 accordance with claim 1, wherein the second menu overwrites the first menu.

14 10. The information management and synchronous communications system of
15 claim 1, wherein the first menu and the second menu are both capable of being displayed in the
16 same window on the display screen.

17 11. The information management and synchronous communications system of
18 claim 1, wherein the items comprising the second menu are a subset of the items comprising the
19 first menu.

20 12. An information management and synchronous communications system for
21 generating menus comprising:

- 22 a. a microprocessor,
- 23 b. a display device,
- 24 c. a data and instruction input device,

- 1 **d.** a data storage device for storing information and
- 2 instructions entered through said data and
- 3 instruction input means or information generated by
- 4 said microprocessor,
- 5 **e.** an operating system,
- 6 **f.** a master menu stored on said data storage device for
- 7 generating a modified menu, and
- 8 **g.** application software,

9 wherein said microprocessor, operating system and application software are operative to display
10 the master menu on the display device in response to instructions programmed into said
11 microprocessor, operating system, application software and information and instructions entered
12 through said data input device, and wherein said microprocessor, operating system and
13 application software are operative to create the modified menu from said master menu in
14 response to information and instructions entered through said data and instruction input device
15 and wherein data comprising the modified menu is synchronized between the data storage device
16 and at least one other computing device.

17 13. The information management and synchronous communications system of
18 claim 12, further comprising means for transferring the modified menu to a digital computing
19 device.

20 14. The information management and synchronous communications system of
21 claim 13, wherein the digital computing device is a wireless handheld device.

22 15. The information management and synchronous communications system of
23 claim 12, further comprising means for downloading the modified menu to the internet or a Web
24 page.

1 16. The information management and synchronous communications system of
2 claim 15, further comprising means for converting the modified menu to hypertext markup
3 language or extensible markup language.

4 17. The information management and synchronous communications system of
5 claim 15, wherein the items comprising the modified menu are a subset of the items comprising
6 the master menu.

7 18. An information management and synchronous communications system in
8 accordance with claim 12, wherein said operating system includes a graphical user interface and
9 wherein said microprocessor, operating system and application software are operative to generate
10 the modified menu by facilitating selection of items from said master menu using the graphical
11 user interface of said operating system.

12 19. An information management and synchronous communications system in
13 accordance with claim 12, wherein said master menu is organized in a hierarchical tree structure
14 having branches comprising menu items and wherein the modified menu is at least partially
15 generated by selecting items from the branches of the tree structure.

16
17
18 20. In a computer system having an input device, a storage device, a video
19 display, an operating system including a graphical user interface and application software, an
20 information management and synchronous communications method comprising the steps of:

- 21 a. outputting at least one window on the video display;
- 22 b. outputting a first menu in a window on the video
23 display;
- 24 c. displaying a cursor on the video display;

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- d. selecting items from the first menu with the input device or the graphical user interface;
- e. inserting the items selected from the first menu into a second menu, the second menu being output in a window;
- f. optionally adding additional items not included in the first menu to the second menu using the input device or the graphical user interface;
- g. storing the second menu on the storage device; and

synchronizing the data comprising the second menu between the storage device and at least one other data storage medium, wherein the other data storage medium is connected to or is part of a different computing device.

21. The method of claim 20, further comprising the step of transferring data or instructions representative of the second menu to a remote digital device or Web page.

22. The method of claim 21, wherein said data or instructions representative of the second menu are transferred by a wireless link.

23. The method of claim 20, wherein the selected items and optional additional items are inserted into a second menu which is displayed in the same window as the first menu.

24. The method of claim 21, comprising the further steps of selecting at least one item from the second menu and transmitting at least one item selected to another computer.

25. The method of claim 24, wherein at least one item selected from the second menu is transmitted to another computer by wireless link or the internet.

26. The method of claim 21, wherein the second menu is displayed on the remote digital device or Web page in page format.

1 27. The method of claim 20, wherein the second menu overwrites the first
2 menu.

3 28. The method of claim 20, wherein the items comprising the second menu
4 are a subset of the items comprising the first menu.

5
6 29. An information management and synchronous communications system for
7 use with wireless handheld computing devices and hospitality computing systems comprising:

- 8 a. a central database containing hospitality
- 9 applications and data,
- 10 b. at least one wireless handheld computing device on
- 11 which hospitality applications and data are stored or
- 12 displayed,
- 13 c. an application program interface, and
- 14 d. a communications control module;
- 15

16 wherein applications or data are synchronized wirelessly between the central database and at
17 least one wireless handheld computing device and wherein the applications program interface
18 and communications control module establish a seamless link between the data in the central
19 database and the data on the wireless handheld computing device.

20
21 30. The information management and synchronous communications system of
22 claim 29 wherein the communications control module and the application program interface
23 enable the automatic generation of and updating of operator menus or screens on the handheld
24 computer based on data from the central hospitality database.

1 31. The information management and synchronous communications system of
2 claim 30 wherein messaging formats are used which are in conformity with HTML or XML
3 messaging formats.

4 32. An information management and synchronous communications system for use
5 with wireless handheld computing devices and hospitality applications comprising:
6

- 7 **a.** a central database containing hospitality
8 applications and data,
9
- 10 **b.** at least one wireless computing device,
- 11 **c.** at least one wireless paging or beeper device,
- 12 **d.** an applications program interface, and
- 13 **e.** a communications control module;

14 wherein hospitality applications or data are synchronized between the central database, at least
15 one wireless computing device and at least one wireless paging or beeper device and wherein
16 messaging to the wireless paging or beeper device is enabled directly from the operator interface
17 of the wireless computing device.
18

19 33. An information management and synchronous communications system
20 comprising:

- 21 **a.** a central database containing applications and data,
- 22 **b.** a first computing device associated with the central
23 database,
- 24 **c.** a second computing device associated with a second
25 storage medium containing applications and data,
- 26 **d.** an applications program interface, and
- 27 **e.** a communications control module;

1 wherein applications or data are synchronized between the central database and the second
2 storage medium and wherein the applications program interface and communications control
3 module establish a seamless link between the data in the central database and the data on the
4 second storage medium.

5 34. The information management and synchronous communications system of
6 claim 33 wherein the communications control module and the applications program interface
7 enable the automatic generation of and updating of operator menus or screens on the second
8 computing device based on data from the central database.

9 35. The information management and synchronous communications system of
10 claim 1 wherein the second menu is generated by manually selecting items from the first menu,
11 adding items to the second menu or assigning parameters to items in the second menu.

12 36. The information management and synchronous communications system of
13 claim 1 wherein the data is synchronized by digital transmission between the data storage device
14 connected to the central processing unit and at least one other computing device.

15 37. The information management and synchronous communications system of
16 claim 12 wherein the modified menu is generated by manually selecting items from the master
17 menu.

18 38. The information management and synchronous communications system of
19 claim 12 wherein the data is synchronized by digital transmission between the data storage
20 device and at least one other computing device.

21 39. The computer system of claim 20 wherein the data is synchronized by digital
22 transmission between the storage device and at least one other data storage medium.

1 40. The information management and synchronous communications system of
2 claim 29 wherein the applications or data are synchronized by digital data transmission between
3 the central database and at least one wireless handheld computing device.

4 41. The information management and synchronous communications system of
5 claim 32 wherein the applications or data are synchronized by digital data transmission between
6 the central database, at least one wireless computing device and at least one wireless paging or
7 beeper device.

8 42. The information management and synchronous communication system of
9 claim 29, 32, or 33 wherein the synchronized data relates to orders.

10 43. The information management and synchronous communication system of
11 claim 29, 32, or 33 wherein the synchronized data relates to waitlists

12 44. The information management and synchronous communication system of
13 claim 29, 32, or 33 wherein the synchronized data relates to reservations.

14 45. The information management and synchronous communication system of
15 claim 29 or 32 wherein the synchronized data is sent from at least one of the wireless computing
16 devices to a receiver at a valet parking base station.

17 46. The information management and synchronous communication system of
18 claim 29 or 32 wherein the synchronized data is sent from at least one of the wireless computing
19 devices to a wireless paging device.

20 47. The information management and synchronous communication system of
21 claim 33 wherein the synchronized data is sent from said second computing device to a receiver
22 at a valet parking base station.

1 48. The information management and synchronous communication system of
2 claim 33 wherein the synchronized data is sent from said second computing device to a wireless
3 paging device.

4 49. The information management and synchronous communication system of
5 claim 1 wherein said application software acts to facilitate generation of the second menu such
6 that the second menu is appropriate for a specified time of day.

7 50. The information management and synchronous communication system of
8 claim 1 wherein said application software further facilitates the generation of multiple menus,
9 each of said multiple menus being appropriate for a particular time of day.

10 51. The information management and synchronous communication system of
11 claim 1 wherein the facilitation of second menu generation by said application software takes
12 into account specified parameters, such that the second menu so generated includes items that
13 satisfy the specified parameters.

14 52. The information management and synchronous communication system of
15 claim 51 wherein the second menu so generated further includes manually selected items.

16 53. The information management and synchronous communication system of
17 claim 1 wherein the second menu is applicable to table-based customer ordering.

18 54. The information management and synchronous communication system of
19 claim 1 wherein the second menu is applicable to drive-through customer ordering.

20 55. The information management and synchronous communication system of
21 claim 1 wherein the second menu is applicable to customer ordering via internet .

22 56. The information management and synchronous communication system of
23 claim 1 wherein the second menu is applicable to customer ordering via telephone.

1 57. The information management and synchronous communication system of
 2 claim 1 wherein the second menu is applicable to customer ordering via wireless device.

3 58. The information management and synchronous communication system of
 4 claim 51 wherein said specified parameters involve recipe content.

5 59. The information management and synchronous communication system of
 6 claim 12 wherein said microprocessor, operating system, and application software are further
 7 operative to create said modified menu such that the modified menu is appropriate for a specified
 8 time of day.

9 60. The information management and synchronous communication system of
 10 claim 12 wherein said microprocessor, operating system, and application software are further
 11 operative to create multiple menus, each of said multiple menus being appropriate for a
 12 particular time of day.

13 61. The information management and synchronous communication system of
 14 claim 12 wherein the creation of said modified menu by said microprocessor, operating system,
 15 and application software takes into account specified parameters, such that the modified menu so
 16 created includes items that satisfy the specified parameters.

17 62. The information management and synchronous communication system of
 18 claim 61 wherein the modified menu so generated further includes manually selected items.

19 63. The information management and synchronous communication system of
 20 claim 12 wherein the modified menu is applicable to table-based customer ordering.

21 64. The information management and synchronous communication system of
 22 claim 12 wherein the modified menu is applicable to drive-through customer ordering.

1 65. The information management and synchronous communication system of
2 claim 12 wherein the modified menu is applicable to customer ordering via internet.

3 66. The information management and synchronous communication system of
4 claim 12 wherein the modified menu is applicable to customer ordering via telephone.

5 67. The information management and synchronous communication system of
6 claim 12 wherein the modified menu is applicable to customer ordering via wireless device.

7
8 68. The information management and synchronous communication system of
9 claim 61 wherein said specified parameters involve recipe content.

10 69. An information management and synchronous communications system for
11 generating and transmitting menus comprising:

- 12 a. a central processing unit,
- 13 b. a data storage device connected to said central
14 processing unit,
- 15 c. an operating system including a graphical user
16 interface,
- 17 d. a first menu consisting of menu categories, said menu
18 categories consisting of menu items, said first menu
19 stored on said data storage device and displayable in a
20 window of said graphical user interface in a hierarchical
21 tree format,
- 22 e. a modifier menu stored on said data storage device and
23 displayable in a window of said graphical user
24 interface,
- 25 f. a sub-modifier menu stored on said data storage device
26 and displayable in a window of said graphical user
27 interface, and
- 28 g. application software for generating a second menu from
29 said first menu and transmitting said second menu to a
30 wireless handheld computing device or Web page,

1 wherein the application software facilitates the generation of the second menu by
2 allowing selection of categories and items from the first menu, addition of menu categories to the
3 second menu, addition of menu items to the second menu and assignment of parameters to items
4 in the second menu using the graphical user interface of said operating system, said parameters
5 being selected from the modifier and sub-modifier menus, wherein said second menu is
6 applicable to a predetermined type of ordering.

7 70. The system of claim 69 wherein the type of ordering is table-based customer
8 ordering.

9 71. The system of claim 69 wherein the type of ordering is drive-through
10 customer ordering.

11 72. The system of claim 69 wherein the type of ordering is customer ordering via
12 internet.

13 73. The system of claim 69 wherein the type of ordering is customer ordering via
14 telephone.

15 74. The system of claim 69 wherein the type of ordering is customer ordering via
16 wireless device.

17 75. An information management and synchronous communications system for
18 generating and transmitting menus comprising:

- 19 a. a central processing unit,
- 20 b. a data storage device connected to said central processing unit,
- 21 c. an operating system including a graphical user interface,

1 d. a first menu consisting of menu categories, said menu categories
2 consisting of menu items, said first menu stored on said data storage device and displayable in a
3 window of said graphical user interface in a hierarchical tree format,

4 e. a modifier menu stored on said data storage device and displayable
5 in a window of said graphical user interface,

6 f. a sub-modifier menu stored on said data storage device and
7 displayable in a window of said graphical user interface, and

8 g. application software for generating a second menu from said first
9 menu and transmitting said second menu to a wireless handheld computing device or Web page,

10 wherein the application software facilitates the generation of the second menu by
11 allowing selection of categories and items from the first menu, addition of menu categories to the
12 second menu, addition of menu items to the second menu and assignment of parameters to items
13 in the second menu using the graphical user interface of said operating system, said parameters
14 being selected from the modifier and sub-modifier menus, wherein said application software acts
15 to facilitate generation of the second menu such that the second menu is appropriate for a
16 specified time of day.

17 76. An information management and synchronous communications system for
18 generating and transmitting menus comprising:

19 a. a central processing unit,

20 b. a data storage device connected to said central processing unit,

21 c. an operating system including a graphical user interface,

1 **d.** a first menu consisting of menu categories, said menu categories
2 consisting of menu items, said first menu stored on said data storage device and displayable in a
3 window of said graphical user interface in a hierarchical tree format,

4 **e.** a modifier menu stored on said data storage device and displayable
5 in a window of said graphical user interface,

6 **f.** a sub-modifier menu stored on said data storage device and
7 displayable in a window of said graphical user interface, and

8 **g.** application software for generating a second menu from said first
9 menu and transmitting said second menu to a wireless handheld computing device or Web page,

10 wherein the application software facilitates the generation of the second menu by
11 allowing selection of categories and items from the first menu, addition of menu categories to the
12 second menu, addition of menu items to the second menu and assignment of parameters to items
13 in the second menu using the graphical user interface of said operating system, said parameters
14 being selected from the modifier and sub-modifier menus, wherein said application software
15 further facilitates the generation of multiple menus, each of said multiple menus being
16 appropriate for a particular time of day.

17 77. An information management and synchronous communications system for
18 generating and transmitting menus comprising:

19 **a.** a central processing unit,

20 **b.** a data storage device connected to said central processing unit,

21 **c.** an operating system including a graphical user interface,

1 d. a first menu consisting of menu categories, said menu categories
2 consisting of menu items, said first menu stored on said data storage device and displayable in a
3 window of said graphical user interface in a hierarchical tree format,

4 e. a modifier menu stored on said data storage device and displayable
5 in a window of said graphical user interface,

6 f. a sub-modifier menu stored on said data storage device and
7 displayable in a window of said graphical user interface, and

8 g. application software for generating a second menu from said first
9 menu and transmitting said second menu to a wireless handheld computing device or Web page,

10 wherein the application software facilitates the generation of the second menu by
11 allowing selection of categories and items from the first menu, addition of menu categories to the
12 second menu, addition of menu items to the second menu and assignment of parameters to items
13 in the second menu using the graphical user interface of said operating system, said parameters
14 being selected from the modifier and sub-modifier menus, wherein the facilitation of second
15 menu generation by said application software takes into account specified parameters, such that
16 the second menu so generated includes items that satisfy the specified parameters.

17 78. The information management and synchronous communication system of
18 claim 77 wherein said specified parameters involve recipe content.

19
20 79. An information management and synchronous communications system for
21 use with wireless handheld computing devices and the internet comprising:

22 a. a central database containing hospitality applications and data,

- 1 **b.** at least one wireless handheld computing device on which hospitality
- 2 applications and data are stored,
- 3 **c.** at least one Web server on which hospitality applications and data are
- 4 stored,
- 5 **d.** at least one Web page on which hospitality applications and data are
- 6 stored,
- 7 **e.** an application program interface, and
- 8 **f.** a communications control module,

9 wherein applications and data are synchronized between the central data base, at
10 least one wireless handheld computing device, at least one Web server and at least one Web
11 page; wherein the application program interface enables integration of outside applications with
12 the hospitality applications and wherein the communications control module is an interface
13 between the hospitality applications and any other communications protocol, wherein the
14 synchronized data relates to orders.

15 80. An information management and synchronous communications system for
16 use with wireless handheld computing devices and the internet comprising:

- 17 **a.** a central database containing hospitality applications and data,
- 18 **b.** at least one wireless handheld computing device on which
- 19 hospitality applications and data are stored,
- 20 **c.** at least one Web server on which hospitality applications and data
- 21 are stored,
- 22 **d.** at least one Web page on which hospitality applications and data
- 23 are stored,

1 e. an application program interface, and

2 f. a communications control module,

3 wherein applications and data are synchronized between the central data base, at
4 least one wireless handheld computing device, at least one Web server and at least one Web
5 page; wherein the application program interface enables integration of outside applications with
6 the hospitality applications and wherein the communications control module is an interface
7 between the hospitality applications and any other communications protocol, wherein the
8 synchronized data relates to waitlists.

9 81. An information management and synchronous communications system for
10 use with wireless handheld computing devices and the internet comprising:

11 a. a central database containing hospitality applications and data,

12 b. at least one wireless handheld computing device on which
13 hospitality applications and data are stored,

14 c. at least one Web server on which hospitality applications and data
15 are stored,

16 d. at least one Web page on which hospitality applications and data
17 are stored,

18 e. an application program interface, and

19 f. a communications control module,

20 wherein applications and data are synchronized between the central data base, at
21 least one wireless handheld computing device, at least one Web server and at least one Web
22 page; wherein the application program interface enables integration of outside applications with
23 the hospitality applications and wherein the communications control module is an interface

1 between the hospitality applications and any other communications protocol, wherein the
2 synchronized data relates to reservations.

3 82. The information management and synchronous communication system of
4 claim 79, 80, or 81 wherein the data is sent to a receiver at a valet parking base station.

5 83. The information management and synchronous communication system of
6 claim 79, 80, or 81 wherein the data is sent to a wireless paging device.

7 84. The method of claim 20 wherein said application software acts to facilitate
8 generation of the second menu such that the second menu is appropriate for a specified time of
9 day.

10 85. The method of claim 20 wherein said application software facilitates the
11 generation of multiple menus, each of said multiple menus being appropriate for a particular
12 time of day.

13 86. The method of claim 20 wherein said application software acts to facilitate
14 generation of the second menu, the taking into account specified parameters such that the second
15 menu so generated includes items that satisfy the specified parameters.

16 87. The method of claim 86 wherein the second menu so generated further
17 includes manually selected items.

18 88. The method of claim 20 wherein the second menu is applicable to table-based
19 customer ordering.

20 89. The method of claim 20 wherein the second menu is applicable to drive-
21 through customer ordering.

22 90. The method of claim 20 wherein the second menu is applicable to customer
23 ordering via internet .

1 91. The method of claim 20 wherein the second menu is applicable to customer
2 ordering via telephone .

3 92. The method of claim 20 wherein the second menu is applicable to customer
4 ordering via wireless device.

TOP SECRET

1 ABSTRACT

2 An information management and synchronous communications system and
3 method facilitates database equilibrium and synchronization with wired, wireless and Web-based
4 systems, user-friendly and efficient generation of computerized menus and reservations for
5 restaurants and other applications that utilize equipment with nonstandard graphical formats,
6 display sizes and/or applications for use in remote data entry, information management and
7 communication with host computer, digital input device or remote pager via standard hardwired
8 connection, the internet, a wireless link or the like.

9

1

POS - Menu Explorer

File Edit View Help

Menu

- Appetizers
- Desserts
- Drinks
- Entrees
 - Chicken
 - Red Meat
 - BEEF TOURNEO
 - LAMB
 - NY STRIP
 - VEGETABLES
 - MEAT TEMPERATURE
 - MED RARE
 - MED WELL
 - MEDIUM
 - RARE
 - WELL
 - VEAL SCALOPPINI
 - Seafood
 - Salads
 - Sandwiches
 - Soups

Modifier

Modifier	Code	Price
CHEESE	1107	0
CONDIMENTS	3984	0
DRESSING	1084	0
MEAT TEMPERATURE	4083	0
PREPARED	3481	0
QUANTITY	1466	0
VEGETABLES	3486	0

Sub Modifier

Sub Modifier	Code	Display
NO	3241	NO
EXTRA	3242	EXTRA
SIDE	3243	SIDE

Ready

MENU TREE

1/6

MODIFIERS WINDOW

SUB-MODIFIERS WINDOW

FIG. 1

A screenshot of a dialog box titled "Modifier" with a close button (X) in the top right corner. The dialog contains four input fields: "Long Name:", "Short Name:", "Code:", and "Price:". The "Price:" field contains the number "0". At the bottom of the dialog are three buttons: "OK", "Cancel", and "Browse". A reference numeral "10" is located to the right of the dialog box.

FIG.2

A screenshot of a dialog box titled "Menu Category" with a close button (X) in the top right corner. The dialog contains two input fields: "Long Name:" and "Short Name:". At the bottom of the dialog are three buttons: "OK", "Cancel", and "Browse". A reference numeral "11" is located to the right of the dialog box.

FIG.3

UNIT 62500

Menu Item X

Long Name: Code:

Short Name: Price: Prep. Time:

Recipe

Flame broiled brandy marinated Tender Chicken Breast topped with a creamy cilantro sauce. Served with steamed broccoli, carrots and zucchini.
Spices include lemon pepper, paprika, ginger.

OK

12

FIG. 4

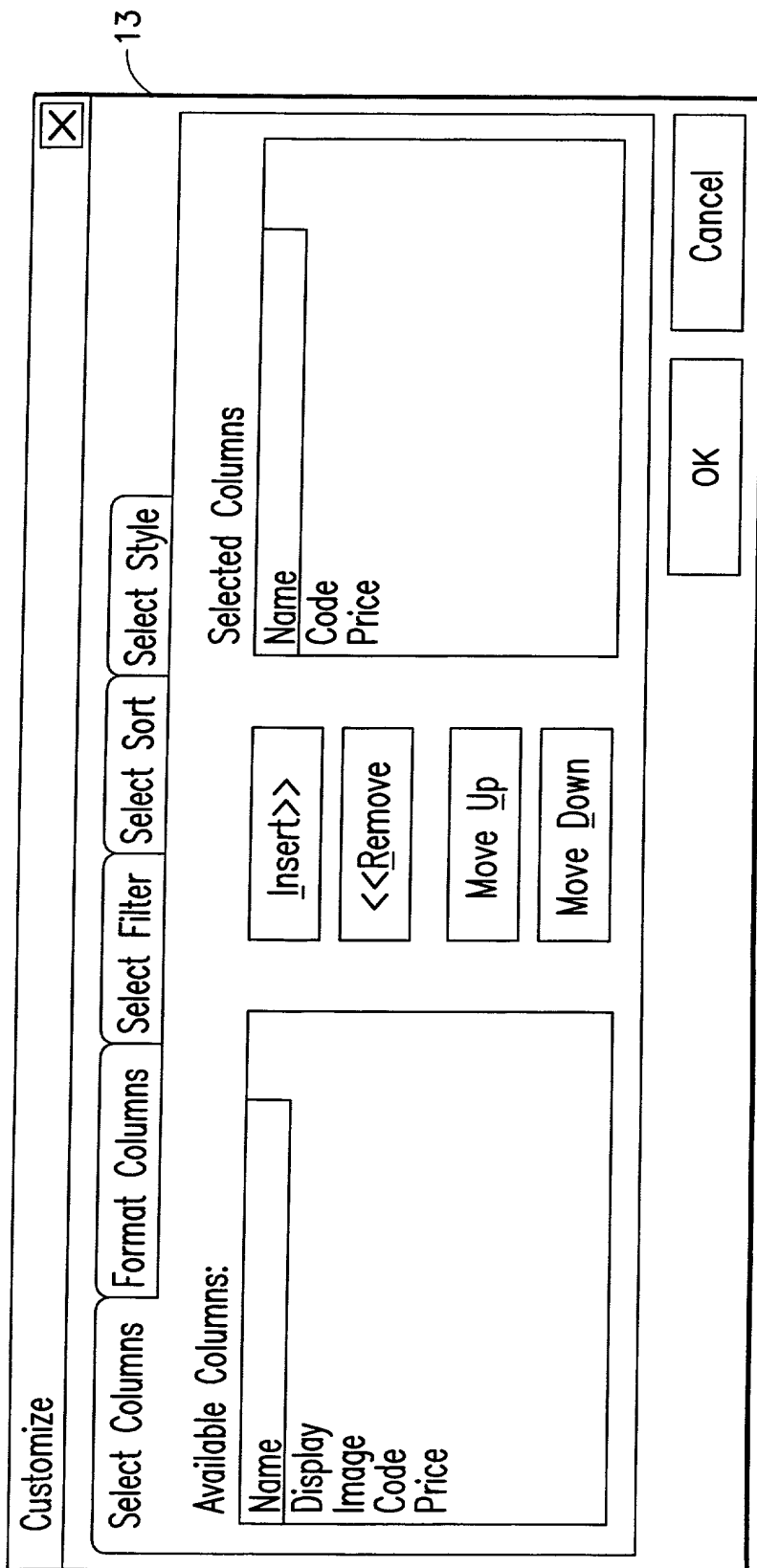


FIG.5

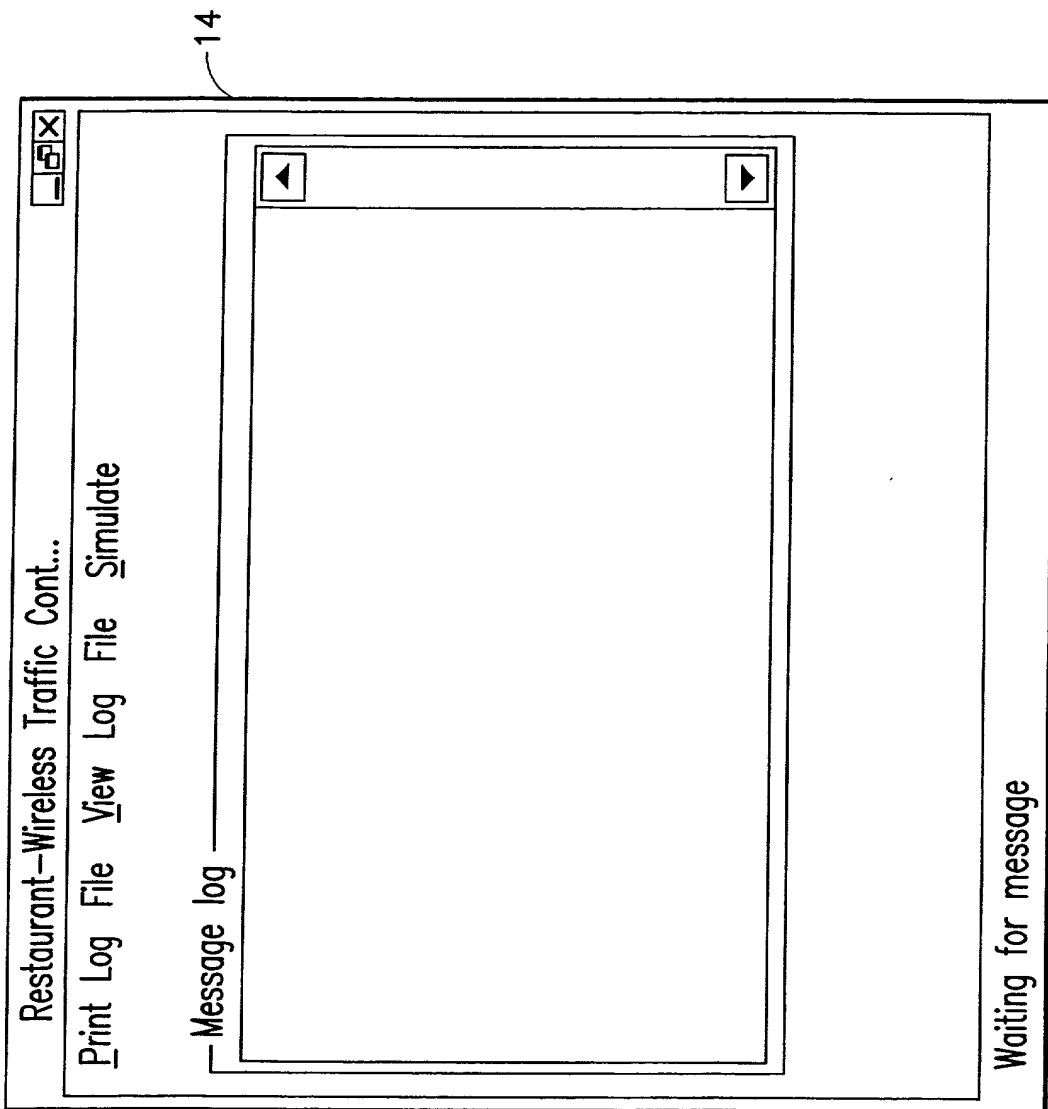


FIG. 6

POScce-System

Choose Item: Tbl67 5st 2

App	Dessert	Drinks	Entrees
Salads	Sdwch	Soups	

Direction:

Select Guest to Order for:

Last Selection

15

16

FIG.7

COMBINED DECLARATION AND POWER OF ATTORNEY FOR ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL DIVISIONAL, CONTINUATION OR CONTINUATION-IN-PART APPLICATION

As a below name inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS SYSTEM WITH MENU GENERATION

the specification of which

- a. [] is attached hereto
b. [X] was filed on September 21, 1999 as application Serial No. 09/400,413 and was amended on (if applicable).

PCT FILED APPLICATION ENTERING NATIONAL STAGE

- c. [] was described and claimed in International Application No. filed on and as amended on (if any).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

I hereby specify the following as the correspondence address to which all communications about this application are to be directed:

SEND CORRESPONDENCE TO: MORGAN & FINNEGAN, L.L.P
345 Park Avenue
New York, N.Y. 10154

DIRECT TELEPHONE CALLS TO: (212) 758-4800

[] I hereby claim foreign priority benefits under Title 35, United States Code § 119(a)-(d) or under § 365(b) of any foreign application(s) for patent or inventor's certificate or under § 365(a) of any PCT international application(s) designating at least one country other than the U.S. listed below and also have identified below such foreign application(s) for patent or inventor's certificate or such PCT international application(s) filed by me on the same subject matter having a filing date within twelve (12) months before that of the application on which priority is claimed:

[] The attached 35 U.S.C. § 119 claim for priority for the application(s) listed below forms a part of this declaration.

<u>Country/PCT</u>	<u>Application Number</u>	<u>Date of filing (day, month, yr)</u>	<u>Date of Issue (day, month, yr)</u>	<u>Priority Claimed</u>
				<input type="checkbox"/> YES <input type="checkbox"/> NO
				<input type="checkbox"/> YES <input type="checkbox"/> NO
				<input type="checkbox"/> YES <input type="checkbox"/> NO

I hereby claim the benefit under 35 U.S.C. § 119(e) of any U.S. provisional application(s) listed below.

<u>Provisional Application No.</u>	<u>Date of Filing (day, month, yr)</u>

ADDITIONAL STATEMENTS FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN-PART OR PCT INTERNATIONAL APPLICATION(S) (DESIGNATING THE U.S.)

I hereby claim the benefit under Title 35, United States Code § 120 of any United States application(s) or under § 365(c) of any PCT international application(s) designating the U.S. listed below.

<u>US/PCT Application Serial No.</u>	<u>Filing Date</u>	<u>Status (patented, pending, abandoned)/ U.S. application no. assigned (For PCT)</u>

<u>US/PCT Application Serial No.</u>	<u>Filing Date</u>	<u>Status (patented, pending, abandoned)/ U.S. application no. assigned (For PCT)</u>

In this continuation-in-part application, insofar as the subject matter of any of the claims of this application is not disclosed in the above listed prior United States or PCT international application(s) in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application.

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.

I hereby appoint the following attorneys and/or agents with full power of substitution and revocation, to prosecute this application, to receive the patent, and to transact all business in the Patent and Trademark Office connected therewith: John A. Diaz (Reg. No. 19,550), John C. Vassil (Reg. No. 19,098), Alfred P. Ewert (Reg. No. 19,887),

David H. Pfeffer (Reg. No. 19,825), Harry C. Marcus (Reg. No. 22,390), Robert E. Paulson (Reg. No. 21,046), Stephen R. Smith (Reg. No. 22,615), Kurt E. Richter (Reg. No. 24,052), J. Robert Dailey (Reg. No. 27,434), Eugene Moroz (Reg. No. 25,237), John F. Sweeney (Reg. No. 27,471), Arnold I. Rady (Reg. No. 26,601), Christopher A. Hughes (Reg. No. 26,914), William S. Feiler (Reg. No. 26,728), Joseph A. Calvaruso (Reg. No. 28,287), James W. Gould (Reg. No. 28,859), Richard C. Komson (Reg. No. 27,913), Israel Blum (Reg. No. 26,710), Bartholomew Verdirame (Reg. No. 28,483), Maria C.H. Lu (reg. No. 29,323), Joseph A. DeGirolamo (Reg. No. 28,595), Michael P. Dougherty (Reg. No. 32,730), Seth J. Atlas (Reg. No. 32,454), Andrew M. Riddles (Reg. No. 31,657), Bruce D. DeRenzi (Reg. No. 33,676), Michael M. Murray (Reg. No. 32,537), Mark J. Abate (Reg. No. 32,527), Alfred L. Haffner, Jr. (Reg. No. 18,919), Harold Haidt (Reg. No. 17,509), John T. Gallagher (Reg. No. 35,516), Steven F. Meyer (Reg. No. 35,613) and Kenneth H. Sonnenfeld (Reg. No. 33,285) of Morgan & Finnegan, L.L.P. whose address is: 345 Park Avenue, New York, New York, 10154; and Edward A. Pennington (Reg. No. 32,588), Michael S. Marcus (Reg. No. 31,727) and John E. Hoel (Reg. No. 26,279) of Morgan & Finnegan, L.L.P., whose address is 1775 Eye Street, Suite 400, Washington, D.C. 20006.

[] I hereby authorize the U.S. attorneys and/or agents named hereinabove to accept and follow instructions from _____ as to any action to be taken in the U.S. Patent and Trademark Office regarding this application without direct communication between the U.S. attorneys and/or agents and me. In the event of a change in the person(s) from whom instructions may be taken I will so notify the U.S. attorneys and/or agents hereinabove.

Full name of sole or first inventor Keith R. McNally
 Inventor's signature* *Keith R. McNally* 10/25/99
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 Post Office Address _____

Full name of third joint inventor, if any Richard Bergfeld
 Inventor's signature* *Richard Bergfeld* 10/25/99
 Residence 20719 Nashville ^{Street} Court, Chatsworth, CA 91311 date
 Citizenship USA

Post Office Address _____

[] ATTACHED IS/ARE ADDED PAGE(S) TO COMBINED DECLARATION AND POWER OF ATTORNEY FORM FOR SIGNATURE BY FOURTH AND SUBSEQUENT INVENTORS

* Before signing this declaration, each person signing must:

1. Review the declaration and verify the correctness of all information therein; and
2. Review the specification and the claims, including any amendments made to the claims.

After the declaration is signed, the specification and claims are not to be altered.

To the inventor(s):

The following are cited in or pertinent to the declaration attached to the accompanying application:

Title 37, Code of Federal Regulation, § 1.56

Duty to disclose information material to patentability.

(a) A patent by its very nature is affect with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is canceled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in patent was cited by the Office or submitted to the Office in the manner prescribed by §§1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

- (1) prior art cited in search reports of a foreign patent office in a counterpart application, and
- (2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

Title 35, U.S. Code § 101

Inventions patentable

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Title 35 U.S. Code § 102

Conditions for patentability; novelty and loss of right to patent

A person shall be entitled to a patent unless –

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent,
- (b) the invention was patented or described in a printed publication in this or foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States, or
- (c) he has abandoned the invention, or
- (d) the invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate filed more than twelve months before the filing of the application in the United States, or
- (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent, or
- (f) he did not himself invent the subject matter sought to be patented, or
- (g) before the applicant's invention thereof the invention was made in this country by another had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other ...

Title 35, U.S. Code § 103

Conditions for patentability; non-obvious subject matter

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed

invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Title 35, U.S. Code § 112 (in part)

Specification

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise and exact terms also enable any person skilled in the art to which it pertains, or with which it is mostly nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Title 35, U.S. Code § 119

Benefit of earlier filing date in foreign country; right of priority

An application for patent for an invention filed in this country by any person who has, or whose legal representatives or assigns have, previously regularly filed an application for a patent for the same invention in a foreign country which affords similar privileges in the case of applications filed in the United States or to citizens of the United States, shall have the same effect as the same application would have if filed in this country on the date on which the application for patent for the same invention was first filed in such foreign country, if the application in this country is filed within twelve months from the earliest date on which such foreign application was filed; but no patent shall be granted on any application for patent for an invention which had been patented or described in a printed publication in any country more than one year before the date of the actual filing of the application in this country, or which had been in public use or on sale in this country more than one year prior to such filing.

Title 35, U.S. Code § 120

Benefit of earlier filing date in the United States

An application for patent for an invention disclosed in the manner provided by the first paragraph of section 112 of this title in an application previously filed in the United States, or as provided by section 363 of this title, which is filed by an inventor or inventors named in the previously filed application shall have the same effect, as to such invention, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to the earlier filed application.

Please read carefully before signing the Declaration attached to the accompanying Application.

If you have any questions, please contact Morgan & Finnegan, L.L.P.

FORM:COMB-DEC.NY
Rev. 5/21/98

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2001

Application or Docket Number

3125-400205

CLAIMS AS FILED - PART I

SMALL ENTITY TYPE OR OTHER THAN SMALL ENTITY

	(Column 1)	(Column 2)
TOTAL CLAIMS	93	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	105 minus 20 = *	85
INDEPENDENT CLAIMS	13 minus 3 = *	10
MULTIPLE DEPENDENT CLAIM PRESENT <input checked="" type="checkbox"/>		

RATE	FEE		RATE	FEE
BASIC FEE	370.00	OR	BASIC FEE	740.00
X\$ 9=	765	OR	X\$18=	
X42=	420	OR	X84=	
+140=	140	OR	+280=	
TOTAL	1695	OR	TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

SMALL ENTITY OR OTHER THAN SMALL ENTITY

AMENDMENT A	(Column 1)	(Column 2)	(Column 3)	
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>				

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 9=		OR	X\$18=	
X42=		OR	X84=	
+140=		OR	+280=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B	(Column 1)	(Column 2)	(Column 3)	
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>				

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 9=		OR	X\$18=	
X42=		OR	X84=	
+140=		OR	+280=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C	(Column 1)	(Column 2)	(Column 3)	
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <input type="checkbox"/>				

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X\$ 9=		OR	X\$18=	
X42=		OR	X84=	
+140=		OR	+280=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. 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.

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

12/19/2001 MWLDER1 00000030 134500 10015729

01 FC:201		370.00	OP
02 FC:202		420.00	OP
03 FC:203		765.00	OP
04 FC:204	27.00	113.00	OP

CLAIMS ONLY

SERIAL NO.

10005729

FILING DATE

11-01-01

APPLICANT(S)

CLAIMS

	AS FILED		AFTER 1st AMENDMENT		AFTER 2nd AMENDMENT		☆		☆		☆	
	IND.	DEP.	IND.	DEP.	IND.	DEP.	IND.	DEP.	IND.	DEP.	IND.	DEP.
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TOTAL IND.		0		0		0						0
TOTAL DEP.		0		0		0						0
TOTAL CLAIMS		0		0		0						0
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TOTAL IND.		134		0		0						0
TOTAL DEP.		92		0		0						0
TOTAL CLAIMS		105		0		0						0

52
39
91
13
164

* MAY BE USED FOR ADDITIONAL CLAIMS OR ADVERTISEMENTS

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(11) EP 0 779 759 A2

(12)

EUROPEAN PATENT APPLICATION

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NL PT SE

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(30) Priority: 11.12.1995 US 570210
11.12.1995 US 570384

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(54) **A method and architecture for an interactive two-way data communication network**

(57) A two-way data communication device such as a data ready cellular telephone, a two-way pager, or a telephone communicates via a two-way data communication network with a server computer on a computer network that has an interface to the two-way data communication network, i.e. is coupled to the two-way data communication network. For example, the computer network can be a corporate wide area network, a corporate local area network, the Internet, or any combination of computer networks. The two-way data communication device utilizes a client module to transmit message including a resource selector chosen by the user to a server on a server computer on the computer network. The server processes the message and transmits a response over the two-way data communication network to the client module. The client module interprets the response and presents the response to the user via a structured user interface. Alternatively, the user transmits a request that directs the server to transmit the response to the request to another location or to another user.

EP 0 779 759 A2

Description

A portion of the disclosure of this patent document contains material, that includes, but is not limited to Appendix I, Appendix II, and Figures 10A to 10T, which is subject to copyright protection. The copyright owner has no objection to the facsimile reproduction by anyone of the patent document or the patent disclosure, as it appears in the Patent and Trademark Office patent files or records, but otherwise reserves all copyright rights whatsoever.

BACKGROUND OF THE INVENTION**Field of the Invention**

This invention relates generally to data communications, and in particular to two-way data communication devices including a cellular telephone, a two-way pager, and a telephone that permit a user to interface with and interact with a server on a computer network.

Description of Related Art

For at least the last five years, the wireless communication industry has tried to merge computing with wireless communications. This industry wide effort has held the promise of bringing software intelligence to telecommunication devices including mobile wireless communications devices such as cellular telephones and two-way pagers as well as standard telephones.

After years of research and development, and hundreds of millions of dollars' investment by some of the largest companies in the field such as Motorola, AT&T, Sony, Matsushita, Phillips and IBM, the results have been nothing but disappointing. Typically, the intelligent communication devices resulting from these efforts include both the hardware necessary for a computer module and the hardware for a wireless communications module. Examples of such products are Simon from IBM and Bell South, MagicLink from Sony, and Envoy from Motorola.

Fundamental design and cost problems arising directly from the approach taken by the designers of these intelligent communication devices have limited widespread market acceptance of these devices. The combination of a wireless communication module with a computing module leads to a device that is too bulky, too expensive, and too inflexible to address the market requirements.

The combination of the two modules is too large and too heavy to fit in a user's pocket. Pocket size is a key requirement of the mobile communication market which remains unmet by these devices.

In addition, the cost of these devices is close to the sum of the cost of the computer module and of the communications module, which is around a one thousand dollar end-user price. Market research indicates that the market for intelligent wireless communications devices is at prices around \$300. Even with a 20% compound cost decline, it would take five years for the combination units to meet today's customers' price requirements. It is therefore unlikely that devices designed by combining a computer and a wireless module, no matter how miniaturized and cost reduced, can satisfy the cost requirement of the market during this decade.

To succeed in the market place, intelligent wireless communication devices must be able to support a wide variety of applications specific to each market segment. Typically, these applications must be added to the device by the end-user after purchase. Thus, the device must provide a method for loading the initial application and for subsequent updating of the application.

The price sensitivity for intelligent communication devices and the size limitations means that an intelligent communication device cannot support the amount of core memory (RAM), a hard disk or non-erasable memory, or a traditional floppy disk drive, commonly found on computers. These limitations close the traditional routes for delivering new applications or updates to intelligent communications devices.

As a result, the current crop of intelligent communication devices run only the few applications which were burned into their ROMs at the factory or which are contained in a ROM card plugged into a slot designed for this purpose. This scheme lacks the flexibility needed to run the thousands of applications required to address the fragmented requirements of the market and provides no simple method for updating the applications after the device has been sold.

Two other communication oriented attempts at bringing intelligence to telephones are Short Messaging Service (SMS) and Analog Display Service Interface (ADSI). SMS specifies how messages are delivered to and from a cellular telephone and how the cellular telephone should store the messages. SMS also defines some simple processing which the cellular telephone can perform on the message, such as calling a telephone number embedded in the message.

SMS's architecture is similar to that of paging networks with the difference that devices implementing the SMS architecture operate over the control channel of the cellular telephone network. SMS is deployed primarily in Europe over the GSM network.

SMS messages are not delivered in real time. The time delays can range from 30 seconds up to 10 minutes, which makes SMS unsuitable for real time applications. The main purpose of SMS is the delivery of messages. SMS does not

specify an application protocol or cellular telephone application module which further restricts its usefulness in running applications on cellular telephones. After a few years of deployment in Europe, SMS implementations have been limited to notification services such as two-way paging and voice mail notification.

SMS as a medium is unsuited to building applications which allows the retrieval, manipulation, and storage of information. This is the reason why the industry giants have not turned to SMS in their quest to add intelligence to cellular telephones, but have consistently attempted to combine a computer module with a wireless communications module.

ADSI was designed as an extension to Interactive Voice Response Systems. ADSI allows a smart telephone with a small screen to display prompts to assist users in choosing among various options. By using visual prompts instead of cumbersome voice prompts, ADSI is thought to make the use of interactive voice services easier and faster.

ADSI allows data to be sent from the service provider to the telephone in the form of screens. ADSI also allows the telephone to respond through touch tone signaling with a special coding to describe the full alphanumeric character set. With ADSI, a telephone is primarily a passive device. Services send text screens to the telephone, and the telephone sends back short strings indicating the choices the user made from the text screen.

ADSI makes no provisions for performance of processing in the telephone. As a result, ADSI generates a high traffic load on the telephone network since each user input is sent back to the service for processing. This makes ADSI unsuitable for wireless networks where bandwidth is at a premium and "air efficiency" is one of the most sought after qualities. The lack of processing capability in the telephone and the high bandwidth requirements of ADSI have prevented it from being considered by the industry for implementing intelligent wireless devices.

Up to now, intelligent communication devices have combined a computing module with a wireless communications module. However, to gain widespread acceptance, a two-way data communication device with processing capability and the ability to run a wide variety of differing user applications is needed. In addition, such a device should be comparable in size, cost, and weight to a cellular telephone.

SUMMARY OF THE INVENTION

According to the principles of this invention, the prior art limitations of combining a computer module with a wireless communication module have been overcome. In particular, a two-way data communication device of this invention, such as a cellular telephone, two-way pager, or telephone includes a client module that communicates with a server computer over a two-way data communication network. The principles of this invention can be used with a wide variety of two-way data communication networks. For example, two-way data communication networks for cellular telephones that may be used include a cellular digital packet data network as well as TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, the new AT&T endorsed two way paging standard, or other priority two-way paging networks with data transport capability. The two-way data communication network for a telephone is the public switched telephone network.

Using the two-way communication device that includes the client module, a user can provide information to the server computer, retrieve information from the server computer, provide data to an application on the server computer which uses the data and provides information to the two-way communication device, or sends the information to another location. The functionality provided to the user of the two-way communication device is limited only by the applications available on a server computer that is accessible to the user over the two-way data communication network.

This invention allows for the first time two-way communications devices such as cellular telephones, two-way pagers, and telephones to become open application platforms which in turn empowers software developers to deliver value-added applications and services to any two-way communication device that incorporates the principles of this invention. This is a radical shift from the current situation where telephones and two-way pagers are closed, proprietary systems. Consequently, an even playing field is created for the market to invent new uses for two-way communication devices and for two-way communication networks. Any entity from corporations to individuals can make new applications available to the installed base of two-way data communication devices that include this invention without physical modification or addition to the two-way communication device. Years after purchase, a two-way communication device incorporating this invention will run all the applications which were developed since its purchase.

Further, all these applications are available without the end user having to add anything or make any modification to the two-way communication device. Also, the applications are independent of the two-way data communication network. The applications do not depend on any feature of the two-way data communication network. Thus, the applications are unaffected by a change in the two-way data communication network.

Also, the applications on the server computer are independent of the two-way data communication device with which the server computer is interacting. An application on the server computer can communicate with any two-way data communication device that includes the client module of this invention and a network interface module to transmit data over, and receive data from the two-way data communication network. These two features mean that an investment in developing an application is insulated from either advances in two-way data communication devices, or advances in two-way data communication network technology.

As indicated above, the two-way data communication device of this invention utilizes a client module to transmit a message including a resource locator selected by the user over the two-way data communication network to a server on a server computer on the computer network. For example, the computer network can be a corporate wide area network, a corporate local area network, the Internet, or any combination of computer networks.

5 The server processes the message, i.e., executes the application addressed by the resource locator and transmits a response over the two-way data communication network to the two-way data communication device, which stores the response in a memory. The client module interprets the response and generates a user interface using information in the response. In one embodiment, the user interface includes at least one user data input option that is associated with a resource locator. In another embodiment, the user interface is a display.

10 The resource locator associated with the at least one user data input option can address any one of a wide variety of objects. In one embodiment, the resource locator associated with the at least one user data input option addresses an object on the server computer that transmitted the response. In another embodiment, the resource locator addresses an object on another server computer coupled to the two-way data communication network. In yet another embodiment the resource locator addresses an object stored in the two-way communication device.

15 When the user selects the at least one user data input option, the client module interprets the selection and if required, appends any input data to the resource locator associated with the at least one user data input option. The client module transmits a message including the resource locator with any appended input data to the server computer. Alternatively, the resource locator with any appended data can be addressed to another server computer, or can address an object stored in the two-way communication device. If the resource locator addresses an object on a server
20 computer, the client module provides the message to the network interface module which in turn transmits the message over the two-way data communication network.

Thus, in this embodiment, the message originally transmitted to the two-way data communication device included all the information necessary for the client module to generate the user interface, to associate the user selection and any data entered with a particular resource locator, and to transmit the appropriate resource locator in a subsequent
25 message. The client module includes an interpreter that processed the information in the message. Since the message included all the information needed by the client module, the server computer that transmitted the message retained no state information concerning the message. Consequently, the server computer is defined as a stateless server computer.

An important aspect of this invention is that the message includes all information necessary for the client module
30 to generate the user interface and a particular user interface can be independent from other user interfaces. Unlike prior art systems that gave the user a predetermined menu from which to select items, or limited the user to an E-mail like format, according to the principles of this invention, the user interfaces and possible interactions available to the user are determined only by the applications that developers make available. The possible interactions and user interfaces for one application can be totally different and independent from the possible interactions and user interfaces of another
35 application. Thus, a cellular telephone, two-way pager, and a telephone all truly become an open platform.

These features of the invention are a significant departure from prior art systems. Typically, in the prior art, use of a particular application on a particular platform required that the application be compatible with the operating system on that platform. Further, each time a new version of the application was released, the user was required to take steps to update the application on the user's platform. Further, if the user of the platform did not modify the operating system as new versions of the operating system were released, at some point in time, the platform would no longer be capable of processing a new version of an application that required a current version of the operating system.

This invention eliminates these problems. As explained above, the client module in the two-way data communication device functions as an interpreter. The application on the server computer provides all information necessary for the
40 interpreter to generate a user interface on the two-way data communication device, and in response to user selections or data input using the user interface, to route messages to an appropriate server, i.e., either the server that sent the original information or another server.

Thus, the client module only interprets this information and interacts appropriately with the hardware of the two-way data communication device. Consequently, to update an application requires only changes on the server computer and not changes in each two-way data communication device that communicates with that server computer. This invention
45 eliminates the usual requirement for distribution of application software, and application software updates to the end user of the two-way data communication device.

In one embodiment, a two-way data communication system for communication between a server computer and a two-way data communication device selected from a group consisting of a cellular telephone, a two-way pager, and a telephone, includes a two-way data communication network, a server computer coupled to the two-way data communication
50 network, and a two-way data communication device coupled to the two-way data communication network. The server computer includes a two-way data communication interface module coupled to the two-way data communication network, and a server coupled to the two-way data communication interface module. The server receives a message including a resource locator from the two-way data communication network. The resource locator includes an address of the server computer and of an application on that server computer. The server processes the message using the

resource locator. In this embodiment, the server transmits a response to the message over the two-way data communication network.

The two-way data communication device, selected from the group consisting of a cellular telephone, a two-way pager, and a telephone, includes a network interface module coupled to the two-way data communication network, and a client module coupled to the network interface module. The client module transmits the message including the resource locator to the server over the two-way data communication network. The client module also processes the response to the message from the server. The response includes information for a user interaction over the two-way data communication network.

The client module of this invention is lightweight, and thus requires only lightweight resources in a two-way data communication device. Consequently, the client module can use existing resources in such a device and therefore does not add to the cost of the two-way data communication device.

In one embodiment, the interpreter within the client module includes a plurality of managers including a user interface manager coupled to a display of the two-way data communication device where the user interface manager handles interactions with the display. The user interface manager also is coupled to a keypad of the two-way data communication device and handles interactions with the keypad. Herein, a keypad can be a telephone keypad, the keys found on a two-way pager, or other data input interface of a two-way communication device.

In one embodiment, the response generated by the server computer includes a plurality of resource locators and at least one of the plurality of resource locators includes an address to another server coupled to the communication network.

According to the principles of this invention, a method for using a two-way data communication device, selected from a group consisting of a cellular telephone, a two-way pager, and a telephone, to communicate with a server computer includes:

generating a message by a client module in response to data entered by the user of a two-way data communication device coupled to a two-way data communication network,

wherein the client module executes on a microcontroller of the two-way data communication device; and

the message includes a resource locator; transmitting the message over the two-way data communication network to a server computer wherein the server computer is identified by the resource locator;

executing an application on the server computer identified by the resource locator to generate a response to the message; and transmitting the response to a location identified by the application.

As indicated above the location can be the two-way communication device, another server computer, or some other device coupled to the server computer.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates one embodiment of the airnet network of this invention that includes the two-way data communication devices of this invention.

Figures 2A to 2H are illustrations of a series of screen displays of the two-way data communication device of this invention that illustrate one application of the principles of this invention.

Figures 3A to 3F are illustrations of a series of screen displays of the two-way data communication device of this invention that illustrate a second application of the principles of this invention.

Figures 4A to 4I are illustrations of a series of screen displays of the two-way data communication device of this invention that illustrate yet another application of the principles of this invention.

Figure 5 illustrates another embodiment of the airnet network of this invention that includes the two-way data communication devices of this invention and an airnet network translator.

Figure 6 is a block diagram of a mobile wireless communication device that includes the client and support modules of this invention.

Figure 7 is a more detailed diagram of the mobile wireless communication device and a server computer within the airnet network architecture of this invention.

Figures 8A to 8D are a process flow diagram showing the process performed by the client in the mobile wireless communication device and the server on the server computer of Figure 7.

Figure 9 is a diagram of a mobile wireless communication device of this invention that includes a novel predictive text entry system that is a part of this invention.

Figures 10A to 10T are one embodiment of a letter frequency table.

Figure 11 is a process flow diagram for one embodiment of a data entry process that includes the novel predictive data entry process of this invention.

Figure 12 is a more detailed diagram of the mobile wireless communication device and the airnet network translator within the airnet network architecture of the another embodiment of this invention.

Figure 13 is a process flow diagram showing the various processes performed by the airnet network translator of Figure 12.

Figure 14 is a diagram illustrating the various module managers included in one embodiment of the client module of this invention.

Herein, objects with the same reference numeral are the same object. Also, the first number of a reference numeral indicates the Figure where the object first appeared.

DETAILED DESCRIPTION

According to the principles of this invention, a novel airnet network 150, i.e., a two-way data communication network, interconnects any one, any combination, or all of two-way data communication devices 100, 101, or 102, that each include this invention, with a wide variety of computer networks 120, 130, and 140, for example. As explained more completely below, each two-way data communication device 100, 101, and 102 can be configured to transmit data to and receive data from any desired combination of computers on computer networks 120, 130, and 140. Airnet network 150 is the two-way data communication path from the two-way data communication device to the particular computer that is accessed by the user of that two-way data communication device.

Each wireless communication device 100 that includes this invention can communicate over airnet network 150 with any server computer 121, 131, and 141 on airnet network 150 that includes at least one application that communicates and interacts with the processes of this invention that are included within device 100. Thus, device 100 can access information on the computer network and provide information to the computer network. Similarly, a two-way pager 101, and a telephone 102 with a modem 103, that each include this invention, can communicate over airnet network 150 with any of server computers 121, 131, and 141 that includes at least one application that communicates and interacts with the processes of this invention that are included within devices 101 and 102.

As explained more completely below, an application on a server computer can be accessed by any two-way data communication device that can communicate with that server computer. The application is independent of the particular type of two-way data communication device that is used to access the application and independent of the particular two-way data communication network used. This means that a user can access an application from anywhere so long as the user has a two-way data communication device that can communicate with the server computer.

In one embodiment, a process on wireless communication device 100 is configured as a client process and the applications on server computers 121, 131 and 141 on airnet network 150, that communicate with the client process, are server processes. This architecture allows some of the processing burden to be moved away from cellular telephone 100, across airnet network 150, to a server module on any computer on airnet network 150.

Specifically, a wireless communication device 100 e.g., a cellular telephone, with a telephone like keypad, communicates via a data capable cellular telephone network 110, e.g., a cellular digital packet data telephone network, with an application on a server computer on a computer network that has an interface to data capable cellular telephone network 110. For example, the computer network can be a corporate wide area network 120, a corporate local area network 130, or perhaps the Internet 140.

Similarly, a two-way pager 101 communicates via a two-way pager network 111 with an application on a server

computer on a computer network that has an interface to two-way pager network 111: Again, for example, the computer network can be a corporate wide area network 120, a corporate local area network 130, or perhaps the Internet 140. Finally, a telephone 102 communicates via a modem 103 and public switched telephone network 112 with an application on a server computer on a computer network that has an interface to public switched telephone network 112. As
 5 with the other two-way data communication devices, the computer network can be, for example, a corporate wide area network 120, a corporate local area network 130, or perhaps the Internet 140.

In each of two-way data communication devices 100, 101, and 102, the client process is stored as a client module in the device and the execution of the client module on a microcontroller in the device is sometimes referred to as the client process. The client process performs important processing functions locally. This allows the communication
 10 between the client process, hereinafter sometimes referred to as simply client, and the server process, hereinafter sometimes referred to as server, to be minimized and the server computing requirements to grow slowly as the number of clients, i.e., users, grows.

The client module is small, e.g., under 64 KByte, and requires only low processing power congruent with the memory chips and built-in microcontrollers in two-way data communication devices such as cellular telephone 100, two-way
 15 pager 101, and telephone 102. Thus, unlike the prior art attempts at an intelligent telephone, the cost, size, and battery life of either cellular telephones, two-way pagers, or telephones that incorporate this invention are not adversely affected.

While client/server architectures have been used extensively in computer networks, a client/server architecture implemented using two-way communication data devices such as cellular telephone 100, two-way pager 101, or tele-
 20 phone 102 yields new and unexpected results. This invention allows for the first time a wide variety of two-way data communication devices including but not limited to cellular telephones, two-way pagers, and telephones to become open application platforms which in turn empowers software developers to deliver value added applications and services to any two-way data communication device which incorporates the principles of this invention.

This is a radical shift from the current situation where cellular telephones, two-way pagers, and telephones are
 25 closed, proprietary systems. Consequently, an even playing field is created for the market to invent new uses for cellular telephones and data capable cellular networks, for two-way pagers and two-way pager networks, and for telephones on the public switched network.

Any entity from corporations to individuals can make new applications available to the installed base of data ready cellular telephones, two-way pagers, and telephones, that include this invention without physical modification or addi-
 30 tion to the devices. Years after purchase, a two-way data communication device with this invention can run all the applications which were developed since its purchase. Further, all these applications are available without the user having to add anything or make any modification to the two-way data communication device. These features of the invention are a significant departure from prior art systems. Typically, in the prior art, use of a particular application on a particular platform required that the application be compatible with the operating system on that platform. Further, each time a
 35 new version of the application was released, the user was required to take steps to update the application on the user's platform. Further, if the user of the platform did not modify the operating system as new versions of the operating system were released, at some point in time, the platform would no longer be capable of processing a new version of an application that required a current version of the operating system.

Also, small devices, such as cellular telephones or pagers, usually do not have card slots, floppy or hard disk drives,
 40 or other means commonly found on computers to add or update applications. This limitation has led prior art attempts at intelligent communication devices to design closed systems with fixed functionality. Such devices can neither adapt nor be adapted to the fast changing requirements of the market place and so have not met with market success.

This invention eliminates these problems. The client process in the two-way data communication device functions
 45 as an interpreter. The application on the server computer provides all information necessary for the interpreter to generate a user interface on the two-way data communication device, and in response to user selections or data input using the user interface, to route messages to an appropriate server, i.e., either the server that sent the original information or another server.

Thus, the client process only interprets this information and interacts appropriately with the hardware of the two-
 50 way data communication device. Consequently, to update an application requires only changes on the server computer and not changes in each two-way data communication device that communicates with that server computer. This invention eliminates the usual requirement for distribution of application software, and application software updates to the end user of the two-way data communication device.

For example, if initially, two-way pager 101 receives a response to a message from an application on server com-
 55 puter 121 on corporate wide area network 120, the interpreter in two-way pager 101 generates a user interface on display screen 106 using information in the message. As described more completely below, options presented in the user interface can allow the user to access information, or provide information to any one, any combination of, or all of networks 120, 130, and 140.

Specifically, in the response to the message from two-way pager 101, the application initially accessed on server
 computer 121 included resource locators for applications on each of networks 120, 130, 140, typically common gateway

interface programs, accessible to the user of pager 101 as well as information required to generate the user interface. Consequently, when the user makes a particular selection or enters data, the interpreter accesses the appropriate resource locator and appends any necessary data to the resource locator. The client transmits a message including the resource locator to the appropriate server.

5 As shown by this example, the applications on networks 120, 130, 140 send to the two-way data communication device all information necessary to generate a user interface, and to process all user input. Consequently, only an application must be changed to update the information provided to the two-way data communication device.

In addition, since all the information needed by the client to generate a user interface and all information necessary for the client process to respond to any input data is included in the message, the computer server does not retain any state information concerning the information transmitted to the client process. Consequently, the computer server is stateless.

10 Each two-way data communication device 100, 101, and 102 that utilizes airnet network 150, includes a data communication capability, a display screen, preferably a multi-line display screen, and storage capability for the processes of this invention in an on-board memory, and for the message being processed. Nearly every data capable cellular telephone, e.g., a telephone that utilizes a cellular digital packet data network, includes excess on-board memory capacity and a multi-line display screen. These hardware resources are often available, but unused in a data capable cellular telephone because of the indivisibility of memory chip packages. The inclusion of the processes of this invention in such cellular telephones therefore has very little effect on the cost, size, and power consumption of the cellular telephone. Similarly, the inclusion of the processes of this invention in two-way pagers and telephones, that include a microcontroller and memory, has very little effect on the cost, size, and power consumption of these devices.

20 Thus, unlike prior art approaches that attempted to combine a computer module and a wireless communication module in a single package, this embodiment of the invention preferably utilizes the memory and processing power that currently exists in the cellular telephone 100, two-way pager 101, telephone 102 or other wireless or landline two-way data communication devices. This approach limits the cost of the resulting device and overcomes many of the problems of the prior art devices, e.g., the size and weight of the two-way data communication device is not changed, and, as explained above, updating user applications is removed from cellular telephone 100, two-way pager 101, and telephone 102.

In particular, unlike devices produced by previous industry attempts at combining computing modules and a wireless cellular module, two-way data communication devices which incorporate this invention are size and cost competitive with voice-only telephones and can, for the first time, satisfy the market cost and size requirements for an intelligent cellular telephone, for example.

30 The incremental cost of supporting interactive applications on cellular telephone 100, two-way pager 101, and telephone 102 is reduced to at most a slightly larger screen that is required to display the application to the user. This is a fraction of the cost of adding a complete computer module to a cellular telephone, for example.

35 The incremental power consumption required to support this invention is also very small, as the incremental memory and screen required are small consumers of power compared to the cellular radio itself. Intelligent two-way data communication devices built according to the principles of this invention are not expected to have a significantly lower battery life than standard cellular telephones, or two-way pagers, for example.

40 The configuration and processes of the client process in two-way data communication devices 100, 101, and 102 are similar when the differences in the devices and the two-way data communication network over which the devices communicate are considered. Consequently, in the following description, the operation of data-ready cellular telephone 100 is considered. The same or similar operations can be performed on two-way data communication devices 101, and 102. The main difference is that some device dependent features within the client module must be changed to accommodate the particular hardware used in the two-way communication device. However, the client module architecture described more completely below limits the number of changes that must be made.

45 As indicated above, in response to user actions, wireless communication device 100 transmits a message, typically a data request, to a server computer 121 on computer network 120 and receives a response to the message. Alternatively, the user action can result in directions to server computer 121 on computer network 120 to transmit the response to the message to another location or to another user. Also, wireless communication device 100 can receive a message from any one of the computers coupled to airnet network 150.

50 An important aspect of this invention is that the client module interpreter in wireless communication device 100 generates a user interface by which the user can both initiate and receive messages from a variety of applications. The interactions take place in real-time and are not limited by the client module interpreter. The uses of wireless communication device 100 are limited only by the availability of applications on server computers.

55 The applications available are determined by application developers. Prior to considering one implementation of the invention in further detail, several illustrative examples of applications that can be implemented according to the principles of this invention are described. These applications are illustrative only and are not intended to limit the invention to the particular applications and features described.

In one use, the user configures cellular telephone 100 to access server computer 121 on XYZ corporate wide area

network 120. In response to the access by the user, server computer 121 transmits a card deck to cellular telephone 100 over data capable cellular telephone network 110. As explained more completely below, a card deck includes one or more cards, and each card is interpreted by the client module to generate a user interface screen.

In the embodiment illustrated in Figure 2A, the initial card deck transmitted to cellular telephone 100 includes an introductory display card and a choice card. Figure 2A is an example of introductory screen display 200 that is generated on display screen 105 by the client process in cellular telephone 100 by interpreting the display card. As used herein, a display screen is the physical display apparatus in a two-way communication device. A screen display is the image presented on the display screen.

In this embodiment, display screen 105 is a pixel display that displays graphics. In another embodiment, display screen 105 displays only text and so the graphics would not appear on display screen 105. Screen display 200, and other screen displays described more completely below, include a horizontal arrow, i.e., a multi-card deck indicator, to communicate to the user that the current deck includes another card. The inclusion of screen indicators, such as the multi-card deck indicator, to communicate with the user is optional. The functionality of this invention is independent of such screen indicators.

When the user presses a predetermined key, or key sequence, the client process in cellular telephone 100 interprets the next card in the card deck, i.e., the choice card, and in turn generates a menu 201 (Fig. 2B) of items that can be accessed by the user. In this embodiment, each of the menu items is available on server computer 121 to the user who, in this example, is a representative of XYZ corporation visiting ABC Designs.

As explained more completely below, each of the menu items is associated with a resource locator that includes an address of the particular object associated with that menu item, typically an address to a common gateway interface program on server computer 121. In general, a resource locator includes an address and may include appended data. The address can be to a local object within the two-way data communication device or to a remote object on a server computer. As is known to those skilled in the art, the common gateway interface is an Internet standard that is used to dynamically generate information, e.g., cards. In view of this disclosure, other techniques to generate dynamic cards could be used.

Initially, the highlighting of the first line of menu 201 is not present. When a key on the keypad of cellular telephone 100 is pressed, the menu item corresponding to that key is highlighted on screen 105. Thus, menu 201 shows the first item highlighted to indicate that the one key was pressed by the user. However, highlighting a selected item is a feature that is specific to this example, and in general is not required to implement the invention. Other methods can be used to indicate the user's choice on display screen 105 such as an arrow pointing at the choice, if such an indication is desired.

After the one key is pressed, the user presses a predetermined key, e.g., an enter key, to verify the selection. Alternatively, in another embodiment, the verification of the selection is not required. In both embodiments, the resource locator for the selection is transmitted to server computer 121 by the client process in cellular telephone 100 over data capable cellular telephone network 110. In response to the selection, server computer 121 processes the message containing the selection, and in this embodiment, transmits another card deck to cellular telephone 100.

The client process in cellular telephone 100 interprets the first card in the deck received from server computer 121, which is a choice card, and generates a screen display 202, that includes a second menu as illustrated in Fig. 2C, on display screen 105. Initially, none of the items in the second menu are highlighted.

Notice that screen display 202 includes a header, that describes the selection made by the user on screen display 201, in addition to the second menu of choices available to the user. A multi-display screen card indicator 203, e.g., in this embodiment, a hand icon with a finger pointing down, shows that the screen associated with the current choice card includes additional items that are not shown on display screen 105. Herein, a screen can be larger than the number of lines available on display screen 105 and so the user must scroll the screen display to view the complete screen.

Thus, to view the additional items, the user presses a first screen scroll key, e.g., a next key, on cellular telephone 100. In this embodiment, when the first screen scroll key is pressed, each line of the display is rolled up one line. The resulting display has an icon with a finger pointing up (not shown) if the menu requires only two screen displays. If the menu requires more than two screen displays, the second screen display of the menu would have two icons, one with a finger pointing up, and another with a finger pointing down. To scroll between the various lines in the second menu, the user uses the first screen scroll key, and a second screen scroll key.

If the user displays the last line of a card, e.g., the last line in the second menu, and presses the first screen scroll key nothing happens. In this embodiment, the user must make a choice before the next card is available.

Screen display 202 also includes representations of two soft keys, a home key 204, and an info key 205. In this example, these soft keys are defined only for the card used to generate screen display 202. When the user presses a predetermined key sequence, the home key is highlighted to indicate the selection. In this embodiment, when the home key is selected, the user is returned to screen display 200. In another embodiment, the user could be returned, for example, to a home screen display that is displayed each time the user activates cellular telephone 100 for use on airmet network 150.

The home key is associated with a pointer, that in one embodiment is a resource locator, and the card addressed

by the pointer is displayed by the client process when the home key is selected by the user. Specifically, if the pointer is to a card in the current deck, the client process simply displays that card. If the pointer is to other than a card in the current deck, the client process in cellular telephone 100 retrieves the deck containing the card at the location identified by the pointer. The location could be, for example, either a memory in cellular telephone 100, or a memory in computer

5 121. Similarly, when the user presses another predetermined key sequence, the info key is highlighted to indicate the selection. In this embodiment, when the info key is selected, a help screen is displayed for the user that describes the possible selections. The particular contents of the help screen are determined by the provider of the service. Specifically, a pointer is associated with the info key and when the info key is depressed by the user, the information stored at

10 the location identified by the pointer is retrieved and interpreted by the client process in cellular telephone 100. Returning to the menu in Figure 2C, since the user wants to determine the status of an order, the user pushes the two key on the keypad of cellular telephone 100. In response to the key press, the second choice in the menu is highlighted as shown in Figure 2C. In response to verification of the key press, e.g., the user presses a predetermined key sequence, cellular telephone 100 transmits a check open order request to computer 121, i.e. the client process transmits

15 a message that includes a resource locator associated with the menu item selected by pressing the two key. In response to the check open order request, computer 121 transmits yet another card deck to cellular telephone 100. The client process in cellular telephone 100 interprets this deck, that is an entry card, and in turn generates a purchase order number entry screen display 206 (Fig. 2D) on display screen 105. Notice that screen display 206 has a previous soft key 207 and a fax soft key 208. Again, each of these soft keys has an associated pointer and the information stored at the location identified by the pointer is retrieved and interpreted by the client process when the user selects

20 the soft key. In this example, the user does not select a soft key, but rather the user enters the purchase order number as shown in Figure 2E using the keypad of cellular telephone 100. The user enters only the various numbers. The client process formats the number and inserts the dashes as shown in Figure 2E.

25 After the purchase order is entered, the user presses a predetermined key sequence to indicate to the client process that entry of the purchase order number is complete. Notice that the user is entering data and not simply selecting a menu item. The user is utilizing cellular telephone 100 as if cellular telephone 100 was a computer connected to network 120, but, as explained more completely below, cellular telephone 100 is similar to a standard digital data capable cellular telephone that communicates over data capable cellular telephone network 110. Specifically, cellular telephone

30 100 is not a combination of a computer module and a wireless communication module as in prior art attempts to create an intelligent telephone. In addition, the user enters data using only the standard cellular telephone keypad. Thus, cellular telephone 100 eliminates the need for a computer keyboard or for a sophisticated touch screen that recognizes motion of a pointing object. This is important to maintaining the size, weight, and power requirements of cellular telephone 100 similar to

35 those of a voice-only cellular telephone. In one embodiment, to facilitate data entry, as explained more completely below, cellular telephone 100 includes a text prediction process that reduces the number of key strokes required to enter text data. In this embodiment, the text prediction process is turned on or off for each entry card. In response to entry of the purchase order number, the client process transmits a request to server computer 121 for the particular purchase order. Specifically, the client process appends the entered data to a resource locator and transmits a message containing the resource locator to server computer 121. Server computer 121, in response to the

40 message, retrieves the appropriate purchase order and transmits the purchase order as a card deck to the client process in cellular telephone 100 over airmet network 150. The client process interprets the card deck and generates a screen display 209 (Fig. 2F). Initially, fax key 208 is not highlighted in screen display 209.

45 Notice that screen display 209 includes multi-display screen card indicator 203 to show the user that the purchase order screen contains more information that can be displayed at one time on display screen 105.

After the user reviews the purchase order, the user presses the key sequence for fax key 208 and in response, fax key 208 is highlighted as illustrated in Figure 2F.

50 In response to selection of fax key 208, the client process retrieves the card deck at the location identified by the pointer associated with fax key 208. If the location is on server computer 121, the client process transmits a message including a resource locator to server computer 121 and in response to the message, server computer 121 transmits back yet another card deck. If the location is on a server computer other than server computer 121, the client process transmits a message including a resource locator to that server computer and in response to the message, that server computer transmits back yet another card deck. If the location identified by the pointer is within cellular telephone 100, the client process simply retrieves the deck. In either case, fax form 210 (Fig. 2G), that is an entry card, is displayed on

55 display screen 105 by cellular telephone 100. This example demonstrates the information accessed by the client process can be located in any number of locations. The resource locator associated with the fax key identifies the appropriate location.

When fax form 210 is displayed, the user enters the facsimile machine telephone number at ABC Designs, as

shown in Figure 2H, using the cellular telephone keypad. In this embodiment, the telephone number is automatically formatted by the client process. After the telephone number is entered, the client process appends the telephone number to a resource locator and transmits the information to server computer 121.

When server computer 121 receives the information, server computer 121 executes a common gateway interface application (CGI) pointed to by the resource locator. The CGI application grabs the necessary information and transmits the information via e-mail to a fax gateway. The fax gateway, upon receipt of the e-mail, converts the information to a fax and sends the information to the specified telephone number. Thus, cellular telephone 100 requires neither a printer connection nor a print driver, but yet can print using the facsimile machine at ABC Designs.

As illustrated in this example, cellular telephone 100 transmits a request for a particular purchase order, and scheduled transmission of data responsive to the request to a local machine capable of printing the data. Thus, the processes of this invention, as described more completely below, in cellular telephone 100 in combination with data capable cellular telephone network 110 and server computer 121 permit cellular telephone 100 to effectively utilize an application on server computer 121 on network 120 even though cellular telephone 100 utilizes only a microcontroller found in telephone 100 and does not require a separate computer module as in the prior art.

In addition, the client process using the information transmitted from server computer 121, i.e., the cards, generates a wide-variety of user interfaces as illustrated in Figures 2A to 2H. The particular configuration of the various user interfaces is defined by the cards transmitted in a card deck. Consequently, the user interface is not fixed to one particular format such as an E-mail type format, but rather the format is variable and can be redefined by each card that is interpreted by the client process. Also, in general, the user interface for one application on a server computer is independent from the user interface for another application on that server computer.

Specifically, the application accessed on server computer 121 generates the card deck and so in turn defines each of the various user interfaces. Each user interface permits the user to identify a particular selection. Each particular selection could result in generation of a different user interface with different selections. Thus, the user interfaces are limited only by the applications accessible to the two-way data communication device.

As shown below, a wide variety of applications can be provided on a server computer. Despite the robustness of the client module in interpreting a wide variety of application, typically, the client process is lightweight and thus requires only lightweight resources, e.g., 60 Kbytes of read-only memory (ROM) for the client module, 10 Kbytes of random access memory (RAM), and less than one million instructions per second (MIPS) of processing power. Since the client process needs only these lightweight resources in a two-way data communication device, the client can use existing resources in such a device and therefore does not add to the cost of the two-way data communication device such as data capable cellular telephone 100.

In another embodiment, the user can configure cellular telephone 100 to access server computer 131 on corporate local area network 130. In response to the access by the user, computer 131 transmits a home card (not shown) to cellular telephone 100 which in turn generates a home screen display on display screen 105.

When the user selects personal information on the home screen display or on a subsequent screen display associated with the home card, a message including a resource locator for a personal information deck is transmitted from cellular telephone 100 to computer 131. In response to the message, computer 131 transmits a card deck that includes a display card and a choice card to cellular telephone 100. In these examples, the card deck is described as including one of three cards, a display card, a choice card, and an entry card. However, these examples are illustrative only, and are not intended to limit the invention to those particular embodiments of cards. In view of this disclosure, those skilled in the art will be able to form combinations of these types of cards and define other types of cards, if such cards are appropriate for the particular application.

The client process in cellular telephone 100 interprets the display card that includes image and text data and generates screen display 300 on display screen 105 (Fig. 3A). Screen display 300 includes a home key 301, and an info key 302. When the user selects home key 301, the user is returned to the home screen. Info key 302 functions in a manner similar to that described above for info key 205.

When the user presses a predetermined key, the client process interprets the choice card and a second screen display 304 (Fig. 3B) is driven on display screen 105. Screen display 304 is a menu of the personal information that is stored on server computer 131 for use by the user of cellular telephone 100. Multi-display screen card indicator 203, e.g., the hand with a finger pointing down, illustrates to the user that the list has additional items that appear on the next screen display. Screen display 304 also indicates the number of E-mail messages, faxes, and voice messages waiting for the user.

The user scrolls the screen display line by line until screen display 305 is on display screen 105. Initially, the fourth item in the menu is not highlighted. In this example, the user presses the four key on the keypad of cellular telephone 100 to view the user's schedule. In response to the key press, the client module in cellular telephone 100 transmits a message, including a resource locator associated with the menu item selected by pressing the four key, to server computer 131 using data capable cellular telephone network 110 and corporate local area network 130.

In response to the message, server computer 131 executes the application identified in the resource locator. Upon completion of the execution, server computer 131 transmits, over corporate local area network 130 and data capable

cellular telephone network 110 to cellular telephone 100, a card deck that includes a choice card that describes the user's schedule for that day.

In this embodiment, when server computer 131 completes the transmission, server computer 131 has completed the response to the message and has transmitted all necessary information to cellular telephone 100. Therefore, server computer 131 does not retain any state information concerning the transmitted information and so is referred to as a stateless server computer 131. In this embodiment, the client process can only request a card deck. However, as demonstrated herein, card decks and the two-way interactive data communication system of this invention provide the user with a new level of capability.

When cellular telephone 100 receives the card deck, the client process in cellular telephone 100 interprets the choice card and drives screen display 306 (Fig. 3D) on display screen 105. Initially, the first item in the menu of screen display 306 is not highlighted. When the user depresses the one key on the keypad of cellular telephone 100, cellular telephone 100 highlights the first item in the menu. Cellular telephone 100 generates screen display 308 (Fig. 3E) upon the user subsequently depressing a predetermined key. Screen display 308 includes a schedule key 309, that when selected returns the user to screen display 306 (Fig. 3D). Screen display 308 also includes a more detailed description of the 10:00 a.m. meeting.

While screen display 308 is active, if the user depresses a predetermined key, the user is presented with the options in screen display 310 (Fig. 3F). Initially, item two in screen display 310 is not highlighted.

In this example, the user depresses key two on the keypad of cellular telephone 100 and so cellular telephone 100 sends a message including a resource locator to server computer 131 to send an E-mail message to Bill Smith confirming the meeting at 10:00 a.m. When server computer 131 executes the application addressed by the resource locator, an E-mail message is sent.

In another example, the user of cellular telephone 100 connects to Internet service provider computer 141 on Internet 140 using data capable cellular telephone network 110. Upon connection of cellular telephone 100, service provider 141 transmits to cellular telephone 100 a card deck to generate Figures 4A to 4C.

The client process in cellular telephone 100 interprets the first card in the card deck from computer 141 and generates screen display 400 (Fig. 4A). When the user presses a predetermined key, cellular telephone 100 displays screen display 401 (Fig. 4B). Screen display 401 provides the user with a series of choices that group services alphabetically.

When the user depresses the seven key on the keypad of cellular telephone 100, cellular telephone 100 displays a list of the services that have letters P, R, or S as the first letter in the service name. In this embodiment, screen displays 401 and 402 are a single card, e.g., a single screen. Each of the various services associated with a key has an index and when a particular choice is made by the user, the choice defines an index. The client process then displays all of the services with the index that corresponds to the index defined by the user's choice.

In screen display 402, the user is given a series of choices of services that are available to the user under tab seven. Initially, item three in screen display 402 is not highlighted. In this example, the user depresses the three key on the keypad of cellular telephone 100 to select the stock quotes and item three in screen display 402 is highlighted.

In response to this selection, cellular telephone 100 transmits a request for a stock quote, i.e., a message including a resource locator, over cellular telephone network 100 and internet 140 to service provider 141. In response to the request, service provider computer 141 executes the application addressed by the resource locator. The application retrieves a card deck that, in turn is transmitted to cellular telephone 100. The card deck includes a display card and an entry card.

Upon receiving the card deck, the client process in cellular telephone 100 interprets the display card and generates screen display 403 (Fig. 4D). When the user depresses a predetermined key, entry screen display 406 (Fig. 4E) is generated on display screen 105 of cellular telephone 100.

Initially, the box with letters SUNW in screen display 406 is empty. The letters SUNW are entered in the box by the user to indicate the ticker symbol of the stock for which the user wants information. After the user has entered the stock ticker symbol, the user presses the predetermined key to indicate that the entry is complete.

In response to the entry by the user, the client module appends the stock ticker symbol to the resource locator and transmits the resource locator to service provider computer 141 which, in turn, executes an application addressed by the resource locator to retrieve the latest stock market information for the stock ticker symbol. Service provider 141 uses the retrieved information to generate a card deck that contains the information and then transmits the card deck to cellular telephone 100.

The client process in cellular telephone 100 interprets the first card in the deck and generates screen display 409 (Fig. 4F). For convenience, the Figures 4F to 4I are grouped together and separated by a dotted line. However, at any given time, in this embodiment, display screen 105 can display any four adjacent lines and so the grouping of lines in Figures 4F to 4I is for convenience only to demonstrate the level of information that can be retrieved and displayed by the client process. The use of a four line display screen is illustrative only. The client process of this invention can work with any size display screen, even a one line display screen. However, a multi-line display screen is preferred.

In the Figures discussed above, the display screen is a pixel display and so can display images. In another embod-

iment, the display screen only displays text and is smaller in size. For such an embodiment, the various entries are abbreviated and only text is displayed, but the general operation is identical to that just described. Also, the various computer networks can be interlinked so that a user with access to one computer network can obtain information on another computer network. Moreover, the embodiments described above are merely illustrative. One important aspect of this invention is that cellular telephone 100 can interact with any type of server application that is configured to communicate with and interact with the client process in cellular telephone 100. Thus, the user is no longer limited to only a few services offered by a telephone network provider.

In Figure 1, the cellular telephone user must address, i.e., connect to, each computer of interest to access the different services. Consequently, each computer requires the information necessary to communicate with cellular telephone 100. In another embodiment, not illustrated, cellular telephone 100 contacts a single central computer over data capable cellular telephone network 110. This computer is connected to each of the other networks illustrated in Figure 1. Consequently, the user of cellular telephone 100 sends a message including a resource locator to the central computer, the central computer processes the message and retrieves the information addressed by the resource locator from the appropriate network shown in Figure 1. After the requested information is retrieved, the central computer generates a card deck and transmits the card deck to cellular telephone 100. In this embodiment, only one computer must be configured to communicate with cellular telephone 100. However, that same computer must be configured to communicate with all other computer networks that are of interest to the user of cellular telephone 100.

Hence, according to the principles of this invention, the client process on a two-way data communication device can initiate an interaction with a particular server computer. The server computer transmits (i) information to the client process to generate a user interface, and (ii) a resource locator for each possible selection by the user from the user interface. The resource locators can address applications on the server computer, applications on other server computers, or an application on the server computer that in turn accesses other server computers. Consequently, the user of a two-way data communication device is limited only by the applications provided on the server computers.

Further, the user can be provided new and/or updated capabilities by modifying the applications on the server computers. There is no requirement that the client process be changed for a new or updated application. The client process must only interpret the information received from an application and transmit a message for additional information. These operations are unaffected by a new or updated application. Consequently, as noted above, this invention does not require distribution of application updates or new applications to the end user of the two-way data communication device.

Figure 5 is an illustration of another embodiment of airnet network 150. In this embodiment, the messages from a two-way data communication device, e.g., devices 100, 101, and 102 are directed to an airnet network translator 500. Airnet network translator 500 and a particular two-way data communication device, e.g., any one of devices 100, 101, and 102 communicate using the protocol for point-to-point communication on the particular network linking airnet network translator 500 and that two-way data communication device. For example, if data capable cellular telephone network 110 is a cellular digital packet data network, either the transmission control protocol (TCP) or the user datagram protocol (UDP) can be used.

Airnet network translator 500 transfers data between the two-way data communication device and the selected computer network after translator 500 validates the communication path, as explained more completely below, and encrypts the message transferred to the computer network if necessary. In addition, airnet network translator 500 collects transaction and billing information concerning the communication between the two-way data communication device and the designated computer network. Specifically, airnet network translator 500 provides access control for paying services and a logging mechanism for billing. Airnet network translator 500 can also provide a directory service to users.

Figure 6 is a block diagram of a typical GSM digital cellular telephone. Each of the hardware components in cellular telephone 600 is known to those skilled in the art and so the hardware components are not described in detail herein. The compiled and linked processes of this invention are stored in ROM 601 as a client module 602 and support modules 603. Upon activation of a predetermined key sequence utilizing the keypad, physical layer processor 610, that is sometimes referred to herein as a microcontroller, initiates a client process using client module 602 in ROM 601.

In this embodiment, client module 602 includes a plurality of manager modules, as explained more completely below. The particular manager modules utilized is determined by the characteristics of the particular cellular telephone 100 in which client module 602 is implemented. Client module 602 must include manager modules to interface with modules that control the particular hardware in cellular telephone 100, a manager module to interface with the particular cellular telephone network protocol used by cellular telephone 100, and a manager module to interpret the card decks received. Therefore, the particular manager modules described herein are only illustrative of the principles of this invention and are not intended to limit the invention to the specific modules described more completely below.

In this embodiment, the client process controls the operations of a plurality of cellular telephone dependent support processes that are stored in ROM 601 such as a display module, a keypad module, and a network and terminal control module, that were referred to above collectively as support modules 603. The combination of the client process, display process, keypad process, and network and terminal control process are considered foreground tasks by the microker-

nel in cellular telephone 600. Also, herein module and process are used interchangeably, but those skilled in the art will appreciate that the module is the computer software as stored in a memory, preferably, a ROM, of cellular telephone 600 and the corresponding process is the execution of the module by the microcontroller in cellular telephone 600. Again, note that this invention does not require a separate processor and instead can utilize the processing power that already exists in cellular telephone 600, because as described above, the client process of this invention is so light-weight.

The user interface for cellular telephone 600 determines the version of the user interface manager module that is stored in ROM 601. In one embodiment, the parameters used to define the user interface level are the display resolution, the pixel access of the display, and the support of soft keys. One definition of the user interface levels is given in Table 1.

TABLE 1

USER INTERFACE LEVEL DEFINITIONS	
Level 1	Text only; 1 or more lines; 12 to 15 characters per line; and no soft keys.
Level 2	Text only; 4 or more lines; 20 to 25 characters per line; and soft keys.
Level 3	Pixel access; 150 by 75 pixels or larger; and soft keys.

The user interface manager module presents data to the display module which in turn drives display screen 605; and captures data entered by the user on display screen 605. In response to this information, the client process prepares a message for transmission by a network manager module.

To more completely explain the operations performed over airmet network 150, Figure 7 is a block diagram that illustrates the various components in one embodiment of this invention of cellular telephone 700. Those skilled in the art will appreciate that cellular telephone 700 includes circuitry and software similar to that illustrated in cellular telephone 600 for voice and data operations supported by cellular telephone 700 in addition to the modules for operation on airmet network 750. Similarly, server computer 743 includes other software and hardware that is known to those skilled in the art and so is not illustrated in Figure 7 for clarity.

In this embodiment, client module 702 in digital cellular telephone 700, that is executing on the microcontroller of telephone 700, communicates with server computer 743 over cellular digital packet data (CDPD) network 710. Cellular digital packet data network 710 is used to illustrate one embodiment of this invention on one two-way data communication network. The principles of this invention can be used with a wide variety of two-way data communication networks. For example other two-way data communication networks for cellular telephones that may be used include TDMA, CDMA, and GSM circuit switched data networks; and the AMPS analog cellular network with a modem. Similarly, for two-way pagers, two-way data communication networks include PACT, or other priority two-way paging networks with data transport capability.

Prior to considering the operation of this configuration of airmet network 750 in more detail, another aspect of this invention is required. Specifically, a technique is required for conveying instructions from digital cellular telephone 700 to a server application on server computer 743; and conversely.

A telephone interaction description language (PIDL) is defined for use by service developers. A terminal interaction language (TIL) is a distillation of the telephone interaction description language and describes the same interaction to digital cellular telephone 700 as the telephone interaction description language describes to computer 743.

With the exceptions described more completely below, a process in the terminal interaction language is a compressed version of the same process written in the telephone interaction description language. The terminal interaction language allows easy parsing on the two-way data communication device, which in turn makes the client smaller than a client for the telephone interaction description language that is readable by humans, but is not optimized for parsing by a machine.

The compression from the telephone interaction description language to the terminal interaction description language is done typically at run time because some cards are computed cards and so cannot be precompiled. A wide variety of techniques can be used to convert the telephone interaction description language to terminal interaction language. The important aspect is that, if bandwidth across the cellular telephone network is limited, a compressed form of the telephone interaction description language is used.

Preferably, each data type is compressed to facilitate optimal transfer over the two-way data communication network. For example, the verbs in the telephone interaction description language are compressed using a binary tokenization. Graphics are compressed using run length limited compression and text is compressed using any one of the well-known techniques for text compression. While compression of the telephone interaction description language is not required to implement this invention, compression makes the invention more efficient by utilizing the bandwidth of

the network more effectively.

Instructions in the telephone interaction description language and in the terminal interaction language are grouped into a deck and a card. Each deck includes one or more cards. A card includes the information, i.e., a set of telephone interaction description language, required to generate a screen. As indicated above, a screen can be larger than the number of lines in a display screen. Other equivalent terms for a card include a page and an atomic interaction. Thus, a card deck is simply a group of screens. The number of cards in a card deck is selected to facilitate efficient use of the resources in the two-way data communication device and in the airnet network.

For simplicity, in this embodiment, each card is a single operation. Herein, an operation is defined as a related set of actions such that the user does not encounter an unanticipated delay in moving from one action to the next, i.e., the user does not have to wait for client module 702 to retrieve another card deck from computer 743. Also, a deck may include definitions of soft keys that stay in force while the deck is active, i.e., being executed by the cellular telephone microcontroller.

Computer 743 may contain stored static telephone interaction description language decks. Computer 743 also generates telephone interaction description language decks in response to data from, or choices made by, the user of cellular telephone 700.

In the embodiment shown in Figure 7, computer 743 converts a telephone interaction description language deck to a terminal interaction language deck, that in turn is transmitted to cellular telephone 700. The terminal interaction language is designed so that decks can be stored unaltered in memory 716 of cellular telephone 700 and referenced directly, with little or no parsing. While telephone interaction description language decks on computer 743 may contain references to images, a terminal interaction language deck contains the images at the end of the deck. Thus, if a particular two-way data communication device does not support display of images, the images are easily stripped from the terminal interaction language deck before the deck is transmitted to that particular two-way data communication device.

As indicated above, each interaction with the user of cellular telephone 700 is described by a deck or a series of decks. Logically, the user retrieves a terminal interaction language deck stored in a memory 716 of cellular telephone 700 after receipt from computer 743 over CDPD network 710. The user reviews the information displayed by cards in the deck and makes choices and/or enters requested information and then requests another deck, as described above with respect to Figures 2A to 2H, for example.

When the user receives a deck, the first card of information is displayed on display screen 705. Typically, as shown above, the first card is text, an image, or a combination of an image and text. After the user has reviewed the first card, the user hits a NEXT key to view the next card in the deck. Similarly, a user can return to a previous card in the deck by using a PREV key. Thus, using the NEXT and PREV keys, the user can navigate back and forth through the deck. Within a card, the user uses a scroll key or keys to move the portion of the card displayed up and down. This description of a particular method used to navigate through a deck and within a card is not intended to limit the invention to this particular method. In view of this disclosure, those skilled in the art will be able to use a wide variety of ways to navigate through a deck and within a card.

Cards, in this embodiment, are one of three types, a display card, a choice card, and an entry card. Independent of the type of card, the card can contain text and images. In addition, the invention is not limited to these three particular types of cards. The definition of the three particular types of cards is used to facilitate a description of the invention and to assist the developer's in organizing applications.

A display card gives information to the user to read. The display content can include any one of, or any combination of text, an image, and a soft key. The soft key is in effect only while the display card is active.

A choice card displays a list of choices for the user. The choices are automatically presented in a format specified on the choice card. See Appendix I, which is a part of the present disclosure and is incorporated herein by reference in its entirety. As explained above, the user makes a choice by depressing the key corresponding to the choice.

An entry card is used to obtain input data from the user. An entry card displays one or more entry lines. Typically, each entry line includes a display followed by an entry line. The entry line, in this embodiment, can be for either numeric or text data.

In this embodiment, choice and entry cards prevent the user from moving to the next card until the user has entered the requested information. When the user reaches the last card in a deck and hits the NEXT key, a request for a new deck is initiated. The deck requested is determined by either the deck that the user has completed, or by the choices made by the user. Also, when the deck is completed, the choices and/or data entered by the user typically are transmitted along with the request for the new deck to computer 743.

Appendix I is one embodiment of a syntax for the telephone interaction description language and the terminal interaction language of this invention. In one embodiment, the telephone interaction description language is described using a subset of the standard generalized markup language. Only a subset of the standard generalized markup language is utilized so that telephone interaction description language parsers also can be written easily using simple tools like lex and yacc.

Returning to operation over airnet network 750, cellular telephone 700 includes a display module 712, a keyboard module 711, a client module 702, and a UDP interface module 714. In this embodiment, module 702 is stored in a non-

volatile memory (not shown) of telephone 700 and is executed by the microcontroller (not shown) in telephone 700. Modules 711, 712, and 714 operate under the control of client module 702.

Client module 702 includes instructions that direct the microcontroller in cellular telephone 700 to perform the operations described more completely below with respect to Figures 8A to 8D. The operations include sending uniform resource locator (URL) requests to HyperText Transfer Protocol (HTTP) server 749, parsing and displaying a TIL deck or decks returned by HTTP server 749, and generating new URLs based on the user's key presses. For a description of HTTP server software and platforms that can run the HTTP server software, see, for example, Ian S. Graham, The HTML Sourcebook, John Wiley & Sons, Inc., New York, Chapt. 8, (1995), which is incorporated herein by reference.

User datagram protocol (UDP) interface module 714 couples CDPD network 710 to client module 702, and allows client module 702 to communicate using UDP over CDPD network 710. The user datagram protocol is well known to those skilled in the art and is documented extensively. UDP interface module 714 supports transmission of simple stand-alone messages between the connection partners.

Display module 712 is a display driver that couples client module 702 to display screen 705 and so allows client module 702 to specify the information presented on display screen 705. The user interface manager module within client module 702 converts the display information in a card to instructions for display module 704 which in turn provides signals that drive the hardware that controls the operation of display screen 705. For example, if the TIL deck includes an image, the user interface manager module determines whether the active card calls for display of the image. If the active card directs the user interface manager module to display the image, the user interface manager module passes the image in memory 716 to display module 712, which in turn displays the image on display screen 705.

Keyboard module 705 couples keypad 715 to client module 702, and stores data representing keys pressed by the user on physical keypad 715 in memory 716. Keyboard module 705 notifies client module 702 when the user has pressed a key.

When client module 702 is notified of a key press, the user interface manager module within client module 702 passes information about the key press to display module 712 that in turn displays the appropriate character on display screen 705, if an entry card is active. If the user interface manager module determines that a choice card is active, and the key press corresponds to one of the choices, the user interface manager module sends instructions to display module 712 that result in the choice being identified for the user, e.g., highlighted as described above.

In addition to HTTP server 749, host computer 743 includes a UDP interface module 748, CGI programs 761 stored in a memory 755 of host computer 743, and TIL decks 760 stored in memory 755.

HTTP server 749 uses UDP interface module 748 to send data to and receive data from CDPD network 710. TIL decks 760 are TIL decks that can be accessed by HTTP server 749. Static files containing PIDL decks are converted to TIL decks only once on HTTP server 749. CGI programs 761 are common gateway interface programs that produce PIDL decks that are used by HTTP server 749 to produce TIL decks that in turn are transmitted via UDP interface modules 748 and 714 and cellular telephone network 710 to client module 702. In this embodiment, the services available over airnet network 750 are applications accessible by HTTP server 749 on Internet 140 for which a service developer has written a PIDL deck, or a CGI script that in turn generates a PIDL deck, and is stored on computer 743.

The architecture in Figure 7 demonstrates some important aspects of this invention. First, the applications, the PIDL decks and CGI scripts in this embodiment, are independent of the particular two-way data communication network. For HTTP server 749 to communicate over a different two-way data communication network that does not support UDP, only UDP interface module 748 must be changed. The applications are unaffected by such a change.

Second, the applications on HTTP server 749 are independent of the two-way data communication device with which HTTP server 749 is interacting. An application on HTTP server 749 can communicate with any two-way data communication device that includes the appropriate client and a module to transmit and receive data over the two-way data communication network. These two facts mean that an investment in developing an application is insulated from either advances in two-way data communication devices, or advances in two-way data communication network technology.

Figures 8A to 8D are a process flow diagram for one embodiment of this invention. Initially, when the user initiates communication over airnet network 750, client module 702 initializes a work space in memory 716 of cellular telephone 700 and then, in get home URL process 801, stores a URL in the work space. According to the principles of this invention, in one embodiment, each cellular telephone that utilizes the airnet network has a home URL stored in a non-volatile memory that is used to retrieve a home card deck for the cellular telephone. In another embodiment, the cellular telephone obtains the home URL from server 749. Thus, in get home URL process 801, client module 702 obtains the home URL. Herein, a URL is an example of a specific embodiment of a resource locator.

For example, in get home URL process 801, client module 702 obtains a home URL, such as <http://www.libris.com/airnet/home.cgi>

and stores the home URL in the work space. The portion of the home URL, <http://www.libris.com>, identifies a particular HTTP server, i.e., server 749, on the world-wide web. The portion of the URL, </airnet/home.cgi>, specifies a particular common gateway interface program within CGI programs 761. The use of a URL pointing to a server on the world-wide web is illustrative only is not intended to limit the invention to applications on the world-wide web. In general, cellular

telephone 700 obtains an identifier, i.e. a resource locator, of a home application on a home server that is executed by the server when the cellular telephone initially becomes active on airtel network 750, and stores the resource locator in the work space.

Next in create HTTP request process 802, client module 702 converts the URL in the work space to a HTTP request. For example, for the above URL, create HTTP request process 802 generates a method field, such as

GET /airnet/home.cgi HTTP/1.0

The GET method is part of HTTP. Thus, the format for the GET method is known to those skilled in the art. Also, this particular form of the method is used because a specific server connection is established by cellular telephone 700 and so identification of the server is unnecessary. Nevertheless, briefly, this command instructs server 749 to execute application home.cgi and execution of application home.cgi in turn results in generation of a home deck and a subsequent transmission of the home deck to cellular telephone 700. HTTP/1.0 specifies the HTTP version used by client module 702 in cellular telephone 700.

In addition to the method field, client module 702 in process 802 could also generate appropriate HTTP request fields to pass information to server 749 about the capabilities of client module 702. The request fields can include information such as lists of the MIME content-types acceptable to the client; lists of data encoding types acceptable to the client; user authentication and encryption scheme information for the server; the length in bytes of the message being sent to the server; and the Internet mail address of the user accessing the server. This list of information is illustrative only and is not intended to limit the invention to the particular request fields described herein. Any request field defined by HTTP can be utilized by client module 702. However, in this embodiment, the defaults are utilized and so no HTTP request fields are generated.

Typical HTTP methods that can be generated in HTTP request process 802 are a GET method for requesting either a TIL deck from server 749, or execution of a common gateway interface program on server 749; and a GET method request to a common gateway interface program with data, e.g., a query string appended to the URL. In either case, a URL is transmitted to server 749 within the particular message. After create HTTP request process 802 is complete, client process transfers to transmit request process 804.

However, if the transmission control protocol is used instead of UDP, client module 702 would access a TCP module in establish server connection process 803 that replaced UDP module 714. Since, in this embodiment, UDP is used, establish connection process 803 is enclosed by a dashed line in Figure 8A to indicate that this process is unnecessary when using UDP.

In establish server connection process 803, a virtual connection would be made over CDPD network 710 between TCP interface module 714 and a TCP interface module in HTTP server 749 so that data could be transmitted between cellular telephone 700 and computer 743 using TCP, e.g., buffers to support data exchange are defined. The establishment of a TCP connection is well-known and so is not described further.

In Figure 8A, a dashed line connects establish server connection process 803 with establish client connection process 860; that is also dashed, that is performed by HTTP server 749. This indicates that both client module 702 and server 749 are required to complete process 803.

When the TCP virtual connection is established, client module 702 transfers processing from establish server connection process 803 to transmit request process 804. Similarly, server 749 transfers to request received check 861, in which server 749 waits until a request is received. Establish client connection process 860 is not needed for UDP and so HTTP server 749 initiates processing in request received check process 861. Process 860 is enclosed within a dashed line box to indicate that the process is used only for TCP.

In transmit request process 804, the HTTP request is sent from the work area in telephone 700 to HTTP server 749. Again, a dashed line connects process 804 of client module 702 to request received check 861 that is performed by HTTP server 749 to indicate that the check is dependent upon information from client module 702. When the transmission of the request is complete, client module 702 transfers to response received check 806.

Upon receipt and storage of the HTTP request, request received check 861 transfers to service request process 862 in which HTTP server 749 initiates service of the received request. In service request process 862, if the HTTP request only seeks transfer of a static deck, HTTP server 749 retrieves the requested static deck from TIL decks 760. Conversely, if the request requires server 749 to obtain data from the Internet or to append data to a particular file, server 749 launches the common gateway interface application addressed in the request, and passes the data in the HTTP request to this application for further processing.

For example, if the user of cellular telephone 700 requested a fax as in Figure 2F, the HTTP request identifies a common gateway interface application in CGI programs 761 that accepts as input data the telephone number and grabs the information to be faxed. The CGI application generates an e-mail transmission to the fax gateway. Similarly, for a stock quote, server 749, in response to the HTTP request, launches a common gateway interface application that sends out a stock query over Internet 140 to a stock quote service provider using the ticker tape symbol passed as input data by server 749 to the common gateway interface application. When the response to the stock query is received, the common gateway interface application builds a PIDL deck that includes the data in the response to the stock query.

Upon completion of servicing the request, HTTP server 749 converts the PIDL deck to a TIL deck and returns the

TIL deck to client module 702 using UDP in transfer response process 863, that is connected by a dotted line to response received check 806 in client module 702. As the TIL deck is transferred, client module 702 stores the deck in memory 716.

After the TIL deck is transferred, HTTP server 749 closes the process for responding to the message from cellular telephone 700. All the information needed by client module 702 to generate a user interface on display screen 705 and for responding to any selection or data entry presented in the user interface is included in the TIL deck. Consequently, client module 702 only has to interpret the TIL deck and interpret the user input to transmit the next message to HTTP server 749. The state for the HTTP server is defined in the next message. Consequently, HTTP server 749 is stateless because HTTP server 749 does not retain state information concerning a response to a message after the message is transmitted.

However, in another embodiment (not shown), a server could retain state information concerning each interaction with a client module. For example, if the server transmitted a choice card to the client module, the server would retain state information indicating that a choice was pending from the client module. In this embodiment, when the user makes a choice, e.g., depresses key two to indicate choice two, the choice is transmitted to the server which in turn accesses the URL associated with choice two. If this URL addresses another application, the server executes that application. Thus, in this embodiment, the server retains state information concerning each interaction with a client module. In view of this disclosure, those skilled in the art can implement the principles of this invention utilizing a server that retains state information when such a client/server combination is advantageous.

Returning to the present embodiment, when the TIL deck is received, client module 702 leaves response received check process 806 and transfers to process first card 808. However, if TCP is used instead of UDP, client module 702 upon leaving check 806 would close the virtual TCP connection in transmission completed process 807. Upon closing the virtual TCP connection, processing would transfer to process first card 808. Again, transmission complete process 807 is enclosed within a dashed line box to indicate that process 807 is used only with TCP.

In process first card 808, client module 702 parses the TIL deck and interprets the first card. Processing transfers from process first card 808 to generate display process 809.

In generate display process 809, client module 702 passes the data to be displayed in the first card to display module 712. Display module 712, in response to the data, drives the text and images in the data on display screen 705. Generate display process 809 transfers processing to key press check 820 through node 813. In Figures 8A to 8D, any circular node with the same alphanumeric character and reference numeral is the same node. The circular nodes are used to establish connections between the various processes in the method of Figures 8A to 8D without cluttering the figures with a number of connection lines.

Client module 702 waits in key press check 820 for the user to press a key on keypad 715 of cellular telephone 700. In this embodiment, cellular telephone 700 is assumed to have the capability to support two soft keys, a scroll-up key, a scroll-down key, a previous key, a next key, and keys zero to 9 that are configured in the standard telephone keypad configuration. In view of the following disclosure, if one or more of these keys are not present, one of skill in the art can alter the method for the particular configuration of the cellular telephone keypad, or other two-way data communication device keypad. For example, if the cellular telephone included a home key, the key press processing described more completely below would include a check that detected when the home key was pressed and would in turn transfer to get home URL process 801.

Briefly, the processes in Figures 8B to 8C, identify the key pressed by the user, identify the action required, and then transfer to a process that implements the action required. Specifically, when a key on the keypad is pressed, keypad module 711 stores an identifier for the key in work memory 716 and notifies client module 702 of the key press. Upon receipt of the notification from keypad module 711, client module 702 reads the storage location in work memory 716 to determine the key pressed and transfers processing from key press check 820 to scroll key check 821.

In scroll key check 821, client module 702 determines whether the user pressed either of the scroll keys. If a scroll key was pressed, processing transfers to adjust display process 822 and otherwise to display card check 823.

In adjust display process 822, client module 702 determines which of the scroll-up or scroll-down keys was pressed. Client module 702 then sends information to display module 712 so that the current display is either scrolled-up one line or scrolled-down one line. If the scroll key would move the display beyond a boundary of the current card, the scroll key press is ignored in adjust display process 822.

In response to the information from client module 702, display module 712 adjusts the screen display on display screen 705. Client module 702 transfers processing from adjust display process 822 to key press check 820 through node 813.

If a scroll key was not pressed, processing is passed through scroll key check 821 to display card check 823. Client module 702 takes action that depends on the particular type of card that is currently being displayed on display screen 705. If the current card is a display card, client module 702 passes through display card check 823 to soft key check 828, and otherwise transfers to choice card check 824.

Assuming for the moment that the current card is not a display card, choice card check 824 determines whether the current card is a choice card. If the current card is a choice card, client module 702 passes through choice card check

824 to choice key check 826, and otherwise transfers to data key check 826.

Assuming for the moment that the current card is neither a display card nor a choice card, the current card must be an entry card, because in this embodiment only three card types are defined. Thus, client module 702 does not check for an entry card. Rather, data key check 826 determines whether a valid data key was pressed. In this embodiment, the data keys are keys zero to nine on the key pad, and the # key. In other embodiments, other combinations of keys could be defined as data keys. If the pressed key was one of the data keys, data key check 826 transfers to process data entry 827 and otherwise transfers to soft key check 828.

In process data entry 827, client module 702 knows whether the predictive text entry process is turned-on, because one of the parameters on the entry card specifies whether to use the predictive text entry process, as described in Appendix I, which is incorporated herein by reference in its entirety.

If the predictive text entry process is not turned-on, client module 702 in process data entry 827 enters the pressed key value in a text entry buffer in work memory 716 at the appropriate location. Also, client module 702 sends information to display module 712 so the value of the pressed key is displayed in the appropriate location on display screen 705 by display module 712.

If the predictive text entry process is turned-on, client module 702 uses the novel predictive text entry process in process data entry 827, as described more completely below with respect to Figures 9, 10A to 10T, and 11, to determine the letter to select from the set of letters associated with the pressed key. After the predictive text entry process determines the appropriate letter, a value representing the letter is stored at the appropriate location in the text buffer in work memory 716. Also, client module 702 sends information to display module 712 so that the letter is displayed in the appropriate location on display screen 705. Upon completion of process data entry 827, client module 702 transfers processing through node 813 to key press check 820.

The previous description assumed that the current card was an entry card, but if the current card is a choice card, choice card check 824 transferred to choice key check 826. In generate display process 804 for the choice card, each of the choices are labeled according to information on the choice card and some or all of the choices are displayed on display screen 705. Thus, choice key check 826 determines whether the pressed key corresponds to one of the choices. If the pressed key is one of the choices, client module 702, in one embodiment, sends information to display module 712 to indicate the selected choice. Client module 702 also transfers from choice key check 826 through node 831 to store identifier process 850 (Fig. 8D), that is described more completely below. Conversely, if the pressed key is not one of the choices, choice key check 826 transfers to soft key check 828.

Soft keys can be specified both for a deck as a whole and per card, i.e., a physical key on the keypad is specified as a soft key as described more completely in Appendix I. Each soft key specification includes an identifier that defines the action to be taken when the soft key is pressed.

When a soft key is specified for a deck, the soft key remains in effect for the entire deck. However, when a soft key is specified for a card, the card soft key specification temporarily overrides the corresponding deck soft key specification, i.e., the deck soft key specification for the same physical key as the card soft key specification, while the card is visible, i.e., displayed on display screen 705. This override is done independently for the two soft keys. Thus, soft key check 828 transfers processing to first soft key check 829 if the key pressed is one of the two possible physical soft keys. Conversely, soft key check 828 transfers processing to next key check 840 (Fig. 8C), if neither of the two possible physical soft keys is pressed by the user.

In first soft key check 829, client module 702 determines whether the pressed key corresponds to the first soft key. If the pressed key is the first soft key, check 829 passes the active identifier for the first soft key to store identifier process 850 through node 831. Conversely, if the pressed key is not the first soft key, processing transfers from check 829 to second soft key check 830.

If the pressed key is the second soft key, check 830 passes the active identifier for the second soft key to store identifier process 850 through node 831. Conversely, if the pressed key is not the second soft key, e.g., a physical key that can be defined as a soft key was pressed but neither the current deck nor the current card defines a soft key for that physical key, processing transfers from check 830 to key press check 820 through node 813.

When pressing transfers to next key check 840, client module 702 determines whether the pressed key was the next key. If the next key was pressed, processing transfers to display card check 841 and otherwise to previous key check 846.

If a display card is the current card, the next key is used to move to another card in a deck, or alternatively to another deck. Thus, display card check 841 transfers processing to last card check 842 when a display card is the current card, and otherwise to entry card check 843.

Last card check 842 determines whether the current card is the last card in the deck. If the current display card is not the last card in the deck, last card check 842 transfers processing to read next card process 845, which in turn reads the next card in the deck and transfers through node 812 to generate display process 809.

If the current display card is the last card in the deck, the deck includes an identifier that specifies the location to transfer to from the last card. This identifier can be a URL to another deck, to a common gateway interface program, or an address for a card within the current deck, for example. Thus, last card check 842 transfers through node 831 to

store identifier process 850 when the current display card is the last card in the deck.

If the current card is not a display card but is an entry card, display card check 841 transfers to entry card check 843. In this embodiment, the next key is the predetermined key used to indicate that all the data for an entry on an entry card has been entered. Thus, if the current card is an entry card, entry card check 843 transfers processing to store data process 844.

Store data process 844 stores the data entered in at an appropriate location in memory that is specified in the current entry card. Typically, the data is combined as an argument with a URL and stored. Upon completion, store data process 844 transfers through node 810 to create HTTP request process 802 (Fig. 8A).

When the next key is pressed, if the current card is neither a display card nor an entry card, the current card is a choice card. However, as indicated above, in this embodiment client module 702 requires that the user make a choice and does not allow use of the next key. Consequently, if the current card is not an entry card, entry card check 843 transfers processing through node 813 to key press check 820.

The previous discussion assumed that the next key was pressed and so next key check 840 transferred processing to display card check 841. However, if the next key was not pressed, next key check 840 transfers processing to previous key check 846. If the previous key was pressed, check 846 transfers to first card check 847 and otherwise returns processing to key press check 820.

First card check 847 determines whether the current card is the first card of a deck. If the current card is not the first card, processing transfers from first card check 847 to read previous card 849, which in turn reads the previous card and transfers to generate display process 809 through node 813. Conversely, if the current card is the first card, processing transfers to home deck check 848.

If the current card is the first card in the home deck, there is not a previous card and so home deck check transfers processing to key press check 820 through node 813 and so the previous key press is ignored. If the current deck is not the home deck, home deck check 848 retrieves the identifier for the previous deck and transfers through node 831 to store identifier process 850.

Store identifier process 850 is reached through node 831 from several different points. The operations in store identifier process 850 are the same irrespective of the particular process that transfers to process 850. In each instance, an identifier is passed to store identifier process 850 and process 850 saves the identifier in working memory 716. The identifier can be, for example, a pointer to another location in the current card, an address of another card in the current deck, a URL to a deck stored in working memory 716, a URL to a TIL deck in TIL decks 760 on computer 743, or perhaps, a URL to a common gateway interface program in CGI programs 761 on computer 743. Thus, process 800 checks the stored identifier to determine the action required.

Specifically, in identifier to current deck check 851, client module 702 determines whether the identifier is to a card in the current deck. If the identifier points to the current deck, check 851 transfers processing to retrieve data process 852 and otherwise to URL to local deck check 853.

In retrieve data process 852, client module 702 retrieves the information stored at the location indicated by the identifier from working memory 716 and processes the information. Retrieve data process 852 transfers through node 812 to generate display 809 (Fig. 8A) that was described above.

URL to local deck check 853 determines whether the identifier is a URL to a deck that is stored in working memory 716, e.g., cached. If the deck is stored locally, check 853 transfers to retrieve local deck 854 which in turn moves the local deck into the storage location for the current deck. Retrieve local deck 854 transfers processing through node 811 to process first card 808 (Fig. 8A), that was described above.

If the identifier is neither to a location in the current deck, nor to a local deck, the identifier is a URL to an object on computer 743. Thus, in this case, check 853 returns processing to create HTTP request 802 through node 810.

Process 800 continues so long as the user continues to enter and process the information provided. In this embodiment, process 800 is terminated, for example, either by the user powering-off cellular telephone 700, selecting a choice or entry card that discontinues operations of client module 702, or remaining inactive for a time longer than a time-out period so that client module 702 shuts itself down.

To further illustrate the operations in process 800, consider the following example which is returned to client module 702 as a TIL deck in response to a HTTP request generated by process 802. For readability, Table 2 presents the deck in PIDL. In this example, all of the choices are for applications on the same server. However, in another embodiment, each URL could address any desired combination of servers.

TABLE 2
EXAMPLE OF PIDL CHOICE DECK

5 (PIDL)
(CHOICE)
(CE URL=http://www.libris.com/airnet/nnn)News
10 (CE URL=http://www.libris.com/airnet/www)Weather
(CE URL=http://www.libris.com/airnet/sss)Sports
(CHOICE)
(PIDL)
15

In process first card 808, client module 702 interprets the information in Table 2 and transfers to generate display process 809. In generate display process 809, client module 702 sends information to display module 712 so that the user is presented with a list of three choices on display screen 705, i.e, a user interface for the choice card is generated:

- 20
1. News
 2. Weather
 3. Sports

25 Generate display process 809 (Fig. 8A) transfers to key press check 820 (Fig. 8B). When the user presses the two key on keypad 715, key press check 820 transfers through check 821 to display card check 823.

Since the current card is a choice card, check 823 transfers processing to choice card check 824, which in turn transfers to choice key check 826. Since the two key was pressed and that key is a choice key, check 826 transfers processing to store identifier process 850 (Fig. 8D). In process 850, client module 702 stores the URL corresponding to two, i.e,

30 URL=http://www.libris.com/airnet/www
in working memory 716.

Since this URL is to an object on computer 743, processing transfers through checks 851 and 853 to create HTTP request process 802, which in turn generates the request. When the HTTP request is transmitted to server 749, as described above with respect to process 804, server 749 in service request process 862 retrieves deck www from TIL decks 760. An example of the deck is given in Table 3. Again for readability, the deck is present herein in PIDL.

TABLE 3
EXAMPLE OF A SECOND PIDL CHOICE DECK

40 (PIDL)
(CHOICE)
(CE URL=http://www.libris.com/airnet/www-1)World
45 (CE URL=http://www.libris.com/airnet/www-2)National
(CE URL=http://www.libris.com/airnet/www-3)State
(CE URL=http://www.libris.com/airnet/www-4)Local
50 (CHOICE)
(PIDL)

55 The deck in Table 3 is transmitted to cellular telephone 700 and stored in memory 716, as described above with respect to process 806. The choice card is processed in process 808 and displayed in process 809. As a result of process 809, the user is presented with a list of choices:

1. World

2. National
3. State
4. Local.

- 5 When the user makes another selection, the same sequence of processes as described above for the first choice card is executed by client module 702, and another URL is stored that points to a program on server 749 that retrieves the desired weather information and generates a deck with that information. This deck is transferred to cellular telephone 700 and displayed.
- As described above, if the current card is an entry card and a key is pressed, client process 702 reaches data key press check 826 (Fig. 8B). If the pressed key is a valid data key, check 826 transfers to process data entry 827.
- 10 In one embodiment, process data entry 827 uses a novel predictive text entry process for text entry. Recall that on a typical telephone keypad, the keys are labeled with both a number and two or three letters. For example, the two key is also labeled abc. This leads to some ambiguity when using the telephone keypad to enter text. Is the user attempting to enter an a, b, or c when the two key is pressed?
- 15 In one prior art method, two keystrokes were required to enter each letter of text. The first keystroke identified the first key and the second key stroke identified the specific letter desired on the first key. For example, to enter the letter s, the user would first press the seven key that is labeled with letters p, r, and s. Next, the user would press the three key to select the letter s. While this method may work well for short sequences that consist of only three or four letters, the method does not work well for English text. For example, if the user has already entered th and then presses the three key that is labeled with letters d, e, and f, almost always the desired next letter is the letter e. Therefore, making the user press the two key is an extra and unnecessary step.
- 20 Client module 702 of this invention utilizes a novel predictive text entry process to reduce the number of key strokes required to enter text using a telephone keypad, or any similar keypad. Using this process, in most cases a single key stroke suffices to enter a single letter.
- 25 While this embodiment of the invention is described in terms of a telephone keypad, the principles of the invention are not limited to only a telephone keypad. In general, the process described more completely below, can be extended to any keypad where a single key is used to enter two or more letters. Further, the process is not limited to only letters, but rather is applicable to any keypad where a single key is used to represent two or more characters. In view of the following disclosure, those skilled in the art can use the principles of the predictive text entry process in a wide variety of applications.
- 30 The system for predictive text entry includes a predictive text entry module 901 that in this embodiment is included in client module 702, keyboard module 711, and a letter frequency table 902 that is loaded into memory 716, when client module 702 is activated. Predictive text entry module 901 is used in process data entry 827 when specified by the current entry card. Predictive text entry module 901 performs routine buffer management processes, that are known to one of skill in the art and so are not described further to avoid detracting from the process.
- 35 Predictive text entry module 901 stores a letter entry for each letter entered in a text buffer 903 in memory 716. In this embodiment, letters Q and Z are assigned to the one key and the zero key is used to enter a space, period, and comma, i.e., the zero key provides punctuation. However, these assignments are illustrative only, and are not intended to limit the invention to this particular embodiment.
- 40 The first letter entered is placed at the left end of the buffer and each additional letter is placed in the left most unused space in buffer 903. Thus, the last letter entered in text buffer 903 is the right most character. Letter frequency table 902, sometimes referred to as a table of predictive letter entries, is a look-up table where each entry in the look-table is addressed by three indices. The first two indices represent the two most recently entered letters in text buffer 903 and the third index represents the key that was pressed. Each predictive letter entry stored in letter frequency table 902 defines which of the letters associated with the pressed key to use given the previous two letters. For example, since the is a commonly occurring string, the entry in table 902 addressed by (t, h, 3) returns e, or more concisely the predictive letter entry 2 is returned to indicate that the second letter of the group of letters d, e, and f associated with the three key is the predicted letter. Of course, letter frequency table 902 could be altered to return more than a single letter.
- 45 In this embodiment, letter frequency table 902 was empirically generated using a collection of e-mail. Appendix II is a computer program listing that was used to generate letter frequency table 902 that is illustrated in Figures 10A to 10T. Briefly, the computer program implements a process that sequentially steps through the data provided and (i) for each possible single letter determines the most likely letter that follows for each key on the keypad; and (ii) for each possible combination of two letters determines the most likely letter that follows for each key on the keypad. In this embodiment, the most likely letter is the letter having the greatest frequency after the single letter. Similarly, the most likely letter is the letter having the greatest frequency after the combination of two letters. If there is a tie in the frequency, the first letter associated with a key is selected. Of course, other measures of likelihood could be used to generate the entries in table 902.
- 50 Thus, in Figures 10A to 10T, the first of the ten columns, i.e., the left most column, is the two letter sequence and

the first row, i.e., the top row is the keys on the key pad used to enter text. A combination of an entry in the first column and a key in the top row is used to select the predicted text entry. Thus, using the example of th, this two key sequence appears in the first column of Figure 100. When the three key is pressed, the letter in the row with th as the first entry and in the column with three as the first entry, i.e., e, is retrieved. Alternatively, if the four key is pressed, letter i is retrieved from the table.

In this embodiment, table 902 is a buffer of two bit numbers. Each two bit number has a value in the range of zero to three, and the two bit number represents a predicted letter for the pressed key. Thus, for a two key labeled with letters A, B and C, a zero represents A; a one represents B; and a two represents C. In general, the number of bits used is determined by the key that represents the maximum number of characters. In this embodiment, the maximum number of characters represented by a key is three. The number of storage bits required is an integer S where S is the smallest number such that 2^S is greater than or equal to the maximum number of characters represented by a key.

In this embodiment, three indices i0, i1, and i2 are used generate a table index that in turn is used to access a particular predictive letter entry in table 902 of two bit numbers. Each letter is represented as a number, i.e., a letter entry, with letter A being zero, letter B being a one, letter C being a two, and so forth with letter Z being twenty-five. A space element is assigned a space element value of twenty-six. Thus, in this embodiment, there are twenty-seven possible characters.

Upon the initial entry to process 1100 (Fig. 11), letter indices i0, i1, and i2 were set to twenty-six in the initial processing of the entry card to indicate that the text buffer is empty. Also, as explained more completely below, as each letter of text is entered, letter indices i0 and i1 are updated and stored in memory 716.

However, in another embodiment, an initialize indices process is the first operation in predictive text entry process 1100. In this embodiment, for the first letter entered, letter indices i0 and i1 are set to twenty six; for the second letter entered, letter index i0 is set to twenty six and letter index i1 is set to the value of the letter in text buffer 903; and for all letters entered after the first two, the value associated with next to the last letter in text buffer 903 is assigned to letter index i0 and the value associated with the last letter in text buffer 903 is assigned to letter index i1.

Punctuation key check 1101 determines whether the zero key was pressed, i.e., the key selected to represent punctuation.

If the zero key was pressed, processing transfers from check 1101 to process punctuation entry 1102. Process punctuation entry 1102 sets index i2 to twenty-six, and sends the space element value to display letter process 1108. Display letter process 1108 transfers the space element value to display module 712 which in turn drives a space in the text entry on display screen 705. This completes the operation of process data entry for a zero key press and so processing returns to key press check 820.

If the zero key was not pressed, processing transfers through punctuation key check 1101 in data entry process 1100 to key one-to-nine check 1103, i.e., to a data entry key check. If the pressed key was any one of keys one to nine, check 1103 transfers to set letter index process 1104 and otherwise to rotate last entry process 1109.

In set letter index process 1104, one is subtracted from the numeric value of the pressed key and the resulting value is assigned to index i2. Set index process 1104 transfers to generate table index process 1105.

Generate table index process 1105 combines indices i0, i1 and i2 to create a table index. In this embodiment, table index TABLE_INDEX is defined as:

$$\text{TABLE_INDEX} = (((i0 * 27) + i1) * 9) + i2$$

Upon completion of generate table index process 1105, generate text entry process 1106, retrieves the two bit value in the table at the location pointed to by table index TABLE_INDEX and converts the two bit value to a letter represented by the two bit value.

Generate text entry process 1106 transfers to update index process 1107, which in turn stores the value of letter index i1 as letter index i0; stores the value of the retrieved letter in letter index i1; and stores the predicted letter in text buffer 903. While this step assumes that letter indices i0, and i1 are stored and accessed each time in process 827, alternatively, the last two letters in text buffer 903 can be retrieved and assigned to indices i0 and i1, respectively, as described above.

Update index process 1107 transfers to display letter process 1108. Display letter process 1108 sends information to display module 712 which in turn generates the predicted letter on display screen 705.

If the pressed key is not one of keys one to nine, i.e., is not a data entry key, processing transfers from check 1103 to rotate last entry 1109. Recall that data key check 826 determined whether the pressed key was one of the zero to nine keys, or the # key. Thus, since checks 1101 and 1103 determined that keys zero to nine were not pressed, the only key press remaining is the # key, i.e., the rotate entry key, which indicates the user wants a letter different than the one entered last in text buffer 903. In rotate last entry 1109, the last character, i.e., the right most character, in text buffer 903 is replaced by the next character in the set of characters assigned to the last key pressed before the # key was pressed. Again, the use of the # key is illustrative only and is not intended to limit the invention to the use of that particular key to rotate an entry.

For example, if the last character in the text buffer 903 was a t and the # key is pressed, process 1109 changes the t to u. If the # key is pressed again, the u is changed to a v. Alternatively, if the last character in text buffer 903 was a u

and the # key is pressed, process 1109 changes the u to a v. If the last character in text buffer 903 was a v and the # key is pressed, process 1109 changes the v to a t. If index i1 is stored, as the last character in text buffer 903 is rotated, index i1 is updated.

Text entry in cellular telephone 700 in different languages or contexts can be supported by using different letter frequency tables. For example, for plumbers, the prediction table can be based on text about plumbing procedures. For Frenchmen, the prediction table can be based on French text. Also, multiple letter frequency tables could be stored in cellular telephone 700, or selectively transmitted to cellular telephone 700, and a particular letter frequency table would be selected on an entry card.

In addition, an entry in the table can be more than a single letter, and thus save even more key strokes. For example, if the text buffer contains sche then typing a 3 could return dule rather than just d. Further, this novel method of text entry can be utilized with other than a cellular telephone. The method is applicable to any device that has several characters assigned to a single key on a keypad.

In the above embodiment, the English alphabet and a space element were used as the character set. Thus, the number 27 used in defining the table index is just the number N of characters in the set. Similarly, the number 9 used in defining the table index is just the number M of keys in the keypad that represent two or more different characters. Hence, predictive text entry method of this invention is not limited to text and is directly applicable to any keypad where each key represents a plurality of different characters.

In the embodiment of Figures 7, 8, and 9, client module 702 and server module 749 communicate over CDPD network 710. However, this architecture is illustrative only of the principles of the invention and is not intended to limit the invention to the particular architecture described. Client module 702 and server module 749 can use a wide variety of two-way data communication links to exchange resource locators, e.g., URLs, and TIL decks. For example, the communications link could be a switched voice circuit in which the client module and server module communicate using modems. Alternatively, the communications link could be any other packet switched network, so long as there is some way for client module 702 to get requests to server module 749 and for server module 749 to send data back to client module 702. Further, a special purpose server could be used in place of HTTP server 749. For example, the principles of this invention can be used over various data transport mechanisms including circuit switched data and packet switched data. These data transport mechanisms are being defined and implemented for most of the cellular network standards including GSM, TDMA, and CDMA.

In the configuration of airnet network 750 (Fig. 7), client module 702 communicated directly with a server computer 743. In another embodiment, as illustrated in Figure 5, the two-way data communication device first communicates with an airnet network translator 500 that in turn communicates with the appropriate server. In this embodiment, the operation of two-way data communication devices 100, 101, and 102 is similar to that described above for cellular telephone 700, except the method field in the request generated in process 802 has a different form. For example, using the same information as before, the method field in this embodiment is:

GET <http://www.libris.com/airnet/home.cgi?&cost=1> ANT/1.0.

The method field includes the full address of the server, the expected cost of the service, and the version of the protocol used for communicating with airnet network translator 500. The two-way data communication device transmits the HTTP request including the complete URL to airnet network translator 500.

Figure 12 is a more detailed block diagram that illustrates the structures in one embodiment of airnet network translator 500, according to the principles of this invention. In this embodiment, airnet network translator 500 is a computer running under the UNIX operating system with an interface to CDPD network 710. Such computers are well known to those skilled in the art. Thus, herein only the structures and processes that must be added to such a computer are described.

Airnet network translator 500 supports internet protocol (IP) connections over CDPD network 710 and with each computer network with which translator 500 can interact. In this embodiment, each of the modules in network translator 500 are processes that are executed by the processor in the computer. Control module 1201 is a daemon that listens for transmissions over an IP connection from CDPD network 710. When control module 1201 accepts a transmission, control module 1201 spawns an ANT request processor 1204, which in this embodiment is a process, as indicated above. While in Figure 12, only one ANT request processor 1204 is shown, there is an ANT request processor spawned for each transmission that control module 1201 accepts and the ANT request processor remains active until the communication is terminated.

Figure 13 is a process flow diagram that illustrates the operation of ANT request processor 1204. This process flow diagram considers transmissions that utilize both TCP/IP and UDP/IP. However, the processes that are specific only to TCP/IP are enclosed in dashed-line boxes. Upon being spawned for a TCP/IP, in establish connection process 1300, ANT request processor 1204 establishes a TCP connection using a TCP module in the server with the client module over CDPD network 710. After the connection is established processing transfers from process 1300 to request received check 1301.

If UDP is being used, upon being spawned ANT request processor 1204 initiates processing in request received check 1301. In check 1301, ANT request processor 1204 determines whether the request from cellular telephone 700

(Fig. 12) has been received and stored in memory 1210. Memory 1210 represents both RAM and non-volatile memory in this embodiment. When the request has been received and stored, processing transfers from check 1301 to retrieve data process 1302.

In retrieve data process 1302, ANT request processor 1204 retrieves information concerning the source of the URL, i.e., client module 702 of cellular telephone 700 from customer database 1213, and the destination specified in the URL, i.e., the designated server, from server database 1212. Both databases 1212 and 1213 are stored in memory 1210. A customer record in database 1213 includes, for example, a carrier address, e.g., an IP number, an airnet network translator account number, billing information, and server subscriptions. A server record in database 1212 includes a server IP address, name, category, and class of service. Class of service refers to the pricing of the service, e.g., basic services, premium services, or pay-per-view services. Other pricing schemes can be supported in other implementations. When the information is retrieved for the server and service specified in the URL, and for the customer, processing transfers to valid request check 1303.

In valid request check 1303, ANT request processor 1204 determines, for example, whether client module 702, i.e., the customer, is authorized to access airnet network translator 500; whether client module 702 is authorized to access the server specified in the URL; whether the specified server is available through translator 500; and whether the specified server supports the requested service. Thus, valid request check 1303, validates the client, the server, and the client/server pair. Also, since an estimated cost is included in the request, the status and credit limits on the customer's account could be checked to determine whether the estimated cost is acceptable. If all of the checks are true, processing transfers to create HTTP request process 1306. Conversely, if any one of the checks is untrue, valid request check 1303 passes information concerning the error to return error process 1304.

Return error process 1304 launches a CGI program stored in memory 1210 based on the information received and passes appropriate information to the CGI program. The CGI program builds an appropriate PIDL deck describing the error and converts the PIDL deck to a TIL deck, as described above. When the TIL deck describing the error is complete, return error process 1304 transfers processing to log transaction process 1315 that is described more completely below.

If all the checks in valid request check 1303 are true, create HTTP request 1306 converts the request in memory 1211 to a request specific to the server specified, which in this embodiment is a HTTP request. For example, for the above request, create HTTP request process 1306 generates a method field, such as

```
GET /airnet/home.cgi?&client=xyz&cost=1 HTTP/1.0
```

In this embodiment, the method field includes the same information as in the embodiment described above, and in addition, the method field includes a client identification and the estimated cost.

After create HTTP request process 1306 is complete, ANT request processor 1204 accesses TCP module 1203 in establish server connection process 1307 for TCP/IP and transfers to secure transmission check 1308 for UDP/IP. In establish connection process 1307, a connection is made between the server designated in the client request and the TCP interface module (not shown) so that data can be transmitted between airnet network translator 500 and the server. When the TCP connection to the server is established, ANT request processor 1204 transfers processing from establish server connection process 1307 to secure transmission check 1308.

In secure transmission check 1308, ANT request processor 1204 determines whether the HTTP request from the client requested a server that utilizes a protocol that supports encryption. If such a server was requested, processing transfers to negotiate process 1309 and otherwise to transmit request process 1310.

In negotiate process 1309, ANT request processor 1204 negotiates an encryption technique with the server. Upon completion of the negotiation, processing transfers from process 1309 to encryption process 1311. In encryption process 1311, the HTTP request is encrypted using the negotiated encryption technique, and then processing transfers to transmit request process 1310.

In transmit request process 1310, the HTTP request is sent from memory 1210 to the HTTP server. When the transmission is complete, ANT request processor 1204 goes to result received check 1312.

As described above, upon receipt of the request, the HTTP server services the request. Upon completion of servicing the request, the HTTP server returns either a PIDL deck or a TIL deck to airnet network translator 500. The deck is stored in memory 1210. If the server does not convert the PIDL deck to a TIL deck, the translation is done by airnet network translator 500.

When the deck is received and stored, ANT request processor 1204 transitions from check 1312 to transmission completed process 1313 for TCP/IP and to secure transmission check 1314 for UDP/IP. ANT request processor 1204 closes the TCP circuit with the server in transmission completed process 1313. Upon closing the server TCP connection, processing transfers to secure transmission check 1314.

If the server utilized encryption, the deck stored in memory 1210 is encrypted. Thus, secure transmission check 1314 transfers processing to decryption process 1316 if encryption was used and otherwise to log transaction 1315.

In decryption process 1316, the encrypted deck is decoded and stored in memory 1210. Also, after the decoding, if the deck must be converted to a TIL deck, the translation is performed. Decryption process 1316 transfer to log transaction process 1315.

In log transaction process 1315, ANT request processor 1204 writes a description of the transaction to transaction log 1211 in memory 1210. In this embodiment, each transaction record includes a customer identification, a server identification, time required for the transaction, cost of the transaction, and a completion code. In one embodiment, for security purposes, each cellular telephone is assigned to only one customer and only one account.

5 After the transaction is logged, processing transfers to transmit result 1317. In transmit result 1317, ANT request processor 1204 returns the deck to client 702. After the deck is transmitted, ANT request processor 1204 is terminated.

In one embodiment, if an ainet network translator is fully loaded and another transmission comes in, the translator returns the address of another ainet network translator and refuses the transmission. The cellular telephone transmits the message to the other ainet network translator. In yet another embodiment, all incoming transmissions are directed to a router. A plurality of ainet network translators are connected to the router. The router monitors the status of each translator. Each incoming transmission is routed to the least busy translator, which in turn responds to the transmission and performs the necessary operations for continuing communications with the client module.

10 In the above description of client module 702, module 702 interacted with components within the cellular telephone to perform the various operations specified by the user. To insulate client module 702 from the exigencies of various cellular telephones to the extent possible, a general architecture for client module 702 is described more completely below. This general architecture is designed to have specific manager modules that interact with the modules described above within the cellular telephone and to provide standard information to the remaining manager modules within client module 702. The manager modules with client module 702 form an interpreter that interprets TIL decks to generate a user interface; interprets data input by the user; and interprets the TIL decks so that the data input by the user is combined with an appropriate resource locator and either a message is sent to an appropriate server, or another local TIL deck is interpreted by client module 702. While this embodiment is for a cellular telephone, the manager modules are generic and so are applicable to any client module in a two-way data communication device.

This approach limits the modifications that must be made to client module 702 to implement the principles of this invention in a wide variety of two-way data communication devices over a wide variety of two-way data communication networks. Also, in the above embodiment, client module 702 supported communications and interactions over the cellular telephone network. However, client module 702 can also support local services on cellular telephone 700. Typical local services includes local messages, an address book, and preconfigured e-mail replies, or any combination of such services.

In this embodiment, client module 702 includes a plurality of manager modules including a navigation manager module 1401, a network manager module 1402, a TIL manager module 1403, an archive manager module 1404, a local manager module 1405, an event manager module 1406, a timer manager module 1407, a user interface manager module 1408, a memory manager module 1409, and a device dependent module 1410.

Navigation manager module 1401 handles card and deck navigation as well as managing any caches. Navigation manager module 1401 owns and manages a history list and as well as a pushed card list. In addition, navigation manager module 1401 functions as the main line of client module 702; does all event distribution; and supports local services.

40 For local services, like local message store, there are two basic approaches that can be used. First, local services are implemented in a CGI-like manner. Each local service has an entry point which is called with an argument list. A TIL deck is returned via the event manager. From that point on, the TIL deck is processed in the standard manner. This approach limits local services to the same constraints as remote services. A less restrictive approach is to allow the local service to field events instead of the standard event loop. The local service would construct TIL cards on-the-fly and feed them to user interface manager 1406. Note that the local service would need to cooperate with the standard event loop with regard to the history, the pushed card list, and any other state that is normally managed by the event loop. Table 4 is a listing of processes for the architecture for navigation manager module 1401.

TABLE 4
ARCHITECTURE FOR NAVIGATION MANAGER MODULE 1401

```

5
ProcessEvents (void);
PushLocation (void * location, Boolean forStack);
10 void * PopLocation (Boolean forStack);
void * CurrentLocation();
struct LOCAL_SERVICE {
15     char name[50];
     FUNC HandleEvent (Event * pevent);
     FUNC StartLocalService (void);
     FUNC StopLocalService (void);
20 };
static LOCAL_SERVICE localServices[]={ ... };
STATUS HandleEvent (Event * pevent);
25 STATUS StartLocalService ();
STATUS StopLocalService ();

```

30 Routine ProcessEvents is the main entry point for event processing in client module 702. Typical events include key presses on the keypad, choice selection for a choice card, text entry for an entry card, network events, and history events. Routine ProcessEvents can be called at any time to process an event or events. Routine ProcessEvents does not return until all events on a queue generated by event manager module 1406 are processed. If a local service is running, events are distributed to the local service before being processed by routine ProcessEvents.

35 The remaining routines in Table 4 are called internally to navigation manager module 1401 and by local services. Routine PushLocation pushes a location on the history list and issues a request for that location. The forStack flag indicates a stack push of local cards.

Routine *PopLocation pops a location on the history stack and issues a request for the top location of the history stack. In routine *PopLocation the forStack flag indicates that all cards since the last stack push should be popped.

40 Routine *CurrentLocation returns the current location the current URL being displayed.

As shown in Table 4, each local service provides a number of functions: If a local service is running, function HandleEvent, the local service's event handler, is called before any processing by navigation manager module 1401: If the event is handled by the local service, the event is not processed any further.

45 Function StartLocalService is the local services start function. Function StartLocalService is called before any events are distributed to the local function. Similarly, function StopLocalService is the stop function for the particular local service. Function StopLocalService is called when no more events are distributed to the local service.

50 Network manager module 1402 insulates the rest of client module 702 from the specific networking protocol used over the cellular telephone network. Network manager module 1402 delivers requests to the server specified in the URL via the cellular telephone network interface; segments responses from the server for lower latency; delivers responses from local services to navigation module 1401 via event module 1406; handles request/response cycle (e.g. cancellation, retry strategy) with the server over the cellular telephone network; can receive asynchronous messages from the server; performs memory management of TIL decks; performs caching of TIL decks; handles all negotiations concerning protocols and server scaling with the server; handles any encryption for information exchanged between cellular telephone 700 and the server.

55 In some cellular telephone, the maximum message size is fixed. However, for UDP and TCP messages, a more direct interface is used that bypasses this limitation of message passing. It is important to avoid copying network data from memory buffer to memory buffer as such copying increases the memory "high water mark" as well as decreases performance. Since different cellular telephones have different interfaces for delivering network data, network manager module 1402 manages the network data. In this way, network data is only copied from the network buffer for long-term

storage.

When a message or reply arrives, network manager module 1402 uses event manager module 1406 to report that fact. However, access to the data by other manager modules in client module 702 is through a protocol that allows storage of data in a variety of fashions on different telephones. Any transparent, short-term caching of TIL data is handled by network manager module 1402. Table 5 is one architecture for network manager module 1402.

TABLE 5
SPECIFICATION FOR NETWORK MANAGER MODULE 1402

```

10 typedef short TID;
void NM_Init(void);
void NM_Terminate(void);
15 TID NM_SendRequest (void *requestData, int length, Boolean ignoreCache);
NM_CancelRequest (TID TRANSACTIONId);
NM_DataType(TID TRANSACTIONId);
20 NM_GetData(TID TRANSACTIONId, void *data, int *length, Boolean *complete);
void *NM_HoldData (TID TRANSACTIONId);
NM_ReleaseData(TID TRANSACTIONId);
TID NM_StartData(int data Type, char *requestData, int length);
25 STATUS NM_EndData(TID TRANSACTIONId);
STATUS NM_SetDataLength (TID TRANSACTIONId, int length);
STATUS NM_GrowDataLength (TID TRANSACTIONId, int grow);
30 int NM_GetDataLength(TID TRANSACTIONId);
void *NM_GetDataPointer (TID TRANSACTIONId);
STATUS NM_DeliverData (TID TRANSACTIONId);

```

35 Network manager module 1402 identifies each network data transaction by a 16-bit transaction identification code TID. Network manager module 1402 increments transaction identification code TID by one for each new transaction. Transaction identification code TID rolls over after 0xffff.

Routine NM_Init initializes network manager module 1402 and so is called before any other calls in network manager module 1402. Routine NM_Terminate closes processing of network manager module 1402 and so is called after all other calls in network manager module 1402.

40 Network manager module 1402 uses routine TID NM_SendRequest as the standard process of sending a request to the server. Pointer *requestData in the call to routine TID MN_SendRequest is defined by the server protocol. Similarly, the state, e.g., the Boolean value, of variable ignoreCache is used to indicate whether any cached replies should be ignored. After sending the request, this routine returns a server transaction identification code TRANSACTIONId. A local service can also send a request to the server.

When the user instructs client module 702 to cancel a request, network manager module 1402 calls a routine NM_CancelRequest with cellular telephone transaction identification code TID and server transaction identification code TRANSACTIONId. Routine NM_CancelRequest issues a command to the server to cancel the specified request.

50 When data are received from the network, the data can be either a response to a request sent by routine TID MN_SendRequest, or by a local service. Thus, in response to receiving data from the server, network manager module 1402 generates an event that includes server transaction identification code TRANSACTIONId and the type of data DATAType. For replies to requests sent by routine TID MN_SendRequest, server transaction identification code TRANSACTIONId is the same as the one returned by the matching call to routine TID MN_SendRequest and data type DATAType indicates that the data is a response. For local service originated messages, server transaction ID is new, and data type DATAType depends on whether the data is an e-mail, pushed TIL, or another type.

55 After the network event is received by event manager module 1406, and navigation manager module 1401 distributes control of the event to network manager module 1402, network manager module 1402 uses the server transaction identification code TRANSACTIONId and the remaining routines in Table 5 to process the data.

Routine NM_DataType is used to return the particular data type dataTYPE, e.g. reply, MIME; server push; etc. Routine NM_GetData sets a pointer to the data identified by server transaction identification code TRANSACTIONId, retrieves the length of the data, and determines whether all the data has been received. The interface provided by this routine allows the first part of a data stream, e.g. the first card of a TIL deck, to be processed by client module 702 before the rest of the deck is received.

Routine NM_HoldData is called before calling routine NM_GetData to hold the data and thus insure that the data remains valid during processing by client module 702. If the data is not held, the data can be deleted or moved with the internal buffers of network manager module 1402. If the data is held, routine NM_ReleaseData is called after network data has been processed to release the data.

Routines TID NM_StartData, NM_EndData, NM_SetDataLength, NM_GrowDataLength, NM_GetDataLength, NM_GetDataPointer, and NM_DeliverData are used internally by network manager module 1402, and by local services to deliver data. By allowing local services to use these routines, the same buffers can be used to store both network and locally generated data thereby reducing the amount of memory required to support client module 702.

Routine TID NM_StartData creates a new data transaction and triggers a data delivery event. Routine NM_EndData is called when all data for the given server transaction identification code TRANSACTIONId has been transmitted. Routine NM_SetDataLength sets the data segment to a given length and may cause the location of the data to change. Routine NM_GrowDataLength grows the data segment by a given length and also may cause the location of the data to change. Routine NM_GetDataLength returns the length of the data segment. Routine NM_GetDataPointer returns a pointer to the data. This routine is preferably called before writing into the data buffer. Also, this routine is preferably called whenever the data's location may have changed. Routine NM_DeliverData can be called when at least one card has been stored to reduce latency while the other cards are being generated.

TIL manager module 1403 insulates the rest of client module 702 from changes to the TIL specification. The interface provided by TIL manager module 1403 has the following characteristics: removes the need for parsing by the rest of client module 702; uses cursors to avoid generating data structures on-the-fly; does not need an entire deck to operate; and handles TIL versioning.

Each TIL deck contains a major and a minor version number. The minor version number is incremented when TIL changes in a way that does not break existing TIL manager modules. The major version number is incremented for non-compatible versions of TIL.

Each TIL deck has the same hierarchy. One embodiment of this hierarchy is presented in Table 6. In Table 6, indentation is used to represent the relationships of the various hierarchical levels.

TABLE 6
TIL DECK HIERARCHY

35	deck
	options
	softkeys
40	options
	card
	options
	softkeys
45	options
	formatted text
	formatted lines
50	entries
	options
	formatted line

55 The interface presented in Table 7 for TIL manager module 1403 is designed with the assumption that TIL is a direct tokenization of PIDL as described in Appendix I. However, the interface does not have any dependencies on that tokenization and can support other PIDL encoding techniques. Given the above assumption, the opaque pointers described below are actual pointers into the TIL deck itself. A rudimentary object typing scheme based on where in the deck the

opaque pointer points can be used to implement the generic functions described below. If this object typing is not feasible due to details of TIL encoding, the generic functions can be replaced with specific functions.

5

TABLE 7

ARCHITECTURE FOR TIL MANAGER MODULE 1403

typedef char *opaque;

10

typedef opaque Deck;

typedef opaque Card;

typedef opaque Text;

15

20

25

30

35

40

45

50

55

```

typedef opaque Entry;
typedef opaque Option;
5 typedef opaque SoftKey;
typedef opaque Object;

10 /* Generic functions */
    FirstOption(Object obj, Option *o);
        /* obj is a card, softkey, entry, or deck */
    GetSoftkey(Object obj, Option *o);
15        /* obj is a card or deck */
    GetText(Object obj, Option *o);
        /* obj is a card or entry */

20 /* Deck functions */
    SetDeck(Deck d, int length);
        /* tells module which deck to use */
25 DeckGetCard(Card *c, int num);
-or-
    DeckGetCard(Deck d, Card *c, int num);

30 /* Card functions */
    int CardType(Card c);
    CardFirstEntry(Card c, Entry *e);
35 CardLookupSoftkey(Card c, int num, Softkey *s);
    CardIsLast(Card c);

40 /* Option cursor functions */
    OptionNext(Option *o);
    char *OptionKey(Option o);
45 char *OptionValue(Option o)

/* Entry cursor functions */
/* Text (and image) cursor functions */
50 TextNextToken(Text *t, int *type, int *subtype,
                int *length, char *data);

```

55

Archive manager module 1404 stores and retrieves long-lived information. This information includes: data related to the server's location and/or required to support server scaling; data related to encryption; TIL caching (transparent to user); TIL storage (specified by user); and message storage and retrieval (see local manager module). Archive man-

ager module 1404 should support a variety of nonvolatile memory schemes that are provided by the two-way data communication devices.

Local manager module 1405 is an interface to local device resources, such as local messages, address book entries, and preconfigured e-mail replies. Local manager module 1405 should also define an abstract interface to navigation manager module 1401 for use by archive manager module 1404.

Table 8 is an architecture for an interface within local manager module 1405 to access to an address book stored on cellular telephone 700. The name of a routine in Table 8 is descriptive of the operations performed by the routine.

TABLE 8

ARCHITECTURE FOR ADDRESS BOOK ACCESS

```

int NumAddresses();
char *AddressName(int num);
char *AddressGetEMail(int num);
    // returns e-mail address
char *AddressGetPhone(int num);
    // returns phone number
char * AddressGetFax(int num);
    // returns fax number
SetAddress(int num, char *name, char *email,
           char *phone, char *fax);
DeleteAddress(int num);
InsertAddress(int before);

```

Table 9 is an architecture for an interface within local manager module 1405 to access predetermined replies stored on cellular telephone 700. The name of a routine in Table 9 is descriptive of the operations performed by the routine.

TABLE 9

ARCHITECTURE FOR PRE-
DETERMINED REPLY
ACCESS

```

int NumReplies();
char * GetReply(int num);
DeleteReply(int num);
SetReply(int num, char *text);
InsertReply(int before);

```

Table 10 is an architecture for an interface within local manager module 1405 to access messages stored locally on cellular telephone 700. The name of a routine in Table 10 is descriptive of the operations performed by the routine.

TABLE 10
ARCHITECTURE FOR LOCALLY STORED MESSAGE ACCESS

5

```

int NumMessages ();
void *FirstMessage ();
10 void *NextMessage ();
int MessageType (void *msg);
    // e.g. e-mail, TIL, etc.
15 void *MessageContent (void *msg);
void *SaveMessage (int type, void *content, int
    contentLength);
DeleteMessage (void *msg);
20

```

Event manager module 1406 handles the distribution of events. In this embodiment, events include low-level events like key presses and higher level navigation and user interface events. There are typically only a small number of events at any one time. The main event loop in the two-way data communication device dependent module keeps calling EM_GetNextEvent() until no events are left in the queue. Note that processing one event can cause another event to be pushed onto the queue. The main event loop is not restarted until another event is pushed onto the queue due to a user key press or a network event.

In this embodiment, the event types include:

30

- 1) keypad events, i.e., pressing of a key;
- 2) choice events relating to a current choice card, e.g., the user selecting choice three;
- 3) text entry events relating to a current entry card, e.g., the user keying in "Hello";
- 4) network events, e.g., response arrived, request arrived, transaction terminated, network status; and
- 5) history events, e.g., pop, pop to marker.

35

Table 11 is an architecture for event manager module 1406. As in the other tables herein, the name of a routine in Table 11 is descriptive of the operations performed by the routine and in addition a brief description is given in the comment field.

40

TABLE 11
ARCHITECTURE FOR EVENT MANAGER MODULE 1406

45

```

struct Event {
    int type;
    void *data;
50     /* e.g. keycode, choice num, entry
        text, status code, other data */

```

55


```

    }
    EM_QueueEvent(int type, void * data);
5      /* Adds event at end of queue*/
    EM_GetNextEvent(Event * event);
      /*Pops next event*/
10     EM_PeekNextEvent(Event event);
      /*Peeks at next event*/

```

15 Timer manager module 1407 allows timer events to support timeouts, animation, and other time-domain features. Timeouts are delivered via event manager module 1406.

Table 12 is an architecture for timer manager module 1407. As in the other tables herein, the name of a routine in Table 12 is descriptive of the operations performed by the routine.

20
 TABLE 12
 ARCHITECTURE FOR TIMER MANAGER MODULE 1407

```

25  TimerInit();
    int TimerSet(int milliseconds, int code, void
      *clientData);
      /*Returns a timer identification timerId to
30      be used for cancellations*/
    TimerCancel(int timerId);
    TimerCancelAll()
35

```

40 User interface manager module 1408 handles interactions with the keypad and the display. Each of the three types of user interfaces defined in Table 1 above requires a different version of user interface manager module 1408. For most cellular telephones, only one card at a time is used. However, some cellular telephones can display multiple cards at once and so would require a different version of user interface manager module 1408 from the version that handled display of only one card at a time.

45 In this embodiment, user interface manager module provides a user interface for the three types of cards display, choice, and entry; provides hooks for custom user interfaces for the address list and e-mail reply entry; only cares about the user interface aspects of cards and provides no navigation, argument, or option processing; handles all text and graphic layout including word wrapping; handles scrolling of text; operates from PIDL data structures; generates keyboard events, some of which may be generated by soft keys; and generates high-level events, e.g. next card, choice entry 3, text entry "IBM".

50 Table 13 is an architecture for processing cards by user interface manager module 1408. As in the other tables herein, the name of a routine in Table 13 is descriptive of the operations performed by the routine.

55

TABLE 13
 ARCHITECTURE FOR CARD PROCESSING
 BY UI MANAGER MODULE 1408

5

10

15

20

```

void UI_StartCard(Card c);
    /* called to begin display and processing of
    a given card*/
void UI_EndCard(Card c);
    /*called when a card is no longer to be
    displayed*/
Boolean UI_HandleEvent(Event *pevent) ;
    /*returns true if the event is handled, false
    if not*/

```

Table 14 is an architecture for the user interface implementation by user interface manager module 1408. As in the
 other tables herein, the name of a routine in Table 14 is descriptive of the operations performed by the routine.

TABLE 14
 ARCHITECTURE FOR UI IMPLEMENTATION
 BY UI MANAGER MODULE 1408

30

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```

UI_LayoutCard(Card c, Boolean draw, Proc
                callback)
    /* relies on global data; needs to be able
    to: draw as it goes; and note the
    special function of the currentLine
    (e.g. none, choice, softkey)*/
int numLines, firstVisible, lastVisible,
                currentLine;
char currentEntry[80];
int currentChoice;
void *currentSoftkey;
Card currentCard; and
    ... other info as needed for in-line
    scrolling

```

The callback routine is notified of the special function of each line as the line is laid out. Thus, routine UI_LayoutCard can be used to scroll to a particular choice. If the current line is too wide to display all at once, horizontal scrolling is used to display the complete line, one display width at a time.

Memory manager module 1409 is optional, and is used in two-way data communication devices that do not support dynamic memory allocation. In these devices, all memory allocation and releases must go through memory manager module 1409. Also, by allocating memory in advance via memory manager module 1409, client module 702 does not run out of memory due to some other process on the device using up memory.

5 In one embodiment, the airnet network translator described above was used with an Internet server to communicate with client module. The Internet server was a UNIX computer running the Mosaic HTTP server. The executable code was generated by compiling the source code on a computer running the Sun Microsystems Operating System Solaris 2.4 using Sun Microsystems compiler SunPro C and C#, and the Sun Microsystems SDK make utility. All of these products are available from Sun Microsystems of Mountain View, California.

10 Various embodiments of a novel interactive two-way data communication system, a two-way data communication device, an airnet network architecture, and a predictive text entry system have been described herein. These embodiments are illustrative only of the principles of the invention and are not intended to limit the invention to the specific embodiments described. In view of this disclosure, those skilled in the art will be able to use the principles of this invention in a wide variety of applications to obtain the advantages of this invention, as described above.

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APPENDIX I

A DESCRIPTION OF PIDL AND TIL
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The main structure of PIDL is described by an abstract syntax. This appendix describes the elements of the language and their semantics. In the syntax description of each element, an element is defined in an enhanced BNF.

a ::= b	the element a is defined as b
a ::= b ::= c	the element a is defined as b or c
b c	the element b followed by element c, the intervening space is just for clarity
a b c	element a or element b or element c
{a}	the element a is optional
{a}*	the element a may appear zero or more times in a row
{a}+	the element a may appear one or more times in a row
<u>abc</u>	the characters abc literally
ol(a)	an option list with zero or more topions of the element a, see Options below

In general, the element blank-space can optionally appear between any two other elements. To keep the diagram clear, it has been omitted except where required. Where a blank-space is illegal or treated specially, it is noted.

The PIDL ELEMENTS

5 deck ::= deck-header {softkey}* {card}+ deck-
 footer
 deck-header ::= <PIDL ol(deck-options) >
10 deck-options ::= o-args | o-cost | o-ttl
 deck-footer ::= </PIDL>

15 A deck consists of one or more cards.
 There must be at least one card. A deck
 may also have a number of softkeys
 defined that stay in force for the whole
20 deck. See soft keys below for the
 syntax and full description.

 o-cost ::= cost= value
25 o-ttl ::= ttl= integer

30 Additional arguments to be passed on the
 next deck request are given in o-args.
 See Arguments below for syntax and full
 description.

35 The cost of retrieving this page
 (exclusive of telephone system charges)
 is represented in o-cost. If no o-cost
40 is given, the deck cost is included with
 the user's standard service contract.

45 Decks can be cached by the cellular
 telephone for a period of time. The o-
 ttl entry indicates the number of
 seconds that the deck can be cached from
50 time of reception. If no o-ttl entry is
 given, the deck can only be cached for
 short periods of time, for example, to

55

5 implement a back function similar to
that of most Web browsers. If the value
of o-ttl is zero, the deck must not be
cached.

10 CARD ELEMENTS

card ::= display-card | choice card | entry-
card

15 A card is one of three types of card in
this embodiment. These are described in
the sections below.

20 card-options ::= o-name | o-next | o-prev
o-name ::= name= identifier
o-next ::= next= destination
o-prev ::= prev= destination

25 All cards can have these options. The
optional o-name option gives a name to
the card. If a card has a name, the
card can be referred to by a
30 destination.

35 The o-next and o-prev give destinations
for the NEXT and PREV keys. If omitted,
the defaults are the next and previous
sequential card in the deck. If o-prev
40 is omitted from the first card, the PREV
key returns to the deck last visited.
If o-next is omitted from the last card,
the NEXT key returns to the first card
45 of the current deck. However, this
default behavior is only a fail-safe:
the last card in a deck should always
50 have either an o-next option, or be a
choice card where each choice entry
indicates a new destination.

5 is based on the o-method option. Note
 that this option is a hint only, and can
 be disregarded by the phone. The number
 10 method is the default and indicates that
 the choices are numbered sequentially
 from one and are chosen by pressing the
 appropriate digit on the keypad. If
 15 there are more than nine options, the
 phone may choose some other method of
 selection. The list method indicates
 that the list should be unnumbered and
 that the user should scroll through the
 20 list and hit some designated enter key
 to choose an entry. The alpha method is
 like list, only it is an indication that
 25 the text of the entries should be used
 to aid selection if at all possible. In
 this case, the entries are assumed to be
 30 alphabetically sorted. The group method
 is described in more detail below.

35 The o-key option indicates, if present,
 the key of an argument to be added to
 the argument list. See Arguments below
 for more information. The value of the
 40 argument comes from the choice entry;
 see below. The o-default option
 indicates the default value if the user
 just hit ENTER. See o-default under
 45 Entry Card below for more information.

choice-entry ::= <CE ol(entry-options) >
 formatted-line

50 entry-options ::= action-options | o-value

Each choice has text displayed to the
 user. If the action-options are given,

5 the indicated action is performed if the
 choice is made. If the o-value option
 10 is present, it supplies the value to the
 argument identified with the o-key
 option in the choice header. If no o-
 value is given, the text of the entry is
 used (without any formatting) as the
 15 argument value.

group-entry ::= <GE ol(group-options) >
 group-options ::= label= value

20 If the group method is used, the choices
 are divided into a number of groups.
 Each group is headed by a group-entry,
 25 which, via the label option, gives a
 short name to the group. The phone can
 then give the user a hierarchial
 interface for choosing among a large
 30 number of choices. The text of the
 label should be limited to eight
 characters and may be truncated by the
 35 phone.

ENTRY CARD

entry-card ::= entry-header display-content entry-
 40 footer
 entry-header ::= <ENTRY ol(entry-options) >
 entry-options ::= card-options | o-format | o-key
 | o-default
 45 entry-footer ::= </ENTRY>

50 Entries let the user enter a value. The
 display content is shown to the user,
 followed by an entry line. The user's
 entry is controlled by the format. The
 o-key option indicates the argument that
 55

is being set by this entry. The value of the argument are the user's entry.

o-format ::= format= value { ; format-hint }
 format-hint ::= value

This option specifies the format for user input entries. The string consists of format control characters and static text which is displayed in the input area. Most of the format control characters control what data is expected to be keyed in by the user. They are displayed as blanks until the user types into them.

The format codes are:

- A entry of any alphabetic character
- 9 entry of any numeric character
- X entry of any alphabetic or numeric character
- *f allow entry of any number of characters; the next character, f, is one of A, 9 or X and specifies what kind of characters can be entered.
- \c display the next character, c, in the entry field; allows display of the formatting characters in the entry field.

Format hints indicate what kind of value is expected. If a format hint is not understood, it is ignored. Currently defined format hints are:

5 text text is expected to be
text, use special
input techniques;
generally follows *A
or *X

10 mail-reply like text, but
expected text is for
an e-mail message or
page; may affect input
algorithm

15 address-list entry is a list of
e-mail addresses

20 o-default ::= default= value
The o-default option supplies a value
that is used if the user simply hits
25 NEXT. If no default value is given,
then the user must supply a value.

30 FORMATTED TEXT
formatted-text ::= { { flow-image } { line-format }
text-line } *
formatted-line ::= text-line
35 text-line ::= { text | image | text-format |
alignment-format } *
Formatted text is what is shown to the
40 user in most cards. Formatted lines are
used for choice entries.

45 text-format ::= | <I> | <BL>
::= | <I> | <BL>
The format codes control Bold, Italic
and Blinking. The slash versions cancel
50 the formatting. Unlike HTML, these
needn't be strictly nested and over
application and over cancellation are

55

5 tolerated. Formatted-text and
formatted-line elements start in plain
mode (no bold, italic, or blinking).

alignment-format ::= <CENTER> | <BOLD> | <TAB>

10 The alignment codes specify how parts of
a line are to be laid out. The text
15 following the alignment code is either
centered or right justified on the same
line as the other text. The text or
20 image following the code is considered
to be all text up to the next alignment
code or line break. All lines start
25 implicitly aligned left. Note that
these do not include an implicit line
break so that one can have both left and
right justified text on a single line.
30 If there is too much text and not enough
room on the line then, if in wrap mode,
the non-fitting text is moved to the
next line and aligned the same way. If
35 in line mode, the line may end up
running together with two spaces between
the left, center, and right justified
segments.

40 The tab code is used to create aligned
columns. Rather than tab to specific
character positions, the tab code
45 separates the text for each column. The
width of the column is determined by the
maximal width of the text (or images) in
each line. The extent of the columns is
50 from the first line with tab codes
through the last contiguous line with
tab codes. Some lines may have fewer

55

tab codes than others, in which case they are assumed to have no text for the extra columns.

5

```
line-format ::= <WRAP> | <LINE>
           ::= <BR>
```

10

Multiple lines of text are separated by the
 code. If a line is too long to fit on the screen and, if in wrap mode, the line is word wrapped onto multiple lines. If in line mode, the line is left as one line and is scrolled horizontally. Formatted-text and formatted-line elements start in wrap mode and may be changed with either the <WRAP> or <LINE> codes. These codes are an implicit line break.

15

20

25

IMAGES

30

```
image ::= <IMAGE ol(image-options) >
       ::= <INLINE ol(image-options) >
       inline-data </INLINE>
```

35

```
flow-image ::= <IMAGE ol(flow-image-options) >
           ::= <INLINE ol(flow-image-options) >
           inline-data </INLINE>
```

40

```
image-options ::= o-source
flow-image-options ::= image-options | o-flow
inline-data ::= ASCII85 encoding of image data
```

45

Images are treated as large words and, by default, are simply displayed as part of the text. Flow-Images have a flow option that causes them to be treated differently. The image data is stored in a separate data stream as identified

50

55

by the source option.

5
10
15
Inline images are treated identically, only the data is part of the current data stream. ASCII85 is a standard way of encoding binary data in printable ASCII, whereby each four bytes of data is encoded in five characters. Note that TIL only uses inline images, and uses a different encoding.

`o-source ::= src= location`

20
This option specifies the location of the source for images.

`o-flow ::= flow= { left | right }`

25
30
This option controls the alignment of flow-images. The option specifies that the image is flush left or flush right with the screen. Subsequent lines of text flow in the remaining right or left hand space.

35
SOFTKEYS

`softkey ::= <SOFTKEY ol(softkey-options) >`

40
`softkey-options ::= o-label | o-button | action-options`

45
50
Softkeys supply definitions for two buttons known as SOFT-L and SOFT-R. They do not show up in the normal text and graphics area displayed to the user, but on a separate line for soft key labels. (Note: in some implementations, where screen real estate is scarce, this label line may get used for normal text

55

and graphics display when there are no
softkeys defined on the current card).

When the softkey is pressed, the
indicated action takes place.

```

o-button ::= button= side
         side ::= left | right
o-label  ::= label= value

```

The button option specifies which
physical key the softkey applies to.
The label option is the text that is
displayed on screen for that key. The
phone may truncate the label. It is
suggested that labels be fewer than
eight characters.

Softkeys can be specified both for the
deck as a whole and per card. When
specified for the deck (after the deck-
header, but before the first card) they
remain in effect for the entire deck.
When specified for a card (at the
beginning of the formatted-text for the
card), they temporarily override any
deck softkeys while the card is visible.
Note that the override is done
independently for the two keys (a card
can override one softkey, but not the
other). To override a deck softkey with
no softkey (in effect, to remove a
softkey for the duration of a card) use
a softkey with no label and no action.

SYNTAX: OPTIONS

5 Many of the syntactic elements of PIDL
 10 have option lists associated with them.
 Options refine the operation of the
 elements they are part of. Unless
 15 otherwise noted, options do not nest,
 even when the same option is given in
 two nested elements. Options that are
 not defined for an element are ignored,
 even if valid for an enclosing element.

```

ol(valid-option) ::= { blank-space valid-option }*
                  {blank-spaces }
option-list ::= ol(option)
option ::= key = value
key ::= identifier
value ::= plain-text
         ::= " { text } "
```

25 An option list contains zero or more
 options. Each option is separated by
 30 blank-space (required!) and optionally
 followed by blank-space. In the syntax
 diagrams, option lists are shown as:
 35 ol(valid-option) where valid-option is
 replaced with an element that defines
 the possible options in this context.
 ol is a generic syntactic description of
 40 option-lists.

45 Each option is a key and a value. They
 may be given in any order within the
 list of options. The key is always an
 alpha-numeric name that is case
 insensitive. The value, if it is
 50 composed of only alphanumeric
 characters, may appear directly after
 the equals sign. Otherwise, the value

5 must be quoted. In quotes, blank-space
is treated literally and is considered
part of the value.

10 In the syntax diagrams, the possible
values for various options are specified
without quotes. However, quotes are
always acceptable around an option
value.

15 Unlike almost all other syntactic
elements, blank space is not permitted
between the key and the equals sign or
between the equals sign and the value.

20 Many options have a more restricted set
of possible values than represented by
the above syntax. See the individual
options for details.

30 DESTINATIONS

destination ::= location { ; animation }
 ::= card-loc { ; animation }
 ::= stack-operation { ; animation }

location ::= full-loc | partial-loc
 | relative-loc

40 full-loc ::= : service-id / deck-path
 ::= : service-host / deck-path

45 partial-loc ::= / deck-path
relative-loc { ../ } * deck-path

card-loc ::= # identifier

50 deck-path ::= plain-text { / plain-text } *
service-id ::= % plain-text

service-host ::= plain-text

5

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25

Destinations are used in some options to indicate the next, or previous deck or card to show. A deck is specified either with a full location (service-id and deck-path), just a deck-path (in which case the service is the same as the current deck's service), or a relative deck-path. In the later case, the last component of the current deck-path is removed, (and one additional component for each ../ in the relative deck-path), and the deck-path appended.

A particular card can be a destination and is specified by a card-loc element.

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stack-operation ::= + card-loc
::= -

In addition to the normal history list of where a user has been that is kept by a phone, the phone also keeps a short stack of locations. Using a plus sign form causes the current location (deck and card, and location in the history list, and animation used) to be pushed on the stack before going to the new card. Using the minus sign form causes a return to the location on the top of the stack, and the history list to be pruned back to the saved point. If no animation is given, the inverse animation is used. The stack is popped.

55

animation ::= slideN | slideS

::= slideW | slideE
 ::= slideSW | slideNE
 ::= slideSE | slideNW
 ::= flipV
 ::= flipH
 ::= fade
 ::= none

The optional animation argument indicates what form of screen animation, if available, is to be used when going to the destination. The animation is remembered with the destination in the history and destination stack. If the user moves to a destination via a 'go' or 'next' operation, then the animation is performed. If the user moves to a destination via a 'prev' or 'pop' operation, the reverse animation associated with the current location is performed.

ACTIONS

Choice entries and soft keys can specify actions to be performed when the user selects the choice or softkey.

action-options ::= o-args | o-call
 | o-page
 o-go ::= go= destination
 o-call ::= call= value

The go operation indicates that the destination should be moved.

ARGUMENT PROCESSING

Each time a deck is requested, arguments may be passed along with the request.

5 These arguments may be used by the
 service end to compute a deck specific
 for the user rather than just return a
 pre-written deck.

10 Arguments are built-up as the user
 traverses the deck. Each argument is a
 key-value pair. While arguments
 15 superficially look like options, these
 two entities are quite distinct: Options
 are a part of PIDL and affect the
 operation of the phone. Arguments are
 20 information gathered by the phone and
 returned to the service. Neither PIDL
 nor the phone understands the arguments
 beyond their basic syntactic structure.
 25

30 Arguments come from three places: Choice
 cards, Entry cards, and the args option.
 Each of these specifies a key-value pair
 that is added to a buffer of arguments
 to be sent. In the case of the args
 35 option, multiple arguments may be
 specified. When an argument key-value
 pair is added to the argument buffer, if
 the key is already present in the
 40 buffer, its value is replaced.

45 o-args ::= args= arg-list
 argument-list ::= arg-key-value { { & | ; }
 key-value }*
 arg-key-value ::= arg-key = arg-value
 arg-key ::= identifier
 50 arg-value ::= plain-text

Note: The entire o-args element is
 55

5 actually the value of an option. If it
 has more than one arg-key-value it will
 need to be in quotes. Since the
 ampersand (&) and semi-colon (;) are
 10 used as key-value pair separators, these
 characters cannot be part of argument
 values.

o-key
 o-value ::= key= arg-key
 15 ::= value= arg-value

20 These options are used in choice and
 entry cards to specify the key and value
 for the arguments those cards set.

BASIC ELEMENTS

25 alpha ::= any alphabetic character
 numeric ::= any digit
 alpha-numeric ::= alpha | numeric
 30 hex ::= numeric | any letter A through F,
 either case
 blank-space ::= { space | tab | new-line }+
 space ::= the space character
 35 tab ::= the tab character
 new-line ::= the carriage return character
 ::= the line feed character
 40 ::= the sequence carriage return, line
 feed
 word ::= { alpha-numeric }+
 45 identifier ::= alpha { alpha-numeric }*
 integer ::= { + | - } { numeric }+
 50 text ::= any 7-bit ASCII character except <,
 >, ", or &
 ::= > | < | " | &

|

::= any ISO-Latin-1 named entity.

::= &# hex hex ;

In text, runs of blank-space are treated as single spaces and may be used as point for word wrapping.

plain-text

safe ::= { alpha | numeric | safe }*

::= \$ | - | _ | @ | . | & | !
| * | ,

TIL ENCODING

Except where noted, TIL is identical to PIDL in structure. To translate PIDL to TIL several steps are conceptually needed (these may be done in one pass by a translator):

1. Escape characters with the high bit set.
2. Compress or remove all blank space where possible.
3. Tokenize comment elements with a single byte with the high bit set.
4. Inline images.

Fundamentally, TIL is just PIDL with certain common character sequences replaced by single bytes with the high-bit set. The first two steps above support this. Additionally, images are further compacted by including them inline in a dense format.

The tokenizing follows the encoding

given in the table below. Note that for
purposes of element separation, the
tokens that represent option key
identifiers (with the equal sign) can be
considered to include all preceding
blank space. Similarly, the tokens that
represent option values can be
considered to include all following
blank space.

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<PIDL>	90	args=	C0	alpha	E0
</PIDL>	91	button=	C1	center	E1
<DISPLAY>	92	call=	C2	fade	E2
</DISPLAY>	93	cost=	C3	flipH	E3
<CHOICE>	94	default=	C4	flipV	E4
</CHOICE>	95	flow=	C5	group	E5
<ENTRY>	96	format=	C6	inline	E6
</ENTRY>	97	go=	C7	left	E7
<CE	A0	key=	C8	list	E8
<GE	A1	label=	C9	none	E9
<IMAGE	A2	method=	CA	number	EA
<INLINE	A3	name=	CB	right	EB
<SOFTKEY	A4	next=	CC	slideE	EC
	B0	page=	CD	slideN	ED
	B1	prev=	CE	slideNE	EE
<I>	B2	src=	CF	slideNW	EF
</I>	B3	t11=	D0	slideS	F0
<BL>	B4	value=	D1	slideSE	F1
</BL>	B5			slideSW	F2
<CENTER>	B6			slideW	F3
<RIGHT>	B7				
<WRAP>	B8				
<LINE>	B9				
 	BA				

APPENDIX II

A COMPUTER PROGRAM TO GENERATE
A LETTER FREQUENCY TABLEFOR USE IN THE PREDICTIVE DATA ENTRY PROCESS
Unpublished © 1995 Libris, Inc.

5

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```
/* This program opens a text file selected by the
user, generates the frequency table for that file,
and then writes the frequency table to another
file also selected by the user.
*/
```

15

20

```
#include <stdio.h>
#include <string.h>
#include <console.h>
#include <assert.h>
```

25

30

```
typedef unsigned char byte;
typedef byte triplet[3];
typedef byte tristorage[27][27][27];
```

35

40

45

```
IncrementTrigram(triplet t, tristorage trigrams)
{
    byte * pb;
    assert(t[0] < 27);
    assert(t[1] < 27);
    assert(t[2] < 27);
    pb = &trigrams[t[0]][t[1]][t[2]];
    if (*pb < 255) *pb = *pb + 1;
    return *pb;
}
```

50

55

```
StoreTrigramValue(triplet t, tristorage trigrams, byte
value)
{
```

```

    assert(t[0] < 27);
    assert(t[1] < 27);
5   assert(t[2] < 27);
    trigrams[t[0]][t[1]][t[2]] = value;
}

10 byte FetchTrigramvalue(triplet t, tristorage trigrams)
{
    assert(t[0] < 27);
15   assert(t[1] < 27);
    assert(t[2] < 27);
    return trigrams[t[0]][t[1]][t[2]];
20 }

byte DumpTrigram(triplet t, tristorage trigrams)
{
25   byte value;
    assert(t[0] < 27);
    assert(t[1] < 27);
30   assert(t[2] < 27);
    value = FetchTrigramValue(t, trigrams);
    if (value != 0)
    {
35       printf("%c%c%c = ", t[0] + 'a', t[1] + 'a', t[2] +
'a');
        if (value == 255) printf("****");
40       else          printf("%3d", value);
    }
    return value;
45 }

int IdFromChar(short c)
{
50   c = tolower(c);
    if (c < 'a' || c > 'z') return 26;
    return c - 'a';
55 }

```

```
    }  
5   AddChar(tristorage trigrams, triplet t, byte b)  
   {  
       byte value;  
10      unsigned short r;  
  
       assert(b <= 26);  
       if (b == 26) { t[0] = t[1] = t[2] = 26; return; }  
15  
       t[0] = t[1];  
       t[1] = t[2];  
20      t[2] = b;  
  
       value = FetchTrigramValue(t, trigrams);  
       if (value == 255) return;  
25  
#if 0  
       if (value > 64) {  
30          r = Random();  
          if (value > 192 && r & 0xE000) return;  
          else if (value > 128 && r & 0xC000) return;  
          else if (value > 64 && r & 0x8000) return;  
35      }  
#endif  
  
40      StoreTrigramValue(t, trigrams, value + 1);  
   }  
  
DumpTrigrams(tristorage trigrams)  
45 {  
    int i, j, k;  
    int x;  
50    triplet t;  
    x = 0;  
    for (i = 0; i < 26; ++i)  
55
```

```

for (j = 0; j < 26; ++j)
  for (k = 0; k < 26; ++k)
5    {
      byte value;
      t[0] = i;
10     t[1] = j;
      t[2] = k;

15     value = DumpTrigram(t, trigrams);

      if (value == 0) continue;
      if (++x == 6) {
20         printf("\n"); x = 0;
      }
      else
25         printf(" ");
    }
}

30 OSErr BuildTrigram(short refNum, tristorage trigrams)
{
    OSErr err;
35     triplet t;
    t[0] = t[1] = t[2] = 26;

40     while (true)
    {
        long count = 80;
        char buf[80];
45         int i;

        err = FSRead(refNum, &count, buf);
50         if (count == 0) return err;
        for (i = 0; i < count; ++i) {
            AddChar(trigrams, t, IdFromChar(buf[i]));
55

```

```
    }
    if (err) return err;
5   }
    return 0;
}

10 Handle OpenTrigrams(void)
{
    OSErr err;
15   OSType type;
    StandardFileReply reply;
    short refNum;
20   short id;
    Handle h;
    Str63 name;
    tristorage *trigrams;
25

    type = 'TEXT';
    StandardGetFile(nil, 1, &type, &reply);
30   if (!reply.sfGood) return nil;
    err = FSpOpenDF(&reply.sfFile, fsCurPerm, &refNum);
    if (err) return nil;

35   memcpy(name, reply.sfFile.name, sizeof(name));

    h = NewHandle(sizeof(tristorage));
40

    HLock(h);
    trigrams = (tristorage *) (*h);
45   memset(*trigrams, 0, sizeof(tristorage));

    BuildTrigram(refNum, *trigrams);
50   FSClose(refNum);
    DumpTrigrams(*trigrams);
    HUnlock(h);
55
```

```

    type = 'rsrc';
    StandardGetFile(nil, 1, &type, &reply);
5   if (!reply.sfGood) return;
    refNum = FSpOpenResFile(&reply.sfFile, fsCurPerm);
    if (refNum == -1) return;
10  UseResFile(refNum);

    id = UniqueID('smrt');
    //id = 128;
15  AddResource(h, 'smrt', id, name);
    UpdateResFile(refNum);
    FSClose(refNum);
20  return h;
}

25  main()
{
    OSErr  err;
    Handle  h;

    cshow(stdout);
    TEInit();
35  InitDialogs(OL);
    InitCursor();
    h = OpenTrigrams();
40

```

Claims

- 45 1. A two-way data communication system for communication between a computer and a two-way data communication device selected from a group consisting of a cellular telephone (105), a two-way pager (106), and a telephone (107), said two-way data communication system comprising:
- 50 a two-way data communication network (110, 111, or 112);
a server computer comprising:
- a two-way data communication interface module (748) coupled to said two-way data communication network; and
55 a server (121, 131, or 141) coupled to said two-way data communication interface module;
- wherein said server (121, 131, or 141) receives a message including a resource locator from said two-way data communication network, and said resource locator includes an address of said server (121, 131, or 141);

said server (121, 131, or 141) processes said message using said resource locator; and
 said server (121, 131, or 141) transmits a response to said message over said two-way data communication network (110, 111, or 112);

5 a two-way data communication device (105, 106, or 107) coupled to said two-way data communication network (110, 111, or 112) wherein said two-way data communication device (105, 106, or 107) is selected from the group consisting of a cellular telephone (105), a two-way pager (106), and a telephone (107), and further wherein said two-way data communication device (105, 106, or 107) further comprises:

10 a network interface module (714) coupled to said two-way data communication network; and
 a client module (702) coupled to said network interface module (704);

wherein said client module transmits said message including said resource locator to said server (121, 131, or 141) over said two-way data communication network; and
 15 said client module processes said response to said message from said server (121, 131, or 141) wherein said response includes information for user interaction over said two-way data communication network (110, 111, or 112).

2. A two-way data communication system for communication between a server computer and a cellular telephone,
 20 said two-way data communication system comprising:

a data capable cellular telephone communication network (110);
 a server computer comprising:

25 a two-way data communication interface module (748) coupled to said data capable cellular telephone communication network (110); and
 a server (121, 131, 141) coupled to said two-way data communication interface module;

wherein said server (121, 131, 141) receives a message including a resource locator from said data
 30 capable cellular telephone communication network (110), and said resource locator includes an address of said server (121, 131, or 141);
 said server (121, 131, or 141) processes said message using said resource locator; and
 said server (121, 131, or 141) transmits a response to said message over said data capable cellular telephone communication network;

35 a cellular telephone device (105) coupled to said data capable cellular telephone communication network (110) wherein said cellular telephone device (105) further comprises:

40 a network interface module (714) coupled to said data capable cellular telephone communication network (110); and
 a client module (702) coupled to said network interface module (714);

wherein said client module transmits said message including said resource locator to said server (121, 131, or 141) over said data capable cellular telephone communication network (110); and
 45 said client module processes said response to said message from said server (121, 131, or 141) wherein said response includes information for user interaction over said data capable cellular telephone communication network (110).

3. A two-way data communication system as in Claims 1 and 2 wherein said client module further comprises an interpreter wherein said interpreter generates a user interface using information in said response, and said user interface includes at least one user data input option associated with a resource locator.
 50

4. A two-way data communication system as in Claim 3 wherein said resource locator associated with said at least one user data input option addresses an object on said server computer.
 55

5. A two-way data communication system as in Claim 3 wherein said resource locator associated with said at least one user data input option addresses an object on another server computer coupled to said communication network.

6. A two-way data communication system as in Claim 3, 4 or 5 wherein said interpreter includes a plurality of managers including a user interface manager coupled to a display of said device wherein said user interface manager handles interactions with said display.
- 5 7. A two-way data communication system as in Claim 7 wherein said user interface manager is coupled to a keypad of said device and further wherein said user interface manager handles interactions with said keypad.
8. A two-way data communication system as in Claim 7 wherein said another resource locator including said address of said server (121, 131, or 141) and said input data comprises a uniform resource locator.
- 10 9. A two-way data communication system as in any preceding Claim wherein said response includes a plurality of resource locators and at least one of said plurality of resource locators includes an address to another server (121, 131, or 141) coupled to said communication network.
- 15 10. A two-way data communication system as in any preceding Claim wherein said server (121, 131, or 141) is a stateless server and upon said server (121, 131, or 141) completing transmission of said response, said server (121, 131, or 141) completes all processing of said request and retains no state information for said response.
- 20 11. A two-way data communication system as in any preceding Claim wherein upon said server (121, 131, 141) completing transmission of said response, said server (121, 131, 141) maintains state information concerning said message wherein said server (121, 131, 141) utilizes said state information concerning said message in response to another message from said device.
- 25 12. A two-way data communication system as in any preceding Claim wherein said device further comprises:
a memory (716); and
a resource locator stored in said memory.
- 30 13. A two-way data communication system as in any preceding Claim wherein said server computer further comprises:
a memory (755); and
at least one common gateway interface program (761) stored in said memory.
- 35 14. A two-way data communication system as in any preceding Claim wherein said server computer further comprises:
a memory (755); and
at least one card deck stored in said memory.
- 40 15. A two-way data communication system as in any preceding Claim wherein said device further comprises:
a keypad (715) having a plurality of keys; and
a keypad module (711) coupled to said keypad (715) and to said client module (702)
wherein upon a user pressing a key in said plurality of keys, said keypad module stores information identifying the pressed key in a buffer memory; and
said keypad module notifies said client module of said key press.
- 45 16. A two-way data communication system as in Claim 15 wherein said client module (702) further comprises a predictive data entry module (901), wherein said client module uses said predictive data entry module to process said stored information identifying the pressed key upon said client module receiving said notification of said key press.
- 50 17. A two-way data communication system as in Claim 16 wherein said predictive text entry module (901) generates a table index using at least one character in said buffer memory of said device in combination with information characterizing said key pressed by said user; and said predictive text entry module retrieves at least one predictive character entry from a table of predictive character entries stored in a memory using said table index wherein said at least one predictive character entry represents a character in a plurality of characters represented by said pressed key.
- 55 18. A two-way data communication system as in Claim 17 wherein said at least one character in said buffer memory is

included in a plurality of characters in said memory buffer and further wherein said plurality of characters are used in generating said table index.

- 5 19. A two-way data communication system as in Claim 18 wherein each character in said plurality of characters in said memory buffer is a character in a set of characters and further wherein
each character in said set of characters is represented by a unique number and said unique numbers range from 0 to (N-1) where N is a number of characters in said set.
- 10 20. A two-way data communication system as in Claim 19 wherein said plurality of keys comprises M keys where M is an integer.
- 15 21. A two-way data communication system as in any preceding Claim wherein said device further comprises:
a card deck stored in a memory of said device.
- 20 22. A two-way data communication system as in Claims 14 and 21 wherein said card deck includes a display card, or a choice card or an entry card.
- 25 23. A two-way data communication system as in any preceding Claim wherein said device further comprises:
a display (705); and
a display module (712) coupled to said display and to said client module (702) wherein said display module drives said display in response to user interface information from said client module.
- 30 24. A two-way data communication system as in any preceding Claim wherein said two-way data communication device is said cellular telephone or said two-way pager or said telephone.
- 35 25. A method for using a two-way data communication device, selected from a group consisting of a cellular telephone, a two-way pager, and a telephone, to communicate with a server computer comprising:
generating a message by a client module in response to data entered by said user of a two-way data communication device coupled to a two-way data communication network,
wherein said client module executes on a microcontroller of said two-way data communication device;
said message includes a resource locator; and
said two-way data communication device is selected from a group consisting of a cellular telephone, a two-way pager, and a telephone
transmitting said message over said two-way data communication network to a server computer wherein said server computer is identified by said resource locator;
executing an application on said server computer identified by said resource locator to generate a response to said message; and
transmitting said response to a location identified by said application.
- 45 26. A method for using a two-way data communication device, selected from a group consisting of a cellular telephone, a two-way pager, and a telephone, to communicate with a server computer, as in Claim 25 wherein said response is transmitted to said client module.
- 50 27. A method for using a two-way data communication device, selected from a group consisting of a cellular telephone, a two-way pager, and a telephone, to communicate with a server computer, as in Claim 26 further comprising:
interpreting said response by said client module and generating a user interface using information in said response wherein said interface includes at least one user data input option associated with a resource locator.
- 55 28. A method for using a two-way data communication device, selected from a group consisting of a cellular telephone, a two-way pager, and a telephone, to communicate with a server computer, as in Claim 27 wherein said resource locator associated with said user data input option addresses an object on said server computer.
29. A method for using a two-way data communication device, selected from a group consisting of a cellular telephone,

a two-way pager, and a telephone, to communicate with a server computer, as in Claim 28 wherein said resource locator associated with said user data input option addresses an object on another server computer.

- 5 30. A method for using a two-way data communication device, selected from a group consisting of a cellular telephone, a two-way pager, and a telephone, to communicate with a server computer, as in Claim 29 further comprising:

interpreting a data input entry by a user of said two-way data communication device.

- 10 31. A method for using a two-way data communication device, selected from a group consisting of a cellular telephone, a two-way pager, and a telephone, to communicate with a server computer, as in Claim 30 further comprising:

appending said data input entry to said resource locator associated with said data input entry option.

- 15 32. A method for using a two-way data communication device, selected from a group consisting of a cellular telephone, a two-way pager, and a telephone, to communicate with a server computer, as in Claim 25 wherein said response is a card deck and further wherein said card deck includes at least one card.

- 20 33. A method for using a two-way data communication device, selected from a group consisting of a cellular telephone, a two-way pager, and a telephone, to communicate with a server computer, as in Claim 25 further comprising:

storing said card deck stored in a memory of two-way communication device.

- 25 34. A method for using a two-way data communication device, selected from a group consisting of a cellular telephone, a two-way pager, and a telephone, to communicate with a server computer, as in Claim 33 further comprising:

processing said stored card deck using said client module.

- 30 35. A method for using a two-way data communication device, selected from a group consisting of a cellular telephone, a two-way pager, and a telephone, to communicate with a server computer, as in Claim 34 further comprising:

generating a display on two-way data communication device for each card in said card deck.

- 35 36. A two-way data communication device having a microcontroller, wherein said two-way data communication device comprises:

a memory;

a display;

a display module coupled to said display wherein said display module drives said display;

a keypad including a plurality of keys;

- 40 a keypad module coupled to said keypad

wherein upon a user pressing a key in said plurality of keys, said keypad module stores information identifying the pressed key in said memory;

a network interface module wherein said network interface module receives data from and sends data to a two-way data communication network;

- 45 a client module coupled to said display module, said network interface module, said keypad module, and said memory;

wherein said client module executes on said microcontroller;

- 50 said client module, in response to a signal from said keypad module, processes said stored information identifying the pressed key and stores a character in a memory buffer; and

upon completion of data entry, said client module retrieves all characters in said memory buffer and generates a request including said characters to said network interface module which in turn transmits said request including said characters over said two-way data communication network.

- 55 37. A two-way data communication device as in Claim 36 further comprising:

a card deck stored in said memory.

38. A two-way data communication device as in Claim 37 wherein said card deck includes a choice card.

39. A two-way data communication device as in Claim 38 wherein upon said client module processing said choice card, said client module retrieves said stored information identifying the pressed key, and generates a request for a choice corresponding to the pressed key to said server (121, 131, 141).

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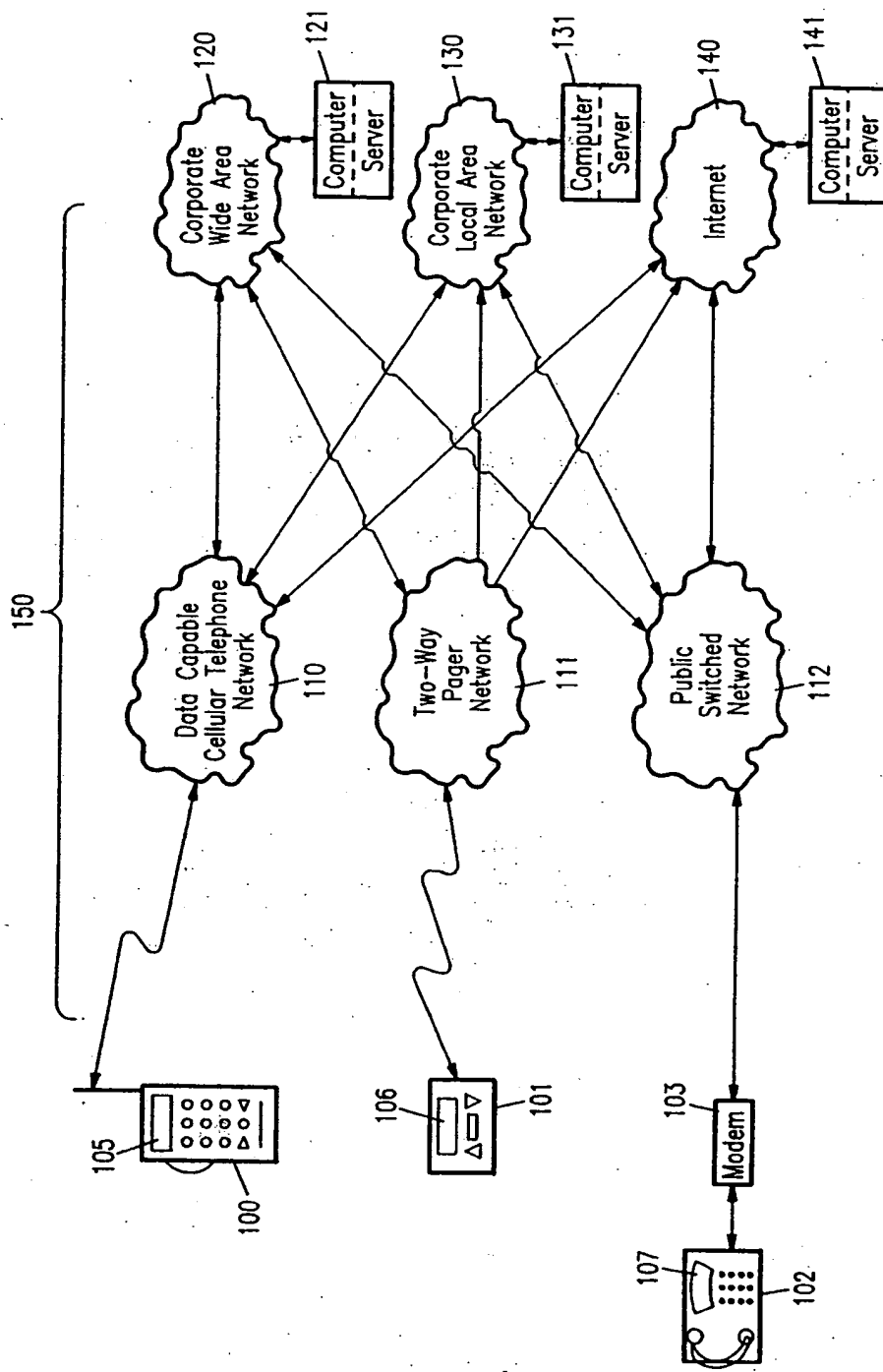


FIG. 1

FIG. 2A

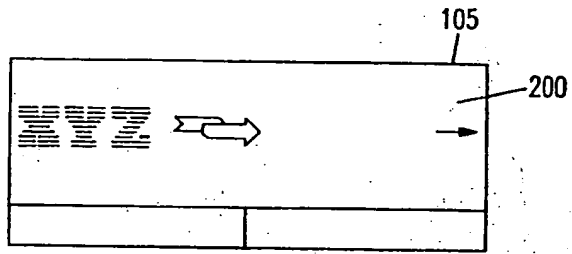


FIG. 2B

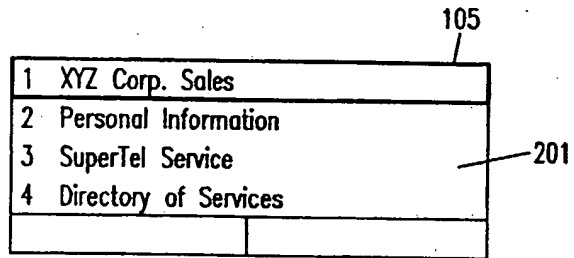


FIG. 2C

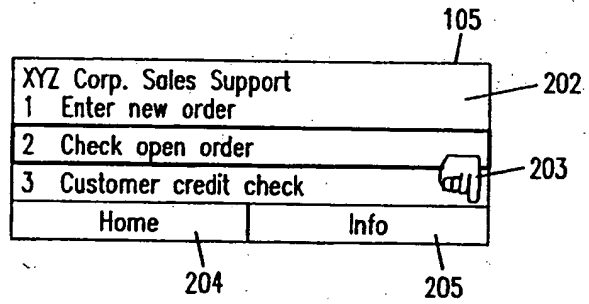


FIG. 2D

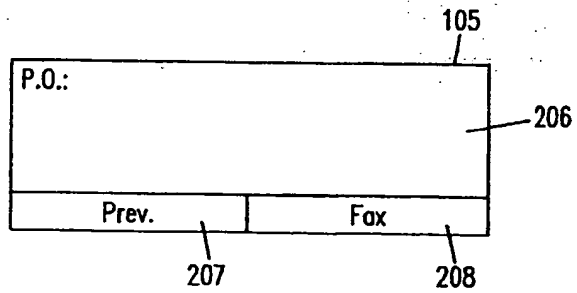


FIG. 2E

P.O.: 11-11-11	
Prev.	Fax

FIG. 2F

P.O.: 11-11-11	
Cust: ABC Designs	
Date: March 3, 1994	
Ship: March 7, 1994	
Prev.	Fax

FIG. 2G

Fax details to what number:	
Prev.	

FIG. 2H

Fax details to what number:	
(415) 341-4473	
Prev.	

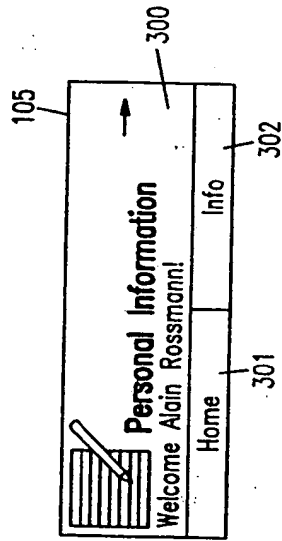


FIG. 3A

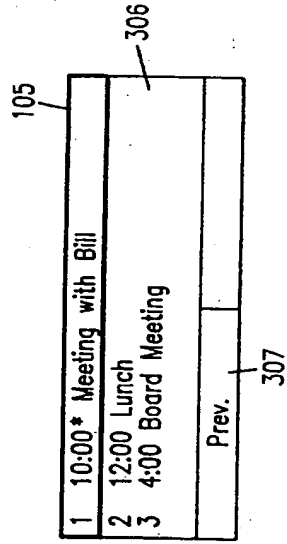


FIG. 3D

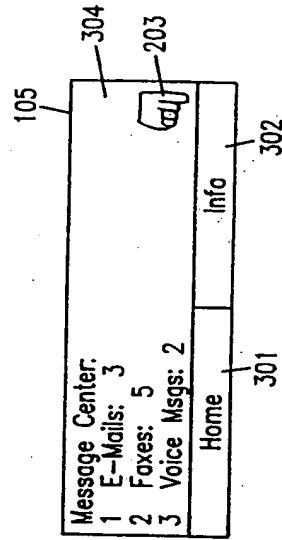


FIG. 3B

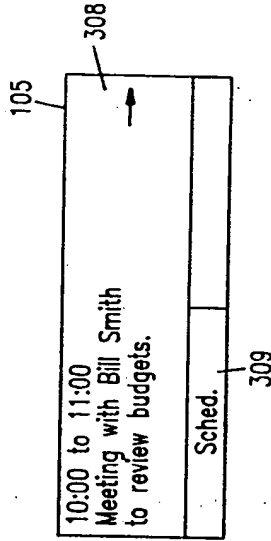


FIG. 3E

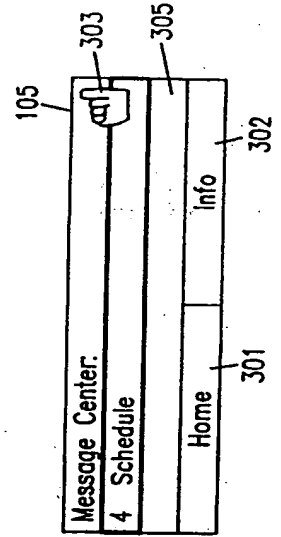


FIG. 3C

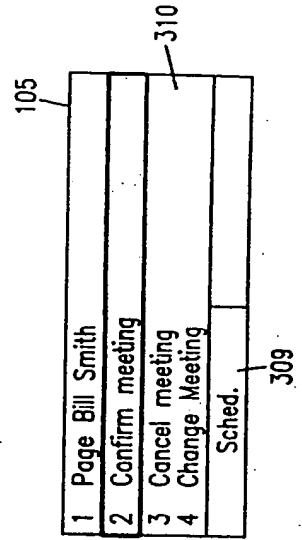
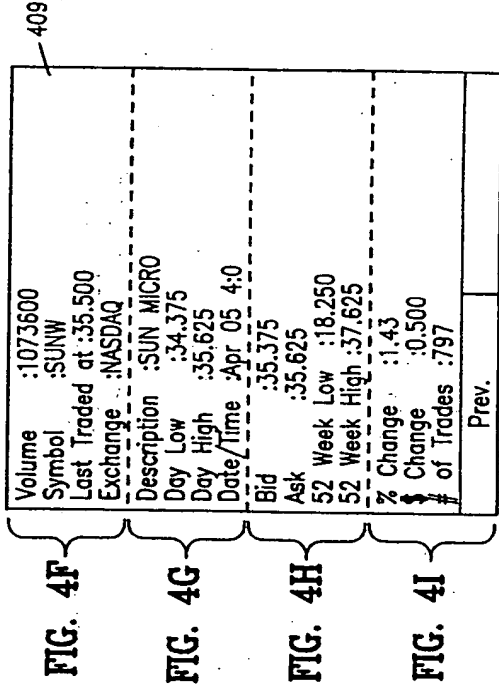
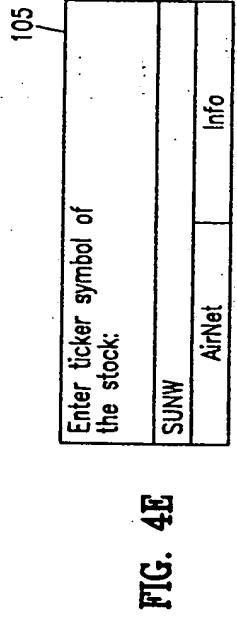
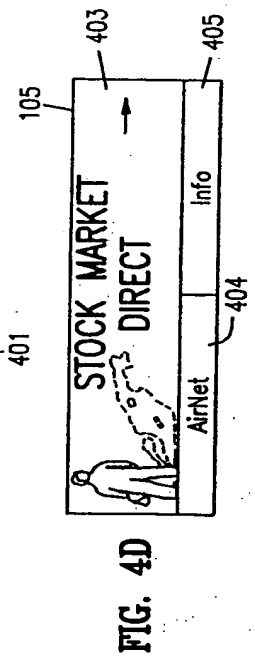
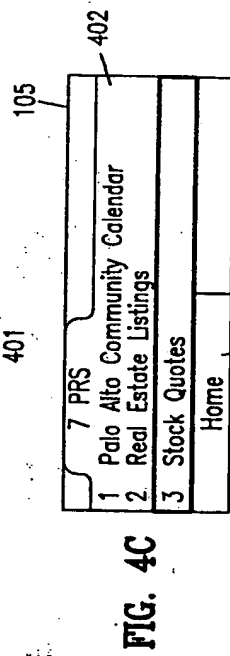
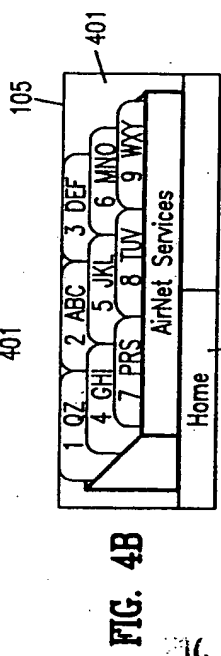
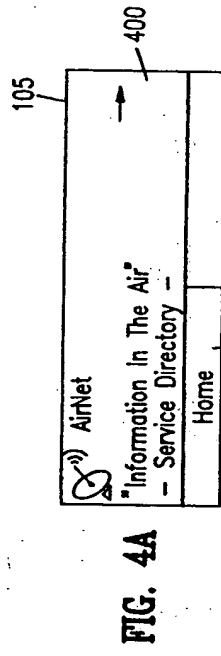


FIG. 3F



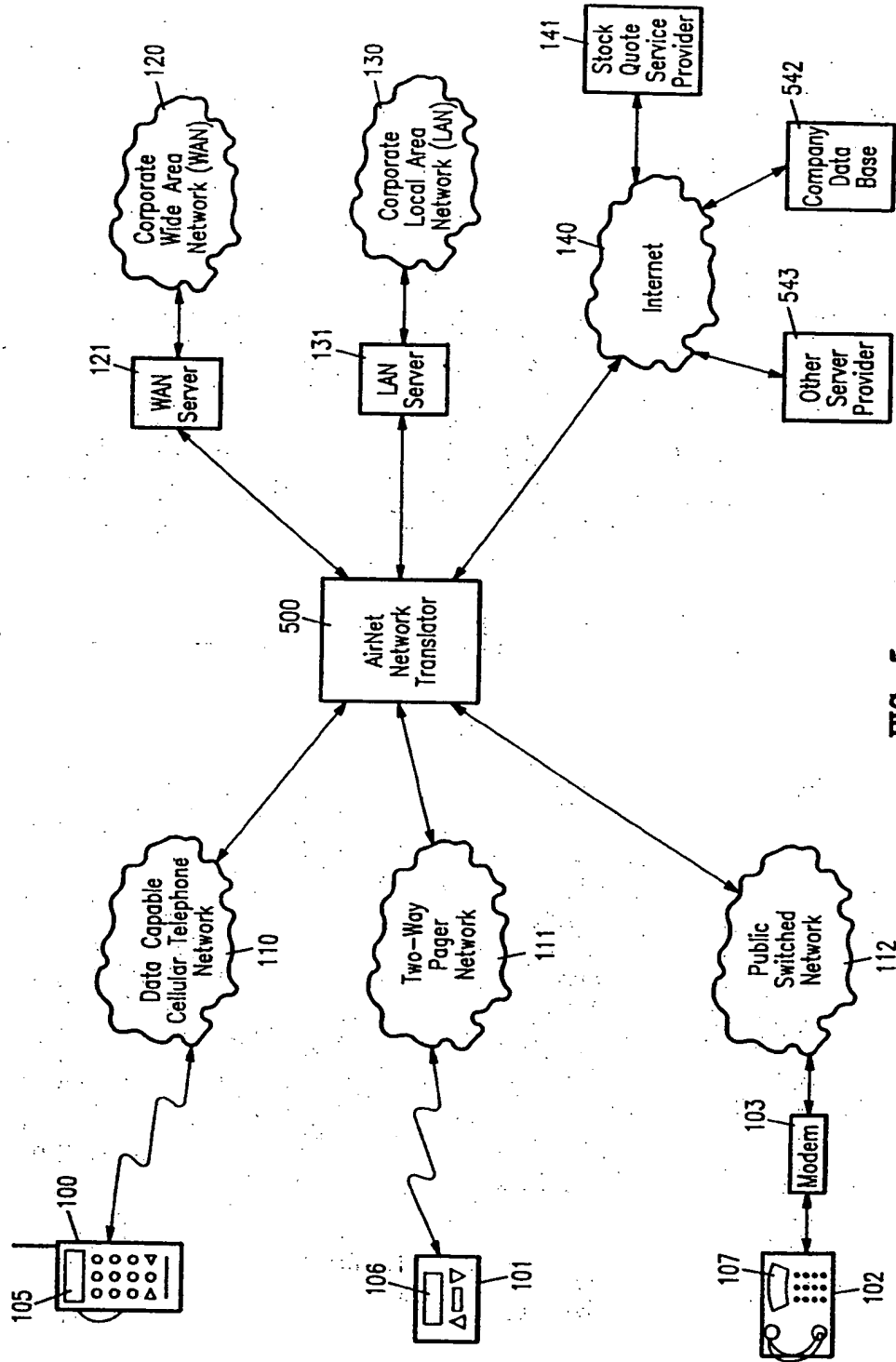


FIG. 5

600 ↗

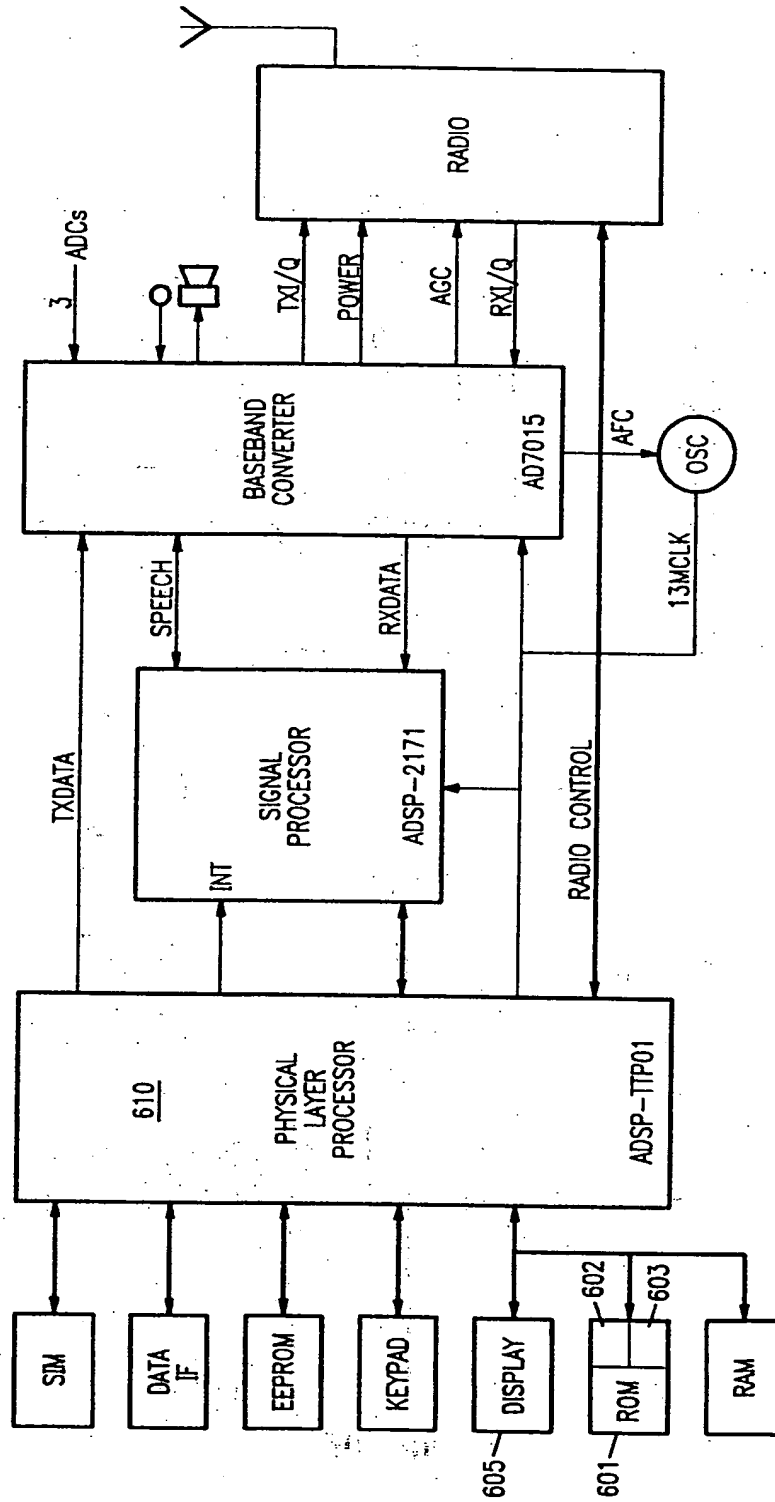


FIG. 6

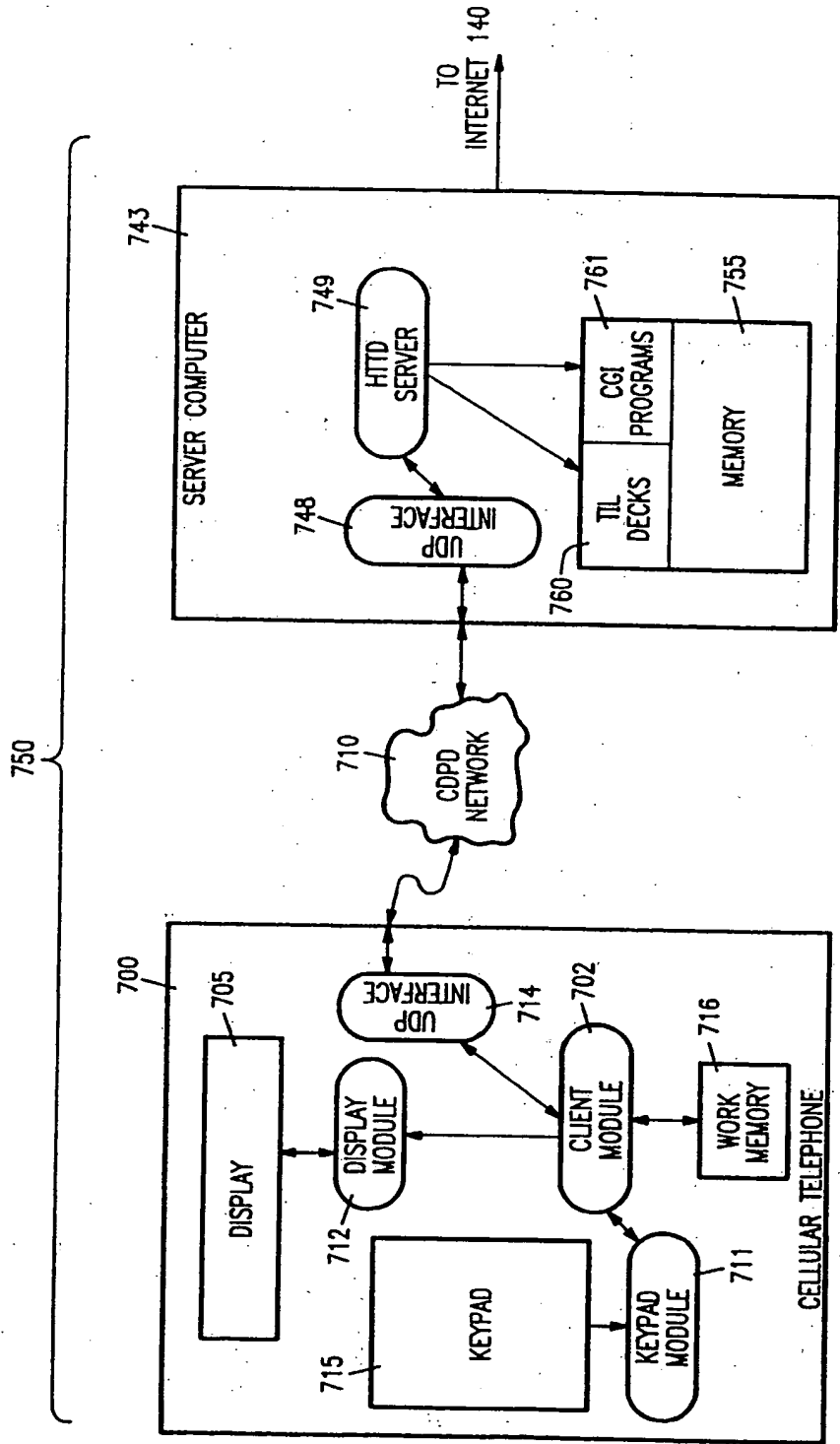


FIG. 7

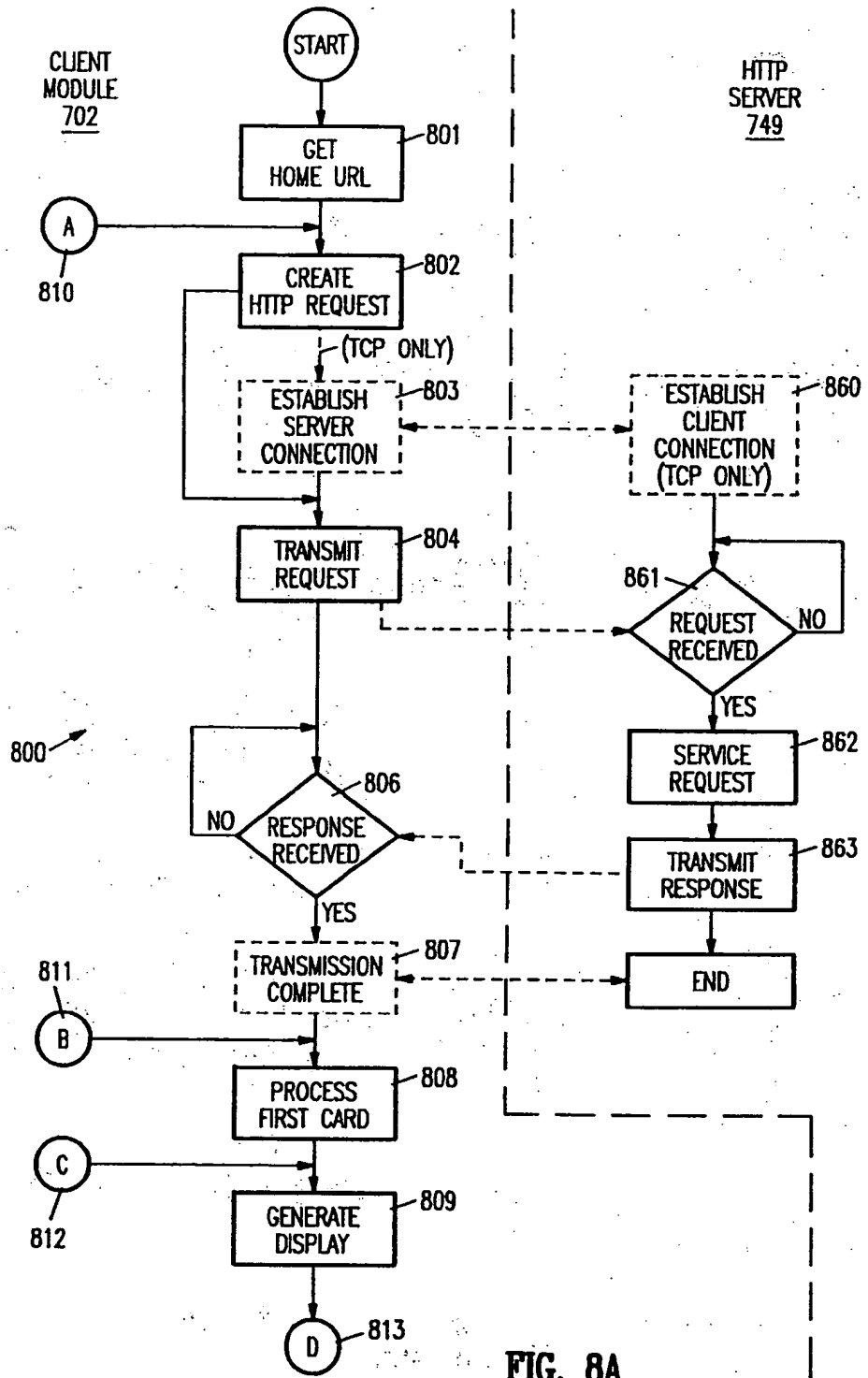


FIG. 8A

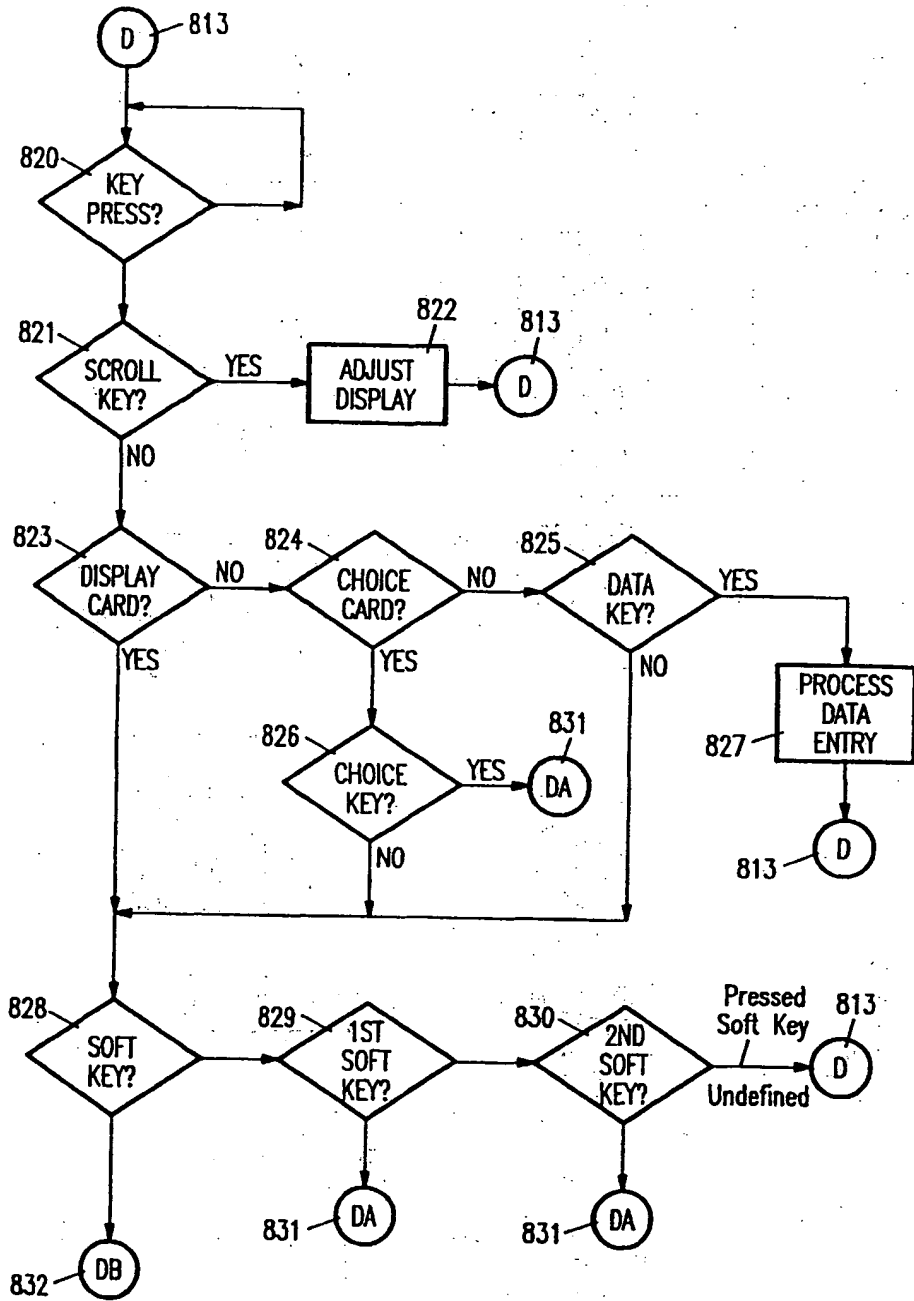


FIG. 8B

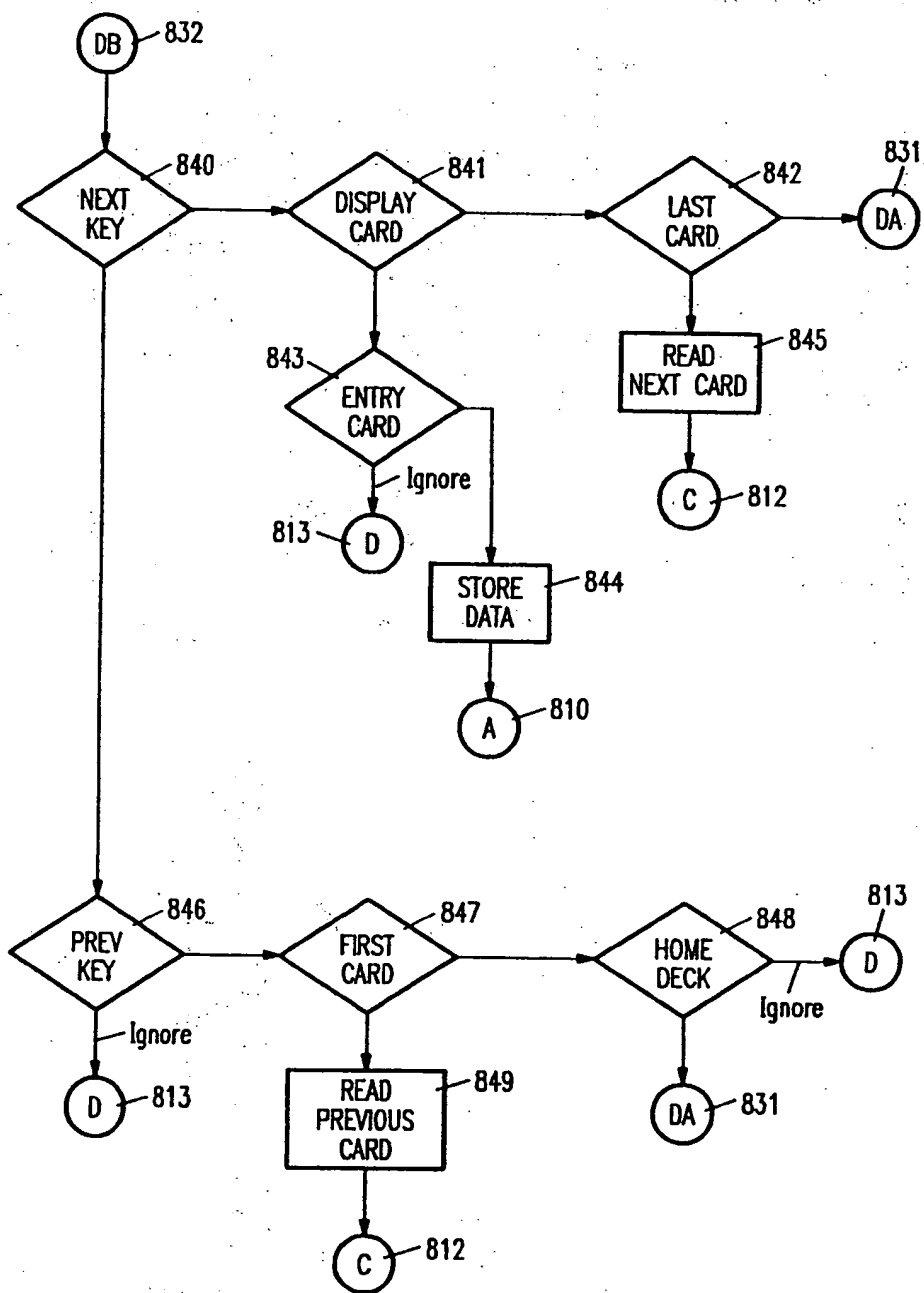


FIG. 8C

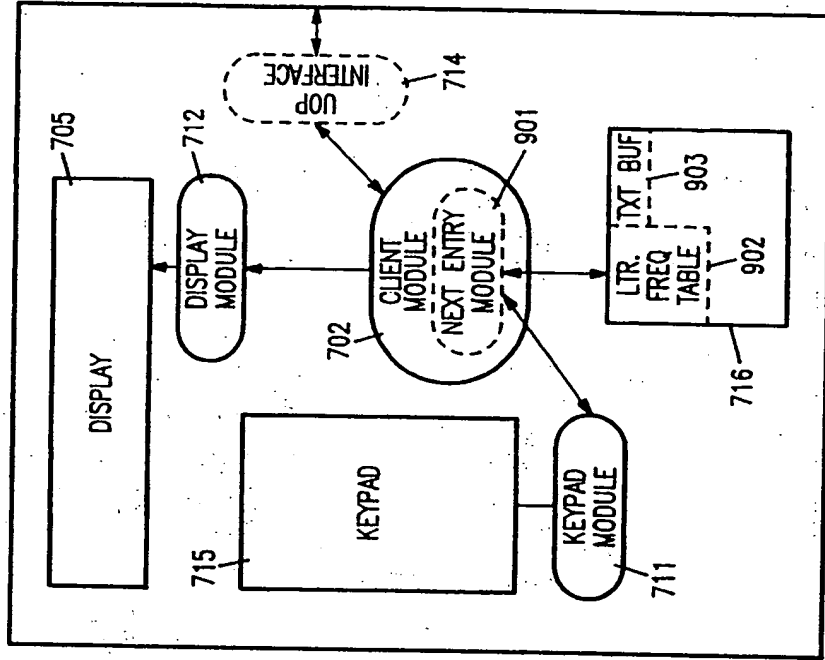


FIG. 9

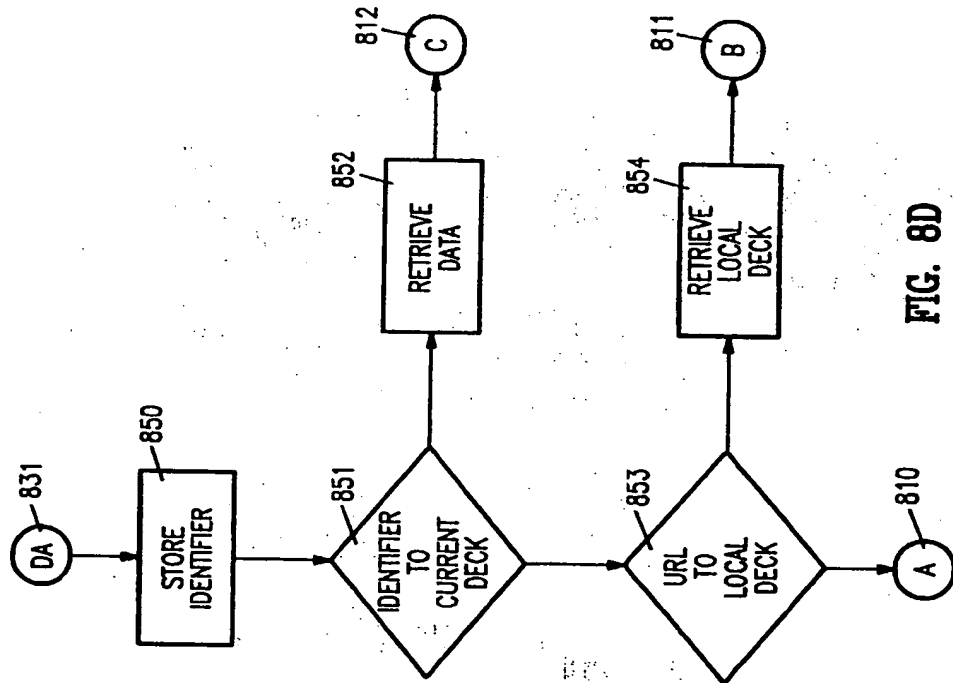


FIG. 8D

"	"	1	2	3	4	5	6	7	8	9
"a	a"	q	a	d	g	j	m	r	t	w
"a	b"	q	a	e	g	l	o	r	u	w
"a	c"	q	a	e	h	k	o	r	u	w
"a	d"	q	a	e	i	j	m	r	v	y
"a	e"	q	a	d	g	j	m	p	t	w
"a	f"	q	a	f	g	j	m	r	t	w
"a	g"	q	a	e	g	j	o	r	t	w
"a	h"	q	a	e	g	j	o	p	u	w
"a	i"	q	c	d	g	l	n	p	t	w
"a	j"	q	a	d	g	j	o	p	t	w
"a	k"	q	a	e	i	j	m	s	t	w
"a	l"	q	a	e	i	j	o	s	t	w
"a	m"	q	a	e	i	l	o	p	u	w
"a	n"	q	a	d	g	k	o	p	t	y
"a	o"	q	a	d	g	j	m	p	t	w
"a	p"	q	a	e	h	l	o	p	t	w
"a	q"	q	a	d	g	j	o	p	t	w
"a	r"	q	a	e	g	k	o	r	t	y
"a	s"	q	c	e	i	k	o	s	t	y
"a	t"	q	a	e	i	l	o	s	t	w
"a	u"	q	a	d	g	l	o	p	t	w
"a	v"	q	a	e	i	j	o	p	t	w
"a	w"	q	a	d	g	k	m	p	t	w
"a	x"	q	a	e	i	l	m	s	t	w
"a	y"	q	b	e	i	j	m	s	t	w
"a	z"	q	a	d	i	j	m	p	t	w
"a	"	q	a	d	g	j	m	p	t	w
"b	a"	q	c	d	g	k	n	s	t	y
"b	b"	q	a	d	g	j	m	s	t	y
"b	c"	q	a	d	g	j	o	r	t	w
"b	d"	q	a	d	g	j	m	s	t	w
"b	e"	q	a	e	g	l	n	s	t	x
"b	f"	q	a	d	g	j	m	p	t	w
"b	g"	q	a	d	g	j	m	p	t	w
"b	h"	q	a	d	g	j	m	p	t	w
"b	i"	q	a	d	g	j	m	p	t	w
"b	j"	q	a	e	g	j	m	p	t	w

FIG. 10A

" -	" -	1	2	3	4	5	6	7	8	9
"c	u"	q	b	e	i	l	m	s	t	w
"c	v"	q	a	d	g	j	m	p	t	w
"c	w"	q	a	d	g	j	m	p	t	w
"c	x"	q	a	d	g	j	m	p	t	w
"c	y"	q	a	d	g	j	m	p	t	w
"c	z"	q	a	d	g	j	n	p	t	w
"c	"	q	a	d	g	j	m	p	t	w
"d	a"	q	b	d	g	j	n	p	t	y
"d	b"	q	a	d	g	j	m	p	t	w
"d	c"	q	a	d	g	j	m	p	t	w
"d	d"	q	a	e	g	l	m	r	t	w
"d	e"	q	a	d	g	j	m	p	v	x
"d	f"	q	a	d	g	j	m	p	t	w
"d	g"	q	a	e	g	j	m	p	t	w
"d	h"	q	a	e	g	j	m	p	t	w
"d	i"	q	a	f	g	j	m	p	t	w
"d	j"	q	a	d	g	j	n	s	t	w
"d	k"	q	a	d	g	j	m	p	t	w
"d	l"	q	a	e	g	j	m	p	t	y
"d	m"	q	a	e	i	j	m	s	t	w
"d	n"	q	a	e	i	j	m	p	t	w
"d	o"	q	a	e	i	j	n	p	t	w
"d	p"	q	a	d	g	j	m	p	t	w
"d	q"	q	a	d	g	j	m	p	u	w
"d	r"	q	a	e	i	j	o	p	t	w
"d	s"	q	a	e	i	j	m	p	t	w
"d	t"	q	a	e	g	j	m	r	t	w
"d	u"	q	a	d	g	j	m	p	t	w
"d	v"	q	a	d	i	j	o	p	t	w
"d	w"	q	a	d	i	j	m	p	t	w
"d	x"	q	a	d	g	j	o	p	t	w
"d	y"	q	a	d	g	j	m	p	t	w
"d	z"	q	a	d	g	j	m	p	t	w
"d	"	q	a	d	g	j	m	p	t	w
"e	a"	q	a	d	g	l	n	s	t	w
"e	b"	q	c	d	g	j	m	p	t	y
"e	c"	q	a	e	g	k	o	s	t	w

FIG. 10C

"f	"n	1	2	3	4	5	6	7	8	9
"f	"o	q	a	d	g	j	m	p	t	w
"f	"p	q	c	d	g	l	n	r	u	w
"f	"q	q	a	d	g	j	m	p	t	w
"f	"r	q	a	d	g	j	m	p	t	w
"f	"s	q	a	e	g	j	o	p	t	y
"f	"t	q	a	e	g	j	m	p	t	w
"f	"u	q	a	d	g	k	m	p	t	w
"f	"v	q	a	d	g	l	n	r	t	w
"f	"w	q	a	d	g	j	m	p	t	w
"f	"x	q	a	d	g	j	m	p	t	w
"f	"y	q	a	d	g	j	m	p	t	w
"f	"z	q	a	d	g	j	m	p	t	w
"f	" "	q	a	d	g	j	m	p	t	w
"g	"a	z	a	d	g	l	n	r	t	w
"g	"b	q	a	d	g	j	m	p	t	w
"g	"c	q	a	d	g	j	o	s	t	w
"g	"d	q	a	d	g	l	n	s	t	w
"g	"e	q	a	d	g	j	m	p	u	w
"g	"f	q	a	d	g	l	o	p	t	w
"g	"g	q	a	e	g	j	m	p	t	w
"g	"h	q	a	e	g	j	o	s	t	w
"g	"i	q	c	f	g	j	n	p	t	w
"g	"j	q	a	d	g	j	m	p	t	w
"g	"k	q	a	d	g	j	o	p	t	y
"g	"l	q	a	e	g	l	m	s	t	w
"g	"m	q	a	e	g	j	o	p	t	w
"g	"n	q	a	e	g	j	o	p	t	w
"g	"o	q	a	d	g	j	m	p	t	w
"g	"p	q	a	d	g	j	o	p	t	w
"g	"q	q	a	d	g	j	m	p	t	w
"g	"r	q	a	e	g	j	o	p	t	w
"g	"s	q	a	e	g	j	o	p	t	w
"g	"t	q	a	e	g	j	o	p	t	w
"g	"u	q	a	e	g	l	m	r	t	y
"g	"v	q	a	d	g	j	m	p	t	w
"g	"w	q	a	d	g	j	m	p	t	w

FIG. 10E

g	x	1	2	3	4	5	6	7	8	9
g	y	q	a	d	g	j	m	p	t	w
g	z	q	a	d	g	j	m	p	t	w
h	a	q	a	d	g	j	m	p	t	w
h	b	q	a	d	g	j	m	p	t	w
h	c	q	a	d	g	j	m	p	t	w
h	d	q	a	d	g	j	m	p	t	w
h	e	q	a	d	g	j	m	p	t	w
h	f	q	a	d	g	j	m	p	t	w
h	g	q	a	d	g	j	m	p	t	w
h	h	q	a	d	g	j	m	p	t	w
h	i	q	a	d	g	j	m	p	t	w
h	j	q	a	d	g	j	m	p	t	w
h	k	q	a	d	g	j	m	p	t	w
h	l	q	a	d	g	j	m	p	t	w
h	m	q	a	d	g	j	m	p	t	w
h	n	q	a	d	g	j	m	p	t	w
h	o	q	a	d	g	j	m	p	t	w
h	p	q	a	d	g	j	m	p	t	w
h	q	q	a	d	g	j	m	p	t	w
h	r	q	a	d	g	j	m	p	t	w
h	s	q	a	d	g	j	m	p	t	w
h	t	q	a	d	g	j	m	p	t	w
h	u	q	a	d	g	j	m	p	t	w
h	v	q	a	d	g	j	m	p	t	w
h	w	q	a	d	g	j	m	p	t	w
h	x	q	a	d	g	j	m	p	t	w
h	y	q	a	d	g	j	m	p	t	w
h	z	q	a	d	g	j	m	p	t	w
i	a	q	a	d	g	j	m	p	t	w
i	b	q	a	d	g	j	m	p	t	w
i	c	q	a	d	g	j	m	p	t	w
i	d	q	a	d	g	j	m	p	t	w
i	e	q	a	d	g	j	m	p	t	w
i	f	q	a	d	g	j	m	p	t	w

FIG. 10F

"	"	1	2	3	4	5	6	7	8	9
"i	g"	q	a	e	h	j	n	r	u	w
"i	h"	q	a	d	g	j	m	p	t	w
"i	i"	q	a	d	g	j	m	p	t	w
"i	j"	q	a	e	g	k	o	p	t	w
"i	k"	q	a	e	g	k	o	p	t	w
"i	l"	q	a	e	i	l	m	s	t	y
"i	m"	q	a	e	i	l	m	s	t	y
"i	n"	q	c	e	g	l	n	r	u	w
"i	o"	q	a	d	g	l	n	r	u	w
"i	p"	q	a	d	i	l	m	s	t	w
"i	q"	q	a	d	i	j	m	s	t	w
"i	r"	q	c	e	i	k	n	s	t	w
"i	s"	q	c	e	h	k	n	s	t	w
"i	t"	q	a	e	h	l	o	s	t	y
"i	u"	q	a	e	g	j	m	p	t	w
"i	v"	q	a	e	i	j	m	p	t	w
"i	w"	q	a	e	g	j	m	p	t	w
"i	x"	q	a	e	g	j	m	p	t	w
"i	y"	q	a	e	g	j	m	p	t	w
"i	z"	q	a	e	g	j	m	p	t	w
"i	"	q	a	e	g	j	m	p	t	w
"j	a"	q	c	d	g	j	n	p	t	w
"j	b"	q	a	d	g	j	m	p	t	w
"j	c"	q	a	d	g	j	m	p	t	w
"j	d"	q	a	d	g	j	m	p	t	w
"j	e"	q	a	d	g	j	m	r	t	w
"j	f"	q	a	d	g	j	m	p	t	w
"j	g"	q	a	d	g	j	m	p	t	w
"j	h"	q	a	d	g	j	m	p	t	w
"j	i"	q	a	d	g	j	m	p	t	w
"j	j"	q	a	d	g	j	m	p	t	w
"j	k"	q	a	d	g	j	m	p	t	w
"j	l"	q	a	d	g	j	m	p	t	w
"j	m"	q	a	d	g	j	m	p	t	w
"j	n"	q	a	d	i	j	m	p	t	w
"j	o"	q	b	e	g	j	m	r	t	w
"j	p"	q	a	d	g	j	m	p	t	w

FIG. 10G

"k	"	1	2	3	4	5	6	7	8	9
"l	"a"	q	a	d	g	j	m	p	t	w
"l	"b"	q	b	d	i	j	n	r	t	y
"l	"c"	q	a	d	g	j	o	p	t	w
"l	"d"	q	a	d	g	j	o	p	t	w
"l	"e"	q	a	d	i	j	n	s	t	w
"l	"f"	q	a	d	g	l	m	s	t	x
"l	"g"	q	a	d	g	j	m	p	t	w
"l	"h"	q	a	d	g	j	m	p	t	w
"l	"i"	z	a	d	g	k	n	s	t	w
"l	"j"	q	a	d	g	j	m	p	t	w
"l	"k"	q	a	d	i	j	m	s	t	w
"l	"l"	q	a	d	i	j	o	s	u	y
"l	"m"	q	a	d	g	j	o	s	t	w
"l	"n"	q	a	d	g	j	o	p	t	w
"l	"o"	q	a	d	g	j	o	s	t	w
"l	"p"	q	a	d	h	j	m	s	t	w
"l	"q"	q	a	d	g	j	m	p	t	w
"l	"r"	q	a	d	g	j	m	p	t	w
"l	"s"	q	a	e	i	j	o	p	t	w
"l	"t"	q	a	e	i	j	o	s	t	w
"l	"u"	q	a	e	i	l	m	s	t	w
"l	"v"	q	a	e	i	j	m	p	t	w
"l	"w"	q	a	e	g	j	m	p	t	w
"l	"x"	q	a	d	g	j	m	p	t	w
"l	"y"	z	a	d	i	j	n	s	t	w
"l	"z"	q	a	d	g	j	m	p	t	w
"m	"a"	q	a	d	g	k	m	r	t	y
"m	"b"	q	a	d	i	l	m	p	t	y
"m	"c"	q	a	d	i	j	o	p	t	w
"m	"d"	q	a	d	g	l	m	p	t	w
"m	"e"	q	a	d	g	j	o	s	t	w
"m	"f"	q	a	d	g	j	o	p	t	w
"m	"g"	q	a	d	g	j	m	p	t	w
"m	"h"	z	a	d	g	j	m	p	t	w
"m	"i"	z	c	d	g	l	n	s	t	x

FIG. 101

"	-	1	2	3	4	5	6	7	8	9
"m	j"	q	a	d	g	j	m	p	t	w
"m	k"	q	a	d	g	j	m	p	t	w
"m	l"	q	a	e	g	j	m	p	t	w
"m	m"	q	a	e	g	j	m	p	u	w
"m	n"	q	a	d	i	j	m	p	t	w
"m	o"	q	a	d	i	j	n	r	v	w
"m	p"	q	a	e	i	l	o	r	t	w
"m	q"	q	a	d	g	j	m	p	t	w
"m	r"	q	a	d	g	j	m	p	t	w
"m	s"	q	a	e	g	j	m	p	t	w
"m	t"	q	a	d	g	j	m	p	t	w
"m	u"	q	a	d	g	l	n	s	t	w
"m	v"	q	a	d	g	j	m	p	t	w
"m	w"	q	a	d	g	j	m	p	t	w
"m	x"	q	a	d	g	j	m	p	t	w
"m	y"	q	a	d	g	j	m	p	t	w
"m	z"	q	a	d	g	j	m	p	t	w
"m	"	q	a	d	g	j	m	p	t	w
"n	a"	q	b	d	g	l	m	r	t	w
"n	b"	q	a	d	g	j	m	p	t	w
"n	c"	q	a	e	i	l	o	r	t	y
"n	d"	q	a	e	i	l	o	s	t	y
"n	e"	q	a	e	i	l	o	s	t	w
"n	f"	q	a	e	i	l	o	s	u	w
"n	g"	q	a	e	i	j	m	s	u	w
"n	h"	q	a	d	g	j	m	p	t	w
"n	i"	z	a	d	g	l	n	s	t	x
"n	j"	q	a	d	g	j	m	p	u	w
"n	k"	q	a	e	i	j	n	s	t	w
"n	l"	q	a	e	i	j	o	p	t	y
"n	m"	q	a	e	i	j	o	p	t	y
"n	n"	q	a	e	i	j	o	p	u	y
"n	o"	q	a	d	g	l	o	r	u	w
"n	p"	q	a	d	g	j	o	p	u	w
"n	q"	q	a	d	g	j	o	p	u	w
"n	r"	q	a	d	g	j	m	p	u	w
"n	s"	q	a	e	i	l	m	p	t	w

FIG. 10J

"	"	1	2	3	4	5	6	7	8	9
"n	t"	q	a	e	i	l	o	s	u	y
"n	u"	q	a	f	g	j	m	s	t	x
"n	v"	q	a	e	i	j	o	p	t	w
"n	w"	q	a	e	g	j	m	p	t	w
"n	x"	q	a	d	g	j	m	p	t	w
"n	y"	q	b	d	h	j	m	p	t	w
"n	z"	q	a	d	g	j	m	p	t	w
"n	"	q	a	d	g	j	m	p	t	w
"o	a"	q	b	d	g	l	m	s	t	w
"o	b"	q	a	e	i	l	o	s	t	w
"o	c"	q	a	e	h	k	o	s	u	w
"o	d"	q	a	e	i	l	o	s	u	y
"o	e"	q	a	d	g	j	m	s	t	w
"o	f"	q	a	f	g	j	o	p	t	w
"o	g"	q	a	e	i	j	n	r	t	y
"o	h"	q	a	d	g	j	n	p	t	w
"o	i"	q	c	d	g	l	n	p	t	w
"o	j"	q	a	e	g	j	m	p	t	w
"o	k"	q	a	e	i	j	m	s	t	w
"o	l"	q	b	d	i	l	o	s	u	w
"o	m"	q	a	e	i	l	m	s	t	w
"o	n"	q	a	e	g	l	n	s	t	y
"o	o"	q	a	d	g	k	n	s	t	w
"o	p"	q	a	d	h	l	m	p	t	y
"o	q"	q	a	d	g	j	m	p	t	w
"o	r"	q	a	e	g	k	m	r	t	w
"o	s"	q	a	e	i	j	o	s	t	y
"o	t"	q	c	e	h	l	o	s	t	y
"o	u"	q	c	d	g	j	n	r	t	y
"o	v"	q	a	e	i	j	m	p	t	w
"o	w"	q	a	e	i	j	n	s	t	w
"o	x"	q	a	d	i	j	m	p	t	w
"o	y"	q	a	d	g	j	m	p	t	w
"o	z"	q	a	d	g	j	m	p	t	w
"o	"	q	a	d	g	j	m	p	t	w
"p	a"	q	c	d	g	l	n	r	t	y
"p	b"	q	a	e	g	j	m	p	t	w

FIG. 10K

"p	c	1	2	3	4	5	6	7	8	9
"p	d	q	a	d	g	j	m	s	t	w
"p	e	q	a	d	g	j	m	p	t	w
"p	f	q	a	d	g	j	n	r	t	w
"p	g	q	a	d	g	j	m	r	t	w
"p	h	q	a	e	i	j	m	p	t	w
"p	i	q	c	d	i	j	o	s	t	x
"p	j	q	a	d	g	j	n	r	t	w
"p	k	q	a	d	g	j	m	p	t	w
"p	l	q	a	e	i	j	o	p	t	y
"p	m	q	a	e	i	j	m	p	t	w
"p	n	q	a	d	g	j	m	p	t	w
"p	o	q	a	d	i	l	n	r	t	w
"p	p	q	a	e	i	l	o	p	t	y
"p	q	q	a	e	i	j	o	p	t	w
"p	r	q	a	e	i	j	o	p	t	w
"p	s	q	a	d	g	j	o	p	t	w
"p	r	q	c	d	g	j	o	s	t	w
"p	u	q	b	d	g	j	m	r	t	w
"p	v	q	a	d	g	j	m	p	t	w
"p	w	q	a	d	g	j	m	p	t	w
"p	x	q	a	d	g	j	m	r	t	w
"p	y	q	a	d	g	j	m	p	t	w
"p	z	q	a	d	g	j	m	p	t	w
"p	"	q	a	d	g	j	m	p	t	w
"q	a	q	a	d	g	j	m	p	t	w
"q	b	q	a	d	g	j	m	p	t	w
"q	c	q	a	d	g	j	m	p	t	w
"q	d	q	a	d	g	j	m	p	t	w
"q	e	q	a	d	g	j	m	p	t	w
"q	f	q	a	d	g	j	m	p	t	w
"q	g	q	a	d	g	j	m	p	t	w
"q	h	q	a	d	g	j	m	p	t	w
"q	i	q	a	d	g	j	m	p	t	w
"q	j	q	a	d	g	j	m	p	t	w
"q	k	q	a	d	g	j	m	p	t	w
"q	l	q	a	d	g	j	m	p	t	w

FIG. 10L

"	"	1	2	3	4	5	6	7	8	9
"q"	m"	q	a	d	g	j	m	p	t	w
"q"	n"	q	a	d	g	j	m	p	t	w
"q"	o"	q	a	d	g	j	m	p	t	w
"q"	p"	q	a	d	g	j	m	p	t	w
"q"	q"	q	a	d	g	j	m	p	t	w
"q"	r"	q	a	d	g	j	m	p	t	w
"q"	s"	q	a	d	g	j	m	p	t	w
"q"	t"	q	a	d	g	j	m	p	t	w
"q"	u"	q	a	d	g	j	m	p	t	w
"q"	v"	q	a	d	g	j	m	p	t	w
"q"	w"	q	a	d	g	j	m	p	t	w
"q"	x"	q	a	d	g	j	m	p	t	w
"q"	y"	q	a	d	g	j	m	p	t	w
"q"	z"	q	a	d	g	j	m	p	t	w
"r"	a"	q	a	d	g	l	m	n	p	t
"r"	b"	q	a	d	g	l	m	n	p	t
"r"	c"	q	a	d	g	l	m	n	p	u
"r"	d"	q	a	d	g	l	m	n	s	v
"r"	e"	q	a	d	g	l	m	n	s	v
"r"	f"	q	a	d	g	j	m	o	p	t
"r"	g"	q	a	d	g	j	m	o	p	t
"r"	h"	q	a	d	g	j	m	o	p	t
"r"	i"	z	c	e	g	l	n	p	t	w
"r"	j"	q	a	d	g	l	m	p	t	w
"r"	k"	q	a	d	g	l	m	p	t	y
"r"	l"	q	a	d	g	j	m	p	t	y
"r"	m"	q	a	d	g	j	m	p	t	w
"r"	n"	q	a	d	g	j	m	p	t	w
"r"	o"	q	b	d	g	l	m	p	r	u
"r"	p"	q	a	d	g	j	m	p	t	w
"r"	q"	q	a	d	g	j	m	p	t	w
"r"	r"	q	a	d	g	j	m	p	t	y
"r"	s"	q	a	d	g	j	m	p	t	w
"r"	t"	z	a	e	h	j	n	s	u	w
"r"	u"	q	a	e	g	l	m	s	t	w

FIG. 10M

"	"	1	2	3	4	5	6	7	8	9
"r	w	q	a	d	i	j	o	p	t	w
"r	x	q	a	d	i	j	m	p	t	w
"r	y	q	b	d	i	j	m	p	t	w
"r	z	q	a	d	g	j	m	p	t	w
"s	"	q	a	d	g	j	m	p	t	w
"s	a	q	b	d	g	l	m	p	v	y
"s	b	q	a	d	g	j	m	p	t	w
"s	c	q	a	d	h	l	o	r	u	w
"s	d	q	a	d	g	j	n	p	t	w
"s	e	q	c	e	g	l	n	r	t	y
"s	f	q	a	e	g	j	m	p	u	w
"s	g	q	a	e	g	j	m	r	t	w
"s	h	q	a	d	i	l	o	r	t	w
"s	i	z	c	d	g	l	n	s	t	x
"s	j	q	a	d	g	j	m	p	t	w
"s	k	q	a	e	i	j	m	p	t	w
"s	l	q	a	e	i	j	o	p	t	y
"s	m	q	a	e	i	j	o	s	t	w
"s	n	q	a	e	g	j	m	p	t	w
"s	o	q	c	f	g	l	m	r	u	w
"s	p	q	a	e	g	l	o	r	u	w
"s	q	q	a	d	g	l	m	p	u	w
"s	r	q	c	d	i	j	m	p	t	w
"s	s	q	a	e	i	l	o	p	u	w
"s	t	q	a	e	i	l	o	r	u	y
"s	u	q	b	e	g	l	m	p	t	w
"s	v	q	a	d	i	j	o	p	t	w
"s	w	q	a	d	i	j	o	p	t	w
"s	x	q	a	d	g	j	m	p	t	w
"s	y	q	a	d	g	j	m	s	t	w
"s	z	q	a	d	g	j	m	p	t	w
"s	"	q	a	d	g	j	m	p	t	w
"t	a	q	c	f	i	l	n	r	t	y
"t	b	q	a	d	g	j	m	p	t	w
"t	c	z	a	d	h	j	o	p	t	w
"t	d	q	a	d	g	j	m	p	t	x
"t	e	q	c	d	g	l	m	r	u	x

FIG. 10N

"	-	1	2	3	4	5	6	7	8	9
"t	f	q	a	d	i	j	o	p	t	w
"t	g	q	a	e	i	j	o	p	t	w
"t	h	q	a	e	i	j	o	p	r	u
"t	i	z	c	e	g	l	o	r	s	v
"t	j	q	a	d	g	j	m	p	t	w
"t	k	q	a	e	g	j	m	p	t	w
"t	l	q	a	e	i	j	m	p	t	y
"t	m	q	a	e	g	l	m	p	t	w
"t	n	q	a	e	g	j	m	p	r	u
"t	o	q	c	d	g	l	m	r	u	w
"t	p	q	c	d	g	j	m	p	u	w
"t	q	q	a	d	g	j	m	p	t	w
"t	r	q	a	e	i	j	o	p	u	y
"t	s	q	c	e	i	j	o	p	u	w
"t	t	q	a	e	i	j	o	p	t	y
"t	u	q	a	f	i	j	n	r	t	w
"t	v	q	a	d	i	j	m	p	t	w
"t	w	q	a	e	g	j	m	p	t	w
"t	x	q	a	d	g	j	m	p	t	w
"t	y	q	a	d	g	l	m	p	t	w
"t	z	q	a	d	g	j	m	p	t	w
"t	"	q	a	d	g	j	m	p	r	t
"u	a	q	a	d	g	l	n	r	t	w
"u	b	q	a	e	i	j	m	s	t	w
"u	c	q	c	e	h	k	m	p	t	w
"u	d	q	a	e	i	j	o	p	t	y
"u	e	q	a	d	g	j	m	s	t	w
"u	f	q	a	f	g	j	m	s	t	w
"u	g	q	a	e	g	j	m	s	t	w
"u	h	q	a	d	g	j	m	p	t	w
"u	i	q	a	d	g	l	n	r	t	w
"u	j	q	a	d	g	j	m	p	t	w
"u	k	q	a	d	g	l	m	p	t	y
"u	l	q	a	d	g	j	m	p	t	w
"u	m	q	a	b	i	j	m	p	t	w
"u	n	q	c	d	i	j	n	s	t	w
"u	o	q	a	d	g	j	m	p	t	w

FIG. 100

"u"	p"	1	2	3	4	5	6	7	8	9
"u"	q"	q	a	d	i	l	o	p	t	y
"u"	r"	q	a	d	i	l	o	p	t	w
"u"	s"	q	a	e	i	l	n	s	t	y
"u"	t"	q	a	e	i	l	m	s	t	y
"u"	u"	q	c	d	g	j	o	s	t	w
"u"	v"	q	a	d	g	j	m	p	t	w
"u"	w"	q	a	d	g	j	m	p	t	w
"u"	x"	q	a	d	g	j	m	p	t	w
"u"	y"	q	a	e	g	j	m	p	t	w
"u"	z"	q	a	d	g	j	m	p	t	w
"v"	a"	q	c	d	g	l	n	r	t	w
"v"	b"	q	a	d	g	j	m	p	t	w
"v"	c"	q	a	d	g	j	m	p	t	w
"v"	d"	q	a	d	g	j	m	p	t	w
"v"	e"	q	a	d	g	j	m	p	t	w
"v"	f"	q	a	d	g	j	m	p	t	w
"v"	g"	q	a	d	g	j	m	p	t	w
"v"	h"	q	a	e	g	j	n	s	t	w
"v"	i"	q	a	d	g	j	m	p	t	w
"v"	j"	q	a	d	g	j	m	p	t	w
"v"	k"	q	a	d	g	j	m	p	t	w
"v"	l"	q	a	d	g	j	m	p	t	w
"v"	m"	q	a	d	g	j	m	p	t	w
"v"	n"	q	a	d	g	l	o	r	t	w
"v"	o"	q	a	d	g	j	m	p	t	w
"v"	p"	q	a	d	g	j	m	p	t	w
"v"	q"	q	a	d	g	j	m	p	t	w
"v"	r"	q	a	d	g	j	m	p	t	w
"v"	s"	q	a	d	g	j	m	p	t	w
"v"	t"	q	a	d	g	j	m	p	t	w
"v"	u"	q	a	d	g	j	m	p	t	w
"v"	v"	q	a	d	g	j	m	p	t	w
"v"	w"	q	a	d	g	j	m	p	t	w
"v"	x"	q	a	d	g	j	m	p	t	w
"v"	y"	q	a	d	g	j	m	p	t	w

FIG. 10P

"	"	1	2	3	4	5	6	7	8	9
"v	z"	q	a	d	g	j	m	p	t	w
"v	"	q	a	d	g	j	m	p	t	w
"w	a"	q	a	d	g	j	m	p	t	w
"w	b"	q	a	d	g	j	m	p	t	w
"w	c"	q	a	d	g	j	m	p	t	w
"w	d"	q	a	d	g	j	m	p	t	w
"w	e"	q	a	d	g	j	m	p	t	w
"w	f"	q	a	d	g	j	m	p	t	w
"w	g"	q	a	d	g	j	m	p	t	w
"w	h"	q	a	d	g	j	m	p	t	w
"w	i"	q	a	d	g	j	m	p	t	w
"w	j"	q	a	d	g	j	m	p	t	w
"w	k"	q	a	d	g	j	m	p	t	w
"w	l"	q	a	d	g	j	m	p	t	w
"w	m"	q	a	d	g	j	m	p	t	w
"w	n"	q	a	d	g	j	m	p	t	w
"w	o"	q	a	d	g	j	m	p	t	w
"w	p"	q	a	d	g	j	m	p	t	w
"w	q"	q	a	d	g	j	m	p	t	w
"w	r"	q	a	d	g	j	m	p	t	w
"w	s"	q	a	d	g	j	m	p	t	w
"w	t"	q	a	d	g	j	m	p	t	w
"w	u"	q	a	d	g	j	m	p	t	w
"w	v"	q	a	d	g	j	m	p	t	w
"w	w"	q	a	d	g	j	m	p	t	w
"w	x"	q	a	d	g	j	m	p	t	w
"w	y"	q	a	d	g	j	m	p	t	w
"w	z"	q	a	d	g	j	m	p	t	w
"x	a"	q	a	d	g	j	m	p	t	w
"x	b"	q	a	d	g	j	m	p	t	w
"x	c"	q	a	d	g	j	m	p	t	w
"x	d"	q	a	d	g	j	m	p	t	w
"x	e"	q	a	d	g	j	m	p	t	x
"x	f"	q	a	d	g	j	m	p	t	w
"x	g"	q	a	d	g	j	m	p	t	w
"x	h"	q	a	d	g	j	m	p	t	w

FIG. 10Q

"	"	1	2	3	4	5	6	7	8	9
"x	i"	q	c	d	g	j	n	s	t	w
"x	j"	q	a	d	g	j	m	p	t	w
"x	k"	q	a	d	g	j	m	p	t	w
"x	l"	q	a	d	i	j	m	p	t	w
"x	m"	q	a	d	g	j	m	p	t	w
"x	n"	q	a	d	g	j	m	p	t	w
"x	o"	q	a	d	g	j	m	p	t	w
"x	p"	q	a	e	i	j	o	p	t	w
"x	q"	q	a	d	g	j	m	p	t	w
"x	r"	q	a	d	g	j	m	p	t	w
"x	s"	q	a	e	i	j	m	p	t	w
"x	t"	q	a	e	g	j	m	r	u	w
"x	u"	q	a	d	g	j	m	p	t	w
"x	v"	q	a	d	g	j	m	p	t	w
"x	w"	q	a	d	g	j	m	p	t	w
"x	x"	q	a	d	g	j	m	p	t	w
"x	y"	z	a	d	g	j	m	p	t	w
"x	z"	q	a	d	g	j	m	p	t	w
"x	"	q	a	d	g	j	m	p	t	w
"y	a"	q	a	d	g	j	m	p	t	w
"y	b"	q	a	e	i	j	o	p	t	w
"y	c"	q	a	d	g	j	m	p	t	w
"y	d"	q	a	d	g	j	m	p	t	w
"y	e"	q	a	e	g	j	m	s	t	w
"y	f"	q	a	d	g	j	m	p	t	w
"y	g"	q	a	d	g	j	m	p	t	w
"y	h"	q	a	d	g	j	m	p	t	w
"y	i"	q	c	d	g	j	n	p	t	w
"y	j"	q	a	d	g	j	m	p	t	w
"y	k"	q	a	e	g	j	m	p	t	w
"y	l"	q	a	e	g	j	m	p	t	w
"y	m"	q	a	e	g	j	o	p	t	w
"y	n"	q	c	d	g	j	m	p	t	x
"y	o"	q	a	d	g	j	n	r	u	w
"y	p"	q	a	e	i	j	m	p	t	w
"y	q"	q	a	d	g	j	m	p	t	w
"y	r"	q	a	d	i	j	m	p	t	w

FIG. 10R

"	-	1	2	3	4	5	6	7	8	9
"y	s"	q	c	e	i	j	m	p	t	w
"y	t"	q	a	e	h	j	m	p	t	w
"y	u"	q	a	d	g	k	m	r	t	w
"y	v"	q	a	d	g	j	m	p	t	w
"y	w"	q	a	d	h	j	m	p	t	w
"y	x"	q	a	d	g	j	m	p	t	w
"y	y"	q	a	d	g	j	m	p	t	w
"y	z"	q	a	e	g	j	m	p	t	w
"y	"	q	a	d	g	j	m	p	t	w
"z	a"	q	a	d	g	j	m	p	t	w
"z	b"	q	a	d	g	j	m	p	t	w
"z	c"	q	a	d	g	j	m	p	t	w
"z	d"	q	a	d	g	j	m	p	t	w
"z	e"	q	a	d	g	j	n	r	t	w
"z	f"	q	a	d	g	j	m	p	t	w
"z	g"	q	a	d	g	j	m	p	t	w
"z	h"	q	a	d	g	j	m	p	t	w
"z	i"	q	a	d	g	j	n	p	t	w
"z	j"	q	a	d	g	j	m	p	t	w
"z	k"	q	a	d	g	j	m	p	t	w
"z	l"	q	a	d	g	j	m	p	t	w
"z	m"	q	a	d	g	j	m	p	t	w
"z	n"	q	a	e	g	j	m	p	t	w
"z	o"	q	a	d	g	j	n	p	t	w
"z	p"	q	a	d	g	j	m	p	t	w
"z	q"	q	a	d	g	j	m	p	t	w
"z	r"	q	a	d	g	j	m	p	t	w
"z	s"	q	a	d	g	j	m	p	t	w
"z	t"	q	a	d	g	j	m	p	t	w
"z	u"	q	a	d	g	j	m	p	t	w
"z	v"	q	a	d	g	j	m	p	t	w
"z	w"	q	a	d	g	j	m	p	t	w
"z	x"	q	a	d	g	j	m	p	t	w
"z	y"	q	a	d	g	j	m	p	t	w
"z	z"	q	a	d	g	j	m	p	t	w
"z	"	q	a	d	g	j	m	p	t	w
"	a"	q	c	d	i	l	n	r	t	w

FIG. 10S

"	"	1	2	3	4	5	6	7	8	9
"	b"	q	a	e	i	l	o	r	u	y
"	c"	q	a	e	h	l	o	r	u	y
"	d"	q	a	e	i	j	o	r	u	w
"	e"	q	a	d	i	l	n	s	v	x
"	f"	q	a	e	i	l	o	r	u	w
"	g"	q	a	e	i	l	o	r	u	w
"	h"	q	a	e	i	j	o	p	t	w
"	i"	q	c	f	g	j	n	s	t	w
"	j"	q	a	e	i	j	o	p	u	w
"	k"	q	b	e	i	j	n	p	t	w
"	l"	q	a	e	i	l	o	p	u	y
"	m"	q	a	e	i	k	o	s	u	y
"	n"	q	a	e	i	j	o	p	u	w
"	o"	z	b	f	g	k	n	r	u	w
"	p"	z	a	e	h	l	o	r	u	w
"	q"	z	a	d	g	j	m	p	u	w
"	r"	q	a	e	i	j	o	s	u	w
"	s"	q	a	e	h	l	o	p	t	y
"	t"	q	a	e	h	j	o	r	u	w
"	u"	q	a	d	i	k	n	s	t	w
"	v"	q	a	e	i	l	o	p	t	w
"	w"	q	a	e	i	j	o	r	t	w
"	x"	q	a	d	g	j	m	p	t	y
"	y"	q	a	e	i	j	o	p	u	w
"	z"	q	a	f	i	l	o	s	t	w

FIG. 10T

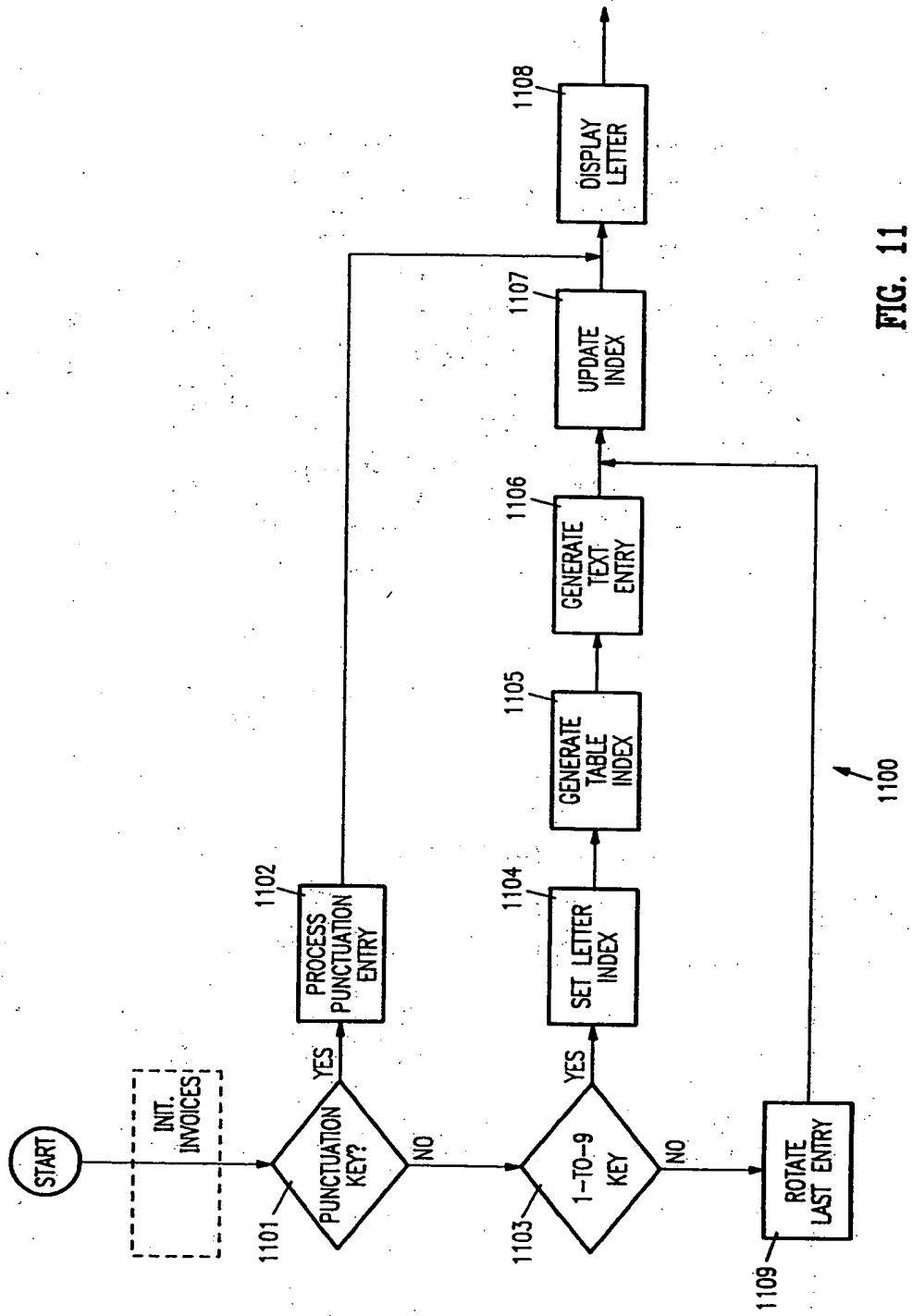


FIG. 11

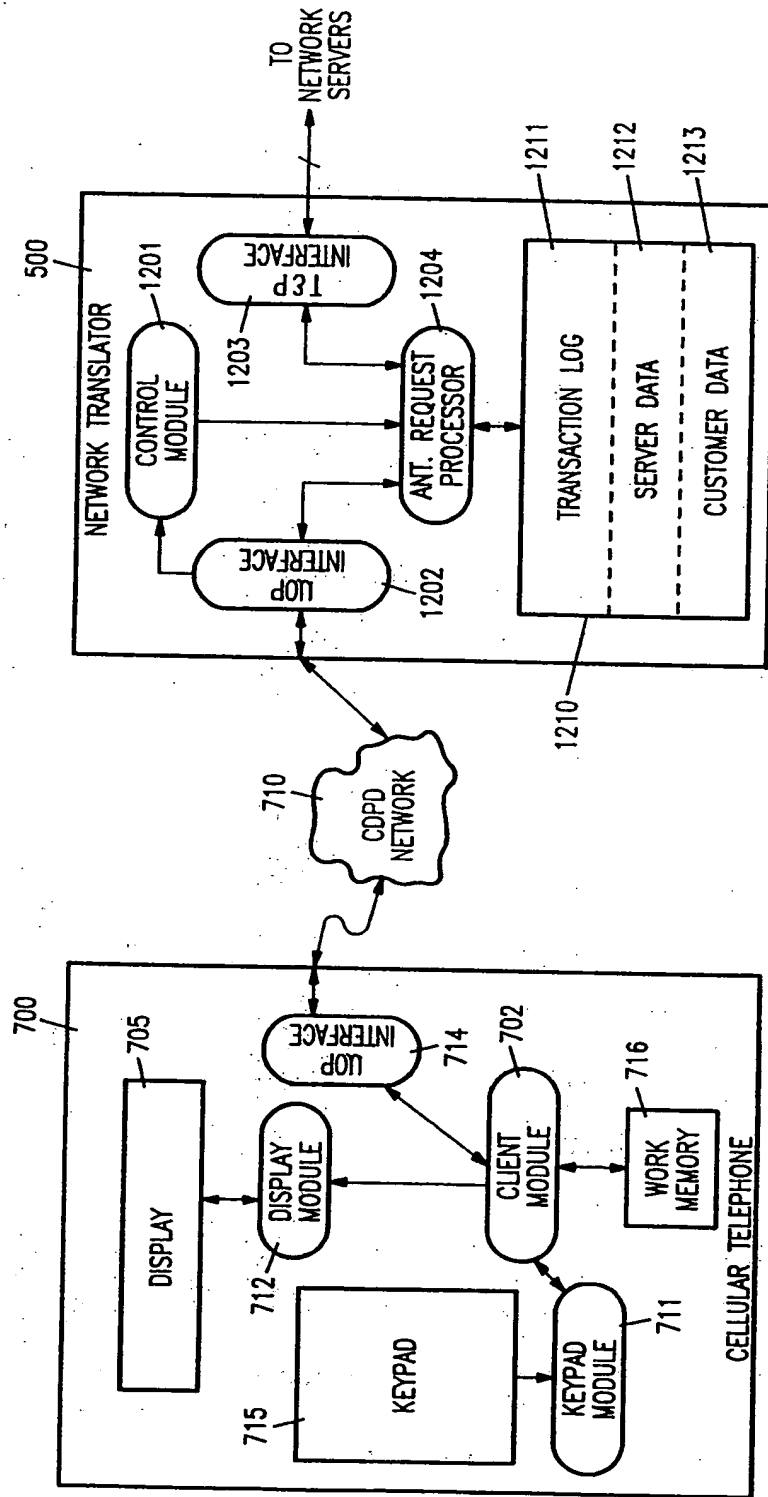


FIG. 12

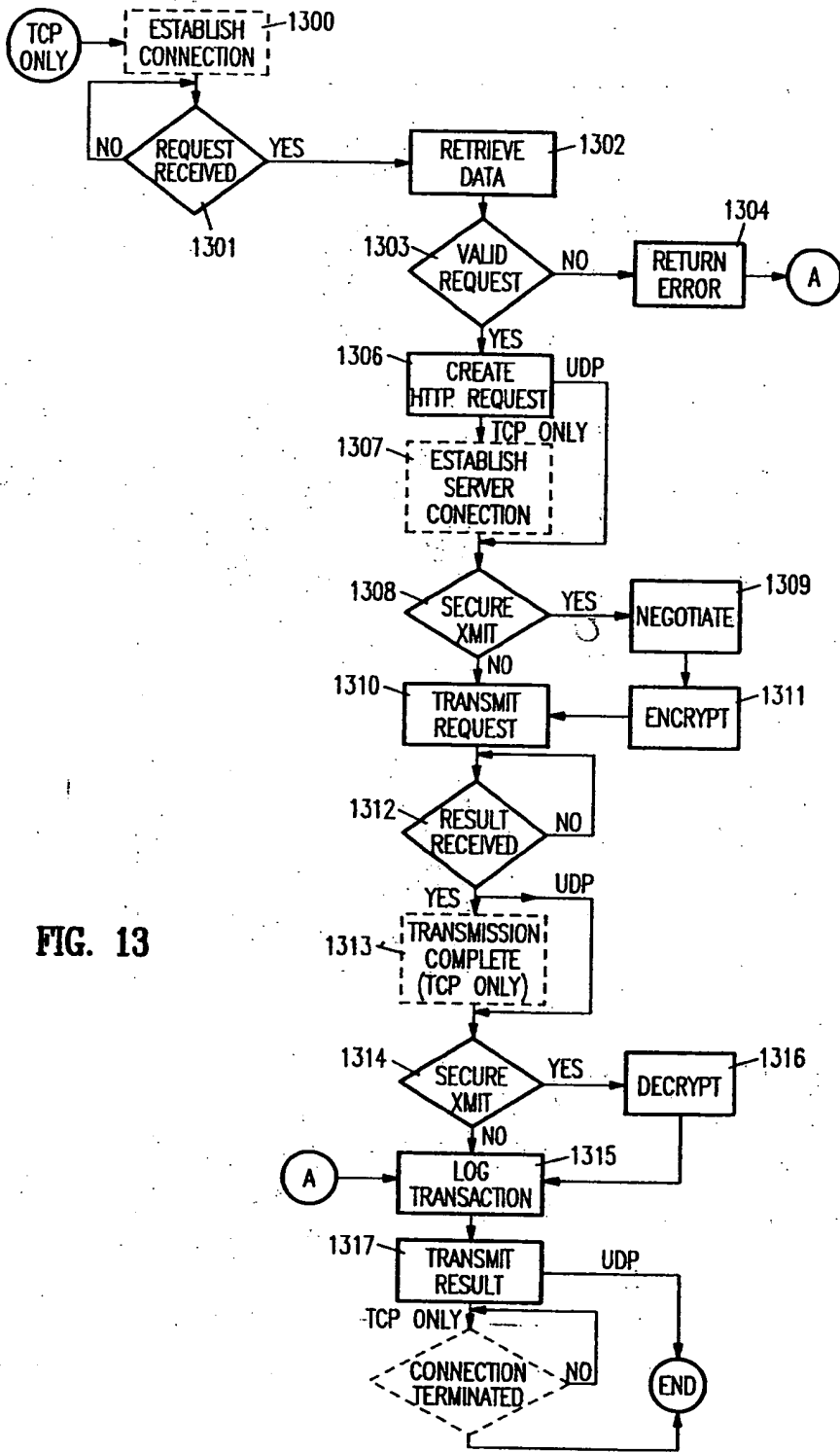


FIG. 13

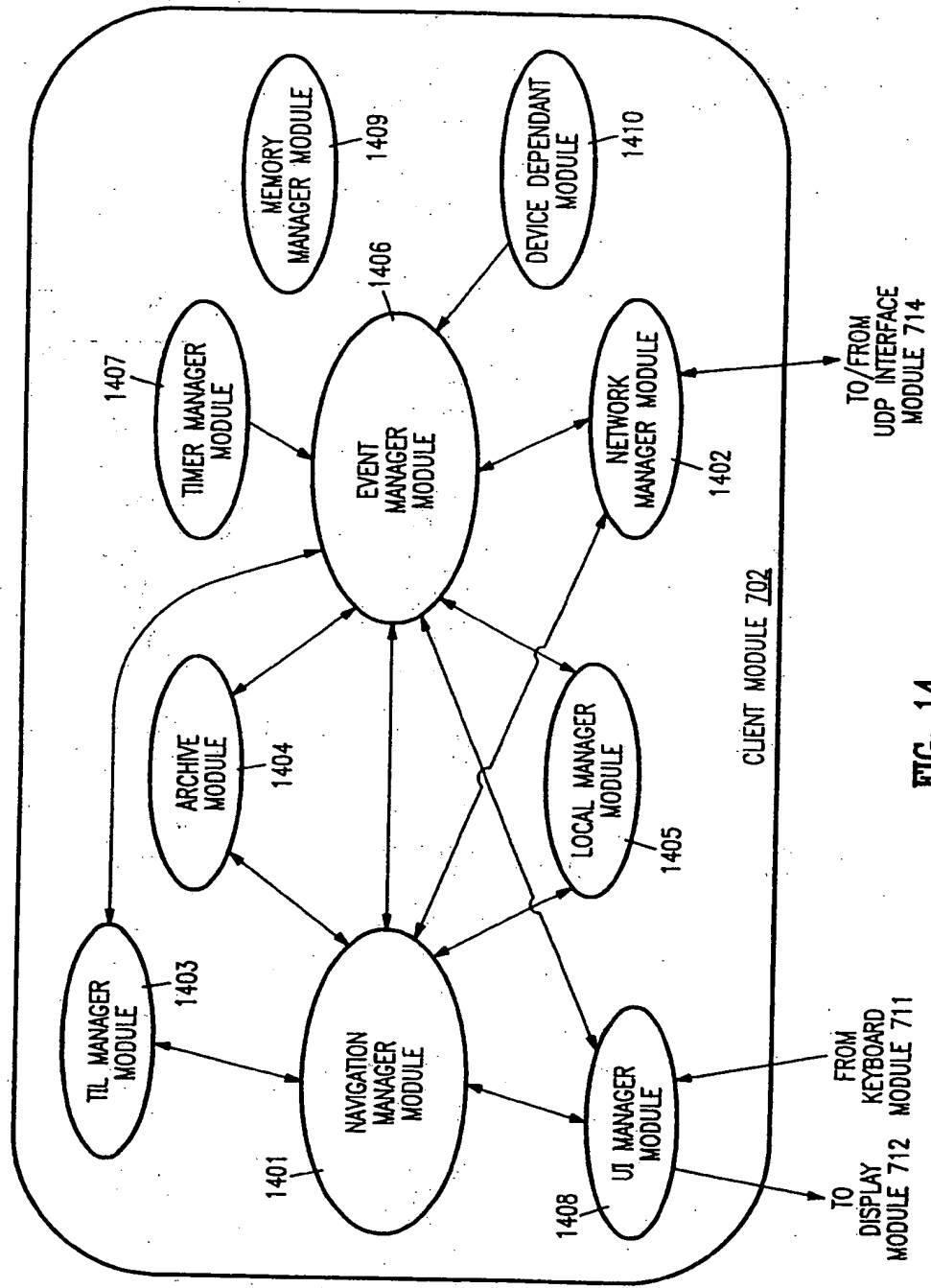


FIG. 14



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(54) **A method and architecture for an interactive two-way data communication network**

(57) A two-way data communication device such as a data ready cellular telephone, a two-way pager, or a telephone communicates via a two-way data communication network with a server computer on a computer network that has an interface to the two-way data communication network, i.e., is coupled to the two-way data communication network. For example, the computer network can be a corporate wide area network, a corporate local area network, the Internet, or any combination of computer networks. The two-way data communication device utilizes a client module to transmit message including a resource selector chosen by the user to a server on a server computer on the computer network. The server processes the message and transmits a response over the two-way data communication network to the client module. The client module interprets the response and presents the response to the user via a structured user interface. Alternatively, the user transmits a request that directs the server to transmit the response to the request to another location or to another user.

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EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (InCL.6)
X	LILJEBERG M ET AL: "OPTIMIZING WORLD-WIDE WEB FOR WEAKLY CONNECTED MOBILE WORKSTATIONS: AN INDIRECT APPROACH" INTERNATIONAL WORKSHOP ON SERVICES IN DISTRIBUTED AND NETWORKED ENVIRONMENTS, 5 June 1995 (1995-06-05), pages 132-139, XP000764774 * the whole document *	1-11, 25-29	H0407/24 H04L12/28
A	KAASHOEK M F ET AL: "DYNAMIC DOCUMENTS: MOBILE WIRELESS ACCESS TO THE WWW" PROCEEDINGS, WORKSHOP ON MOBILE COMPUTING SYSTEMS AND APPLICATIONS, 8 December 1994 (1994-12-08), pages 179-184, XP002016896 * the whole document *	1-11, 23-29	
X	WO 93 16550 A (BELL ATLANTIC NETWORK SERVICES) 19 August 1993 (1993-08-19) * page 10, line 15 - line 22 * * page 11, line 19 - page 12, line 2 * * page 17, line 6 - page 18, line 14; figures 6,7 *	36	
A	GESSLER S ET AL: "PDAs as mobile WWW browsers" COMPUTER NETWORKS AND ISDN SYSTEMS, vol. 28, no. 1, 1 December 1995 (1995-12-01), page 53-59 XP004001210 ISSN: 0169-7552 * the whole document *	36-39	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (InCL.6)
			H04Q H04L G06F
Place of search	Date of completion of the search	Examiner	
THE HAGUE	23 September 1999	Gerling, J.C.J.	
CATEGORY OF CITED DOCUMENTS			
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EPO FORM 1503 03 92 (P4/C01)



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 30 9006

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	VOELKER G M ET AL: "MOBISAIC: AN INFORMATION SYSTEM FOR A MOBILE WIRELESS COMPUTING ENVIRONMENT" PROCEEDINGS, WORKSHOP ON MOBILE COMPUTING SYSTEMS AND APPLICATIONS, vol. 5, no. 10, 1 January 1995 (1995-01-01); pages 185-190, XP002062595		
A	US 5 128 672 A (KAEHLER EDWIN B) 7 July 1992 (1992-07-07)		
			TECHNICAL FIELDS SEARCHED (Int.Cl.8)
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 23 September 1999	Examiner Gerling, J.C.J.
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ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 96 30 9006

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23-09-1999

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9316550	A	19-08-1993	AU 3601593 A	03-09-1993
US 5128672	A	07-07-1992	JP 5134797 A	01-06-1993

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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April 06, 1998, Issue: 1001
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News

TechWeb Sites

W3C putting Compact HTML, HDML to test for Net access – Mobile markup languages face off

Yoshiko Hara

Tokyo - A compact version of the Hypertext Markup Language that targets portable Internet access will face off against the Handheld Device Markup Language here this week at a mobile-access workshop hosted by the World Wide Web Consortium (W3C)

Compact HTML was developed by Access Co. Ltd. (Tokyo), which last month submitted the language to W3C as a proposed standard. Fujitsu Ltd., Matsushita Electric Industrial Co. Ltd., Mitsubishi Electric Corp., NEC Corp. and Sony Corp. joined Access in making the proposal. The HTML subset would provide a compact browser to such portable gear as cellular phones, personal digital assistants and personal communicators.

The rival HDML was proposed to W3C last May by Unwired Planet, Alcatel-Asthom Recherche, AT&T, Gemplus, Mitsubishi Electric, Sun Microsystems and Tandem Computers.

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W3C has posted the Compact HTML proposal on its home page, where a "staff comment" suggests the consortium's preference for the HTML subset over HDML. The comment cites "another submission made [last year] to address similar [mobile access] requirements: the HDML Submission" and states that while HDML's backers "proposed a format similar to . . . HTML, the Compact HTML submission is closer to existing W3C recommendations."

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Compact HTML is designed so that a browser based on the language can be implemented in products with steep hardware restrictions. The browser could run on a system with 150 to 200 kbytes of RAM and 150 to 200 Mbytes of ROM. A processor with a relatively low 1 to 10 Mips of performance, similar to those commonly used for embedded applications, could control the Internet access. The system's display is also assumed to be small, featuring 50- x 30-dot resolution, 100- x 72-dot resolution, or 150- x 100-dot resolution with monochrome color and a single font. Four buttons-for forward cursor, backward cursor, select and cancel- will handle all basic operations.

Compact HTML is a subset of HTML 2.0, HTML 3.2 and HTML 4.0. To satisfy portable hardware restrictions, it will support GIF images but not such capabilities as JPEG images or tables, background color, or multiple character fonts and styles.

Officials backing the respective proposals are keenly aware of their competition.

"By contrast [to Compact HTML], HDML has no compatibility with HTML," said Tomihisa Kamada, executive vice president of Access and the leader of the language's development. "Compact HTML can use HTML infrastructure as it is. Simple pages can be viewed directly from portables based on Compact HTML, and home-page creators can write dedicated pages for mobile access easily as a part of HTML home pages."

Once W3C selects a standard, content providers will be able to prepare pages linked to conventional HTML home pages but accessible to mobile gear. "We

proposed the language to expand the market," said Kamada. Access has already developed a browser, called Compact NetFront, based on Compact HTML.



Mitsubishi supports both HDML and Compact HTML. The company is a shareholder of Unwired Planet and manufactures terminals based on HDML for AT&T. "Each format has different advantages; they can coexist in the market in different form of services," a Mitsubishi spokesman said.

An engineer for one of the proponents of Compact HTML said the language is the better of the announced alternatives.

NTT Mobile Communications Network Inc., the largest cellular carrier in Japan, contributed its cell-phone technology to Compact HTML. The company is considering a service based on the language. Such a move could provide vendors with an incentive to support it.

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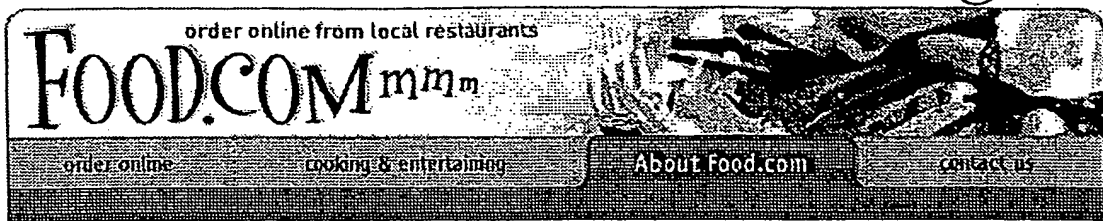
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Press Releases

Entertainment Industry Leader Rich Frank Takes Helm at Cybermeals, World's Largest Online Meal Ordering System

San Francisco, CA (September 15, 1998) - cybermeals (www.cybermeals.com), the world's largest online meal ordering system, today announced the appointment of Richard Frank as the new chairman, president and CEO of the two-year-old Internet start-up. Frank succeeds interim CEO Bill Jesse, who will remain as a member of the Board of Directors.

Frank has driven a wide range of initiatives in traditional and emerging sectors of the entertainment world throughout his career. His move from a foremost position in the entertainment industry to one in the fast-paced Internet commerce and food arena is another strong indication that e-commerce is not merely a trend, but a dominant industry segment attracting the attention and talent of top players. A fact reinforced by Frank's significant financial investment in cybermeals.

cybermeals was founded in 1996 and currently is available in major markets nationwide. The service gives Internet users the ability to locate restaurants in their own neighborhoods and order meals online as far as three months in advance. Currently, cybermeals has over 10,000 restaurants online. cybermeals has long-term, exclusive partnerships with the majority of restaurant delivery services throughout the U.S. and has been exclusively endorsed by a number of leading restaurant trade organizations. Additionally, cybermeals is the exclusive online meal ordering service for America Online, the nation's largest Internet service provider.

"In the rapidly-expanding world of Internet commerce, cybermeals is a dynamic young company with unlimited market opportunity. Based on recent industry estimates, the potential market for online food delivery is five times larger than that of the book and music industries. Leading the charge is a challenge I couldn't pass up and I am delighted to have the chance to build on the initial success of the cybermeals team," said Frank. "cybermeals is well-positioned to capitalize on the promise of the burgeoning Internet food arena with superb technology, outstanding strategic partnerships and a talented group of employees. I am confident that we will rapidly bring the company into its next phase of development and realize its extraordinary potential."

Frank was most recently chairman and CEO of Comcast Content and Communication (C3), a company he founded in 1995 with television/telecommunications giant Comcast Corporation. Prior to his position at C3, Frank served as chairman of Walt Disney Television and Telecommunications (1994 to 1995) and as

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president of The Walt Disney Studios (1985 to 1994). From 1977 to 1985, he served as both vice president and president of the Paramount Television Group of Paramount Pictures.

"Rich Frank is a proven leader with more than 25 years of senior management experience at major consumer-oriented corporations. We are very excited to have him on board both as Chairman and as a major investor," said Bill Jesse. "We immediately recognized Rich's talent for enhancing and building strong brands and his unusual ability to foster environments that generate products with enduring consumer appeal. His proven track record as a strong operational manager and business builder makes him a valuable asset to cybermeals."

"Rich Frank is an outstanding addition to cybermeals," said Jim Breyer, cybermeals Board Member and Managing Partner at Accel Partners. "Accel Partners has made a significant investment in the company and we are confident that under Rich's leadership, cybermeals is well positioned for success in this exciting market."

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E

Graphic User Interface Builder Menu Construction using a Tree-View Container



XP 000540186

p. 65-66

A method for arranging an ordered, hierarchical structure, such as a menu, using a common graphical interface is disclosed. The disclosed means for arranging a hierarchical structure uses a tree-view container. For the particular case of a menu illustrated below, each node in the tree would represent either a menu item or a sub menu. The following diagram (Menu X) illustrates the typical view presented to the user.

MENU X

```
+ File
- Edit
|
--- - Edit_Submenu
    |
    --- Cut
    |
    --- Copy
    |
    --- Paste
    |
    --- -separator-
    |
    --- Clear
- Search
|
--- + Search_Submenu
- Options
|
--- - Options_Submenu
    |
    --- Save options
    |
    --- - Preferences
        |
        --- - Preferences_Submenu
            |
            --- Settings
            |
            --- CUA Accelerators
            |
            --- Ring enabled
...etc.
```

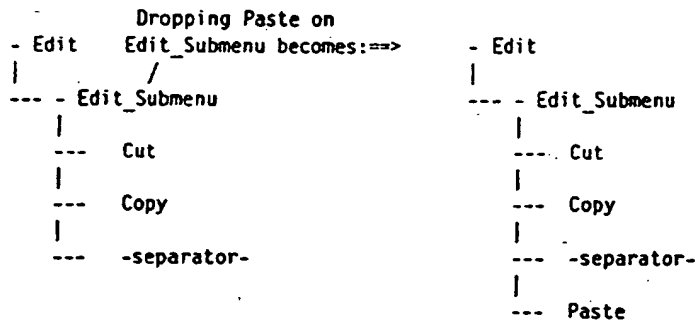

Graphic User Interface Builder Menu Construction using a Tree-View Container - Continued

Pop-up menus on each node would be populated with items relevant to the items they represent. The container itself would represent the object (in this case a menu) as a whole, and would have a popup relevant to that object.

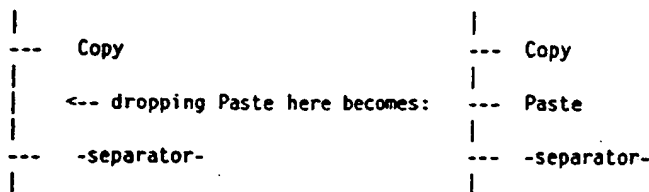
Manipulation of the nodes could be allowed through the popup-menus in order to provide keyboard support, however this system is intended primarily for use with a mouse, or some other pointing device.

The pointing device would be used to drag and drop the different nodes in order to rearrange them. Different keyboard combinations applied during the drag would indicate whether the intended action is a move or a copy. When a node is moved, or copied, all of its descendant nodes would be moved or copied along with it.

If an object is dropped directly on a node, the interpretation would be that the object is intended to be added as the last child of the target node.



If an object is dropped between two nodes at the same level, the interpretation is that the object should be inserted between the two nodes.



A similar method to that disclosed herein could be provided to allow the user to reorder the pages of a notebook control.

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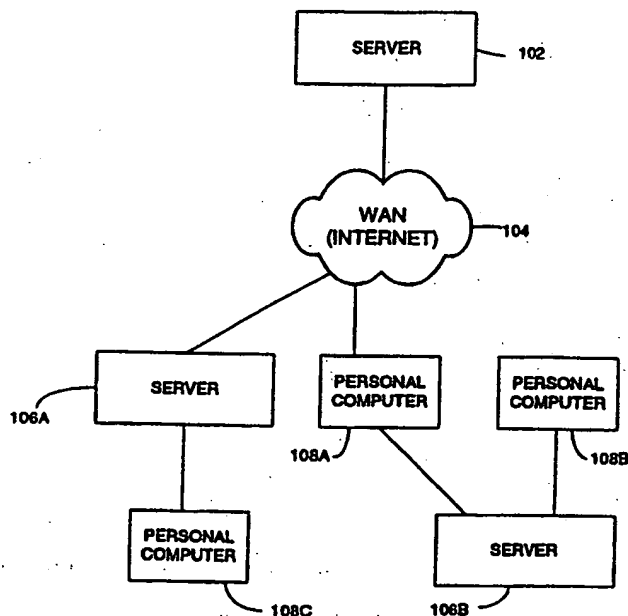
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<p>(51) International Patent Classification ⁶ : G06F 17/30</p>	<p>A2</p>	<p>(11) International Publication Number: WO 98/20434 (43) International Publication Date: 14 May 1998 (14.05.98)</p>
<p>(21) International Application Number: PCT/US97/19719 (22) International Filing Date: 30 October 1997 (30.10.97) (30) Priority Data: 08/745,899 7 November 1996 (07.11.96) US 08/762,289 9 December 1996 (09.12.96) US (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).</p>	<p>(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).</p> <p>Published <i>Without international search report and to be republished upon receipt of that report.</i></p>	

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

CROSS REFERENCE TO RELATED APPLICATION

5 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.

10 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.

15 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

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.

5 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
10 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
15 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
20 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
25 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
30 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.

5 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

10 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.

15 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.

20 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.

25 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.

30 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.

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.

5 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.

10 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.

15 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.

20 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.

25 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.

30 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

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

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
5 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
10 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
15 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
20 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
25 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
30 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

of the web page is the sum of the number of bytes in the page's HTML: the size of all image , 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.

5 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
10 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.

15 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>),
20 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 (), 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
25 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
30 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

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/samplertree/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

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
5 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
10 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
15 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
20 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
25 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
30 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

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.

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.

```
<APPLET CODE="browser.class" WIDTH="10" HEIGHT="10">
5 <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
10 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
15 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'
20 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
25 TRANSIT=MENU]">
                        <PARAM NAME="menu_2_1_1" VALUE="[LINK_OBJECT
URL=http:// www.xyzmotors.com /Images\I_1_1.GIF
30 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
35 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
40 DELAY=10]">
                                        <PARAM NAME="menu_3_1_1" VALUE="[LINK_OBJECT
URL=http:// www.xyzmotors.com /Images\I_1_1.GIF
45 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'
50 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
55 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]">
```



```
<PARAM NAME="menu_5" VALUE=" {MENU_ITEM NAME='New For
'97'} ">
```

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

```
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] ">
```

```
15 <PARAM NAME="menu_5_2" VALUE=" {LINK_FILE NAME=
xyzmotors _menu_5.brw] ">
```

```
</APPLET>
```

Table 1

20 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.

40 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

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 5 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 10 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 15 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 20 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">
```

25 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, 30 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

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

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).

5 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.

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

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

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

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

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

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

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

```

    page1.objects > 10
  THEN
    page1.preload_priority = 8
  ENDIF
5
  ; Set preload order based upon browser type and time
  of
  ; day
  ; MSIE_3x is Microsoft's Internet Explorer Version 3.x
10 IF
    ; night time hours
    browser.type = MSIE_3x AND (env.timeofday > 20:00
  AND env.timeofday < 08:00)
  THEN
15    preload.order = SEQUENTIAL
  ENDIF

  ; Set preload order based upon browser type and time
  of
20  ; day
  ; STRATEGY_7 is load page 1, then 2, then largest to
  ; smallest
  IF
    ; business hours
25    browser.type = MSIE_3x AND (env.timeofday >
  08:00 AND env.timeofday < 20:00)
  THEN
    preload.order = STRATEGY_7
30  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.

45 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

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.

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

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
5 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
10 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
15 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
20 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.

25 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
30 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

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

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
5 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
10 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
15 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.

20 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
25 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
30 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.

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.

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

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
5 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
10 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
15 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
20 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
25 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
30 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

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
5 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
10 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
15 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
20 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 pseudo-code representation used to implement the AI module and is incorporated by reference herein.

25 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
30 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.

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.

5 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.

10 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, 15 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 20 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.

25 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.

30 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.

Appendix A

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

Class Definitions

```

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

class PrSiteView
20 {
    //hierarchical tree of presentations accessible to user logging-in.
    string name;
    PrSite & site;
    PrPage & rootMenuPage; //top-level menu
25 Presentation & rootPresentation; //top-level presentation
};

typedef Vector<Presentation> PresVec

30 class Presentation
{
    //describes a presentation corresponding to a menu item
    string name;
    string type; //sequence, white-paper, order-form
35 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
40 PrPageVec & tailPageVec; //list of pages tacked-on (e.g. order-
//form)
};

45 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;
50 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
55 };

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

```



```

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

class PrPage
20 {
    //HTML page, or special effect page, or applet
    string      name;
    string      type; //HTML, VRML, Applet, FX
    string      url; //locator
25  long        size; //file size (for download monitoring)
    PrComponentVec & componentVec; //list of components (images, sound, video)
};

class PrComponent
30 {
    //image, video, sound, applet and other non-text components of a page
    string      name;
    string      mime_type; //image, sound, etc.
    long        size; //file size
35  long        playTime; //play (display) time; for timing
    string      url; //locator
};

class PrFx
40 {
    //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
45  PrPageVec & pageVec; //page containing this FX
};

class PrEnvironment
50 {
    //class of browser environment
    //for which sequences can be created
    string      name;
55  };

#include "VauyWebPresSmooth.h"

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

```

```

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

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

10 //inquire what kinds of plugins the browser has
  Browser.getPlugins(pluginVec);
  for( plugin = pluginVec.firstElement;
      plugin != NULL;
      plugin = plugin.nextElement())
15 {
    switch plugin.type
    {
      case pluginStreamingVideo:
        streamVideoType = StreamVideoTypeVec(plugin.vendor);
        break;
20      case pluginVirtualReality:
        vrPlayer = Yes;
        break;
    } //switch
25 }

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

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

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

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

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

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

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

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

60 //go through all items of the sequence
  seqItem = mainSequence.pageVec.firstElement;
  while( true)
65 {
    //reassess the state of the network (since prev. page)

```

```

curState = assessState();
switch curState
{
5   case stThroughputDidNotChangeDramatically:
      //can we preload one more component?
      if( preloadedCount >= MaxPreloadedCount)
      {
10          break;
      }
      nextPreloadSeqItem =
          curSequence.getNextPreloadSeqItem();
      nextPreloadComp =
15          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
20      for(i = 0; i < MaxPreloadedCount; ++i)
      {
          comp = componentBeingDownloaded( i);
          if( comp.status != stInProgress)
25              continue;
          comp.calcTimeToStart();
          comp.calcRemainingTimeToDownload();

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

50   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();

60   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)
65          //yes: switch
          setNextItem( nextSequence.nextItem);
      else
          //no: act as if no change
          setStatus( stNormal);

```

```

        break;

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

        calcCurTiming();
10      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)
15      if ( (status = handleLateTiming()) == Success)
            break;

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

        break;

    case stThroughputLow:
        //keep count of how steady is the decrease
        ThroughputDecreasedCount++;
        ThroughputIncreasedCount = 0;
30      calcCurTiming();
        if (curSequenceItem.timingOK)
            //we are still OK for this and next page
            break;
        else
35      {
            setStatus(stThroughputDecreased);
            continue; //next iteration picks it up and handles
it
        }
    } //switch
} //while
} //manager()

int handleLateTiming()
45 {
    //if we currently are displaying text,
    //increase viewing time by 20%
    //(whether it helps or not)
50 if (curItem.page.mimeType = "text")
    {
        increaseViewTime(curItem, percentIncreaseForText);
        calcCurTiming();
        if (curSequenceItem.timingOK)
65 {
            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
65 comp = curItem.replayCompVec.lastElement();
}

```

```

5         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

```

CLAIMS

What is claimed is:

- 5 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
- 10 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
- 15 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.
- 20 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
- 25 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;
- 30 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.

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;
 - 5 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
 - 10 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.

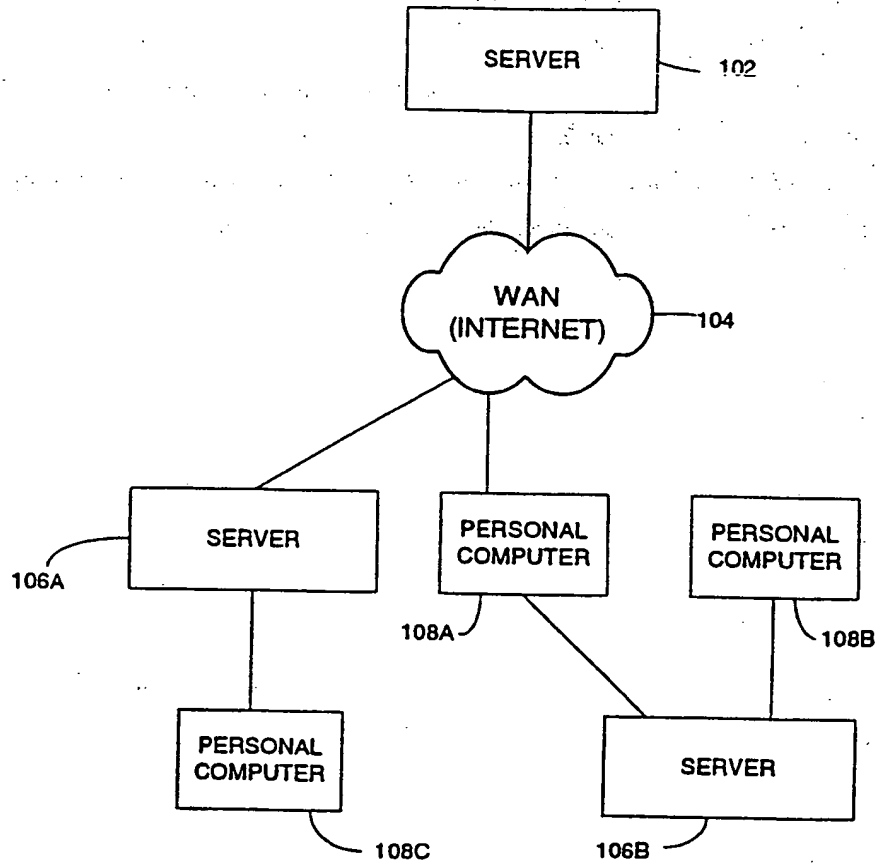


FIGURE 1

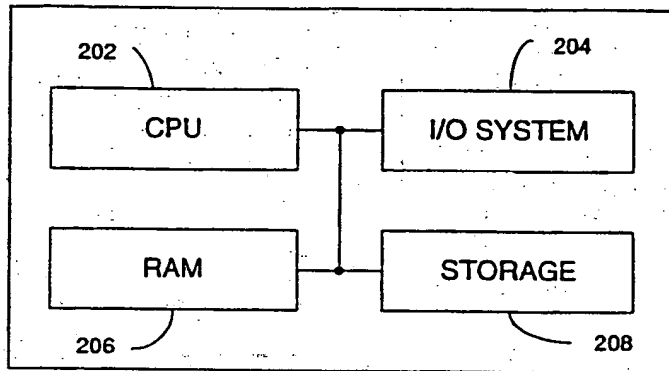


FIGURE 2

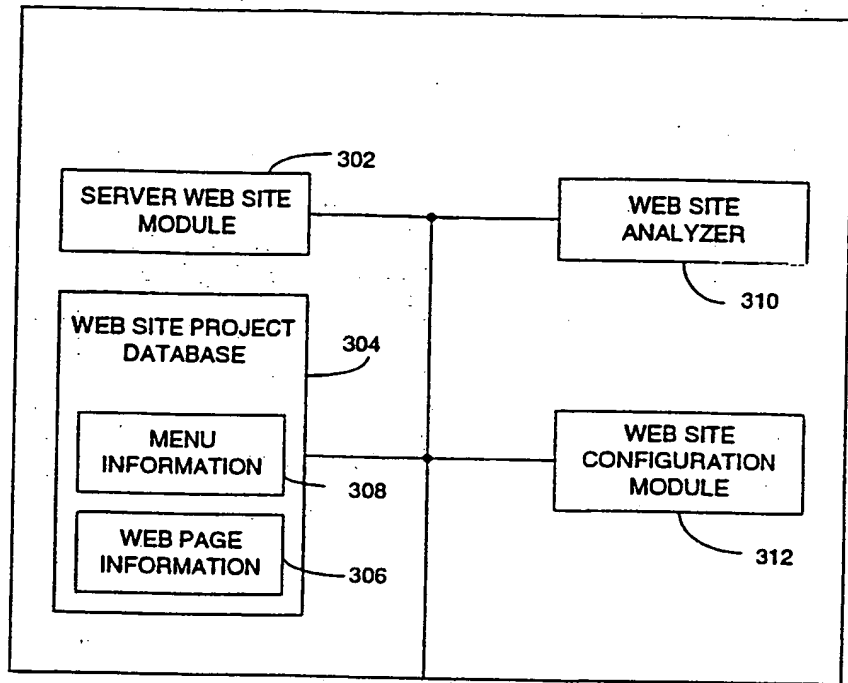


FIGURE 3

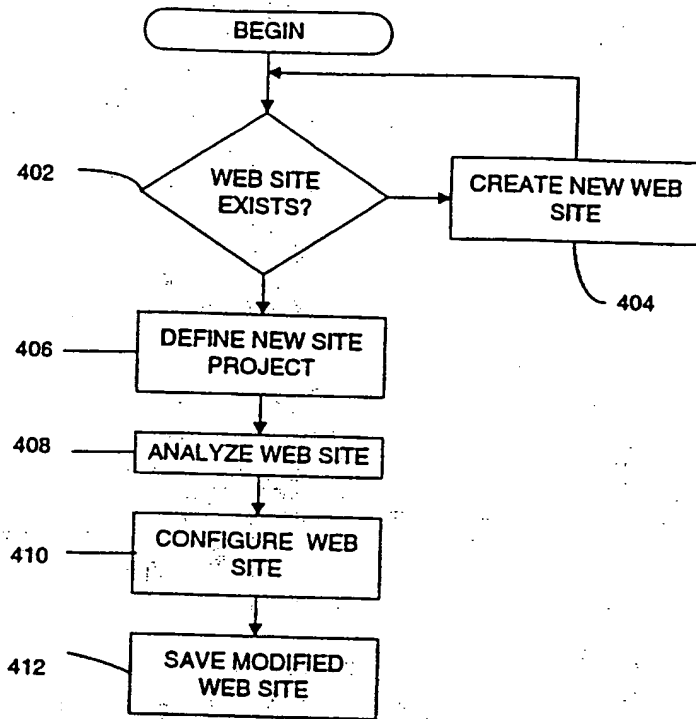


FIGURE 4

5/20

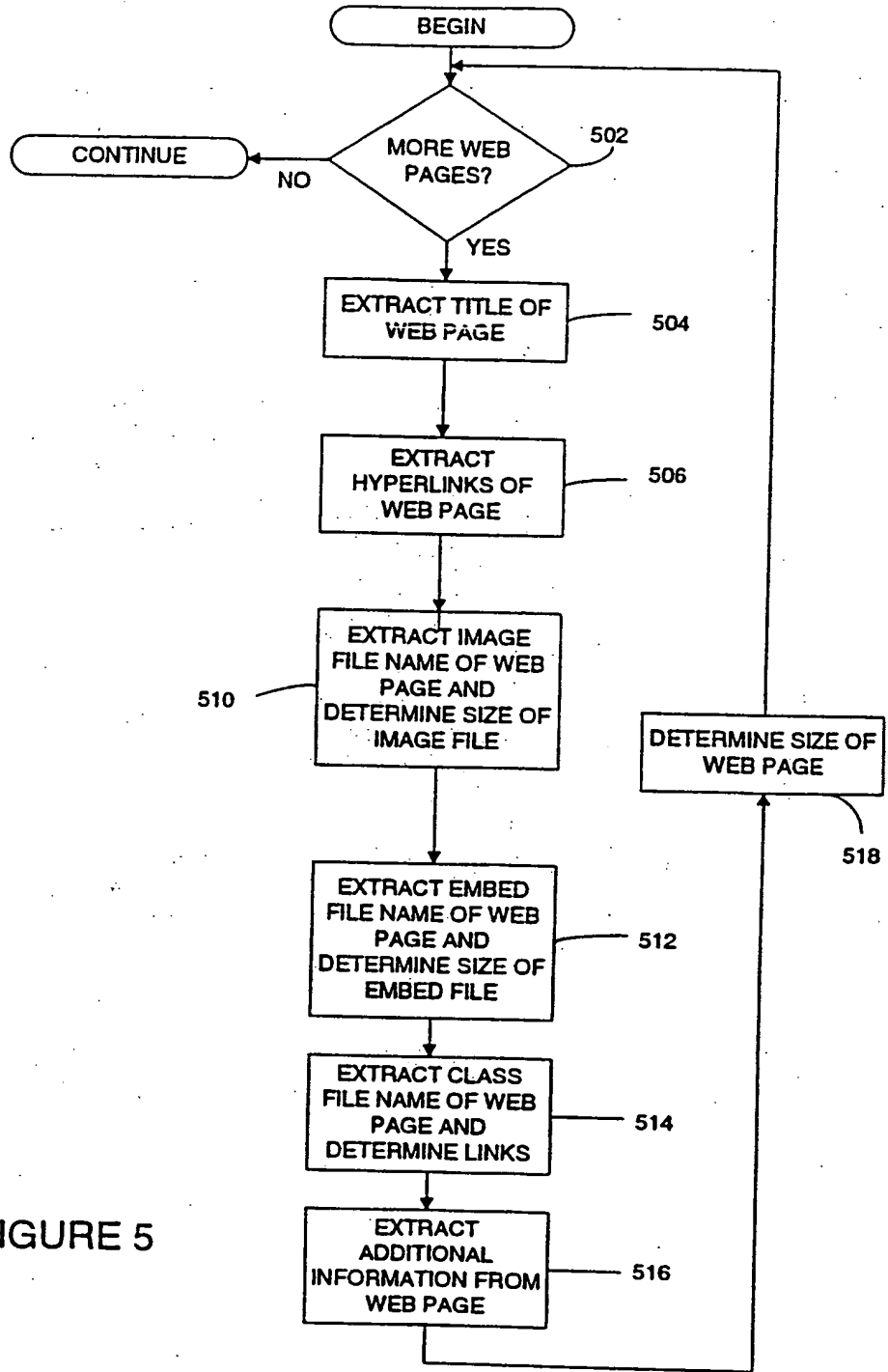
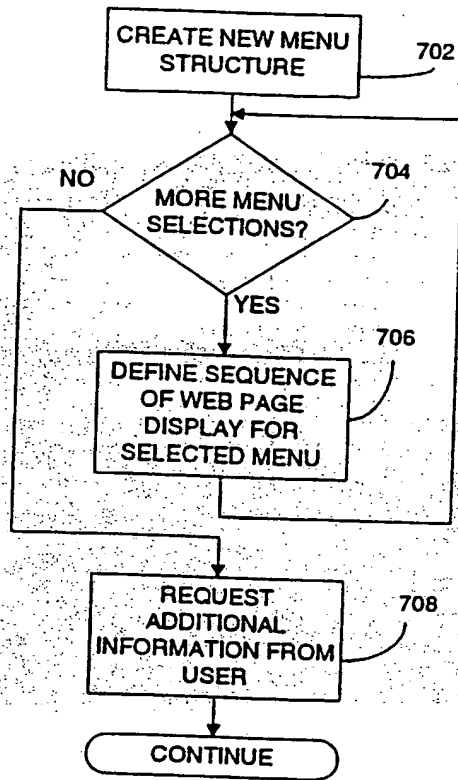


FIGURE 5

7/20



410

FIGURE 7

8/20

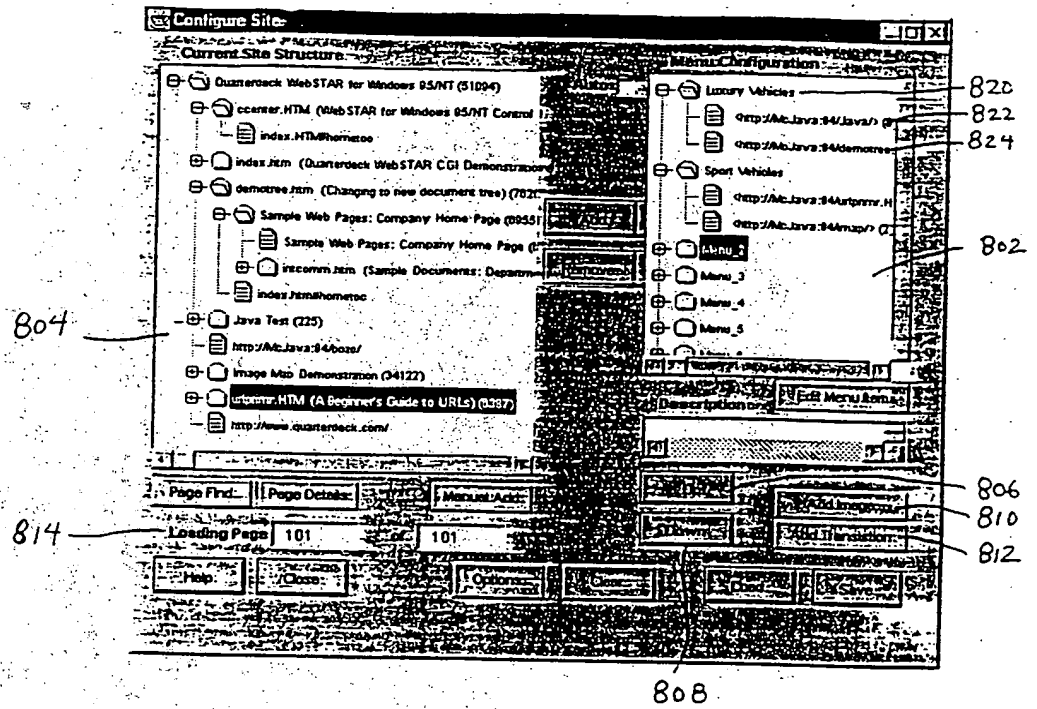


Figure 8

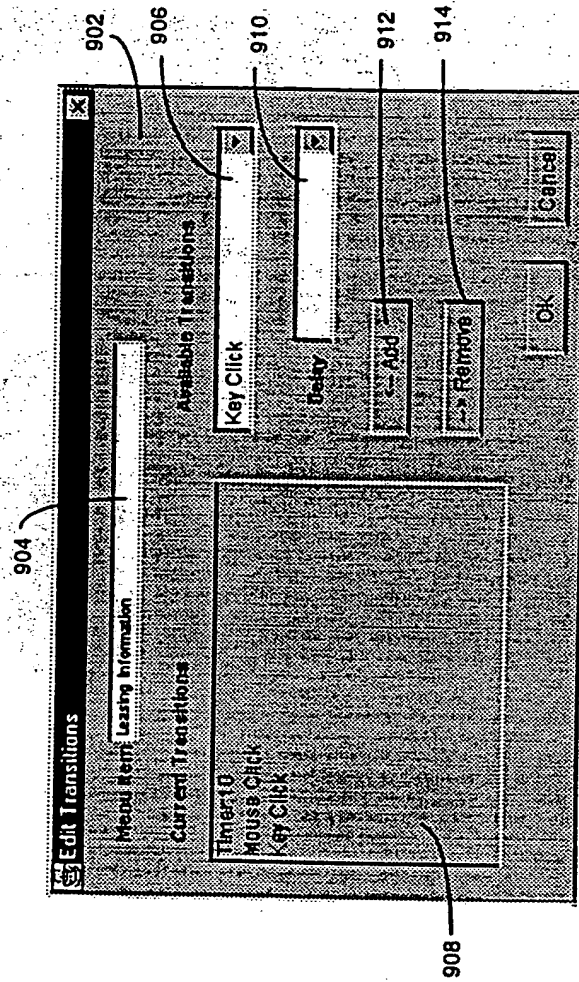


Figure 9

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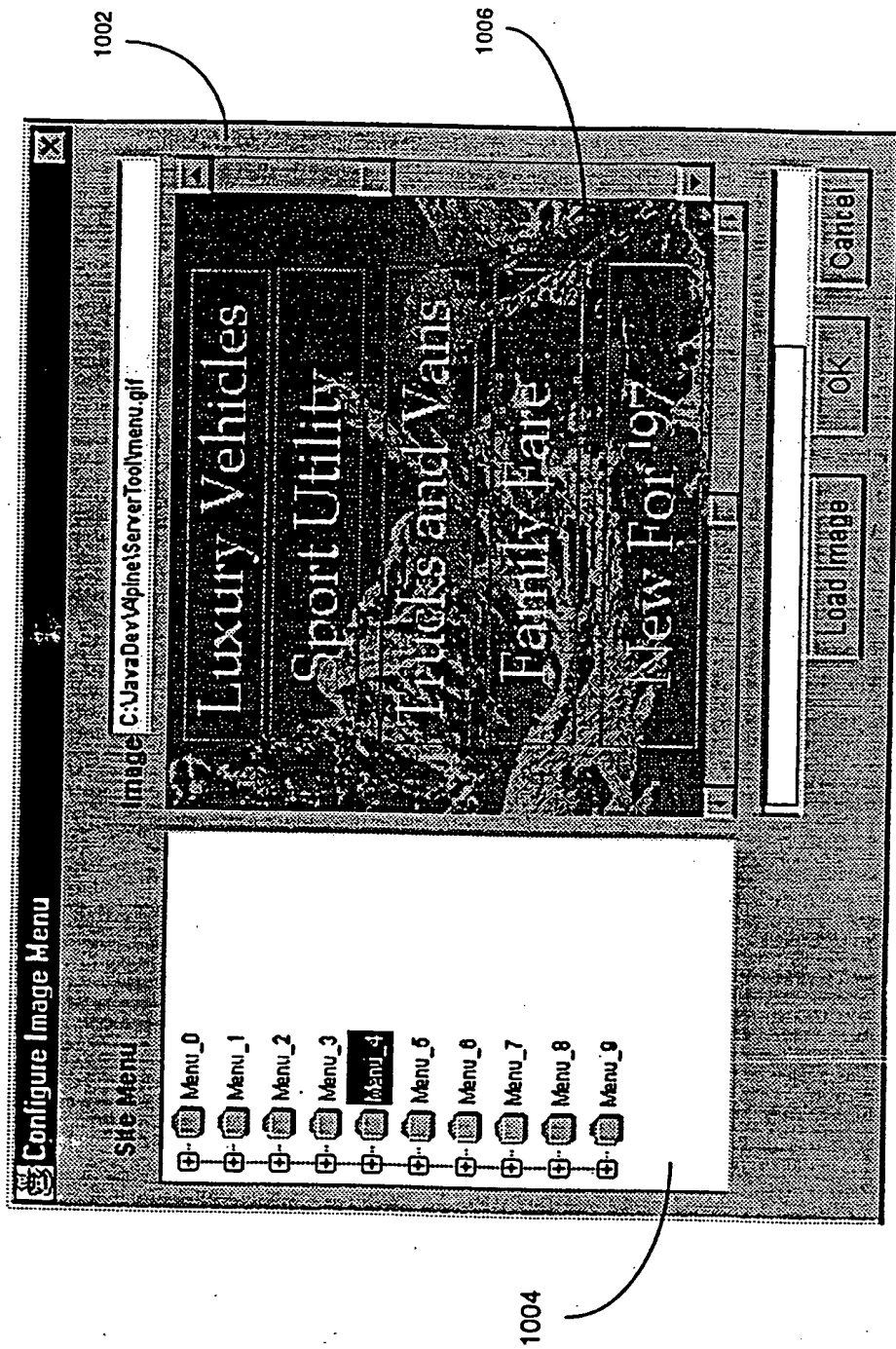


Figure 10

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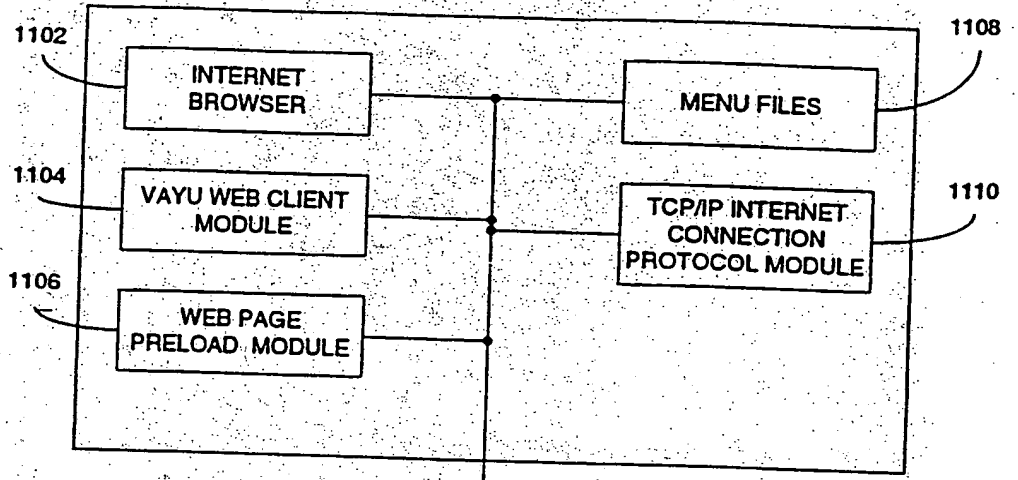


FIGURE 11

12/20

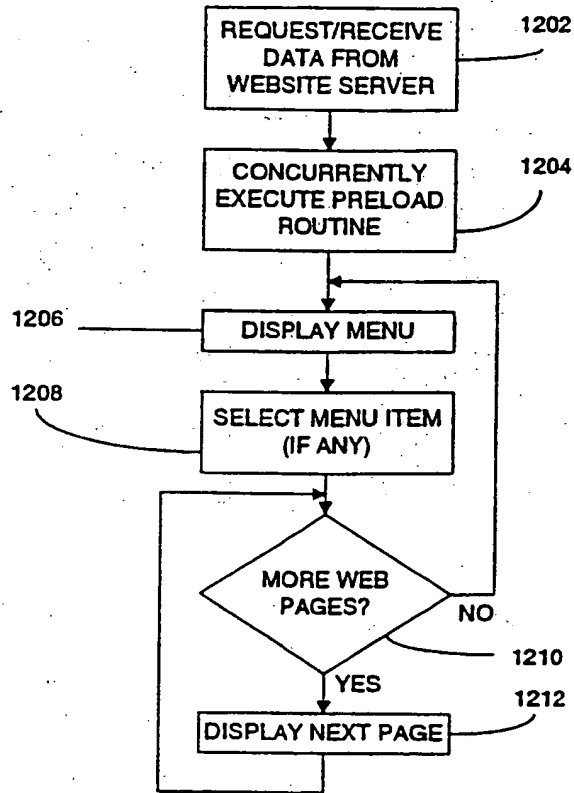


FIGURE 12

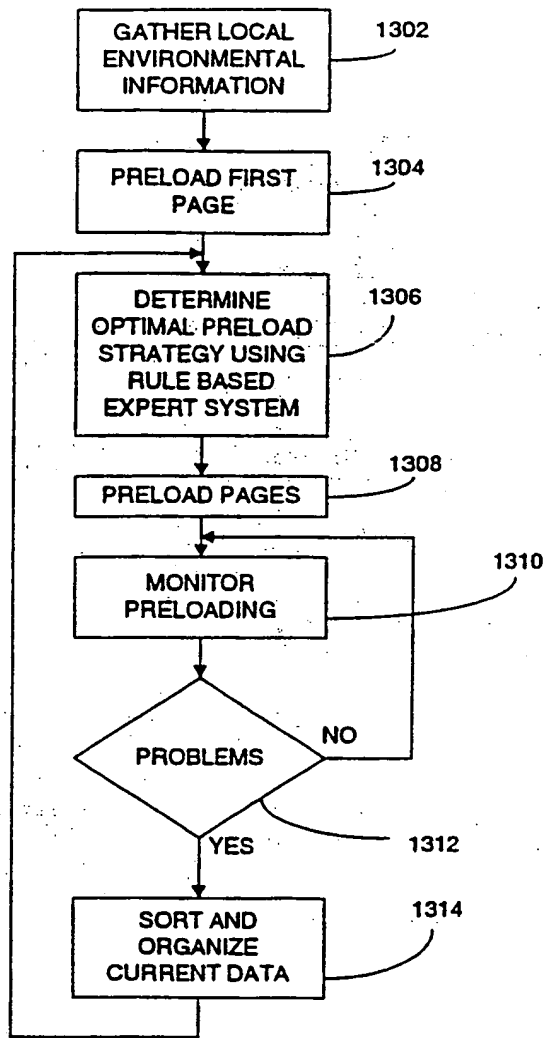


FIGURE 13

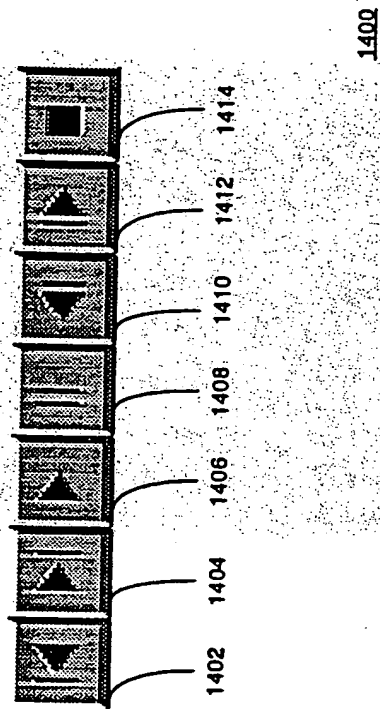


Figure 14

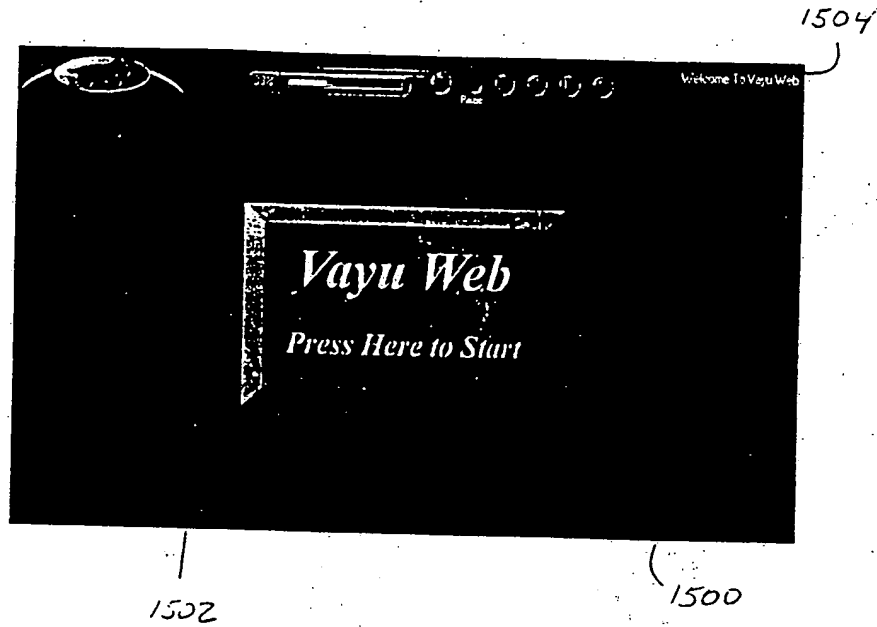


FIGURE 15

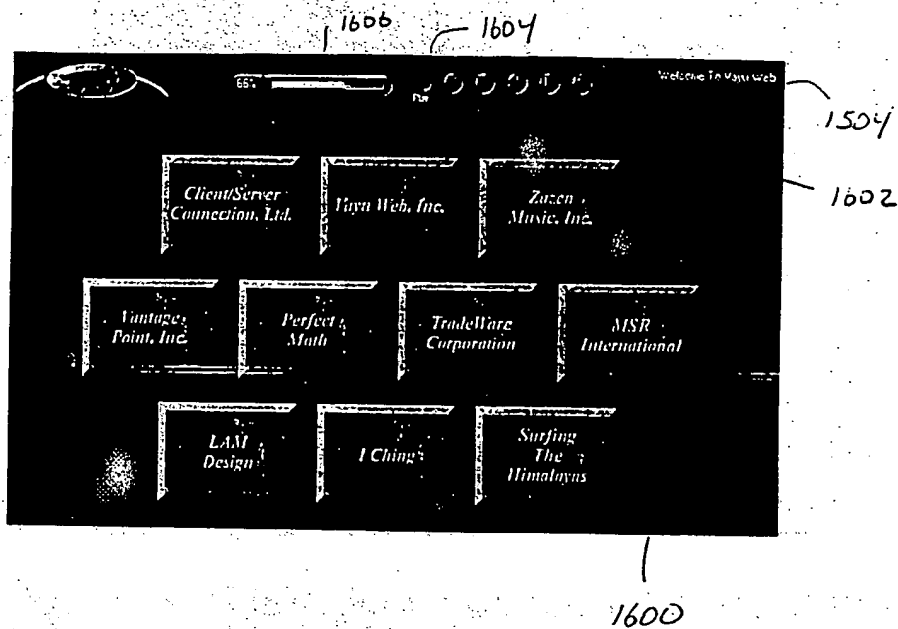


FIGURE 16

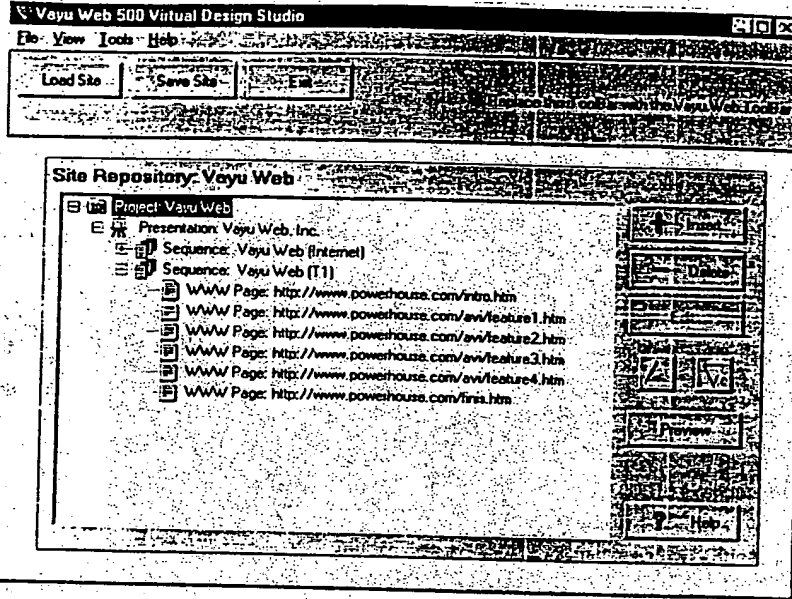


FIGURE 17

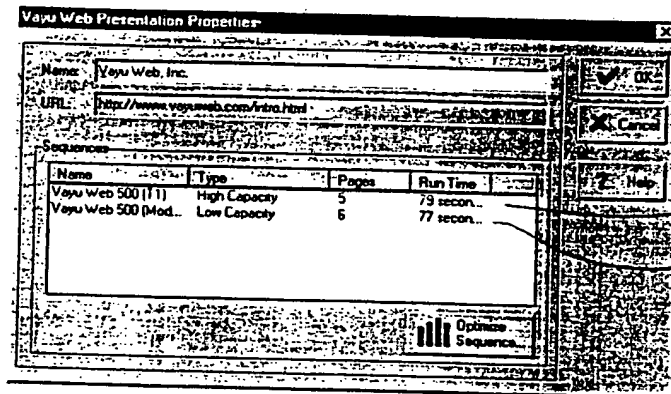


FIGURE 18

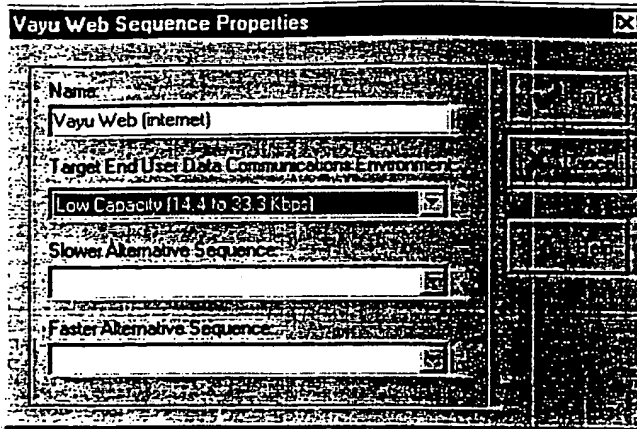
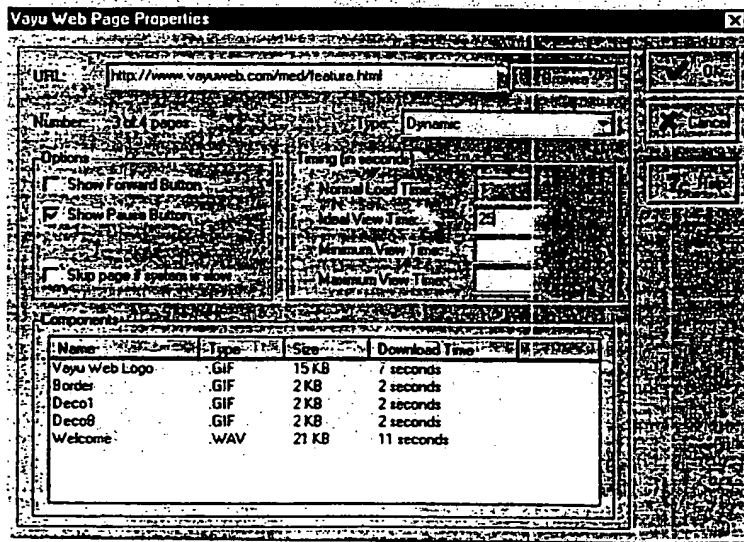


FIGURE 19

1900



2000

FIGURE 20

FIGURE 21

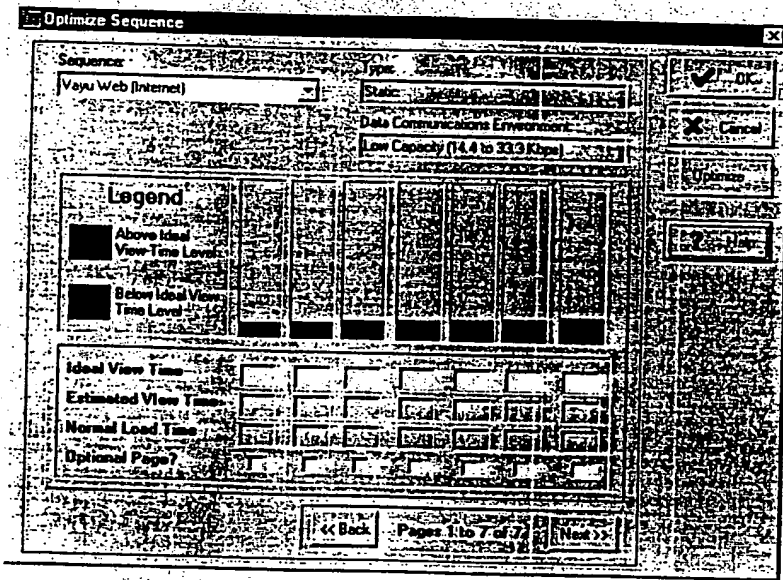
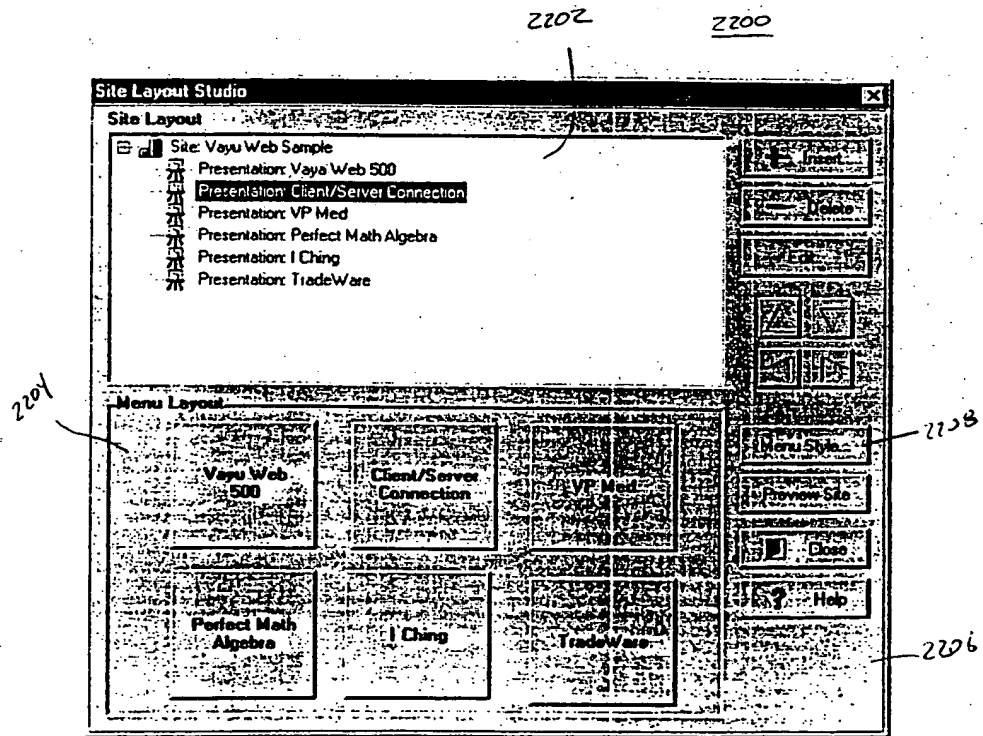


FIGURE 22



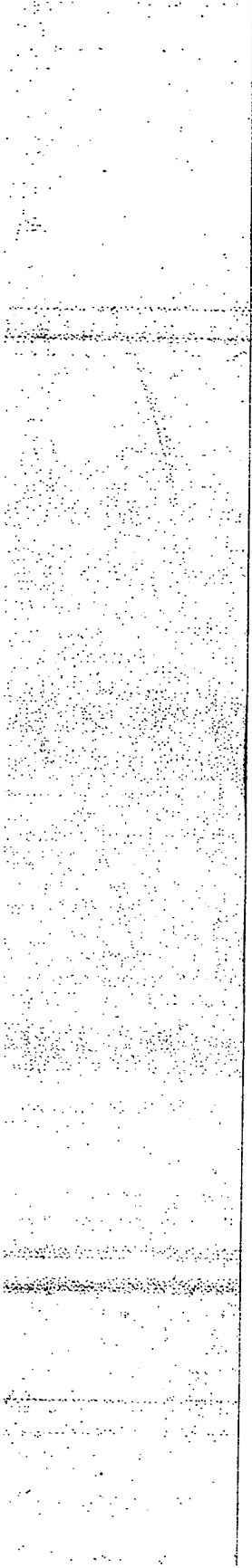


Exhibit 1011



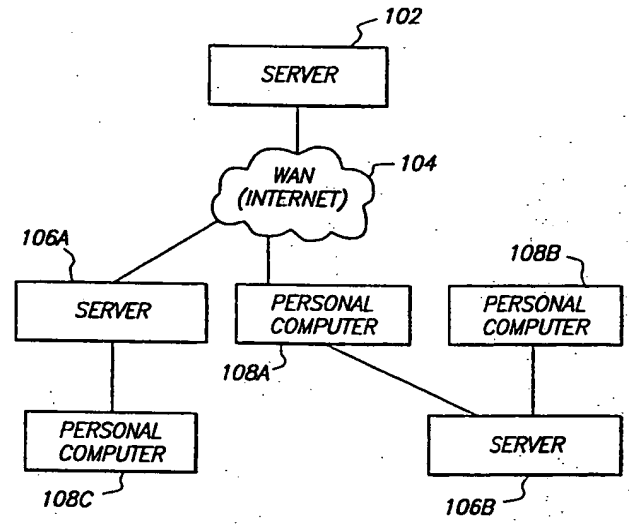
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification 6 : G06F 17/30</p>	<p>A3</p>	<p>(11) International Publication Number: WO 98/20434 (43) International Publication Date: 14 May 1998 (14.05.98)</p>
<p>(21) International Application Number: PCT/US97/19719 (22) International Filing Date: 30 October 1997 (30.10.97) (30) Priority Data: 08/745,899 7 November 1996 (07.11.96) US 08/762,289 9 December 1996 (09.12.96) US (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).</p>	<p>(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). Published With international search report. (88) Date of publication of the international search report: 20 August 1998 (20.08.98)</p>	

(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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Y	---	3,4
	---	-/--
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<input checked="" type="checkbox"/> Patent family members are listed in annex.		
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Date of the actual completion of the international search 24 April 1998		Date of mailing of the international search report 04/05/1998
Name and mailing address of the ISA 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		Authorized officer Abbing, R

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

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 US 5715404 A	25-08-95 03-02-98

Form PCT/ISA/210 (patent family annex) (July 1992)



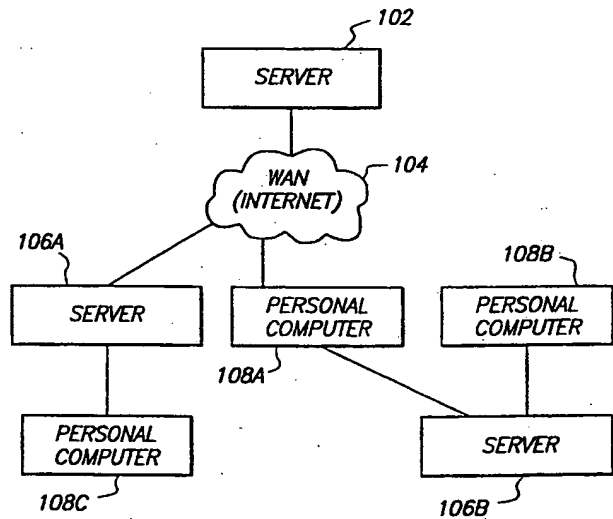
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : G06F 17/30</p>	<p>A3</p>	<p>(11) International Publication Number: WO 98/20434 (43) International Publication Date: 14 May 1998 (14.05.98)</p>
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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.

5 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
10 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
15 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
20 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
25 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
30 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.

5 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

10 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.

15 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.

20 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.

25 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.

30 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.

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.

5 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.

10 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.

15 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.

20 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.

25 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.

30 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

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

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
5 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
10 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
15 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
20 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
25 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
30 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

of the web page is the sum of the number of bytes in the page's HTML, the size of all image , 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.

5 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
10 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.

15 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>),
20 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 (), 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
25 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
30 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

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

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
5 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
10 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
15 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
20 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
25 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
30 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

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 to 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.

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.

```
<APPLET CODE="browser.class" WIDTH="10" HEIGHT="10">
5 <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
10   TRANSIT=TIMER DELAY=10}">
    <PARAM NAME="menu_1_1_1" VALUE="{LINK_OBJECT
      URL=http:// www.xyzmotors.com /Images\I_1_9.GIF
15     SIZE=1059 CONTENT=image/gif}">
      <PARAM NAME="menu_1_2" VALUE="{LINK_FILE
        NAME=xyzmotors_menu_1.brw}">
20 <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
25   TRANSIT=MENU}">
    <PARAM NAME="menu_2_1_1" VALUE="{LINK_OBJECT
      URL=http:// www.xyzmotors.com /Images\I_1_1.GIF
30     SIZE=1257 CONTENT=image/gif}">
      <PARAM NAME="menu_2_2" VALUE="{LINK_FILE_NAME=
        xyzmotors_menu_2.brw}">
35 <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
40   DELAY=10}">
    <PARAM NAME="menu_3_1_1" VALUE="{LINK_OBJECT
      URL=http:// www.xyzmotors.com /Images\I_1_1.GIF
45     SIZE=1257 CONTENT=image/gif}">
      <PARAM NAME="menu_3_2" VALUE="{LINK_FILE_NAME=
        xyzmotors_menu_3.brw}">
50 <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
55   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}">
```

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

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

```
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] ">
```

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

```
</APPLET>
```

Table 1

20 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.

40 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

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 5 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 10 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 15 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 20 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">
```

25 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, 30 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

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.

10 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.

25 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

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).

- 5 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.

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

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

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

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

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

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

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

```

        pagel.objects > 10
    THEN
        pagel.preload_priority = 8
    ENDIF
5
    ; Set preload order based upon browser type and time
    of
    ; day
    ; MSIE_3x is Microsoft's Internet Explorer Version 3.x
10 IF
        ; night time hours
        browser.type = MSIE_3x AND (env.timeofday > 20:00
    AND env.timeofday < 08:00)
    THEN
15         preload.order = SEQUENTIAL
    ENDIF

    ; Set preload order based upon browser type and time
    of
20     ; day
    ; STRATEGY_7 is load page 1, then 2, then largest to
    ; smallest
    IF
        ; business hours
25         browser.type = MSIE_3x AND (env.timeofday >
    08:00 AND env.timeofday < 20:00)
    THEN
        preload.order = STRATEGY_7
30    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

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.

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

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

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

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.

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.

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

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
5 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
10 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
15 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
20 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
25 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
30 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

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
5 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
10 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
15 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
20 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.

25 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
30 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.

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.

5 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.

10 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,
15 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
20 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.

25 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.

30 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.

Appendix A

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

Class Definitions

```

10 class PrSite
    //describes the site (e.g. "General Goods")
    //for which presentations are built
    string name;
    PrSiteViewVec & siteViewVec; //presentation projects
15 };

class PrSiteView
20 {
    //hierarchical tree of presentations accessible to user logging-in
    string name;
    PrSite & site;
    PrPage & rootMenuPage; //top-level menu
25 Presentation & rootPresentation; //top-level presentation
};

typedef Vector<Presentation> PresVec

30 class Presentation
{
    //describes a presentation corresponding to a menu item
    string name;
    string type; //sequence, white-paper, order-form
35 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
40 PrPageVec & tailPageVec; //list of pages tacked-on (e.g. order-
    //form)
};

45 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
50 string name;
    string type;
    environmentType; //e.g. for Java-supporting browsers
    Presentation & presentation; //back pointer to presentation owning
    PrSeqItemVec & itemVec; //list of items (pages) comprising this
55 };

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

```

-28-

SUBSTITUTE SHEET (RULE 26)

```

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

class PrPage
20 {
    //HTML page, or special effect page, or applet
    string      name;
    string      type; //HTML, VRML, Applet, FX
25  string      url; //locator
    long        size; //file size (for download monitoring)
    PrComponentVec & componentVec; //list of components (images, sound, video)
};

class PrComponent
30 {
    //image, video, sound, applet and other non-text components of a page
    string      name;
    string      mime_type; //image, sound, etc.
35  long        size; //file size
    long        playTime; //play (display) time; for timing
    string      url; //locator
};

class PrFx
40 {
    //special effect (filler to smooth out the presentation at changing conditions)
    string      name;
    string      type; //text msg, applet, animation clip
45  string      selectionType; //random, by priority, specific
    PrPageVec & pageVec; //page containing this FX
};

class PrEnvironment
50 {
    //class of browser environment
    //for which sequences can be created
    string      name;
55 };

#include "VauyWebPresSmooth.h"

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

```



```

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

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

10 //inquire what kinds of plugins the browser has
  Browser.getPlugins(pluginVec);
  for( plugin = pluginVec.firstElement;
      plugin != NULL;
      plugin = plugin.nextElement())

15     switch plugin.type
        {
        case pluginStreamingVideo:
          streamVideoType = StreamVideoTypeVec(plugin.vendor);
          break;
20     case pluginVirtualReality:
          vrPlayer = Yes;
          break;
        } //switch

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

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

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

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

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

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

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

  //ProbePage()

55
int Presentation::SequenceManager()
{
  curSequence = startSequence;
  curEnv = startEnv;

60 //go through all items of the sequence
  seqItem = mainSequence.pageVec.firstElement;
  while( true)

65     //reassess the state of the network (since prev. page)

```

```

curState = assessState();
switch curState
5
case stThroughputDidNotChangeDramatically:
    //can we preload one more component?
    if( preloadedCount >= MaxPreloadedCount)
        break;
10
    nextPreloadSeqItem =
        curSequence.getNextPreloadSeqItem();
    nextPreloadComp =
        curSequence.getNextPreloadComponent();
15
    //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
20
    for(i = 0; i < MaxPreloadedCount; ++i)
    {
        comp = componentBeingDownloaded( i);
        if( comp.status != stInProgress)
            continue;
        comp.calcTimeToStart();
        comp.calcRemainingTimeToDownload();
25
        if( comp.timeToStart <
            comp.remainTimeDL +
            nextPreloadComp.timeDL)
        {
            //timing = Late; it is not OK to download
            nextDownloadOK = false;
            break;
        }
    }
    if( !nextDownloadOK)
        break; //switch
30
    //OK to download this component; do it
    spawnThread( nextPreloadComp.preload);
    break; //switch

case stUrlNotFound: //file not found
45
    //can we skip this page?
    if( nextPreloadSeqItem.skipAllowed)
        //yes: skip it
        nextPreloadSeqItem.setSkip();
    else
50
        //no: try to switch sequences
        nextPreloadSeqItem.setJumpSequence();

case stThroughputIncreased:
55
    //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();
60
    if( nextSequence.nextItem.timingOK)
        //yes: switch
        setNextItem( nextSequence.nextItem);
    else
65
        //no: act as if no change
        setStatus( stNormal);

```

```

        break;

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

        calcCurTiming();
10      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)
15      if( (status = handleLateTiming()) == Success)
            break;

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

        break;

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

int handleLateTiming()
45 {
    //if we currently are displaying text,
    //increase viewing time by 20%
    //(whether it helps or not)
50    if(curItem.page.mimeType == "text")
    {
        increaseViewTime(curItem, percentIncreaseForText);
        calcCurTiming();
        if(curSequenceItem.timingOK)
65      {
            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
65    comp = curItem.replayCompVec.lastElement();
}

```

```

5         while (comp != NULL)
            virtualAddComp( comp);
            calcCurTiming();
            if (curSequenceItem.timingOK)
            {
                curItem.setReplay(comp);
                return Success;
10            } else
                //try one more replay-components
                comp = comp.PreviousElement();
        }
15        //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)
        {
20            seqItem = getLatestItemForWhichCompBeingPreloaded();
            if ( seqItem != curItem
                && seqItem != curItem.nextElement()
            )
            {
                virtualStopDownload(seqItem.downloadingComponents);
                calcCurTiming();
                if (curSequenceItem.timingOK)
                {
30                    //we will be OK for this and next page
                    stopDownload(seqItem.downloadingComponents);
                    return Success;
                }
            } else
                break;
        } //while
35        //can we skip next page (or couple)?
        while( curItem.nextElement.skipAllowed)
        {
            curItem.nextElement.setSkip();
            calcCurTiming();
            if (curSequenceItem.timingOK)
            {
40                //we will be OK for this and next page
                return Success;
            }
        }
        //try FXs available
        if ( curItem.FxVec != NULL)
        {
45            fx = curItem.FxVec.firstElement();
            while( fx != NULL)
            {
                virtualApplyFx( fx);
                calcCurTiming();
                if (curSequenceItem.timingOK)
                {
50                    //we will be OK for this and next page
                    return Success;
                }
            }
        }
60        return Fail;
    } //handleLateTiming()
} //class

```

CLAIMS

What is claimed is:

- 5 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
- 10 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
- 15 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
- 20 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
- 25 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:
- 30 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.

-34-

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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:

5 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:

10 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.

1/17

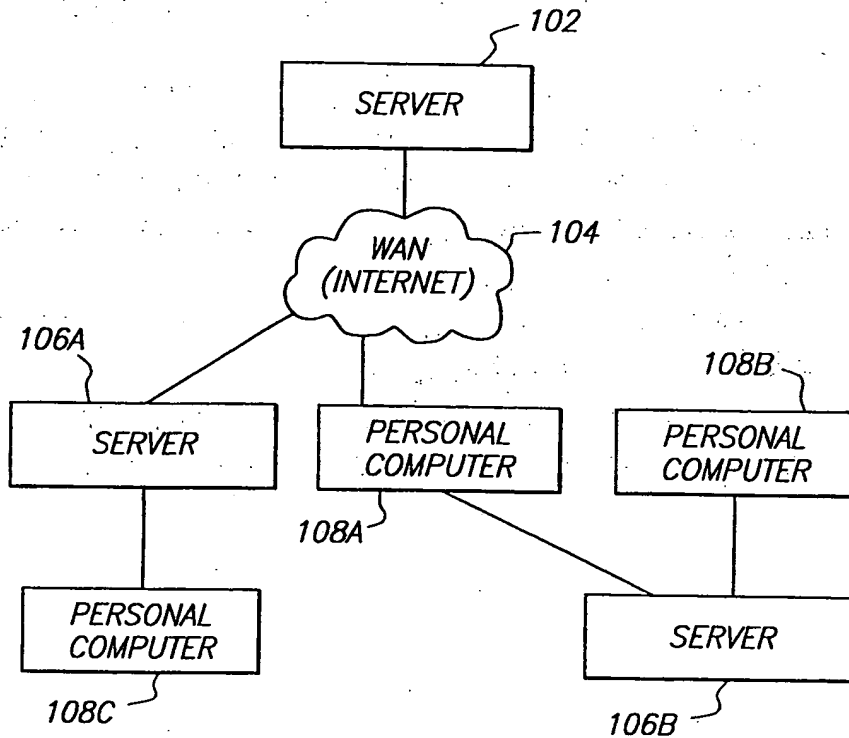


FIG. 1

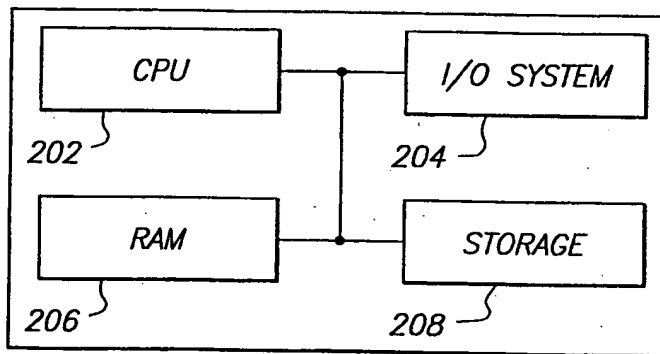


FIG. 2

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2/17

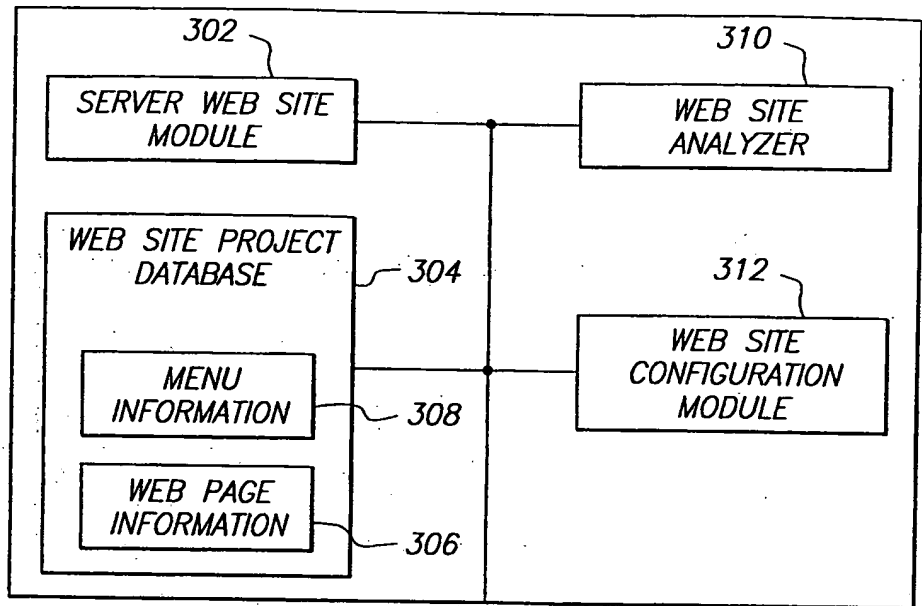


FIG. 3

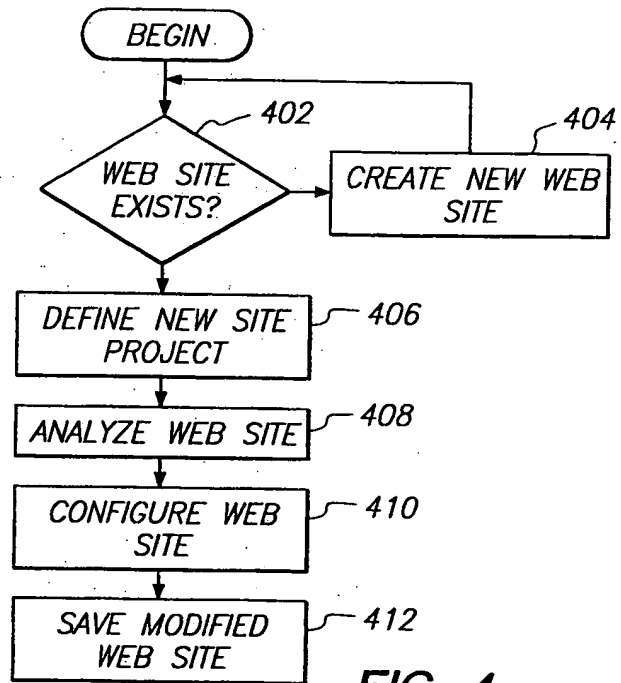


FIG. 4

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3/17

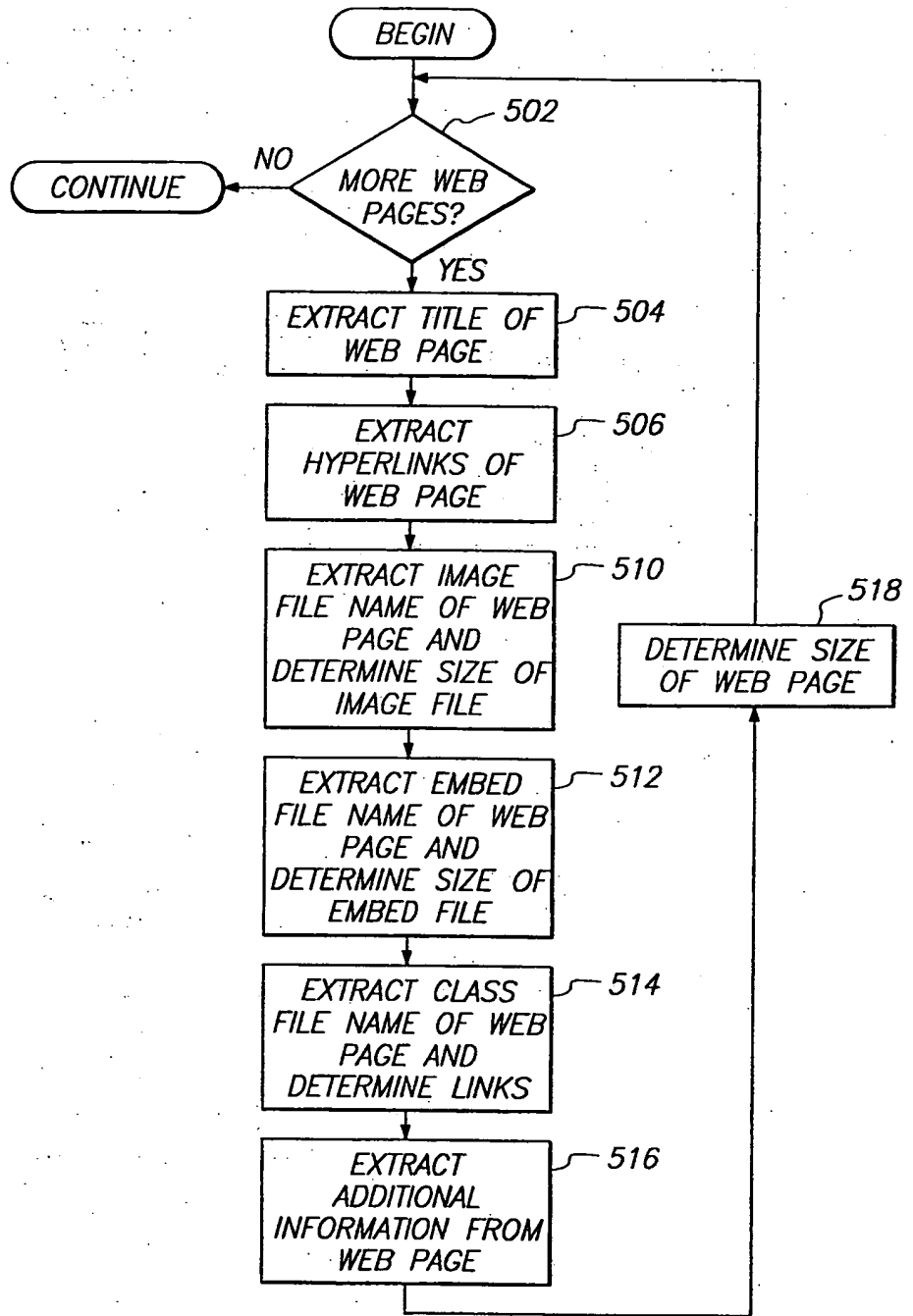


FIG. 5

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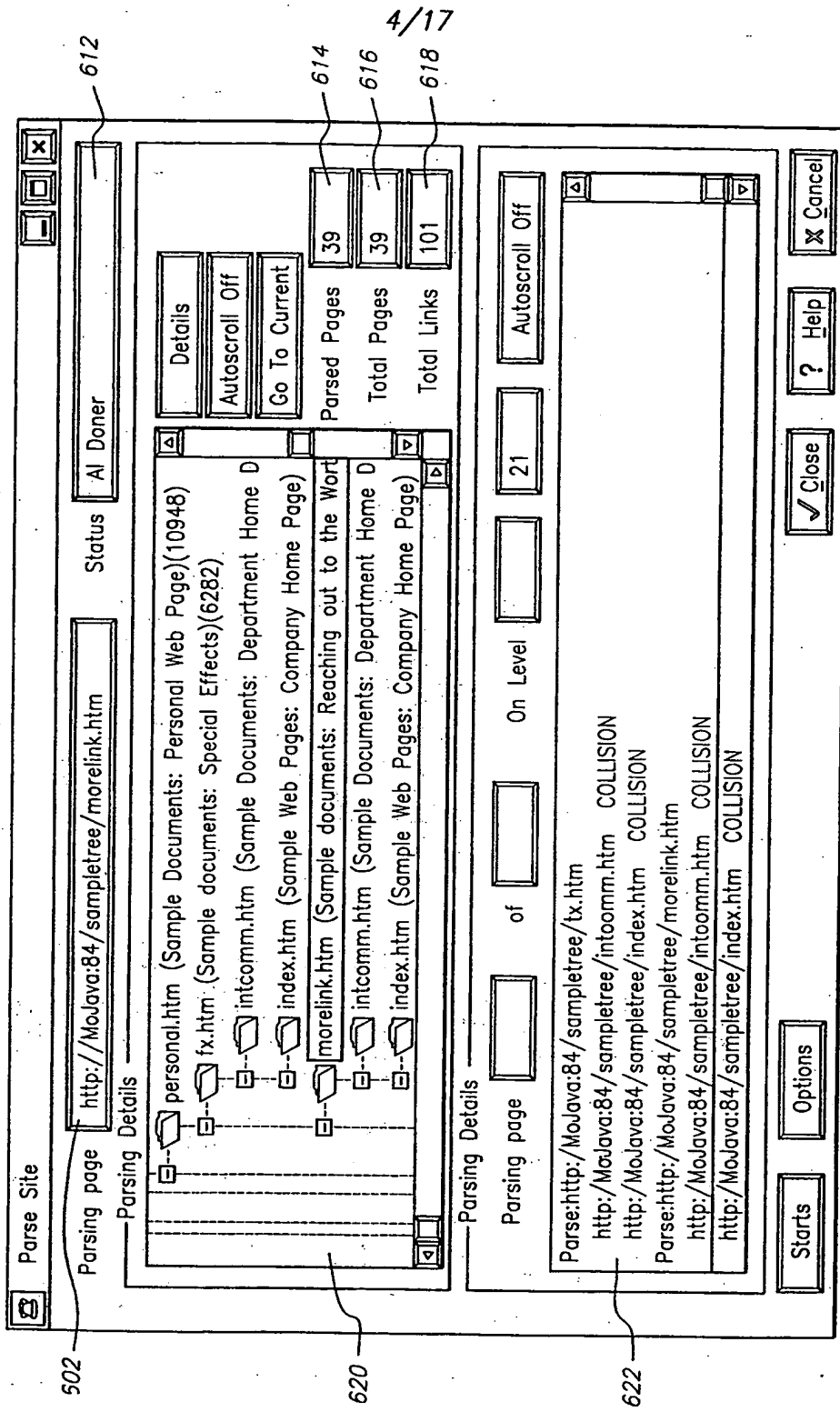
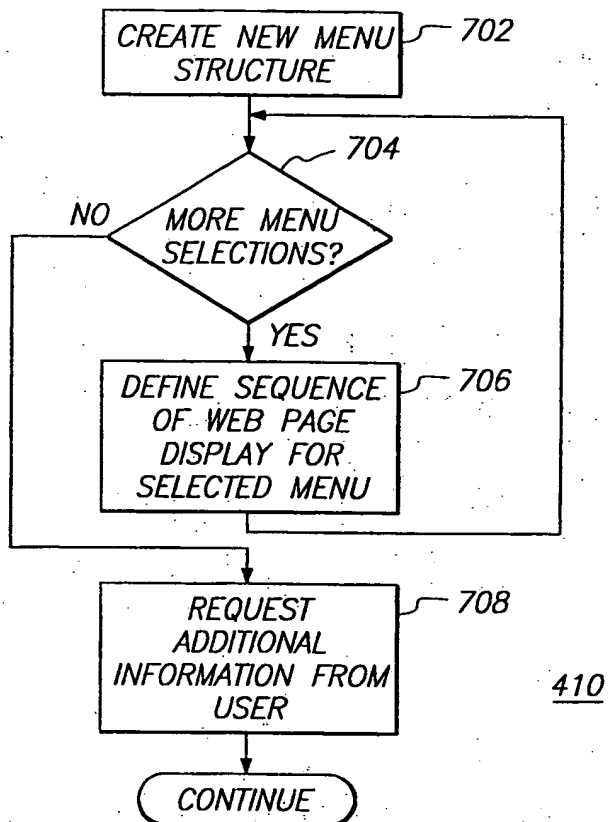


FIG. 6

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5/17



410

FIG. 7

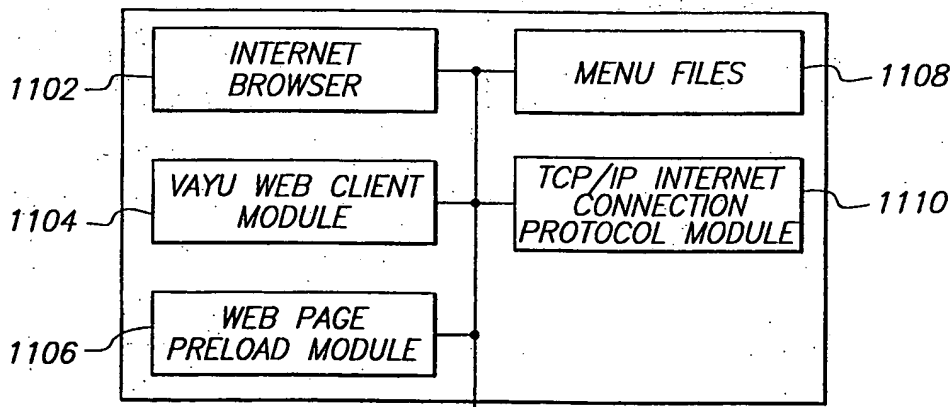


FIG. 11

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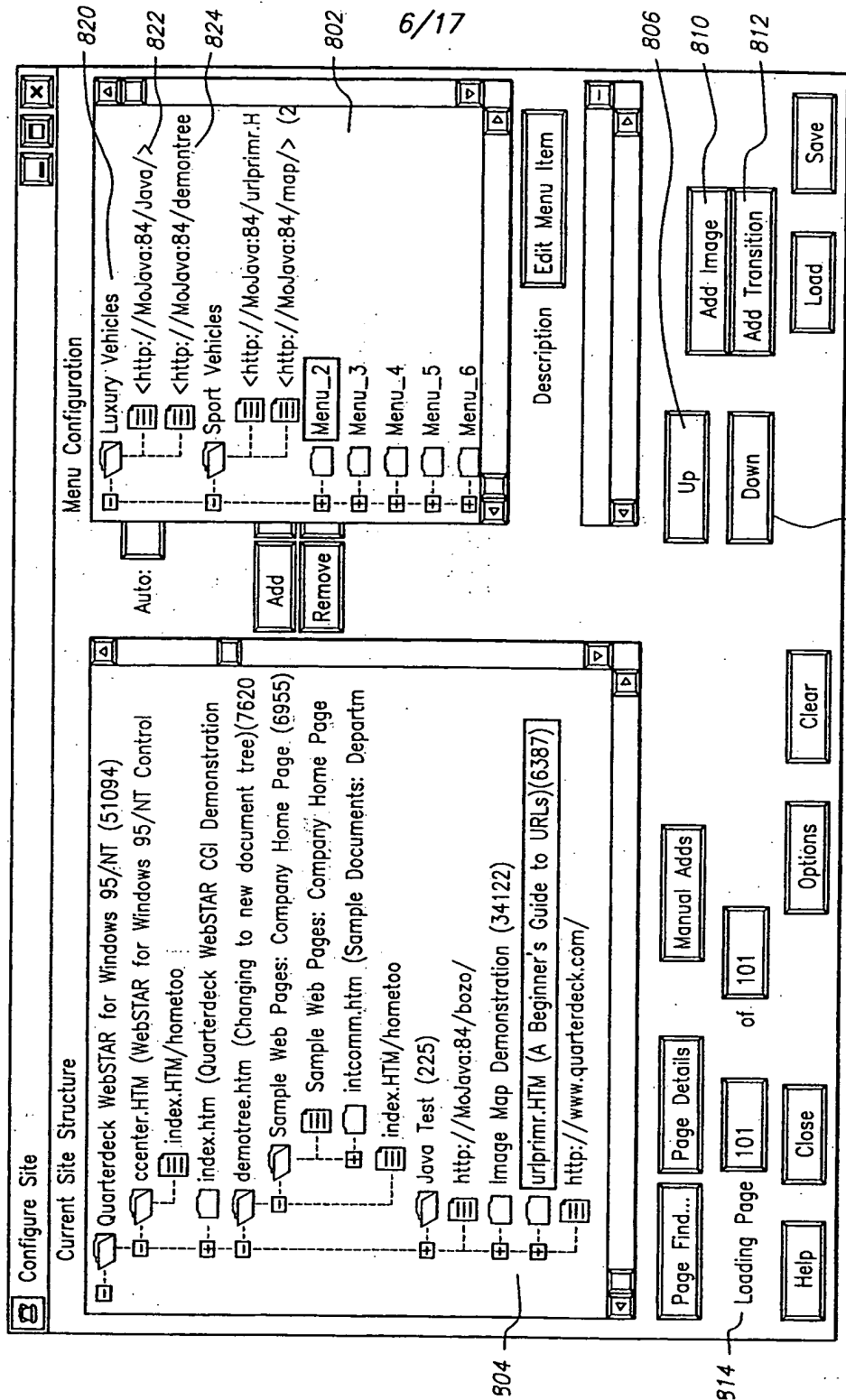


FIG. 8

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7/17

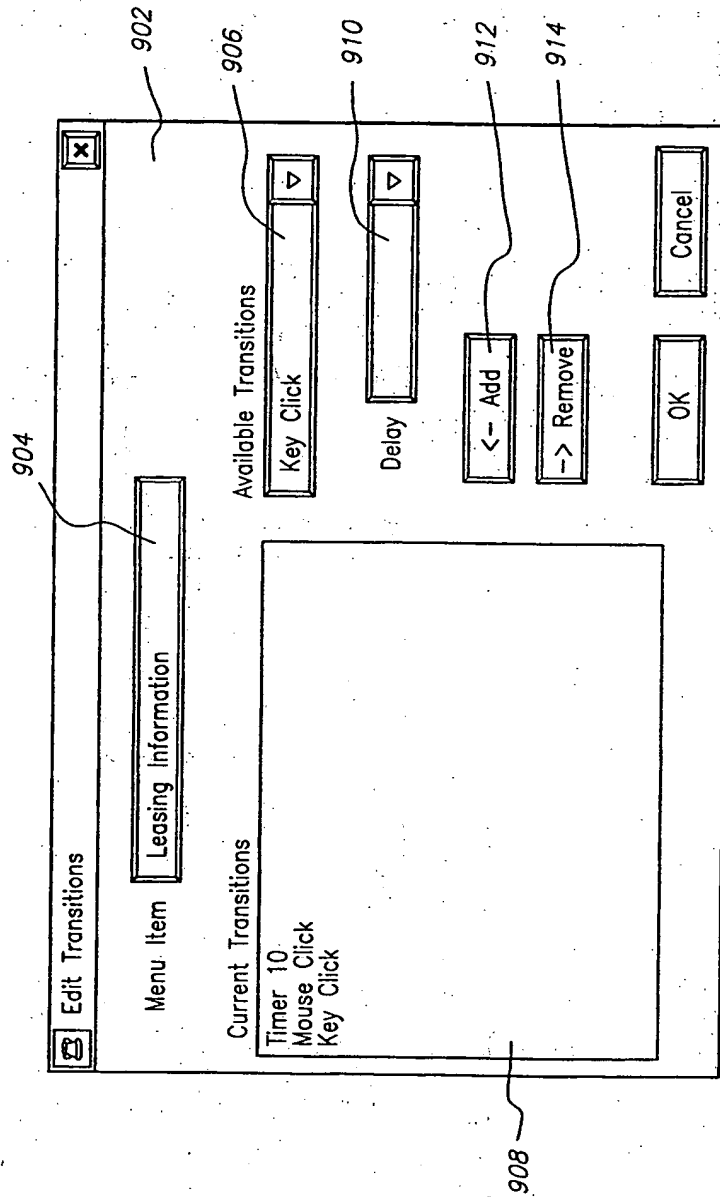


FIG. 9

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8/17

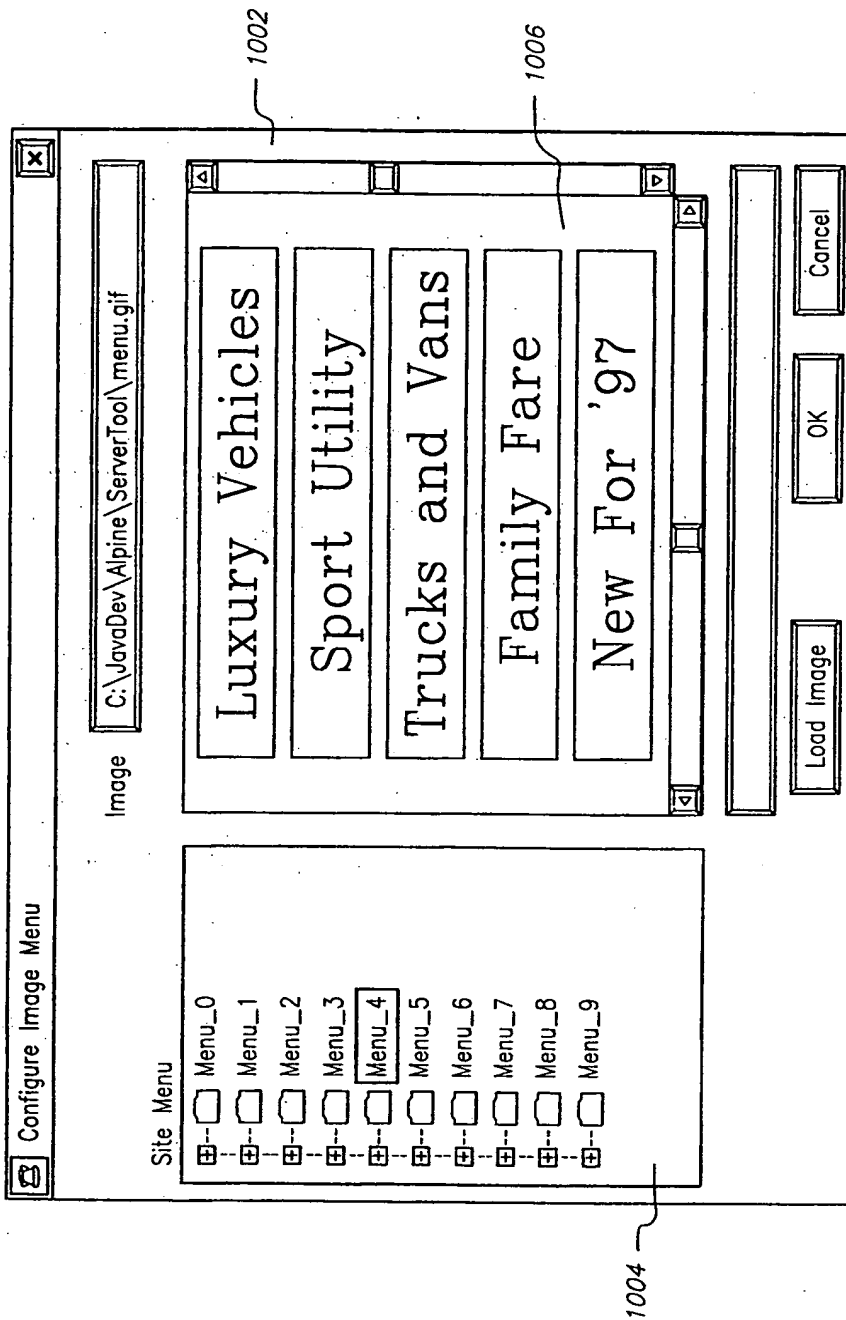


FIG. 10

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9/17

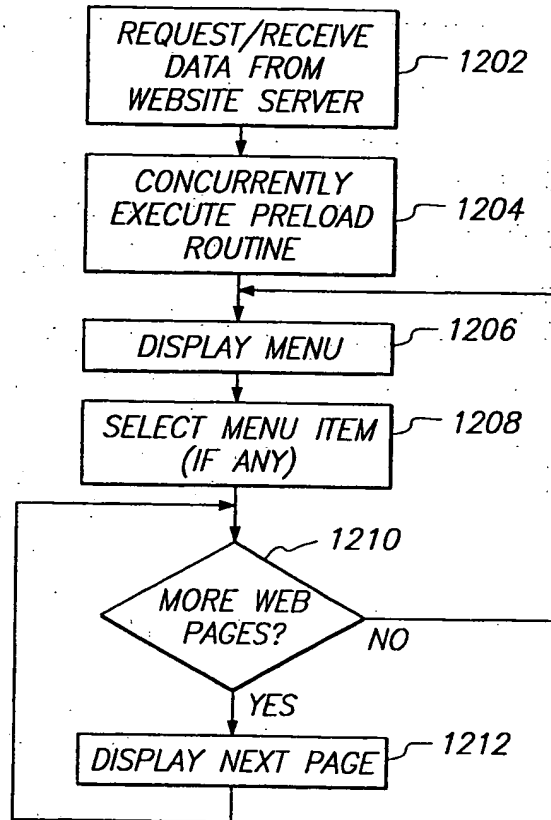


FIG. 12

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10/17

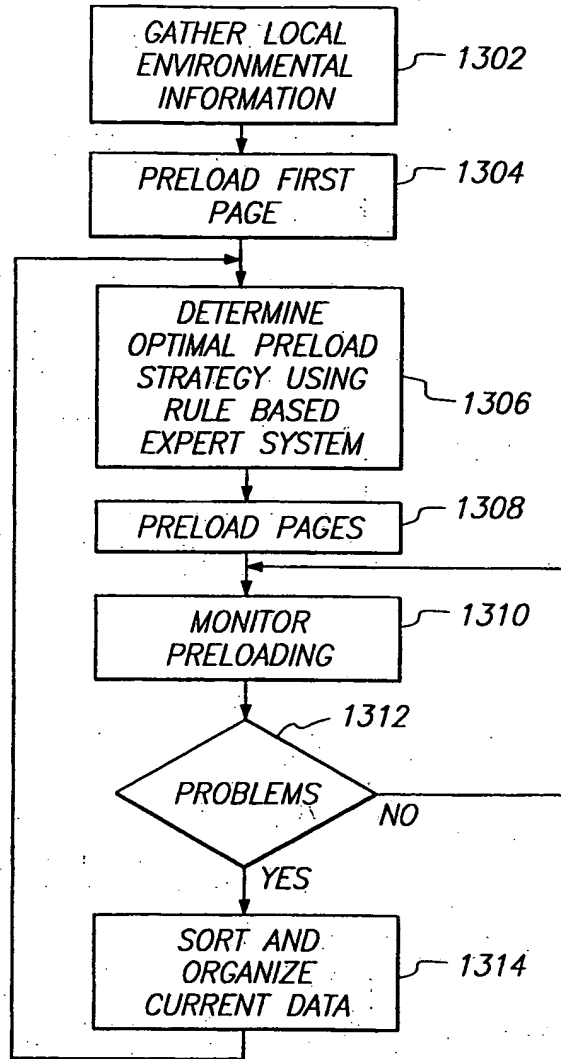


FIG. 13

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11/17

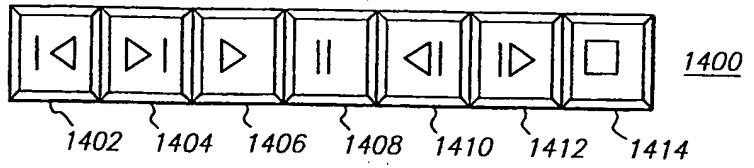


FIG. 14

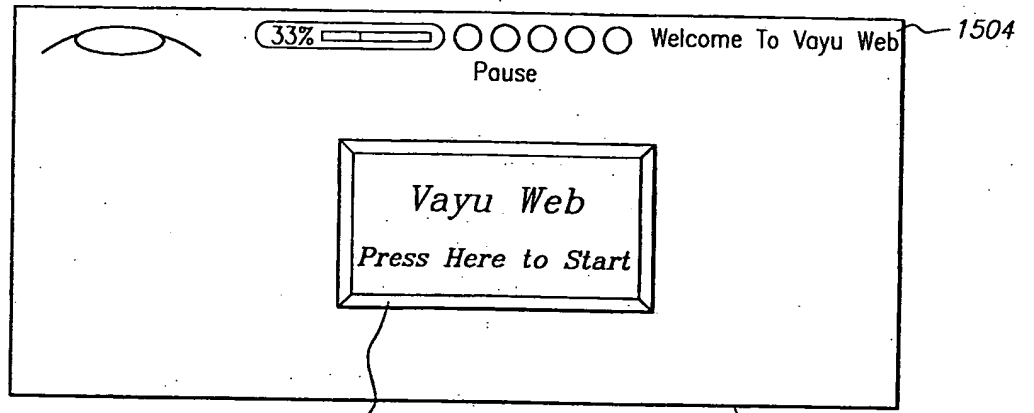


FIG. 15

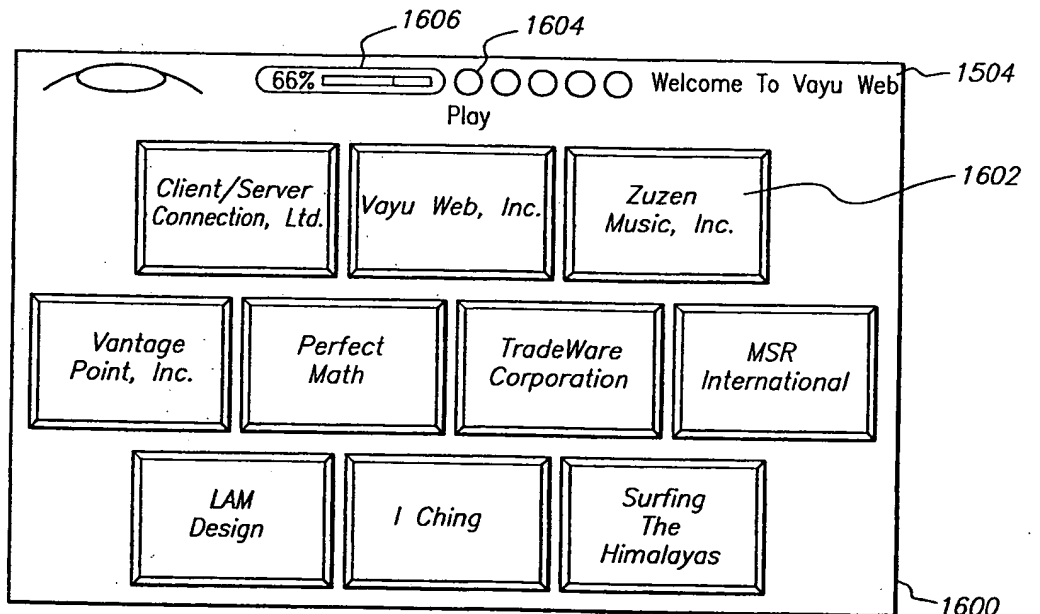


FIG. 16

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12/17

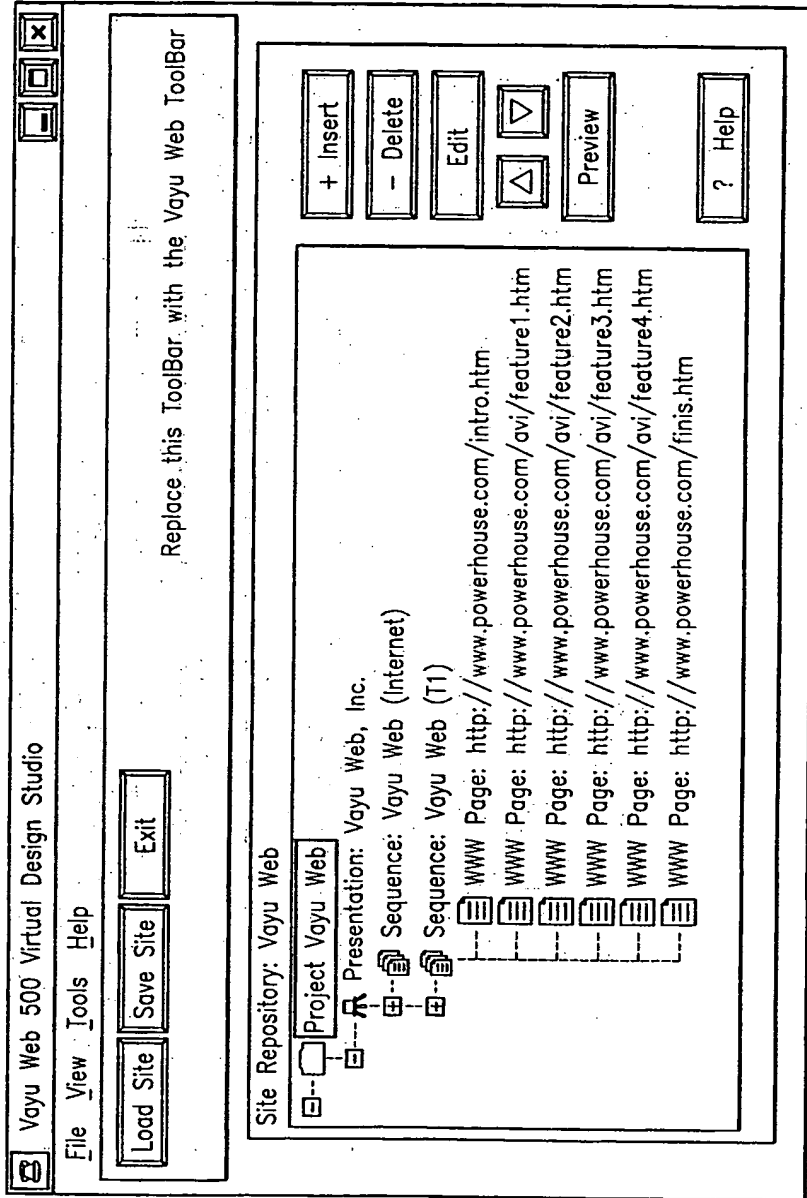


FIG. 17

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13/17

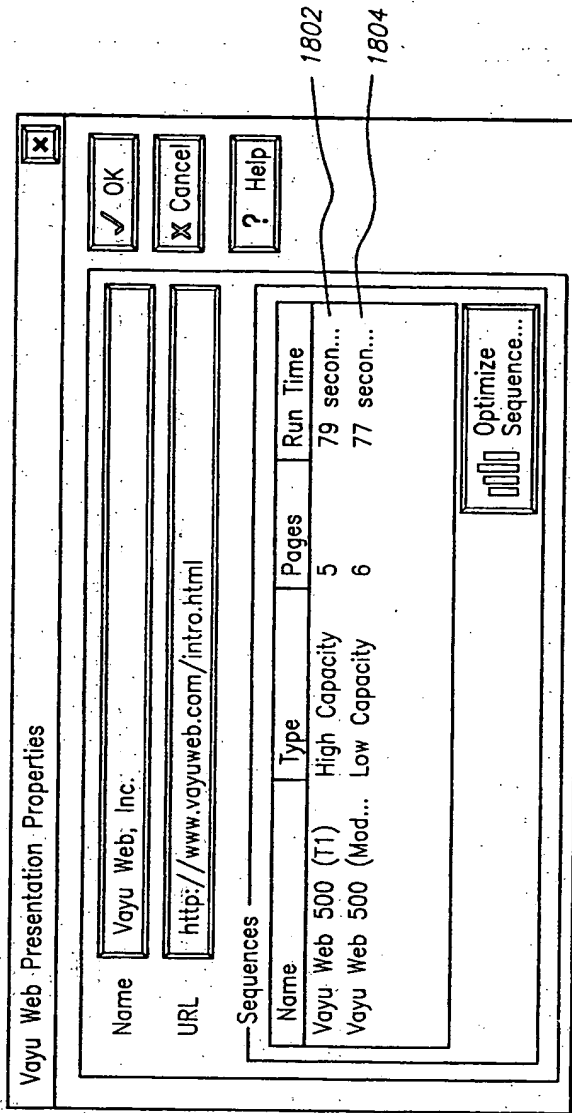


FIG. 18

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14/17

Vayu Web Sequence Properties

Name
Vayu Web (internet)

Target End User Data Communications Environment
Low Capacity (14.4 to 33.3 Kbps)

Slower Alternative Sequence:
[Empty dropdown]

Faster Alternative Sequence:
[Empty dropdown]

OK
Cancel
Help

1900

FIG. 19

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2000

Vayu Web Page Properties

URL:

Number: 3 of 4 pages Type:

Options:

- Show Forward Button
- Show Pause Button
- Skip page if system is slow

Timing (in seconds):

Normal Load Time:

Ideal View Time:

Minimum View Time:

Maximum View Time:

Components:

Name	Type	Size	Download Time
Vayu Web Logo	.GIF	15 KB	7 seconds
Border	.GIF	2 KB	2 seconds
Deco1	.GIF	2 KB	2 seconds
Deco8	.GIF	2 KB	2 seconds
Welcome	.WAV	21 KB	11 seconds

Buttons:

FIG. 20

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Optimize Sequence

Sequence: Type:

Data Communications Environment:

Legend

- Above Ideal View Time Level
- Below Ideal View Time Level

Ideal View Time
 Estimated View Time
 Normal Load Time
 Optional Page?

OK Cancel

 Pages 1 to 7 of 7

FIG. 21

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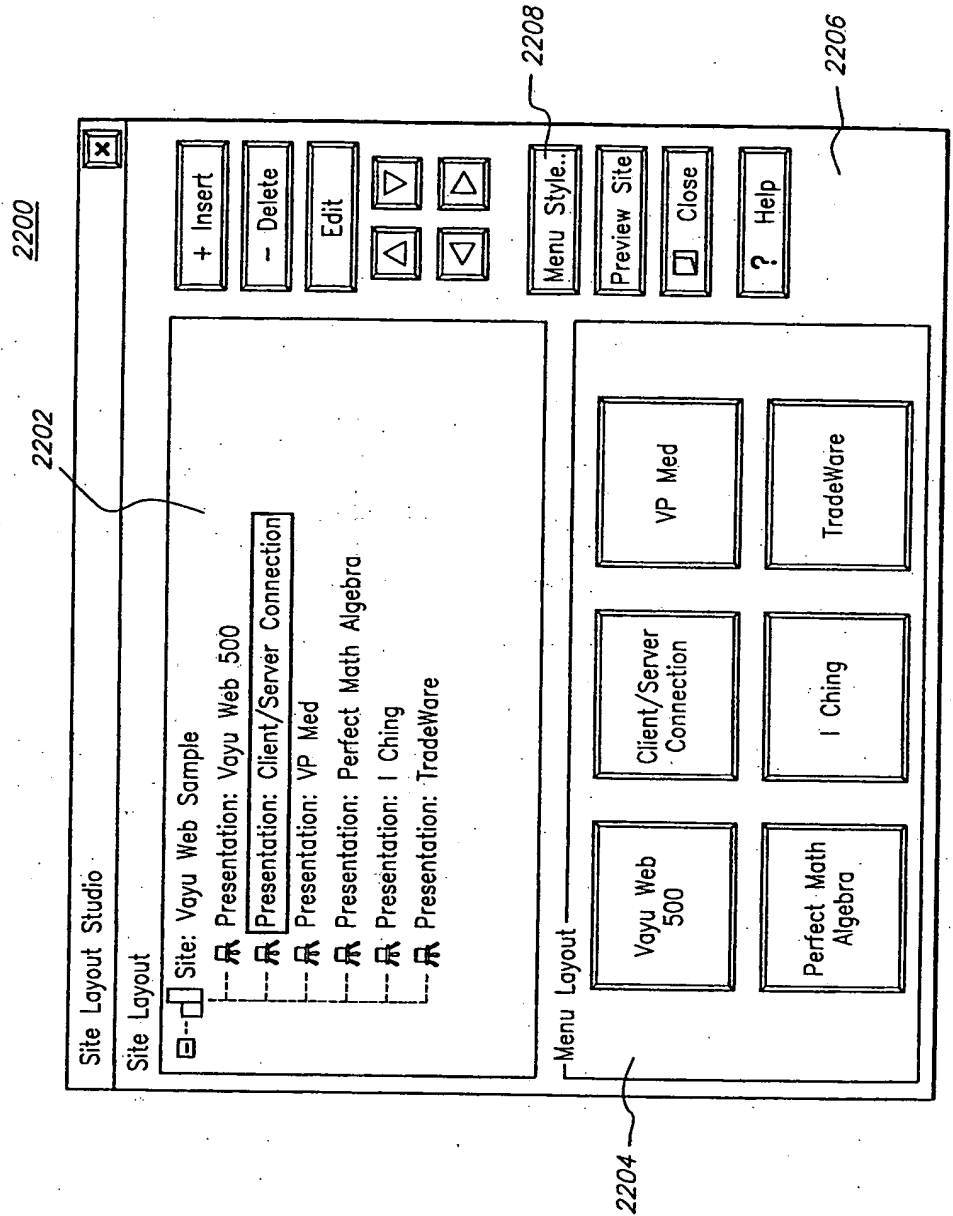


FIG. 22

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INTERNATIONAL SEARCH REPORT

International 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 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
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.		
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* Special categories of cited documents:		
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Date of the actual completion of the international search 24 April 1998		Date of mailing of the international search report 04/05/1998
Name and mailing address of the ISA 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		Authorized officer Abbing, R

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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.
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

1

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 US 5715404 A	25-08-95 03-02-98

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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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08/819,419 17 March 1997 (17.03.97) US

(71) Applicant (for all designated States except US): FRANKEL & COMPANY [US/US]; 111 east Wacker Drive, Chicago, IL 60601 (US).

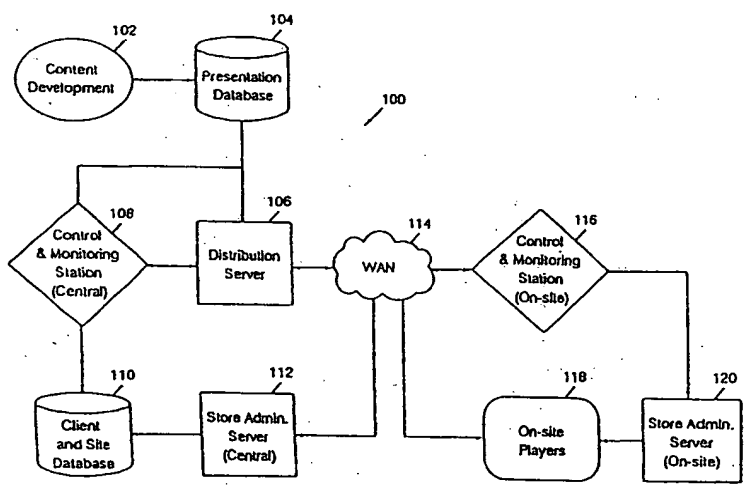
(72) Inventors; and
(75) Inventors/Applicants (for US only): MANDEBERG, Richard, D. [US/US]; 2601 West Coyle Avenue, Chicago, IL 60645 (US). MOLESKI, Desmond, C., J. [US/US]; 627 North Marion Street, Oak Park, IL 60302 (US). ALMAGRO, Manolo, B. [US/US]; 3900 North Pine Grove #401, Chicago, IL 60613 (US). MEYER, Joseph, F. [US/US]; 333 East Ontario Street #2702-B, Chicago, IL 60611 (US).

(74) Agents: BIGEL, Mitchell, S. et al.; Myers, Bigel, Sibley, & Sajovec, L.L.P., P.O. Box 37428, Raleigh, NC 27627 (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, 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, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published
With international search report.

(54) Title: SYSTEMS, METHODS AND COMPUTER PROGRAM PRODUCTS FOR GENERATING DIGITAL MULTIMEDIA STORE DISPLAYS AND MENU BOARDS



(57) Abstract

Digital multimedia presentations are assembled at a central location for stores. Start and end times are assigned. The digital multimedia presentations and the assigned start and end times are transmitted to and received at the stores. The received presentations are stored in digital multimedia players at the stores. Upon occurrence of an assigned start time, the associated digital multimedia presentation is automatically played in the store until the assigned end time. If a presentation is not available at a particular time, a generic default presentation is played. The presentations may be played at assigned start and end times until an expiration date, after which it is automatically deleted from the digital multimedia player. The digital multimedia presentations may be customized at the central location and/or at the stores. The present invention is particularly applicable for generating menu boards for an enterprise which includes multiple sites.

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SYSTEMS, METHODS AND COMPUTER PROGRAM PRODUCTS
FOR GENERATING DIGITAL MULTIMEDIA
STORE DISPLAYS AND MENU BOARDS

Field of the Invention

This invention relates to information processing systems, methods and computer program products, and more particularly to store systems, methods and computer program products.

Background of the Invention

Information processing systems, methods and computer program products are being increasingly used in the store environment. For example, information processing systems may be used for inventory control, point-of-sale and accounting systems. Stores may include wholesale or retail stores or any other consumer environment such as movie theaters, airports, shopping malls, arenas, and other such venues.

Information processing systems continue to play an increasing role at restaurant chains such as "fast food" restaurant chains which include a large number of restaurant sites. Information processing control of distribution, promotion and other activities is increasingly being used to coordinate the large number of restaurant sites.

With the advent of the personal computer, multimedia presentations are also increasingly being

used in commercial and consumer environments. Multimedia presentations may include text, graphics, audio and full motion digital video which are integrated into a single presentation.

5 Attempts have been made to use multimedia presentations in the store environment. See, for example, U.S. Patent 5,412,416 to Nemirofsky entitled "Video Media Distribution Network Apparatus and Method" and International Application WO 96/08113 to Cho et al.
10 entitled "Point of Purchase Video Distribution System". See also the publication entitled "POS Goes Multimedia: Retailers Test New Applications" by Fox, Chain Store Age Executive, Vol. 71, No. 2, February, 1995, pp. 43-46. However, notwithstanding these attempts, there
15 continues to be a need for improved systems, methods and computer program products for generating store displays.

Summary of the Invention

20 The present invention includes methods, systems and computer program products for generating store displays for a plurality of stores. Digital multimedia presentations are assembled at a central location for the plurality of stores. Start and end times are assigned to the digital multimedia
25 presentations for the stores. The digital multimedia presentations and the assigned start and end times are transmitted to the plurality of stores and are received at the stores. The received digital multimedia presentations are stored in digital multimedia players
30 at the stores. Upon occurrence of an assigned start time, the associated stored received digital multimedia presentation is automatically played on a digital multimedia display in the store until occurrence of the assigned end time for the associated digital multimedia
35 presentation. Thus, digital networks and digital

-3-

multimedia presentations are used to effectively generate digital multimedia store presentations.

5 In a preferred embodiment of the present invention, a digital multimedia default presentation is also generated at the central location for the plurality of stores. The digital multimedia default presentation is free of (i.e. it does not include) a start time and an end time. The digital multimedia default presentation is transmitted, received and
10 stored in the digital multimedia players at the stores. At the stores, it is detected that an assigned end time for an associated digital multimedia presentation has occurred, and that a start time for a second digital multimedia presentation does not correspond to the
15 assigned end time. Upon this occurrence, the digital multimedia default presentation is automatically played so that the digital multimedia display always plays a multimedia presentation. Similarly, it may be detected at the store that termination of a digital multimedia
20 presentation has occurred prior to the assigned end time, for example because of an error or other reason. In this case, the digital multimedia default presentation is automatically played on the digital multimedia display in the store.

25 The digital multimedia presentations also preferably include start and end dates which are also transmitted and received at the stores. The received digital multimedia presentation is automatically played on the digital multimedia display in the store upon
30 occurrence of an assigned start time which is between the assigned start date and the assigned end date. After expiration of the assigned end date, the stored digital multimedia presentation is deleted from the digital multimedia player at the store. Thus, digital
35 multimedia presentations may be played at predetermined times during the day, for a period of days between an assigned start day and end day. Thereafter, the

-4-

presentation is deleted to make room for other presentations on the digital multimedia player.

The digital multimedia presentations are preferably customized for selected ones of the plurality of stores. When customized, a store identification may be provided and the customized digital multimedia presentations are transmitted to the identified stores.

Customization may be provided at the central location by accepting customization data related to the selected ones of the stores. Alternatively, customization may take place at the individual store by providing customized data, for example concerning prices or sales periods at the stores. Customization may also take place both at the central location and at the stores. A feedback mechanism may also be provided wherein effectiveness of the digital multimedia presentation in the store is measured, for example by analyzing sales data. If an indication is received that the digital multimedia presentation is not effective, a new multimedia presentation may be assembled, transmitted, received, stored and automatically played.

Transmission may take place using a wide area network such as a wired wide area network, a wireless network and the internet. The digital multimedia presentation may be presented on a display which is a virtual display comprising a plurality of display devices arranged in an array. According to another aspect of the invention, customer inputs may be accepted to provide interactive digital multimedia presentations at the store.

The present invention is particularly applicable for generating menu boards for an enterprise such as a restaurant chain, which includes a plurality of sites such as restaurant sites. As is well known to those having skill in the art, menu boards are

-5-

generally placed above a counter in a restaurant and include an identification of items sold at the particular restaurant, as well as the associated prices. A time of day may also be identified, for example for a breakfast menu. Special promotions may be identified, such as "value meals" or other limited-time promotions. The present invention allows replacement of the static menu board with a digital multimedia menu board which can be displayed on a virtual display including a row or array of multimedia monitors.

Digital multimedia menu presentations are assembled at a central location. The presentations include a menu of items which are sold at the restaurant chain and digital multimedia presentations for selected ones of the menu items to advertise promotions. The digital multimedia presentations may include audio, text, graphics and full motion digital video.

For each restaurant site, a restaurant site specific menu is generated which comprises selected ones of the items from the menu of items which are sold at the restaurant chain, the associated prices for the restaurant site, and the restaurant-specific multimedia advertisements, to form a customized digital multimedia menu board for each restaurant site, including menu items offered at the restaurant site, the associated prices and the multimedia advertisements concerning the menu items. Thus, for example, a nationwide restaurant chain may be running different promotions and may be selling different items in different parts of the country. The prices will also generally vary from store to store. Thus, for each restaurant site, a site-specific menu is generated.

The customized digital multimedia presentation is then transmitted from the central location to the associated restaurant site and is

received at the associated restaurant site. The received customized digital multimedia presentation is then stored in a digital multimedia player at the restaurant site. The customized digital multimedia presentation is then automatically played on a digital multimedia menu board at the restaurant site, so that the digital multimedia menu board indicates the menu items and prices and advertisements for items which are presently being sold at the restaurant site.

According to another aspect of the present invention, start and end times are assigned for the digital multimedia presentations for each restaurant site, and the start and end times are transmitted and received at the restaurant site. Then, the customized digital multimedia presentation is automatically played from the assigned start time until the assigned end time. Thus, for example, a digital multimedia menu board for breakfast may only be played from 7:00AM-11:00AM, and this time can vary from day to day. Thereafter, a lunch menu board may be displayed.

According to another aspect of the present invention, a digital multimedia default menu presentation is also generated, transmitted, received and stored. Then, if an assigned end time for a digital multimedia presentation occurs and a start time for a second digital multimedia menu presentation is not present, the digital multimedia default menu presentation may be played. Accordingly, for example, if a new lunch menu has not been received, a default lunch menu may be displayed until the new lunch menu is received. Thus, it can be ensured that the digital multimedia menu board never displays a blank menu board. Similarly, if a digital multimedia menu presentation terminates prematurely due to an error or other occurrence, the default menu board may be played so that the digital multimedia menu board is never blank.

-7-

According to another aspect of the present invention, start and end dates are provided for the digital multimedia menu presentations for the restaurant sites. The start and end dates may be provided to accommodate price changes, new promotions and new items which are added to the menu board. Thus, the digital multimedia menu presentations are presented between the assigned start and end times and between the start and end dates. After the end date, the stored digital multimedia menu presentation is deleted from the digital multimedia player at the restaurant site, to free up storage space.

According to another aspect of the invention, customization data may also be provided for the restaurant site. For example, a customized list of items which are sold at the restaurant site may be provided centrally, but the prices may be entered at the individual restaurant site. Similarly, local promotions to meet competitive prices may also be entered at the local sites.

The digital multimedia menu boards may also be tied to a point-of-sale system at the restaurant site, which measures effectiveness of the promotions which are advertised on the menu boards. Thus, if point-of-sale data indicates that the promotions on the menu board are not being effective, this indication may be provided to the central location and new digital multimedia presentations may be assembled and transmitted to the store to provide a new presentation. The presentations on the menu board or on another kiosk in the store may also be made interactive by responding to customer inputs to provide interactive presentations. Multilingual presentations may also be provided.

Brief Description of the Drawings

Figure 1 is an overall block diagram of systems, methods and computer program products for generating digital multimedia store displays and menu boards according to the invention.

Figures 2A and 2B are flowcharts illustrating an operational overview of systems, methods and computer program products for generating store displays for a plurality of stores according to the present invention.

Figure 3 is a detailed block diagram of the control and monitoring station of Figure 1.

Figure 4 illustrates an entity relationship conceptual model of the client and site database of Figure 1.

Figure 5 illustrates an entity relationship conceptual model of the presentation tracking database of Figure 3.

Figures 6A and 6B illustrate examples of wide area networks of Figure 1.

Figure 7 illustrates a local area network which may be used at the central location of Figure 1.

Figure 8 illustrates an example of an on-site local area network for Figure 1.

Figure 9 is a block diagram of the on-site players of Figure 1.

Figure 10 is a block diagram of the on-site control and monitoring station of Figure 1.

Figure 11 illustrates a fast-food restaurant including a digital multimedia menu board according to the present invention.

Figure 12 illustrates a digital multimedia interactive kiosk according to the present invention.

Detailed Description of Preferred Embodiments

The present invention now will be described more fully hereinafter with reference to the

-9-

5 accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like numbers refer to like elements throughout.

10 Overview

Referring now to Figure 1, an overall block diagram of systems, methods and computer program products for generating digital multimedia store displays and menu boards according to the invention is illustrated. As shown in Figure 1, system 100 may be used to distribute, manage, monitor and display digital multimedia presentations in store environments. The digital multimedia presentations may serve a promotional, operational, or "edutainment" (education/entertainment) function. By using digital multimedia presentations, the present invention can leverage the strengths of network distribution including rapid updating, improved process management, dynamic integration of multiple data sources and robust control over remote playback.

Promotional applications may include in-store marketing efforts which are targeted to motivate desired consumer behavior by increasing consumer awareness. For example, digital multimedia presentations may highlight product availability or specific in-store incentives to motivate product purchase. Operational presentations may include features which are central to the functioning of the store, for example a fast food restaurant menu board. Finally, edutainment applications may be used to provide computer-based activities to consumers or store

-10-

personnel that are either educational or entertainment, or both. Examples may include staff training, motivational messaging or computer games. Regardless of the content, the digital multimedia presentations may be assembled, transmitted, received and played at the stores using the same software and hardware infrastructure, described below.

Accordingly, the present invention may be used to generate revenue, reduce costs, and/or increase consumer traffic. As a revenue generator, the promotional applications may create a new in-store medium that can be sponsored or cofunded by participating companies, similar to television advertisements. The operational applications can reduce the amount of materials and labor which are currently expended for the same tasks. Finally, the edutainment applications can be the basis for an in-store experience that motivates consumers to visit a given store or motivates staff retention and effectiveness.

It will be understood that the digital multimedia presentations may be passive or interactive. The digital multimedia presentations may respond to direct consumer input. For example, a promotional application can be presented on a touch-screen device which changes the type of information displayed in response to consumer selections.

Figure 1 is a block diagram of systems, methods and computer program products for generating store displays according to the present invention. As shown in Figure 1, system 100 includes an apparatus and/or a step for assembling at a central location, digital multimedia presentations for the plurality of stores. This apparatus or step is indicated in Figure 1 as "content development" 102. Digital multimedia presentations which are developed are stored in a presentation database 104 at the central location and

-11-

are staged for distribution through a distribution server 106 at the central location. Applications are distributed through a wide area network (WAN) 114 to on-site players 118. Information about the digital multimedia presentations in the stores may be transmitted back to the distribution server 106 where it is stored in a client and site database 110.

Continuing with the description of Figure 1, digital multimedia presentations which are assembled during content development 102, may include full motion digital video, still images, computer-generated animation, print prepress files, text and/or audio. The content is assembled into a complete digital multimedia presentation and stored in the presentation database 104. The details of assembling digital multimedia presentations will be described below. All approved digital multimedia presentations in the presentation database 104 are available for scheduling and transmission to the on-site players 118, as will be described in detail below.

The central control and monitoring station 108 enables a system operator to collect data from the client and site database 110 and the presentation database 104 in order to create digital multimedia presentation packages for each site. The digital multimedia presentation for each site may be determined in part by specific instructions or data from the various sites, which may be entered at the on-site control and monitoring station 116 and which is received and processed through the store administration server (central) 112. The central control and monitoring station 108 issues commands to distribute the assembled digital multimedia presentations from the presentation database 104 via the distribution server 106.

Digital multimedia presentations are distributed from the central location, to the plurality

-12-

of stores, using a wide area network (WAN) 114. Thus, the blocks of Figure 1 to the left of WAN 114 are at a central location, whereas the blocks to the right of WAN 114 are at an individual store. It will be understood that the central location may include a plurality of discrete sites which act as distribution points for the stores. Similarly, the various components for the stores need not be physically located in the stores, except for the digital multimedia display of the on-site players 118. Rather, these components may be included at another location associated with the store. The distribution of the digital multimedia presentations from the central locations to the stores may be managed by large multimedia file distribution software such as CreativePartner™, which is marketed by emotion Incorporated, Palo Alto, California.

At the stores, the digital multimedia presentations may be received, disassembled and stored in the on-site players 118. Client instructions or other on-site data such as point-of-sale information can be integrated into the digital multimedia presentations on the on-site players 118. Relevant data about the digital multimedia presentations and the state of the on-site players 118 may be recorded and transmitted to the distribution server 106. A system operator at the control and monitoring station 108 can view this data.

After a predetermined end date, the digital multimedia presentation is retired and replaced by another presentation which is delivered to the on-site player 118 as described above. Alternatively, a site-specific default presentation, which is always present on each on-site player 118, may be used. The default presentation is designed to be appropriate for on-site display at any time for a given client.

-13-

The system 100 is preferably designed to allow most digital multimedia presentations to play without any action on the part of on-site personnel. However, there may be some functions for which it is useful to provide control and management tools to the store manager, such as selecting from among multiple implementations of a particular digital multimedia presentation, or setting the store hours or schedule for a particular store. This on-site customization may be obtained using the on-site control and monitoring station 116 and the store administration server 120, as will be described below.

Operational Overview

Referring now to Figures 2A and 2B, an operational overview of systems, methods and computer program products for generating store displays for a plurality of stores will be described.

As will be appreciated by one of skill in the art, the present invention may be embodied as a method, data processing system and/or computer program product. Accordingly, the present invention may take the form of an entirely hardware embodiment, an entirely software embodiment or an embodiment combining software and hardware aspects. Furthermore, the present invention may take the form of a computer program product on a computer-readable storage medium having computer-readable program code means embodied in the medium. Any suitable computer-readable medium may be utilized including hard disks, CD-ROMs, optical storage devices, or magnetic storage devices.

The present invention is described below with reference to flowchart illustrations of methods, apparatus (systems) and computer program products. It will be understood that each block of the flowchart illustrations, and combinations of blocks in the flowchart illustrations, can be implemented by computer

-14-

program instructions. These computer program instructions may be loaded onto a computer or other programmable data processing apparatus to produce a machine, such that the instructions which execute on the computer or other programmable data processing apparatus create means for implementing the functions specified in the flowchart block or blocks. These computer program instructions may also be stored in a computer-readable memory that can direct a computer or other programmable data processing apparatus to function in a particular manner, such that the instructions stored in the computer-readable memory produce an article of manufacture including instruction means which implement the function specified in the flowchart block or blocks. The computer program instructions may also be loaded onto a computer or other programmable data processing apparatus to cause a series of operational steps to be performed on the computer or other programmable apparatus to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide steps for implementing the functions specified in the flowchart block or blocks.

Referring now to Figures 2A and 2B, store displays 200 are generated by first developing or assembling generic digital multimedia presentations for multiple stores (Block 202). For example, when the store displays are menu boards for a restaurant chain, digital multimedia menu presentations including a menu of items which are sold at the restaurant and digital multimedia presentations such as advertisements for selected ones of the menu items are generated. These digital multimedia presentations are generally developed by creative professionals at advertising agencies or clients. After a generic presentation is assembled, it is released to distribution and stored in

-15-

the presentation database 104 of Figure 1 where it awaits assembly and distribution.

At Block 204, the digital multimedia presentations are customized for individual stores. Customization may take place by generating for each restaurant site, a restaurant site-specific menu comprising selected ones of the items from the menu of items which are sold at the restaurant chain, the associated prices for the restaurant site, and restaurant-specific multimedia advertisements, to form a customized digital multimedia menu board for each restaurant site including menu items offered at the restaurant site, the associated prices, and multimedia advertisements concerning the menu items.

It will be understood that customization may take place independent of store input. However, preferably, instructions or data gathered from the store sites may impact the presentation customization at Block 204. Thus, presentations are preferably customized using the client and site database 110 at the control and monitoring station 108 (Figure 1). The data in the client and site database may be obtained from the store administration server 110 at the store via the store administration server at the central location 112. It will also be understood that additional customization may take place at the stores, as will be described below.

In addition to customization, at Block 206, start and end times and start and end dates are assigned for the customized multimedia presentations. The start and end dates may indicate start and end dates for a particular menu including special products and/or prices. Start and end times may indicate when in the day a specific menu is displayed, for example breakfast, lunch and dinner menus and/or weekend or weekday menus.

-16-

At Block 208, a default digital multimedia presentation is also developed or generated. The default digital multimedia presentation preferably includes generic material for the site which may be displayed in the absence of a customized digital multimedia presentation. Absence of a customized digital multimedia presentation may take place because of an error or because it is desired to display the default digital multimedia presentation.

At Block 212, the digital multimedia presentation packages are assembled for each store. At Block 214, the digital multimedia packages are queued for distribution to the individual stores using the distribution server 106 and wide area network 114 of Figure 1. At Block 216, the digital multimedia packages are transmitted over the WAN 114 and received at the store 216. The received customized digital multimedia presentations are stored at the associated store at Block 218.

At Block 222, further customization may be applied to the presentation. In particular, the on-site store administration server 120 of Figure 1 may be used to provide further customization of the digital multimedia presentation. For example, the playing hours may be modified and prices may be changed. If alternative digital multimedia presentations are stored, one may be selected for presentation at the store. It will be understood that central customization and on-site customization may be used to optimize overall network resources and efficiency. It will also be understood that on-site customization may occur dynamically as the digital multimedia program is played.

Referring to Blocks 226-248, the customized digital multimedia presentations are then automatically played on the on-site player, such as a digital multimedia menu board at the associated restaurant

-17-

site, so that the digital multimedia menu board indicates the menu items and prices, and advertisements for items which are presently being sold at the restaurant site. The appropriate digital multimedia presentation is played between an assigned start and end time and an assigned start and end date.

In particular, the presentations may abut each other in a serial fashion, with a succeeding presentation beginning at the end of a preceding presentation. In other instances, the valid periods for presentations may overlap in several ways. For example, a week-long special promotion presentation may supersede a quarterly seasonal presentation. For that week, the relative start dates are compared, with a preference for the presentation with the most recent start date.

Also, the start and end times which divide a day into periods may be related to a day profile which allows for several different ways of dividing days. For example, a weekend day may have a distinct set of periods from a weekday. More preferably, there is a hierarchy of preferred matching of day profiles which determines what set of time periods are in effect for a given day. These preferred matching profiles may be determined by the manner in which a date is specified. For example, a fully specified date such as 3/17/1997 may have priority over a partially specified date such as 12/25, which itself may have a preference over a day of the week such as Thursday, which itself may have preference over a weekday versus weekend specification.

Accordingly, as shown at Block 226, when the player computer is started, or if the current time is a boundary between sales periods, then at Block 232, a candidate digital multimedia presentation is selected for playback. Candidate digital multimedia presentations are identified as those presentations with an assigned start date greater than or equal to

-18-

the current date and with an assigned start time which falls within the current sales period. If more than one candidate presentation is available, then the candidate with the most recent or greatest assigned start date is started at Block 234. If no candidate presentations are available from Block 232, then the default digital multimedia presentation is started at Block 228.

Having started an appropriate digital multimedia presentation, control returns to Block 226. Until the next sales period boundary or player computer start-up, the player computer storage is periodically checked for outdated digital multimedia presentations beginning at Block 244. If the assigned end date of any digital multimedia presentation is less than, i.e. before, the current date, then the expired presentation is moved to the "outdated" directory at Block 246. If there are no such presentations, then at Block 236 a check is made to determine whether the available storage capacity of the player computer has fallen below a configurable threshold. When the storage capacity falls below that threshold, then the contents of the "outdated" directory are purged to make room for new digital multimedia presentations.

It will be understood that control is periodically passed through Block 238, where a test is made to determine that there is an appropriate digital multimedia presentation displayed. If that test indicates any error in the presentation playback, then the default digital multimedia presentation is displayed at Block 228.

Central Control and Monitoring Station

A detailed operational explanation of control and monitoring station 108 (Figure 1) will now be described in connection with Figure 3. As shown in Figure 3, the control and monitoring station 108

includes control and monitoring software which may be accessed by a system operator to manage the client and site database 110, prepare digital multimedia presentation packages for distribution and track system status and history.

The presentation database 104 is maintained and populated by the content process described in connection with Figure 1. The control and monitoring station 108 accesses the presentation database 104 to identify the digital multimedia presentations which are available for distribution when an operator creates a distribution package.

The client and site database 110 contains information about various enterprises related to the store business, including but not limited to contact and site information and information about the on-site player configuration and installation.

Figure 4 illustrates an Entity-Relationship conceptual model of the client and site database 110. The modeling of databases using entity relationships was first described by Chen. An in-depth presentation of the Entity-Relationship approach may be found in an article by Teorey et al. entitled "*A Logical Design Methodology for Relational Databases Using the Extended Entity-Relationship Model*", published by ACM Computing Surveys, Vol. 18, No. 2, June 1986, the disclosure of which is hereby incorporated herein by reference.

As shown in Figure 4, the client and site database conceptual model represents entities and relationships, implemented in a relational database, which the control and monitoring station 108 manipulates. Enterprise entities can be an advertising agency or its clients, vendors or partners. Alternatively, enterprise entities may be the chain or restaurant chain. As shown in Figure 4, an enterprise owns sites and employs contacts (people) who occupy one or more offices provided by an enterprise site.

-20-

Enterprises may also define regions which allow many sites to be represented by a convenient shorthand notation.

Continuing with the description of Figure 4, a player is a computer configured with a particular set of monitors at a known site. It will be understood that enterprises, contacts, computers, monitors, computer configurations and display configurations can each exist in the database independent of other entities. Thus, they are independent entities. In contrast, regions, sites, offices and players only exist in relation to one or more independent entities. As such, they are shown as "dependent" entities.

Accordingly, in order to assemble a package of digital multimedia presentations for the plurality of stores, an operator at the control and monitoring station 108 selects one or more programs from the presentation database 104, specifies destination sites from the client and site database 110 and schedules the package start and expiration dates. The information that comprises the package is stored in the presentation tracking database 302. Packages are queued for distribution to on-site players using the CreativePartner agent 304. Other multimedia distribution packages may also be employed. The CreativePartner agent 304 copies the package files to on-site players 118 via the distribution server 106 which is connected a wide area network (WAN) 114, as will be described below.

Information such as on-site player operating status and the currently displayed multimedia presentation can also be provided from the on-site players 118 via the distribution server 106 and the CreativePartner agent 304, back to the control and monitoring station 108 to be incorporated into the presentation tracking database 302. For example, a particular digital multimedia presentation may have

-21-

several implementations. An on-site manager may have the option of selecting one of several implementations. The actual digital multimedia presentation which is selected at any given site can be monitored from the control and monitoring station 108 using the presentation tracking database 302. With appropriate interfaces to client point-of-sale data, this data can also be analyzed to monitor program effectiveness with respect to sales and to generate new digital multimedia presentations if a current presentation is not effective. Figure 5 describes an Entity-Relationship conceptual model of the presentation tracking database 302.

Local and Wide Area Networks

Figures 6A and 6B illustrate two examples of wide area networks 114 of Figure 1. It will be understood that many other examples of wide area networks may be used. As shown in Figures 6A and 6B, the central location may include a distribution server 106 for the central local area network 602. An ISDN/FR/ATM router 604 may be used to route messages to one or more wide area networks 114. Client routers 606 may be used to interface local area networks 608 for each site.

Figure 7 illustrates a local area network which may be used at a central location to develop, store and queue digital multimedia presentations. It will be understood that many other local area networks can be used. A plurality of content development stations 702 are shown, as well as a database server 704 to serve the presentation database and the client and site database.

Figure 8 illustrates an example of an on-site local area network which may be used at each of the stores. As shown, a plurality of on-site players 118 and a store administration station 120 may be included.

-22-

The functions of an on-site player and store administration server may be combined into a single unit 802. Other on-site devices 804 such as point-of-sale devices may be included in the local area network.

5 In Figure 8, two types of digital multimedia displays are shown. A kiosk 806 is shown including two separate displays therein. The displays may also be tiled to form a single virtual display. A second on-site player 810 is shown with a five-display
10 operational menu board.

On-Site Players

Referring now to Figure 9, operational details of on-site players 118 (Figure 1) will now be described. The on-site player includes a
15 CreativePartner agent 902, monitor software 904, cron software 906, movie mover software 908 and master player software 912. Each of Blocks 902, 904, 906, 908 and 912 may represent a single software process executing on the player computer. Preferably, each
20 player 118 includes a complete set of the player software to manage its operation.

The player software is responsible for receiving digital multimedia presentation packages, verifying package content, processing packages to
25 schedule presentations and carry out utility maintenance, displaying scheduled presentations, and deleting expired presentations. Player software also monitors the state of the system, with regard to processes and programs that are currently running,
30 reports status to the central monitoring system 108, and may intervene automatically for certain simple error conditions. Initial implementation of the player software may be targeted for Macintosh OS, but the individual components can be portable to other
35 operating systems.

-23-

The descriptions of the player software components below make reference to the player's directory structure:

```

5      HD:
      Player:
          Drop Box:  file packages arrive in the drop box
          Schedule:  holds cron, monitor, log & schedule files
          Movies:    subdirs hold cast/movie (CXT, DXR) files
10      Waiting:    movies not yet schedulable
          Now Playing: copy of the one movie now playing
          Playable:   all currently valid movies and casts
          Outdated:   expired movies/casts (deletable)
          Default:    one movie suitable to play anytime

```

15 The CreativePartner Agent 902 is the gateway to the network for the player software. The monitor 904 registers with the CreativePartner Agent 902 to receive notification of package arrival. The monitor 904 also interfaces with the CreativePartner Agent 902 to upload system status reports to the central

20 monitoring system 108.

When the monitor 904 is notified of a package arrival, the package is verified and processed, or an error report is generated if the package cannot be verified. A package includes a set of files which may

25 include presentations, constituent media files, and utility programs with any associated data files. A package preferably includes a package description file, or PKG file, which details the file set and includes presentation scheduling information.

30 The PKG file format may be a simple, extensible, line-oriented text format. PKG files may be generated automatically by the central control software, but may be hand-edited for testing or exceptional circumstances. Below is a sample PKG file:

```

35      : Just in case we hand-edit these, any lines containing
      : colon characters that aren't recognized are ignored.
      : Any line with no colons is assumed to be a content-file
      : name (no leading/trailing whitespace in filenames).
40      run: util00 HD:Player:Movies:outdated
      start date: 1/15/97 00:00:00
      expire date: 2/15/97 00:00:00
      dayparts: *
      files:
45          VALENTINE 97.DXR
          HEARTS 97.CXT
      : This 'run' command happens after content files are
      : processed, the other one runs before processing.
      run: util00 HD:Evince:Movies:Waiting

```

-24-

: A simple checksum for security/validation
checksum: 0xFF7C02A8

Packages are processed by monitor 904 as follows:

5 Package is validated, if files missing or checksum fails,
 generate error report.
 If package is OK, then:
10 ·Launch pre-run utilities
 ·Move content files to 'Waiting' area
 ·Modify crontab/schedule as needed
 ·Launch post-run utilities
 ·Delete PKG file (if no other PKG files, clean dir,
 too)
 ·Log entry: files listing, PKG file name

15 Cron 906 may utilize a proven, robust UNIX
 utility which has been ported to most common operating
 environments. Cron 906 is driven by a standard format
 text file, called the 'crontab'. It is especially
 suited for scheduling repetitive tasks at fixed times.
20 The player software system also uses cron 906 to
 schedule program changes that occur due to start date
 and expiration date arrival. Below is a sample crontab
 file:

25 // The fields of a crontab entry are:
 // minute hour monthday month weekday user command...
 45 3 * * * nobody reboot
 00 4 * * * nobody timesync
 15 4 * * * nobody disclean

30 0 0 15 1 * nobody moviemover "USPS VAL97.PKG"
 0 0 15 2 * nobody moviemover "USPS VAL97.PKG"

 When the monitor 904 processes a package
 containing start and expire data directives, it makes
 entries in the crontab that correspond to those dates,
 which cause cron 906 to invoke the movie mover 908.
35 The movie mover 908 manages file moves from Waiting to
 Playable, Playable to Outdated, selects a movie for Now
 Playing, and removes entries from the crontab as they
 are completed. It is also invoked at system startup
 and by the monitor 904 whenever a package is processed.
40 The movie mover 908 uses a movie schedule file to
 determine its actions. If a different program is
 selected for Now Playing, then the movie mover 908
 signals the master player 912 to synchronize the

-25-

program movie changeover. Below is a sample movie schedule file:

```

5      01/15/97 00:00:00 playable * HEARTS 97.CXT
      01/15/97 00:00:00 playable * VALENTINE 97.DXR
      01/15/97 00:00:00 cleantab * USPS VAL97.PKG
      02/15/97 00:00:00 outdated * VALENTINE 97.DXR
      02/15/97 00:00:00 outdated * HEARTS 97.CXT
      02/15/97 00:00:00 cleantab * USPS VAL97.PKG

```

The master player 912 may be a custom Macromedia Director™ or other multimedia projector which implements the framework for program playback. The major components of that framework are a 'Send Pulse' routine, and routines which synchronize the changeover from one program to another. The 'Send Pulse' routine makes a timestamped entry in the monitor 904 status log, which the monitor can then use to verify that a valid program is running. If the monitor 904 fails to receive a pulse from the master player 912, it schedules the default presentation for immediate playback and generates an error report. The master player 912 generally has one presentation 914 playing. The presentation 914 may be a Macromedia Director movie which is displayed in a subwindow of the master player process. In other words, the presentation 914 is preferably not itself a projector (self-running movie).

Together, the processes of the on-site player 118 ensure that there is always a valid promotional message displayed, manage presentation scheduling and expiration, report status information, and provide an extensible infrastructure for remotely managing the playback system without requiring intervention by on-site personnel.

Store Administration Servers (Central and On-Site)

35 Referring now to Figure 10, operational details for the central store administration server (112, Figure 1) and the on-site store administration server (120, Figure 1), will now be described. Although

the present invention preferably allows many digital multimedia presentations to be executed without any action on the part of on-site personnel, there are some functions for which it may be useful to provide control and management tools to the store manager.

For example, some presentations may have more than one implementation, which allows the store manager to select which presentation to execute at a particular site. Presentations may also have optional controls, especially in the case of operational presentations such as a menu board, which provide for proper configuration at each site. A schedule of store opening, closing, and division of a day into differing periods may also be used in the automated presentation playback process. Since this schedule is likely to vary by location, the store manager can use the administration software to modify the schedule from the default for the client enterprise. The administration software can also provide help, training and troubleshooting with respect to the on-site operation of the system, as well as a channel for feedback and non-urgent service requests.

The actions taken by a store manager using the control and monitoring station (on-site) 116 may result in communication with either a store administration server (Central) 112 or a store administration server (On-site) 120. The store administration server (Central) 112 communicates site administration input to the distribution server 106 where that input may affect presentation distribution or presentation configuration prior to distribution. When the administration input only affects post-distribution presentation configuration, it can be handled by the store administration server (On-site) 120 which can communicate directly with the On-site Players 118 to respond to the input.

-27-

The control and monitoring station 116 can be implemented by a workstation which supports a typical world-wide web browser application, and is preferably a computer which is already in place in the store environment for administration use. Hosting the administration software using standard Internet protocols and tools such as HTTP, FTP, and HTML allows flexibility not only in the selection of the control and monitoring station 116 but also in the location of the administration functions. The store manager need not be aware of whether a particular function is implemented by a store administration server (central) 112 or a store administration server (on-site) 120. The distribution network can be used to update the content of the store administration server (on-site) 120 similar to presentation updates.

Fast-Food Restaurant Environment

Referring now to Figure 11, the use of the present invention in a fast-food restaurant will now be described. As shown in Figure 11, a fast-food restaurant includes a conventional fast-food restaurant counter 1100 including point-of-sale terminals and food and beverage dispensers. Above the counter 1100 is a menu board 1110. According to the present invention, the menu board comprises a digital multimedia menu board including a plurality of digital multimedia displays 1110a-1110d which are arranged in an array to form a virtual display. The digital multimedia menu board 1110 may include digital multimedia presentations of menu items and prices and advertisements for items which are presently being sold at the restaurant site.

Figure 11 illustrates one arrangement of a digital multimedia menu board 1110. However, it will be understood by those having skill in the art that many other arrangements may be provided. As shown in Figure 11, display 1110a illustrates a multimedia

advertisement for a particular promotional meal. Displays 1110b and 1110c illustrate value meal promotions. Display 1110d illustrates individual menu items and their associated prices.

5 By providing animated movement, a consumer may be induced to try a featured special. The menu board 1110 may change constantly. For example, the menu board may also include advertisements relating to participation of the restaurant in a local charity
10 event for the next week.

Digital multimedia menu boards of the present invention may attract people to purchase selected items at a restaurant. Moreover, the concept-to-delivery cycle may be dramatically shortened. An idea may be
15 created, a prototype generated, revisions made, approval obtained and the message delivered to the environment in a short turnaround time and without costly and time-consuming printing and physical distribution of media. Moreover, the content can be
20 changed constantly and the customer can see a different message with each visit. Messaging can be targeted and refreshed at will. Moreover, testing of new menu boards can be done quickly and results can be evaluated and changes made rapidly to develop highly effective
25 messaging.

Well designed moving images can attract the consumer and deliver message effectively. The use of space can be optimized and multi-part messages can be shown over a short period of time on the same display.
30 Environments can respond to market conditions quickly. A restaurant can rapidly react with its own competitive offerings. Moreover, if a promotion is not effective, the creative agency can rapidly refine the messaging to be more effective.

35 Messaging can be targeted by the time of day and promotional cycle. Customers can see only the breakfast menu in the morning and only the lunch menu

at lunch time. Customer decision-making can therefore be faster and clutter may be reduced. Rush hour messaging can be quick and immediate, while off-peak messages can target a different customer.

5 Moreover, by delivering content digitally from a central location, with promotion parameters such as start and end dates automatically managed, execution can be nearly flawless and nearly effortless for the on-site staff. Resources can be managed more
10 efficiently, because managers no longer need to depend on employees to install and maintain signage throughout the restaurant. Staff mistakes can be reduced or eliminated, and stores do not need to use spare storage space for bulky promotional display materials.

15 Figure 12 illustrates an interactive kiosk which may interface to the system of the present invention. The kiosk may be used to attract customers into the restaurant or to provide interactive game playing for a family as they enjoy a meal. Thus, the
20 restaurant may become a center of family activities, rather than merely a location to eat.

 Accordingly, the present invention provides systems, methods and computer program products which distribute and manage digital multimedia presentations
25 which typically function in a environment as promotional, operational or edutainment applications. The invention allows presentations to be delivered to all sites or to particular sites selected by region or specific address. Presentations are executed on-site
30 using computer systems capable of driving multiple digital displays to create a single virtual display of various sizes. These computer systems are referred to as "players". Since presentations are stored on the player, the site may be disconnected from the network
35 without impacting operations other than presentation distribution. A particular presentation may be static, or may be modified by integration of site-specific

data. Data integration may occur dynamically or one
time only, and may be performed by an in-store computer
system or by a central computer system. Presentations
may be interactive, as in a touchscreen order-entry,
5 wayfinding, or game program, or passive, as in a simple
promotional display which the end-user just reads.
Presentations typically run without requiring any in-
store personnel action, but may include selection,
scheduling, or configuration options which allow on-
10 site personnel to customize the presentations.

In the drawings and specification, there have
been disclosed typical preferred embodiments of the
invention and, although specific terms are employed,
they are used in a generic and descriptive sense only
15 and not for purposes of limitation, the scope of the
invention being set forth in the following claims.

-31-

THAT WHICH IS CLAIMED:

1. A method for generating store displays for a plurality of stores, comprising the steps of:

5 assembling at a central location, digital multimedia presentations for the plurality of stores;

10 assigning start and end times to the digital multimedia presentations for the stores;

transmitting the digital multimedia presentations and the assigned start and end times to the plurality of stores;

15 receiving the digital multimedia presentations and the assigned start and end times at the stores;

storing the received digital multimedia presentations in a digital multimedia player at the store; and

20 upon occurrence of an assigned start time, automatically playing the associated stored received digital multimedia presentation on a digital multimedia display in the store, until occurrence of the assigned end time for the associated digital multimedia presentation.

2. A method according to Claim 1 further comprising the steps of:

5 generating at the central location, a digital multimedia default presentation for the plurality of stores, the digital multimedia default presentation being free of a start time and an end time;

10 transmitting the digital multimedia default presentation to the plurality of stores;

receiving the digital multimedia default presentation at the stores;

storing the received digital multimedia default presentation in the digital multimedia player at the store;

-32-

15 detecting at the store, that an assigned end
time for an associated digital multimedia presentation
has occurred, and that a start time for a second
digital multimedia presentation does not correspond to
the assigned end time; and

20 automatically playing the stored received
digital multimedia default presentation on the digital
multimedia display in the store, upon detecting that an
assigned end time for an associated digital multimedia
presentation has occurred and that a start time for a
second digital multimedia presentation does not
25 correspond to the assigned end time.

3. A method according to Claim 1 further
comprising the steps of:

generating at the central location, a digital
multimedia default presentation for the plurality of
5 stores, the digital multimedia default presentation
being free of a start time and an end time;

transmitting the digital multimedia default
presentation to the plurality of stores;

10 receiving the digital multimedia default
presentation at the stores;

storing the received digital multimedia
default presentation in the digital multimedia player
at the store;

15 detecting at the store, that termination of a
digital multimedia presentation has occurred prior to
the assigned end time; and

20 automatically playing the stored received
digital multimedia default presentation on the digital
multimedia display in the store, upon detecting that
termination of a digital multimedia presentation has
occurred prior to the assigned end time.

4. A method according to Claim 1:

-33-

wherein the assigning step further comprises the step of assigning a start and end date to the digital multimedia presentations for the stores;

5 wherein the transmitting step further comprises the step of transmitting the digital multimedia presentations and the assigned start and end times and start and end dates to the plurality of stores;

10 wherein the receiving step comprises the step of receiving the digital multimedia presentations and the assigned start and end times and start and end dates at the stores;

15 wherein the automatically playing step comprises the step of, upon occurrence of an assigned start time between the assigned start date and the assigned end date, automatically playing the associated stored received digital multimedia presentation on a digital multimedia display in the store, until
20 occurrence of the assigned end time for the associated digital multimedia presentation; and

wherein the method further comprises the step of deleting the stored received digital multimedia presentation from the digital multimedia player at the
25 store, after expiration of the assigned end date.

5. A method according to Claim 1 wherein the assembling step comprises the steps of:

generating at the central location, a generalized digital multimedia presentation for the
75 plurality of stores; and

customizing the generalized digital multimedia presentation for selected ones of the plurality of stores, to create a plurality of customized digital multimedia presentations for
10 selected ones of the stores.

-34-

6. A method according to Claim 5 wherein the assigning step comprises the step of:

assigning start and end times and a store identification to the customized digital multimedia presentations for the stores; and

wherein the transmitting step comprises the step of:

transmitting the customized digital multimedia presentations and the assigned start and end times to the identified stores.

7. A method according to Claim 1 further comprising the steps of:

assembling at a central location, a default digital multimedia presentation for the plurality of stores;

transmitting the default digital multimedia presentation to the plurality of stores;

receiving the default digital multimedia presentation at the stores;

storing the received default digital multimedia presentation in a digital multimedia player at the store; and

wherein the step of automatically playing is followed by the step of:

automatically playing the stored received default digital multimedia presentation on the digital multimedia display in the store, upon occurrence of the assigned end time.

8. A method according to Claim 1 wherein the steps of transmitting and receiving are performed using at least one of a wired wide area network, a wireless wide area network and the internet.

-35-

9. A method according to Claim 1 wherein the digital multimedia display is a virtual display comprising a plurality of display devices.

10. A method according to Claim 5 wherein the step of customizing is preceded by the step of:
accepting from the selected ones of the stores, customization data related to the selected ones
5 of the stores; and

wherein the customizing step comprises the step of:
customizing the generalized digital
multimedia presentation for selected ones of the
10 plurality of stores using the customization data, to create a plurality of customized digital multimedia presentations for selected ones of the stores.

11. A method according to Claim 1 wherein the step of automatically playing is followed by the steps of:
measuring effectiveness of the digital
5 multimedia presentation in the store; and
repeating the steps of assembling, assigning, transmitting receiving storing and automatically playing for second multimedia presentations, upon
receipt of an indication that the digital multimedia
10 presentation is not effective.

12. A method according to Claim 1 wherein the step of automatically playing comprises the step of automatically playing the stored received digital multimedia presentations on a digital multimedia
5 display in the store in response to customer inputs, to provide interactive multimedia presentations.

13. A method according to Claim 1 wherein the step of storing is followed by the step of:

-36-

5 customizing the stored received digital
multimedia presentations with customization data for
the store; and

wherein the step of automatically playing
comprises the step of:

10 upon occurrence of the assigned start time,
automatically playing the customized stored received
digital multimedia presentations on the digital
multimedia display in the store, until occurrence of
the assigned end time.

14. A method for generating menu boards for
an enterprise, including a plurality of sites,
comprising the steps of:

5 assembling at a central location, digital
multimedia menu presentations including a menu of items
which are sold at the enterprise, and digital
multimedia presentations for selected ones of the menu
items;

10 generating, for the sites, a site-specific
menu comprising selected ones of the items from the
menu of items which are sold at the enterprise, the
associated prices for the site, and specific multimedia
advertisements, to form a customized digital multimedia
15 menu board for the site including menu items offered at
the site, the associated prices, and multimedia
advertisements concerning the menu items;

transmitting the customized digital
multimedia presentations from the central location to
the associated sites;

20 receiving the customized digital multimedia
presentation at the associated site;

storing the received customized digital
multimedia presentation in a digital multimedia player
at the site; and

25 automatically playing the customized digital
multimedia presentation on a digital multimedia menu

board at the associated site, so that the digital multimedia menu board indicates the menu items and prices, and advertisements for items which are presently being sold at the site.

30

15. A method according to Claim 14:

wherein the generating step further comprises the step of assigning start and end times for the digital multimedia presentations for the sites;

5

wherein the transmitting step comprises the step of transmitting the customized digital multimedia presentations and the assigned start and end times to the associated sites;

10

wherein the receiving step comprises the step of receiving the customized digital multimedia presentation and the assigned start and end times at the associated site; and

15

wherein the automatically playing step comprises the step of, upon occurrence of an assigned start time, automatically playing the customized digital multimedia presentation on a digital multimedia menu board in the site, until occurrence of the assigned end time for the customized digital multimedia presentation so that the digital multimedia menu board indicates the menu items and prices, and advertisements for items which are presently being sold at the site.

20

16. A method according to Claim 15 further comprising the steps of:

generating at the central location, a digital multimedia default menu presentation for the enterprise, the digital multimedia default menu presentation being free of a start time and an end time;

5

transmitting the digital multimedia default menu presentation to the plurality of sites;

-38-

10 receiving the digital multimedia default menu
presentation at the sites;
storing the received digital multimedia
default menu presentation in the digital multimedia
player at the site;

15 detecting at the site, that an assigned end
time for an associated digital multimedia menu
presentation has occurred, and that a start time for a
second digital multimedia menu presentation does not
correspond to the assigned end time; and

20 automatically playing the stored received
digital multimedia default menu presentation on the
digital multimedia menu board in the store, upon
detecting that an assigned end time for an associated
digital multimedia menu presentation has occurred and

25 that a start time for a second digital multimedia menu
presentation does not correspond to the assigned end
time.

17. A method according to Claim 15 further
comprising the steps of:

generating at the central location, a digital
multimedia default menu presentation for the
5 enterprise, the digital multimedia default menu
presentation being free of a start time and an end
time;

transmitting the digital multimedia default
menu presentation to the plurality of sites;

10 receiving the digital multimedia default menu
presentation at the sites;
storing the received digital multimedia
default menu presentation in the digital multimedia
player at the site;

15 detecting at the site, that termination of a
digital multimedia menu presentation has occurred prior
to the assigned end time; and

-39-

20 automatically playing the stored received digital multimedia default menu presentation on the digital multimedia menu board in the store, upon detecting that termination of a digital multimedia menu presentation has occurred prior to the assigned end time.

18. A method according to Claim 15:
wherein the assigning step further comprises the step of assigning a start and end date to the digital multimedia menu presentations for the sites;
5 wherein the transmitting step further comprises the step of transmitting the digital multimedia menu presentations and the assigned start and end times and start and end dates to the plurality of sites;
10 wherein the receiving step comprises the step of receiving the digital multimedia menu presentations and the assigned start and end times and start and end dates at the sites;
wherein the automatically playing step
15 comprises the step of, upon occurrence of an assigned start time between the assigned start date and the assigned end date, automatically playing the associated stored received digital multimedia menu presentation on a digital multimedia menu board in the store, until
20 occurrence of the assigned end time for the associated digital multimedia menu presentation; and
wherein the method further comprises the step of deleting the stored received digital multimedia menu presentation from the digital multimedia player at the
25 site, after expiration of the assigned end date.

19. A method according to Claim 15 further comprising the steps of:

-40-

assembling at a central location, a default
digital multimedia menu presentation for the
5 enterprise;

transmitting the default digital multimedia
menu presentation to the plurality of sites;

receiving the default digital multimedia menu
presentation at the sites;

10 storing the received default digital
multimedia menu presentation in a digital multimedia
player at the site; and

wherein the step of automatically playing is
followed by the step of:

15 automatically playing the stored received
default digital multimedia menu presentation on the
digital multimedia menu board in the site, upon
occurrence of the assigned end time.

20. A method according to Claim 14 wherein
the steps of transmitting and receiving are performed
using at least one of a wired wide area network, a
wireless wide area network and the internet.

21. A method according to Claim 14 wherein
the digital multimedia menu board is a virtual display
comprising a plurality of display devices.

22. A method according to Claim 14 wherein
the step of generating is preceded by the step of:
accepting from the selected ones of the
sites, customization data related to the items and
5 prices of items which are sold at the selected site.

23. A method according to Claim 14 wherein
the step of automatically playing is followed by the
steps of:

5 measuring effectiveness of the digital
multimedia menu presentation in the store; and

-41-

repeating the steps of assembling, generating, transmitting, receiving, storing and automatically playing for second multimedia menu presentations, upon receipt of an indication that the digital multimedia menu presentation is not effective.

24. A method according to Claim 14 wherein the step of automatically playing comprises the step of automatically playing the stored received digital multimedia menu presentations on a digital multimedia menu board in the store in response to customer inputs, to provide interactive menu board presentations.

25. A method according to Claim 14 wherein the step of storing is followed by the step of:
further customizing the stored received digital multimedia menu presentations with customization data for the store; and
wherein the step of automatically playing comprises the step of:
automatically playing the further customized digital multimedia presentation on a digital multimedia menu board at the associated site, so that the digital multimedia menu board indicates the menu items and prices, and advertisements for items which are presently being sold at the site.

26. A system for generating store displays for a plurality of stores, comprising:
a central system including means for assembling digital multimedia presentations for the plurality of stores and for assigning start and end times to the digital multimedia presentations for the stores;
a network which transmits the digital multimedia presentations and the assigned start and end times to the plurality of stores; and

-42-

a digital multimedia system at each of the stores, the digital multimedia system comprising:

means for storing the received digital multimedia presentations; and

15 digital multimedia displaying means, responsive to occurrence of an assigned start time, for automatically playing the associated stored received digital multimedia presentation, until occurrence of
20 the assigned end time for the associated digital multimedia presentation.

27. A system according to Claim 26 wherein the central system further comprises:

means for generating a digital multimedia default presentation for the plurality of stores, the
5 digital multimedia default presentation being free of a start time and an end time; and

wherein the digital multimedia system further comprises:

10 means for storing the received digital multimedia default presentation;

means for detecting that an assigned end time for an associated digital multimedia presentation has occurred, and that a start time for a second digital multimedia presentation does not correspond to the
15 assigned end time; and

wherein the digital multimedia displaying means further comprises means for automatically playing the stored received digital multimedia default presentation on the digital multimedia displaying
20 means, upon detecting that an assigned end time for an associated digital multimedia presentation has occurred and that a start time for a second digital multimedia presentation does not correspond to the assigned end time.

28. A system according to Claim 26 wherein the central system further comprises:

5 means for generating a digital multimedia default presentation for the plurality of stores, the digital multimedia default presentation being free of a start time and an end time; and

wherein the digital multimedia system further comprises:

10 means for storing the received digital multimedia default presentation;

means for detecting that termination of a digital multimedia presentation has occurred prior to the assigned end time; and

15 wherein the digital multimedia displaying means further comprises means for automatically playing the stored received digital multimedia default presentation on the digital multimedia displaying means, upon detecting that termination of a digital multimedia presentation has occurred prior to the
20 assigned end time.

29. A system according to Claim 26 wherein the central system further comprises:

5 means for assigning a start and end date to the digital multimedia presentations for the stores; and

10 wherein the digital multimedia displaying means further comprises means, responsive to occurrence of an assigned start time between the assigned start date and the assigned end date, for automatically playing the associated stored received digital multimedia presentation on the digital multimedia displaying means, until occurrence of the assigned end time for the associated digital multimedia
15 presentation; and

-44-

wherein the digital multimedia system further comprises means for deleting the stored received digital multimedia presentation, after expiration of the assigned end date.

30. A system according to Claim 26 wherein the assembling means comprises:

means for generating a generalized digital multimedia presentation for the plurality of stores;
5 and

means for customizing the generalized digital multimedia presentation for selected ones of the plurality of stores, to create a plurality of customized digital multimedia presentations for
10 selected ones of the stores.

31. A system according to Claim 30 wherein the assigning means comprises:

means for assigning start and end times and a store identification to the customized digital
5 multimedia presentations for the stores.

32. A system according to Claim 26 wherein the central system further comprises:

means for assembling a default digital multimedia presentation for the plurality of stores;

5 wherein the digital multimedia system comprises:

means for storing the received default digital multimedia presentation; and

10 wherein the digital multimedia displaying means further comprises:

means for automatically playing the stored received default digital multimedia presentation on the digital multimedia displaying means, upon occurrence of the assigned end time.

-45-

33. A system according to Claim 26 wherein the network comprises at least one of a wired wide area network, a wireless wide area network and the internet.

34. A system according to Claim 26 wherein the digital multimedia displaying means comprises a virtual display including a plurality of display devices.

35. A system according to Claim 30 wherein the central system further comprises:

means for accepting from the selected ones of the stores, customization data related to the selected ones of the stores; and

wherein the customizing means comprises:

means for customizing the generalized digital multimedia presentation for selected ones of the plurality of stores using the customization data, to create a plurality of customized digital multimedia presentations for selected ones of the stores.

36. A system according to Claim 26 wherein the central system further comprises:

means for measuring effectiveness of the digital multimedia presentation in the store; and

means for assembling second multimedia presentations, upon receipt of an indication that the digital multimedia presentation is not effective.

37. A system according to Claim 26 wherein the digital multimedia displaying means is further responsive to customer inputs, to provide interactive multimedia presentations.

38. A system according to Claim 26 wherein the digital multimedia system further comprises:

-46-

5 means for customizing the stored received digital multimedia presentations with customization data for the store.

39. A system for generating menu boards for an enterprise including a plurality of sites, comprising:

5 a central system including means for assembling digital multimedia menu presentations including a menu of items which are sold at the enterprise, and digital multimedia presentations for selected ones of the menu items, and for generating, for the sites, a site-specific menu comprising selected
10 ones of the items from the menu of items which are sold at the enterprise, the associated prices for the site, and specific multimedia advertisements, to form a customized digital multimedia menu board for the site including menu items offered at the site, the
15 associated prices, and multimedia advertisements concerning the menu items;

a network which transmits the customized digital multimedia presentations from the central location to the associated sites; and

20 a digital multimedia system at each of the sites, the digital multimedia system comprising:

means for storing the received customized digital multimedia presentation; and

25 digital multimedia menu board displaying means, for automatically playing the customized digital multimedia presentation, so that the digital multimedia menu board displaying means indicates the menu items and prices, and advertisements for items which are presently being sold at the site.

40. A system according to Claim 39:

-47-

wherein the central system further comprises means for assigning start and end times for the digital multimedia presentations for the sites; and

5 wherein the digital multimedia menu board displaying means comprises means, responsive to an assigned start time, for automatically playing the customized digital multimedia presentation on the digital multimedia menu board displaying means, until
10 occurrence of the assigned end time for the customized digital multimedia presentation so that the digital multimedia menu board displaying means indicates the menu items and prices, and advertisements for items which are presently being sold at the site.

41. A system according to Claim 40 wherein the central site further comprises:

 means for generating a digital multimedia default menu presentation for the enterprise, the
5 digital multimedia default menu presentation being free of a start time and an end time; and

 wherein the digital multimedia system further comprises:

 means for storing the received digital
10 multimedia default menu presentation;
 means for detecting that an assigned end time for an associated digital multimedia menu presentation has occurred, and that a start time for a second digital multimedia menu presentation does not
15 correspond to the assigned end time; and

 wherein the digital multimedia menu board displaying means further comprises means for automatically playing the stored received digital multimedia default menu presentation, upon detecting
20 that an assigned end time for an associated digital multimedia menu presentation has occurred and that a start time for a second digital multimedia menu

presentation does not correspond to the assigned end time.

42. A system according to Claim 40 wherein the central system further comprises:

means for generating a digital multimedia default menu presentation for the enterprise, the digital multimedia default menu presentation being free of a start time and an end time; and

wherein the digital multimedia system further comprises:

means for storing the received digital multimedia default menu presentation;

means for detecting that termination of a digital multimedia menu presentation has occurred prior to the assigned end time; and

wherein the digital multimedia menu board displaying means comprises means for automatically playing the stored received digital multimedia default menu presentation, upon detecting that termination of a digital multimedia menu presentation has occurred prior to the assigned end time.

43. A system according to Claim 40 wherein the central system further comprises:

means for assigning a start and end date to the digital multimedia menu presentations for the sites; and

wherein the digital multimedia displaying means further comprises means, responsive to occurrence of an assigned start time between the assigned start date and the assigned end date, for automatically playing the associated stored received digital multimedia menu presentation, until occurrence of the assigned end time for the associated digital multimedia menu presentation; and

-49-

15 means for deleting the stored received
digital multimedia menu presentation from the digital
multimedia system, after expiration of the assigned end
date.

44. A system according to Claim 40 wherein
the central system further comprises:

means for assembling a default digital
multimedia menu presentation for the enterprise;

5 wherein the digital multimedia system
comprises:

means for storing the received default
digital multimedia menu presentation; and

10 wherein the digital multimedia menu board
displaying means further comprises:

means for automatically playing the stored
received default digital multimedia menu presentation
on the digital multimedia menu board displaying means
upon occurrence of the assigned end time.

45. A system according to Claim 39 wherein
the network comprises at least one of a wired wide area
network, a wireless wide area network and the internet.

46. A system according to Claim 39 wherein
the digital multimedia menu board displaying means
comprises a virtual display including a plurality of
display devices.

47. A system according to Claim 39 wherein
the central system further comprises:

5 means for accepting from the selected ones of
the sites, customization data related to the items and
prices of items which are sold at the selected site.

48. A system according to Claim 39 wherein
the central system further comprises:

-50-

means for measuring effectiveness of the digital multimedia menu presentation in the store; and

5 means for assembling second multimedia menu presentations, upon receipt of an indication that the digital multimedia menu presentation is not effective.

49. A system according to Claim 39 wherein the digital multimedia menu board displaying means is responsive to customer inputs, to provide interactive menu board presentations.

50. A system according to Claim 39 wherein the digital multimedia system further comprises:

5 means for further customizing the stored received digital multimedia menu presentations with customization data for the store.

51. A computer program product for generating store displays for a plurality of stores, the computer program product including a computer-readable storage medium having computer-readable program code means embodied in the medium, the computer-readable program code means comprising:

10 computer-readable program code means for assembling digital multimedia presentations for the plurality of stores and for assigning start and end times to the digital multimedia presentations for the stores; and

15 computer-readable program code means for automatically playing the associated stored received digital multimedia presentation on a digital multimedia display in the store upon occurrence of an assigned start time, until occurrence of the assigned end time for the associated digital multimedia presentation.

52. A computer program product according to Claim 51 further comprising:

-51-

computer-readable program code means for
generating a digital multimedia default presentation
5 for the plurality of stores, the digital multimedia
default presentation being free of a start time and an
end time;

computer-readable program code means for
detecting that an assigned end time for an associated
10 digital multimedia presentation has occurred, and that
a start time for a second digital multimedia
presentation does not correspond to the assigned end
time; and

computer-readable program code means for
15 automatically playing the stored received digital
multimedia default presentation on the digital
multimedia display, upon detecting that an assigned end
time for an associated digital multimedia presentation
has occurred and that a start time for a second digital
20 multimedia presentation does not correspond to the
assigned end time.

53. A computer program product according to
Claim 51 further comprising:

computer-readable program code means for
generating a digital multimedia default presentation
5 for the plurality of stores, the digital multimedia
default presentation being free of a start time and an
end time;

computer-readable program code means for
detecting that termination of a digital multimedia
10 presentation has occurred prior to the assigned end
time; and

computer-readable program code means for
automatically playing the stored received digital
multimedia default presentation on the digital
15 multimedia display, upon detecting that termination of
a digital multimedia presentation has occurred prior to
the assigned end time.

-52-

54. A computer program product according to Claim 51 further comprising:

5 computer-readable program code means for assigning a start and end date to the digital multimedia presentations for the stores;

10 computer-readable program code means, responsive to occurrence of an assigned start time between the assigned start date and the assigned end date, for automatically playing the associated stored received digital multimedia presentation on the digital multimedia displaying means, until occurrence of the assigned end time for the associated digital multimedia presentation; and

15 computer-readable program code means for deleting the stored received digital multimedia presentation, after expiration of the assigned end date.

55. A computer program product according to Claim 51 wherein the computer-readable program code assembling means comprises:

5 computer-readable program code means for generating a generalized digital multimedia presentation for the plurality of stores; and

10 computer-readable program code means for customizing the generalized digital multimedia presentation for selected ones of the plurality of stores, to create a plurality of customized digital multimedia presentations for selected ones of the stores.

56. A computer program product according to Claim 55 wherein the computer-readable program code assigning means comprises:

5 computer-readable program code means for assigning start and end times and a store

identification to the customized digital multimedia presentations for the stores.

57. A computer program product according to Claim 51 further comprising:

5 computer-readable program code means for assembling a default digital multimedia presentation for the plurality of stores; and

10 computer-readable program code means for automatically playing the stored received default digital multimedia presentation on the digital multimedia display, upon occurrence of the assigned end time.

58. A computer program product according to Claim 55 further comprising:

5 computer-readable program code means for accepting from the selected ones of the stores, customization data related to the selected ones of the stores; and

wherein the computer-readable program code customizing means comprises:

10 computer-readable program code means for customizing the generalized digital multimedia presentation for selected ones of the plurality of stores using the customization data, to create a plurality of customized digital multimedia presentations for selected ones of the stores.

59. A computer program product according to Claim 51 further comprising:

5 computer-readable program code means for measuring effectiveness of the digital multimedia presentation in the store; and

computer-readable program code means for assembling second multimedia presentations, upon

-54-

receipt of an indication that the digital multimedia presentation is not effective.

5 60. A computer program product for generating menu boards for an enterprise including a plurality of sites, the computer program product including a computer-readable storage medium having computer-readable program code means embodied in the medium, the computer-readable program code means comprising:

10 computer-readable program code means for assembling digital multimedia menu presentations including a menu of items which are sold at the enterprise, and digital multimedia presentations for selected ones of the menu items, and for generating, for the sites, a site-specific menu comprising selected ones of the items from the menu of items which are sold
15 at the enterprise, the associated prices for the site, and specific multimedia advertisements, to form a customized digital multimedia menu board for the site including menu items offered at the site, the associated prices, and multimedia advertisements
20 concerning the menu items; and

computer-readable program code means for automatically playing the customized digital multimedia presentation on a digital multimedia menu board display at the associated site, so that the digital multimedia
25 menu board display indicates the menu items and prices, and advertisements for items which are presently being sold at the site.

61. A computer program product according to Claim 60 further comprising:

5 computer-readable program code means for assigning start and end times for the digital multimedia presentations for the sites; and

-55-

wherein the computer-readable program code automatically playing means comprises computer-readable program code means, responsive to an assigned start time, for automatically playing the customized digital multimedia presentation on the digital multimedia menu board display, until occurrence of the assigned end time for the customized digital multimedia presentation so that the digital multimedia menu board display indicates the menu items and prices, and advertisements for items which are presently being sold at the site.

62. A computer program product according to Claim 61 further comprising:

computer-readable program code means for generating a digital multimedia default menu presentation for the enterprise, the digital multimedia default menu presentation being free of a start time and an end time;

computer-readable program code means for detecting that an assigned end time for an associated digital multimedia menu presentation has occurred, and that a start time for a second digital multimedia menu presentation does not correspond to the assigned end time; and

computer-readable program code means for automatically playing the stored received digital multimedia default menu presentation on the digital multimedia menu board display in the store, upon detecting that an assigned end time for an associated digital multimedia menu presentation has occurred and that a start time for a second digital multimedia menu presentation does not correspond to the assigned end time.

63. A computer program product according to Claim 61 further comprising:

computer-readable program code means for
generating a digital multimedia default menu
5 presentation for the enterprise, the digital multimedia
default menu presentation being free of a start time
and an end time;

computer-readable program code means for
detecting that termination of a digital multimedia menu
10 presentation has occurred prior to the assigned end
time; and

computer-readable program code means for
automatically playing the stored received digital
multimedia default menu presentation on the digital
15 multimedia menu board in the store, upon detecting that
termination of a digital multimedia menu presentation
has occurred prior to the assigned end time.

64. A computer program product according to
Claim 61 further comprising:

computer-readable program code means for
assigning a start and end date to the digital
5 multimedia menu presentations for the sites;

computer-readable program code means,
responsive to occurrence of an assigned start time
between the assigned start date and the assigned end
date, for automatically playing the associated stored
10 received digital multimedia menu presentation on the
digital multimedia menu board display, until occurrence
of the assigned end time for the associated digital
multimedia menu presentation; and

computer-readable program code means for
15 deleting the stored received digital multimedia menu
presentation, after expiration of the assigned end
date.

65. A computer program product according to
Claim 61 further comprising:

-57-

computer-readable program code means for assembling a default digital multimedia menu .

5 presentation for the enterprise; and

computer-readable program code means for automatically playing the stored received default digital multimedia menu presentation on the digital multimedia menu board display upon occurrence of the
10 assigned end time.

66. A computer program product according to Claim 60 further comprising:

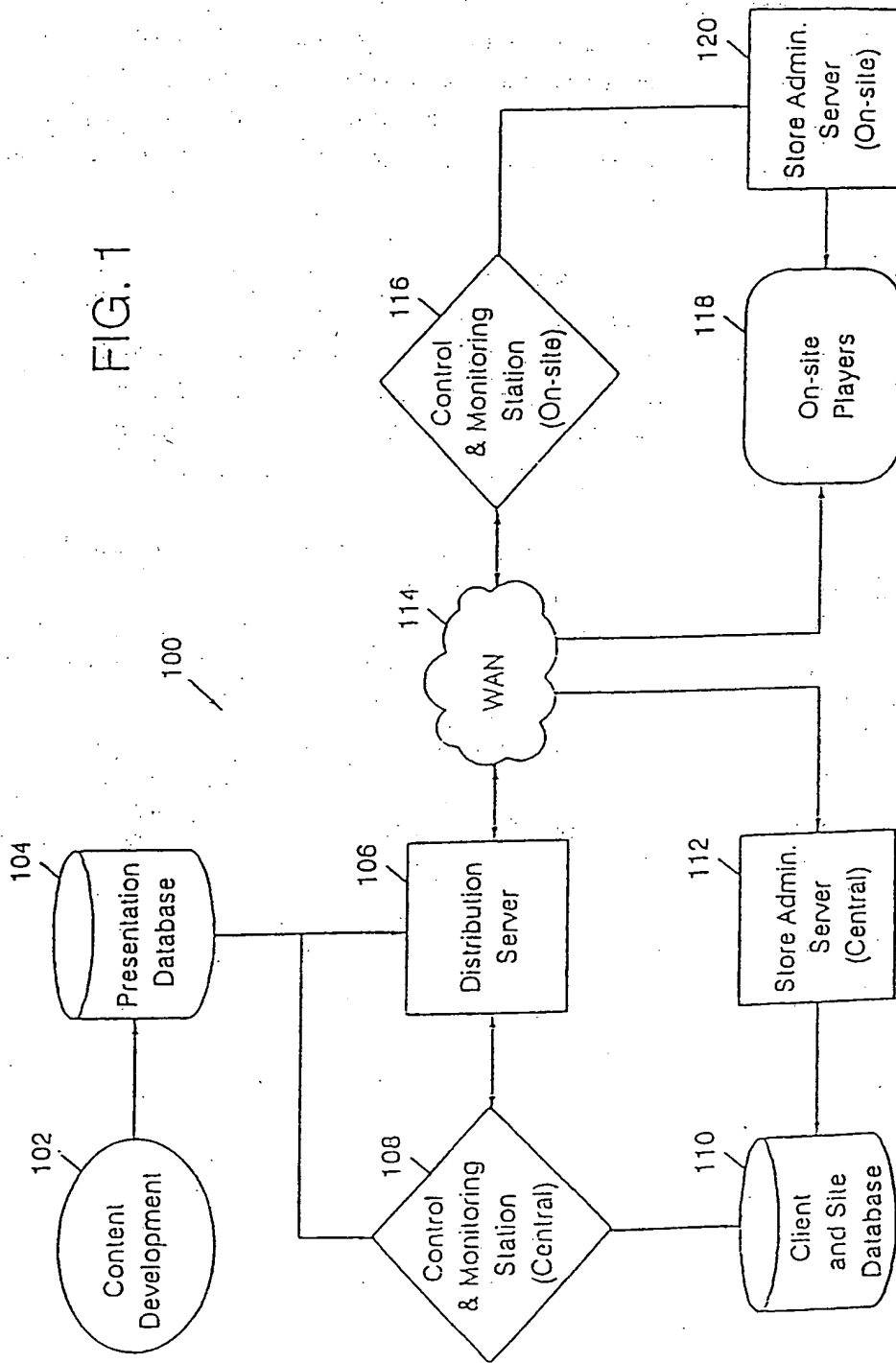
computer-readable program code means for accepting from the selected ones of the sites,
5 customization data related to the items and prices of items which are sold at the selected site.

67. A computer program product according to Claim 60 further comprising:

computer-readable program code means for measuring effectiveness of the digital multimedia menu
5 presentation in the store; and

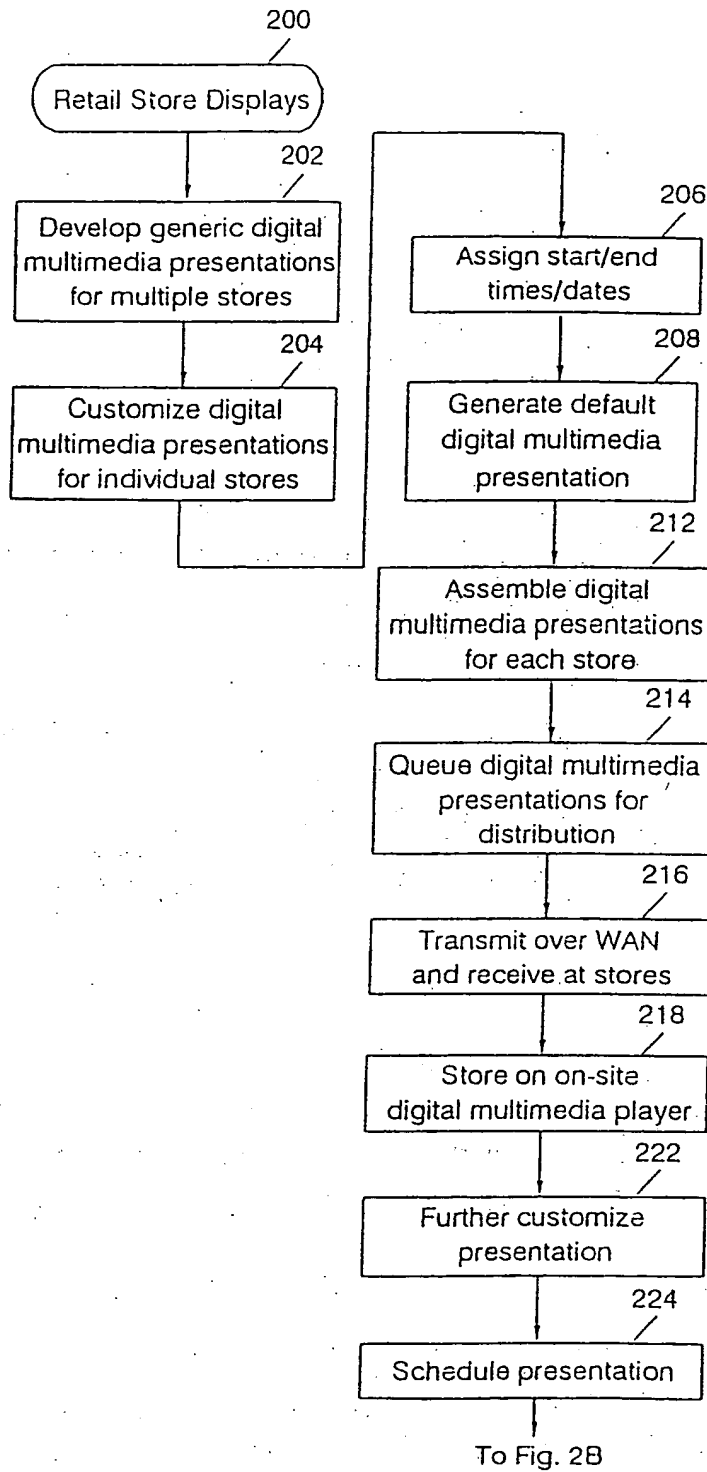
computer-readable program code means for assembling second multimedia menu presentations, upon receipt of an indication that the digital multimedia menu presentation is not effective.

FIG. 1



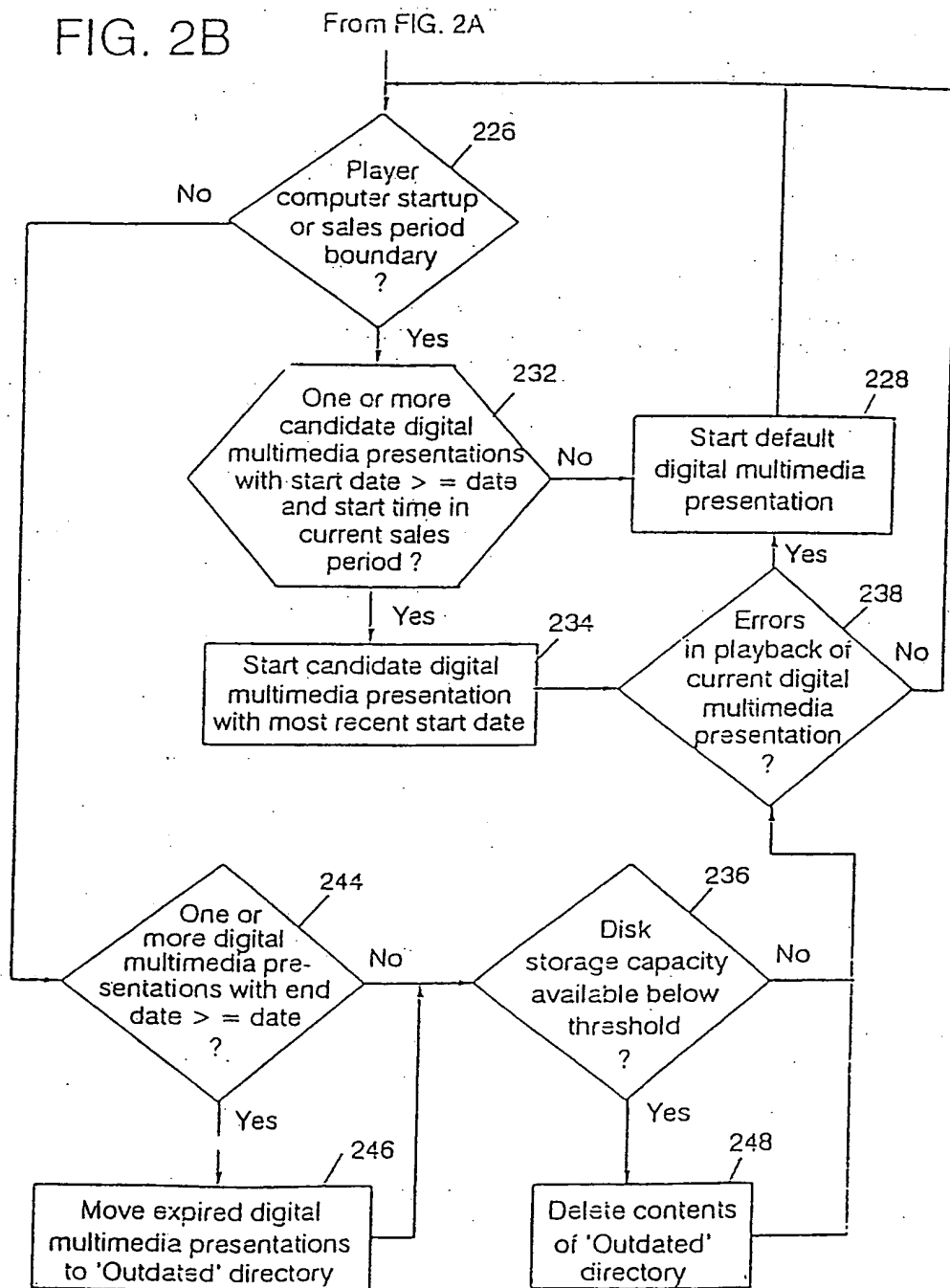
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FIG. 2A



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FIG. 2B



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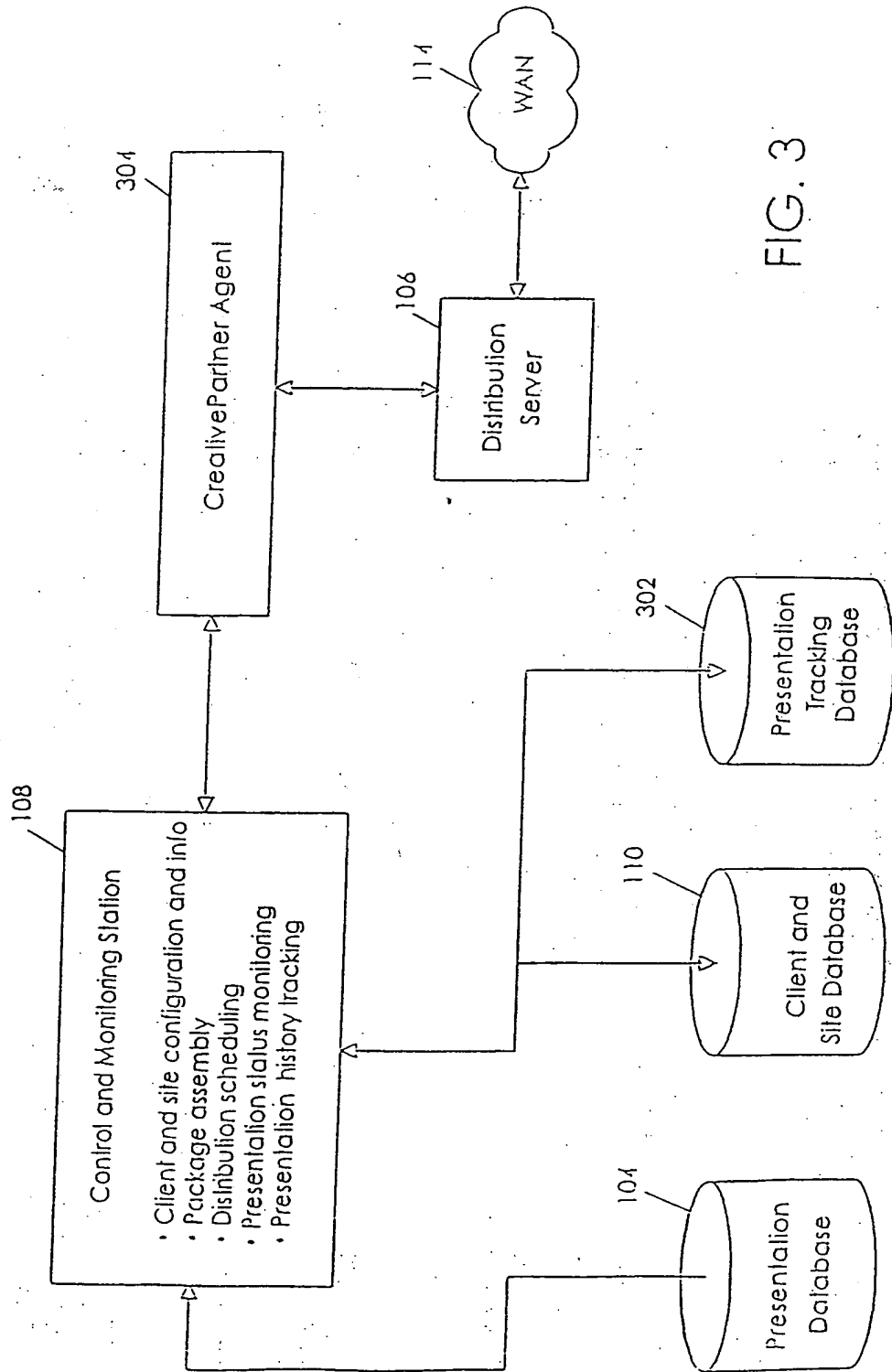
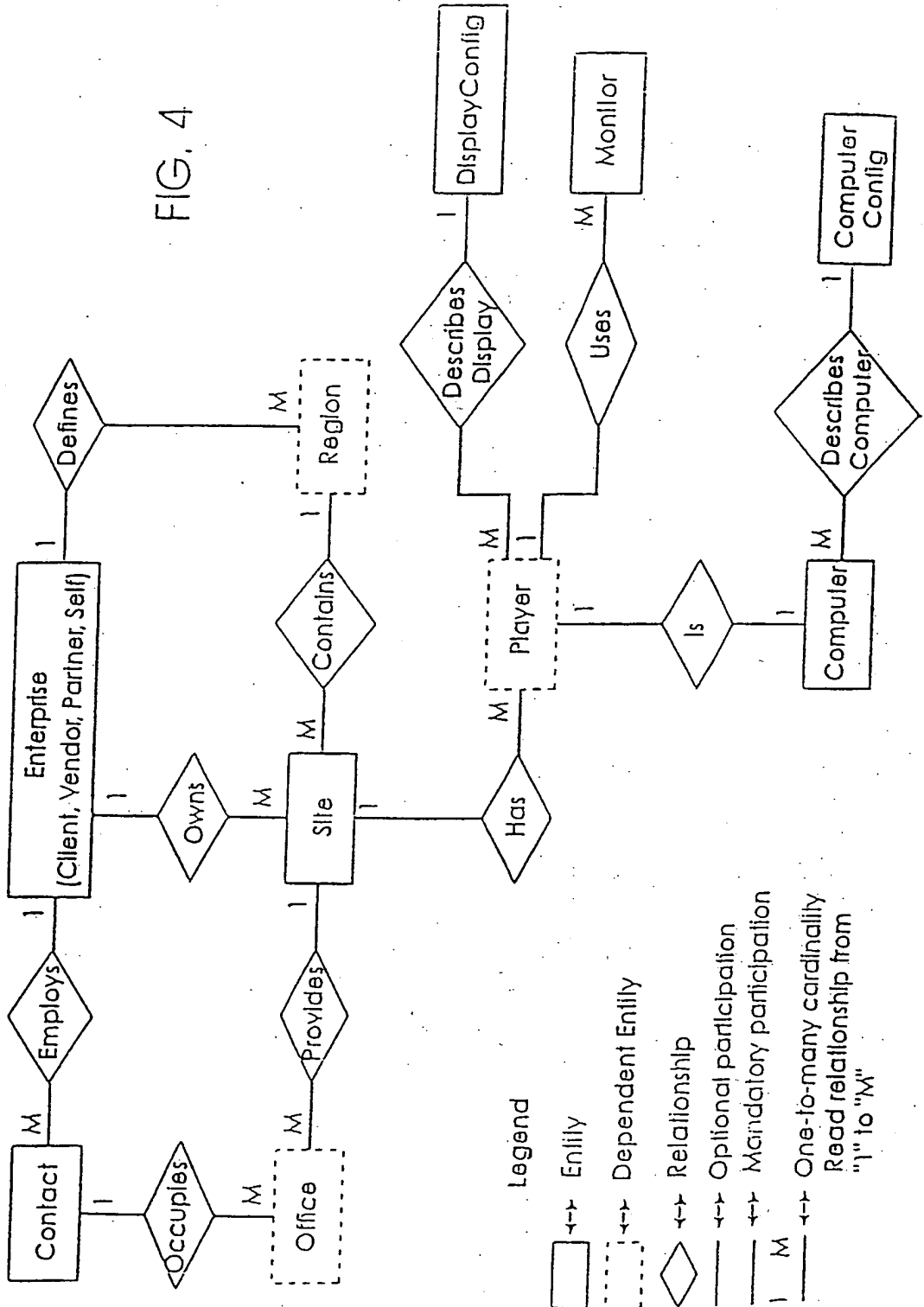


FIG. 3

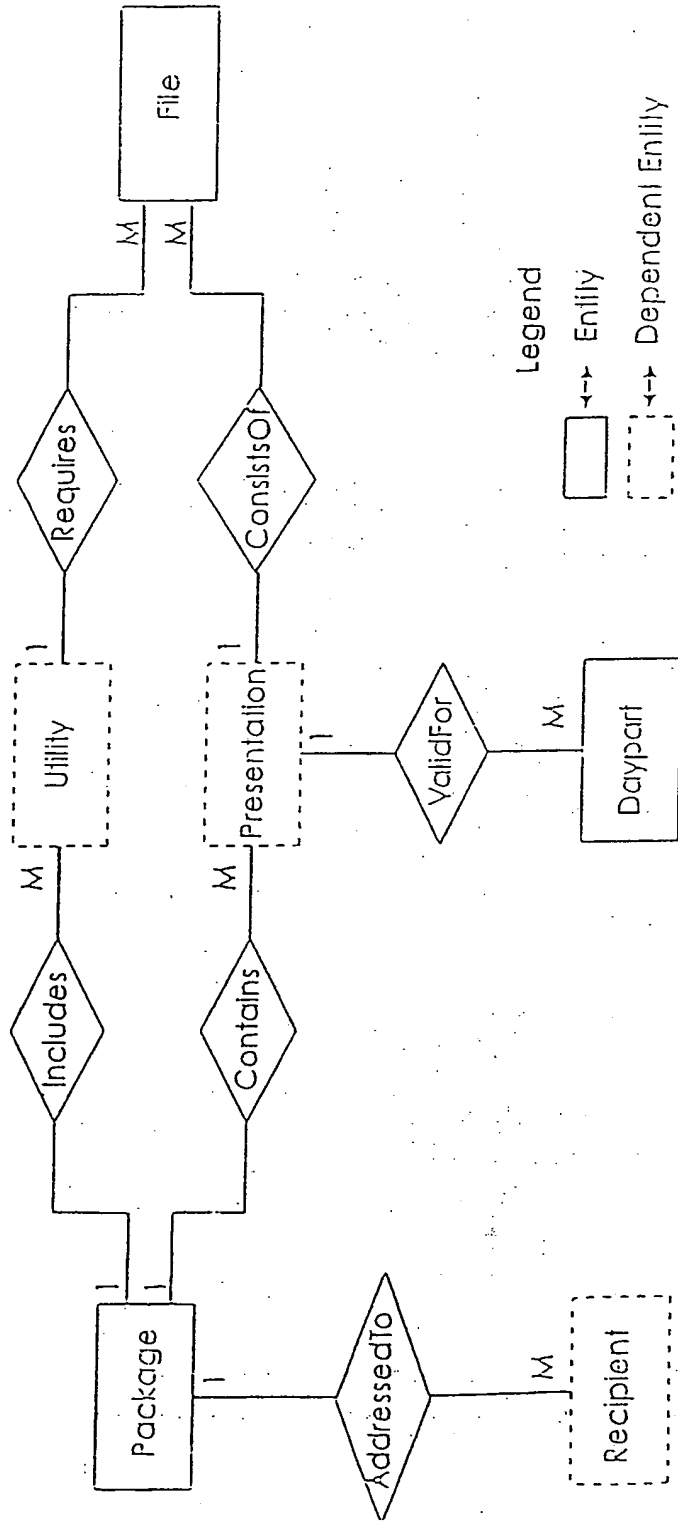
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FIG. 4



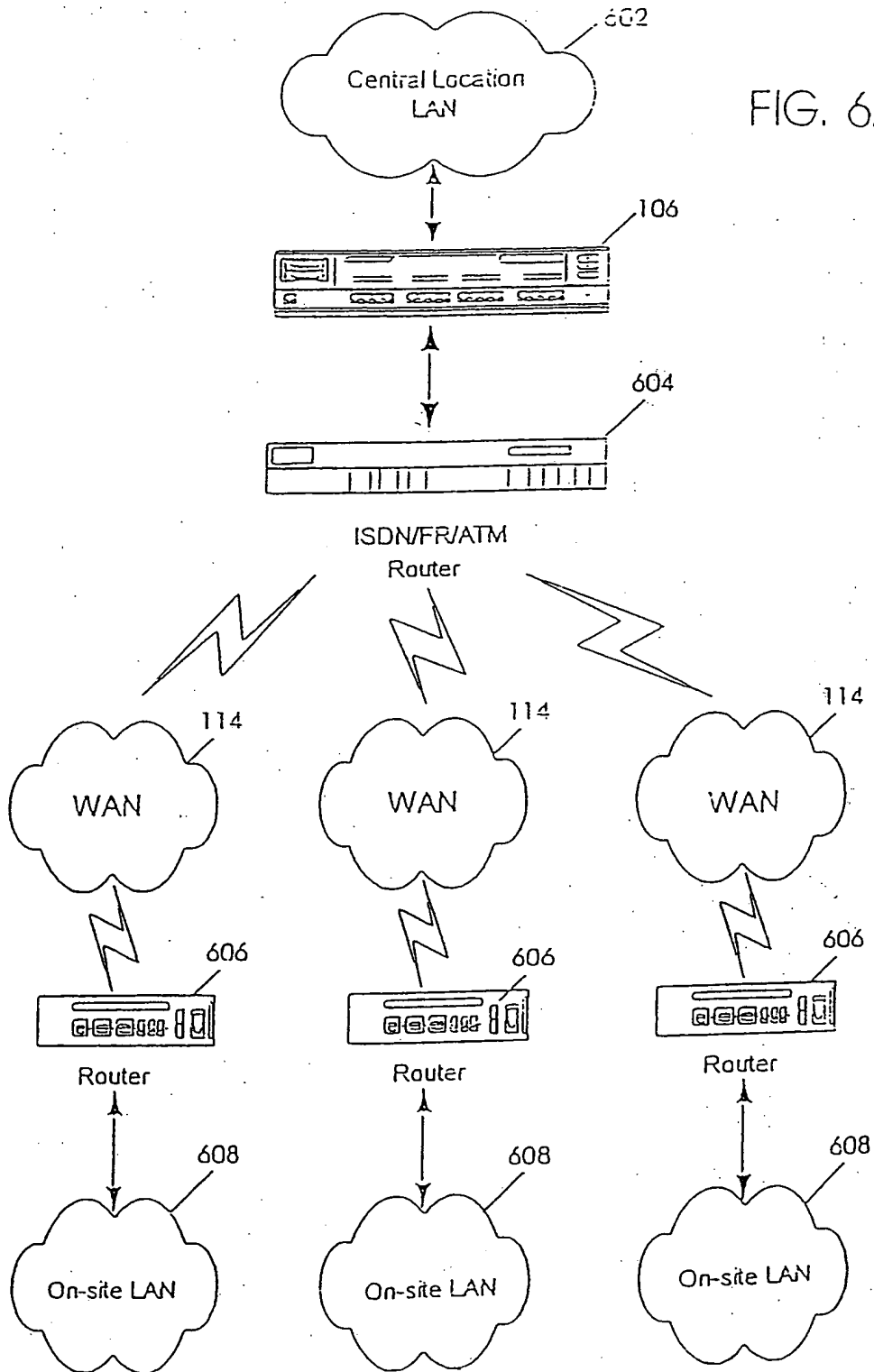
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FIG. 5



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FIG. 6A



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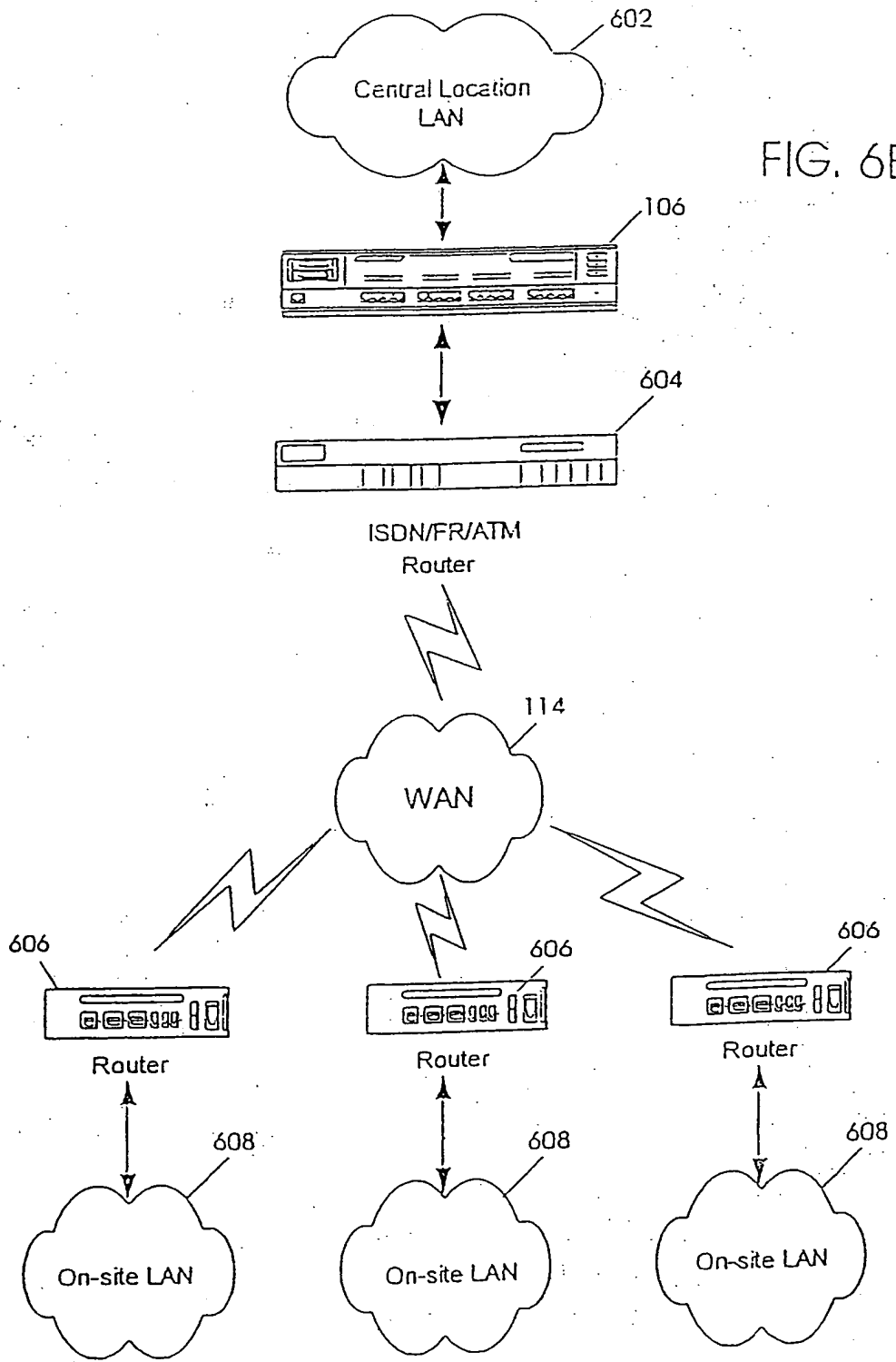
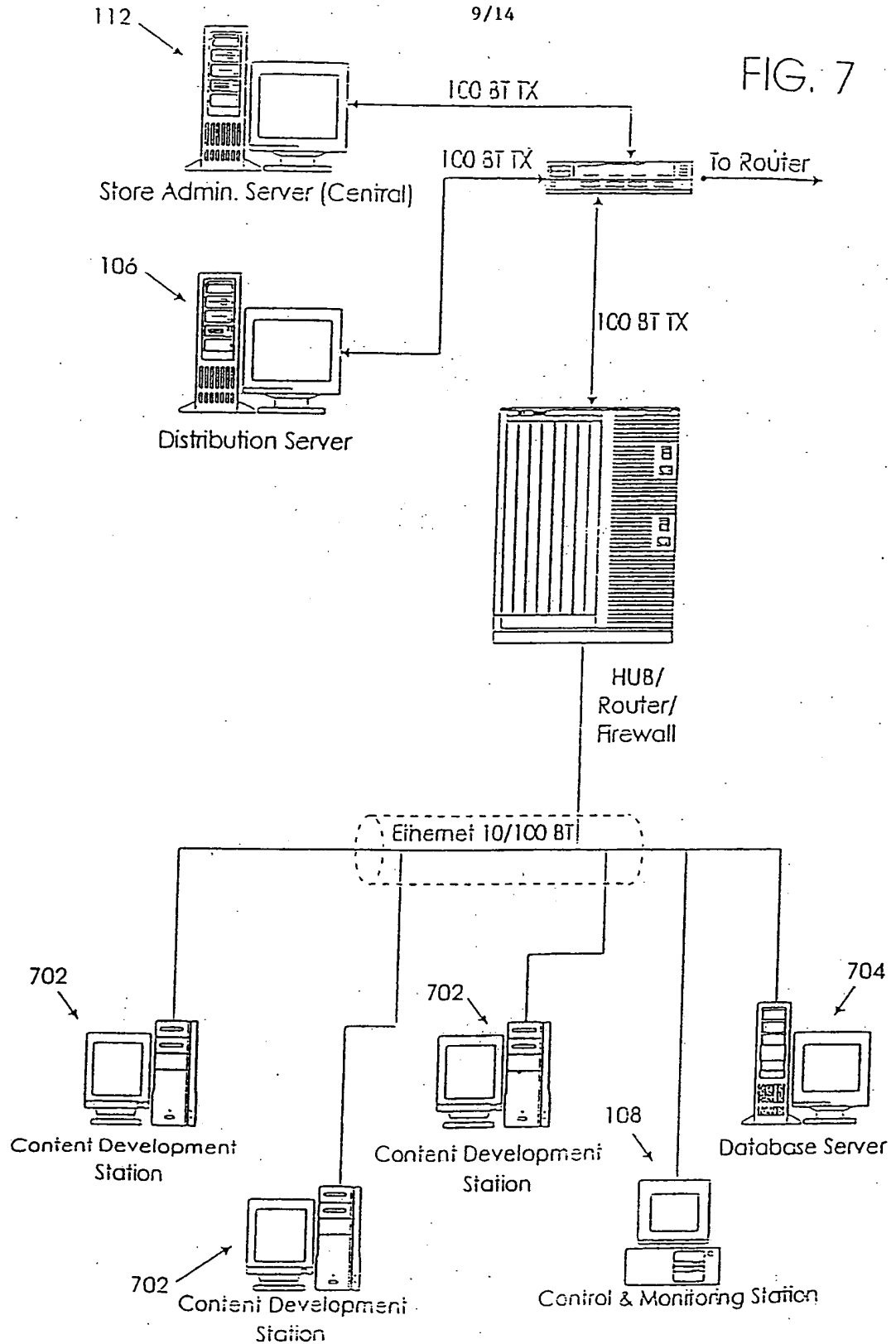


FIG. 6B

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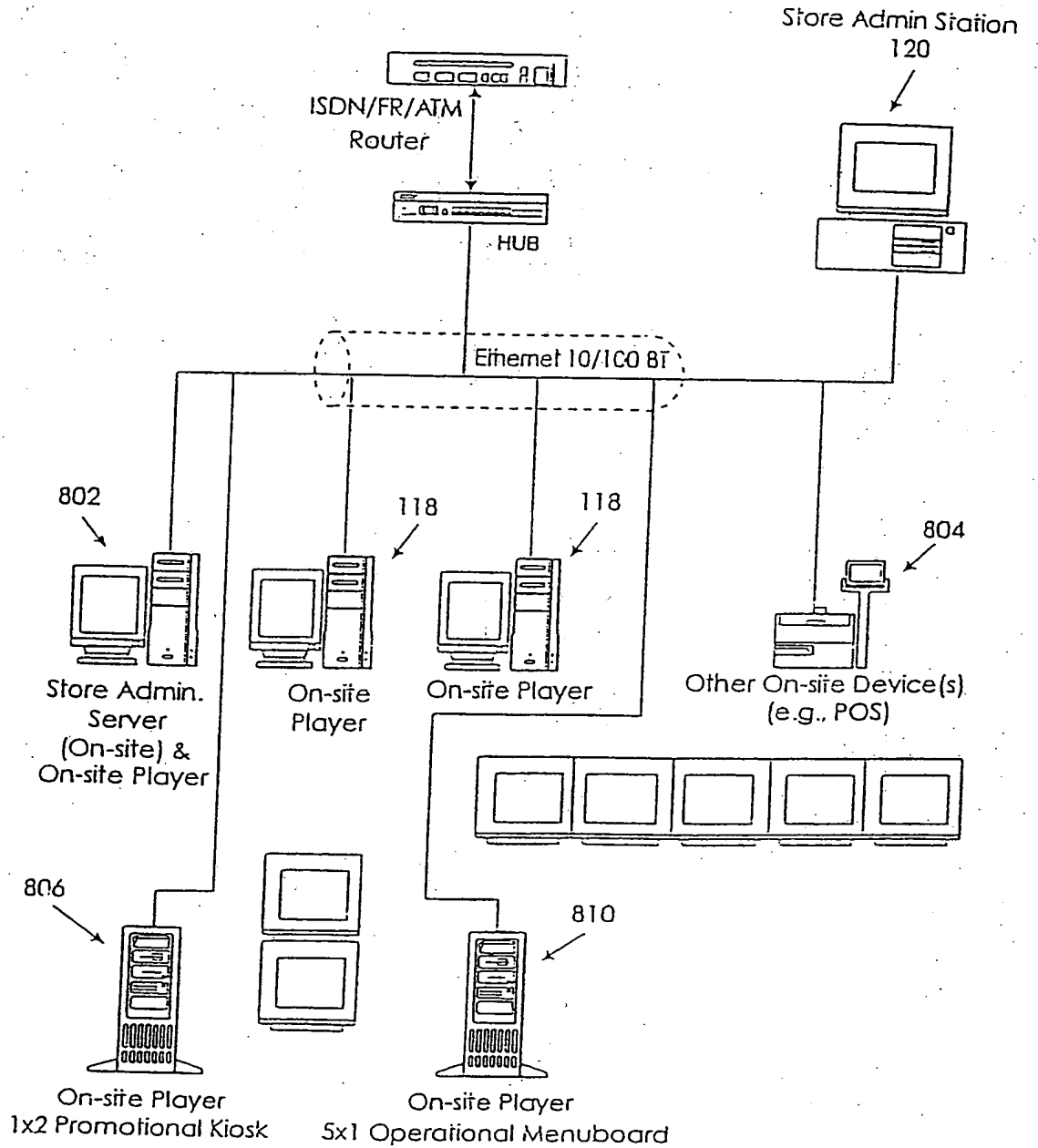
9/14

FIG. 7



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FIG. 8



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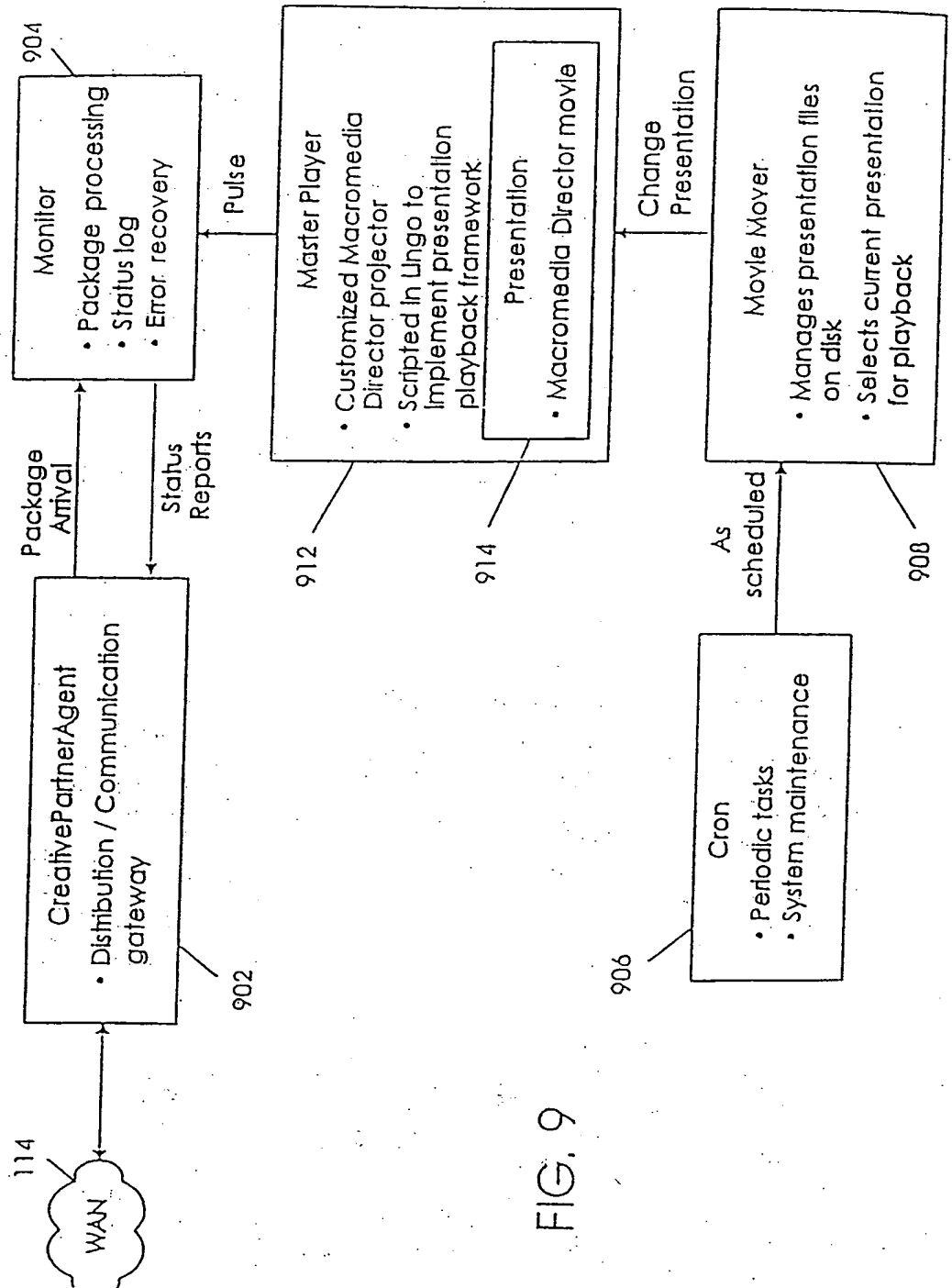
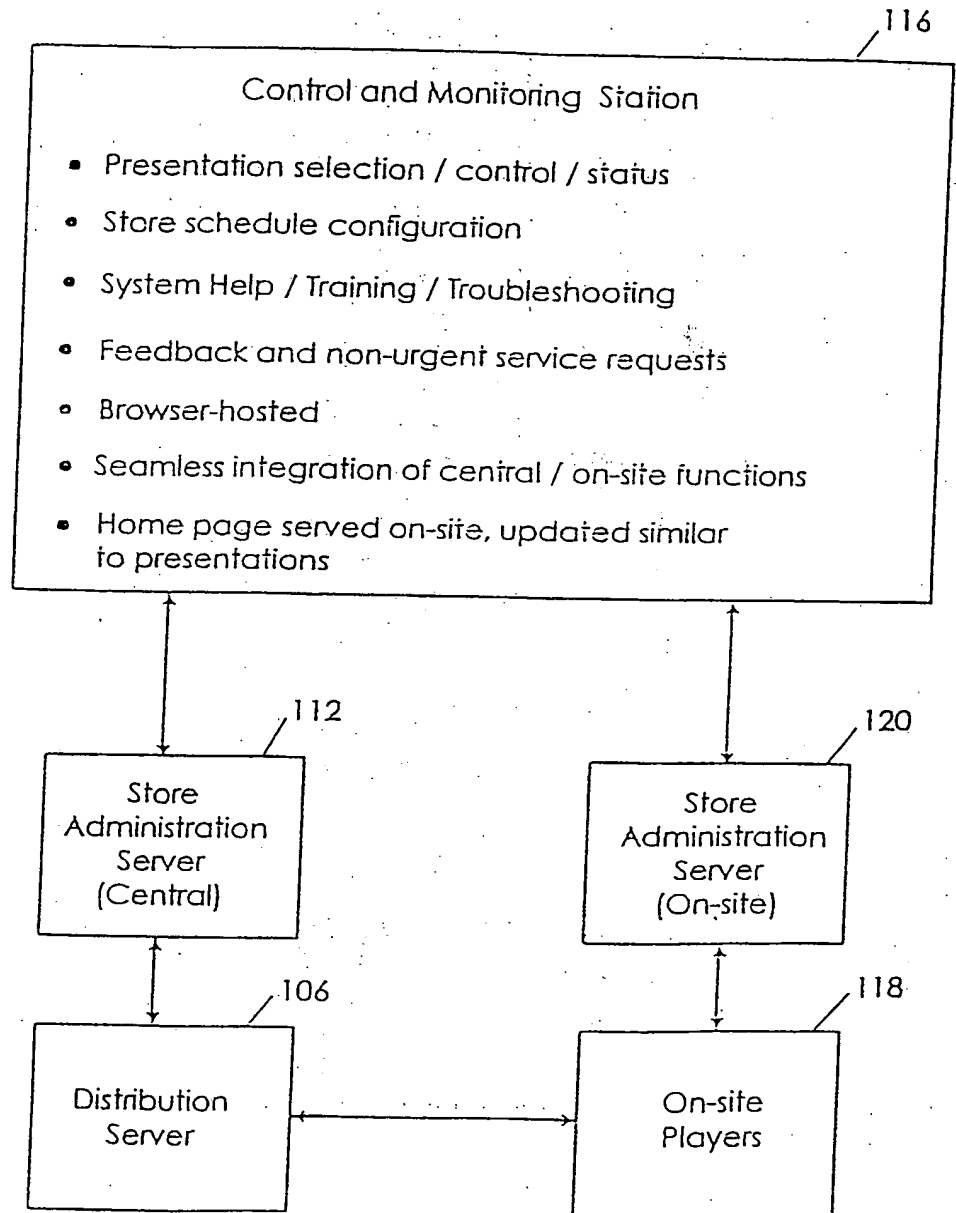


FIG. 9

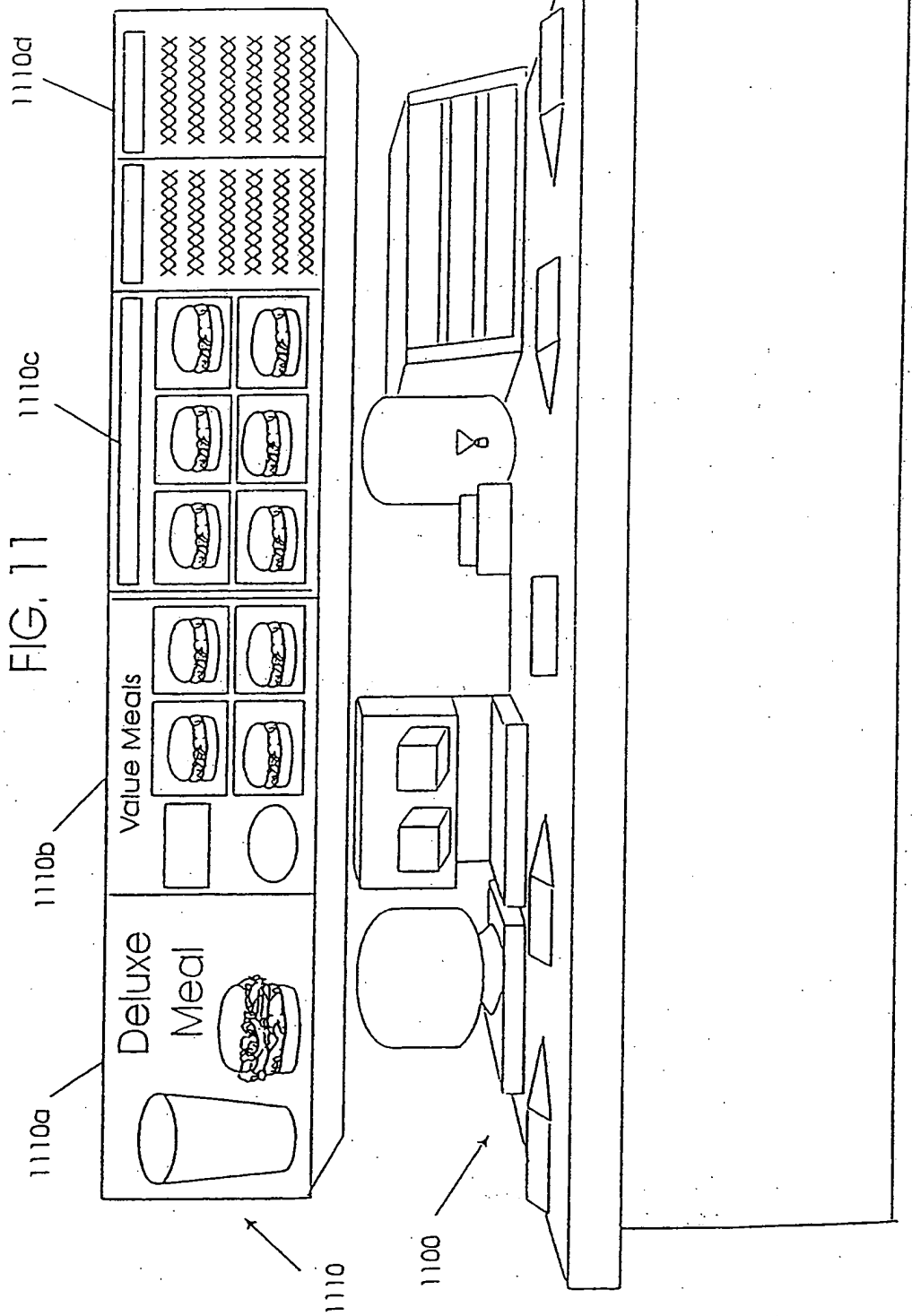
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12/14

FIG. 10

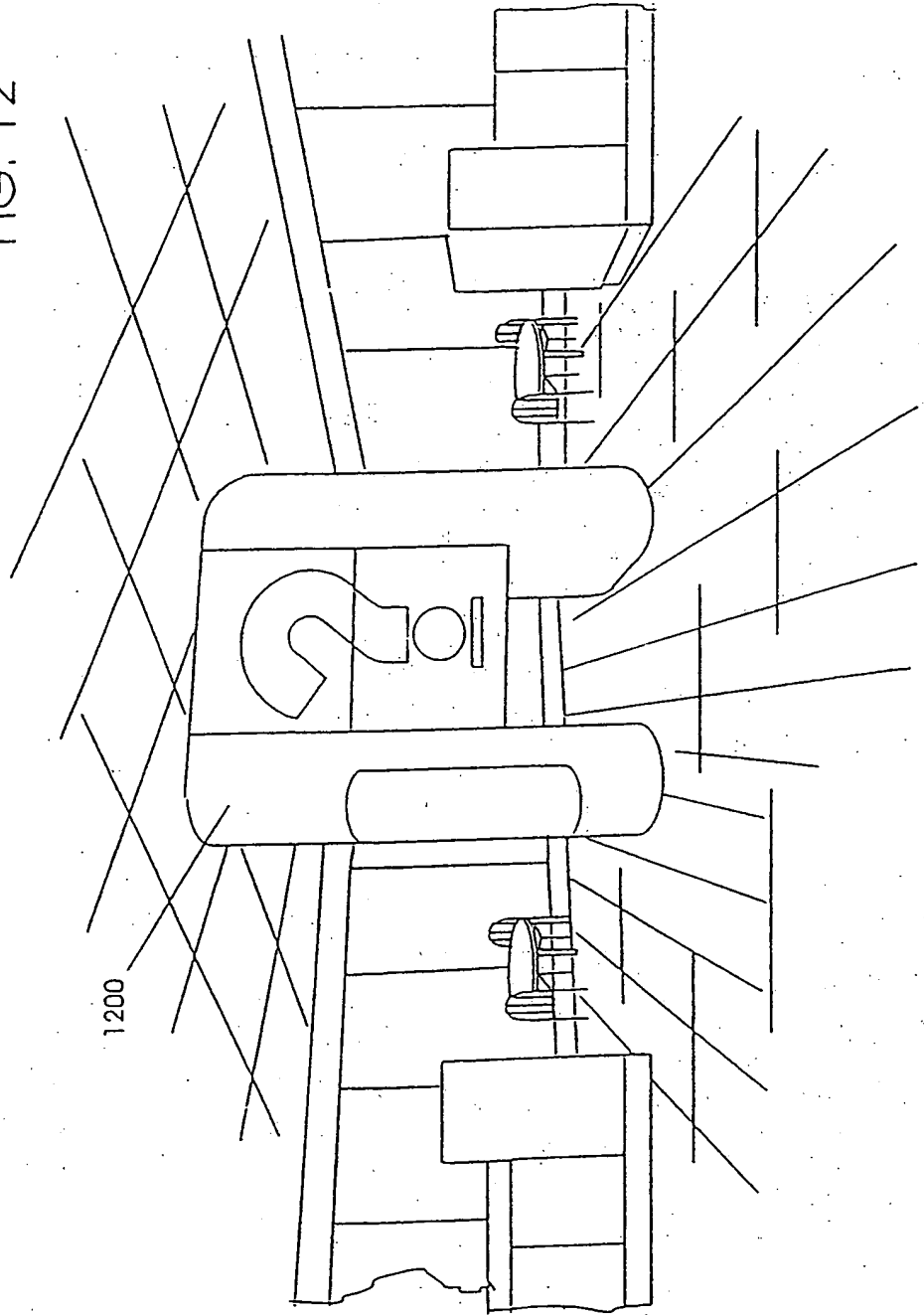


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FIG. 12



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INTERNATIONAL SEARCH REPORT

Int. Jona Application No
PCT/US 98/00513

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 H04N		
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.
Y	WO 96 08113 A (BYLON CO LTD ;CHO NACK Y (US); MAGILTON JERRY E JR (US)) 14 March 1996 cited in the application see claims 18-27 see page 4, line 1 - line 13 see page 5, line 3 - line 11 see page 7, line 26 - line 36 see page 15, line 20 - page 17, line 30	1-67
Y	FR 2 596 605 A (VANDAMME JACQUES) 2 October 1987 see page 5, line 14 - page 6, line 37 see page 8, line 19 - page 8, line 29	1-67
<input type="checkbox"/> Further documents are listed in the continuation of box C.		
<input checked="" type="checkbox"/> Patent family members are listed in annex.		
* Special categories of cited documents :		
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "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) "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 "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 "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 "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. "A" document member of the same patent family		
Date of the actual completion of the international search <p style="text-align: center; font-weight: bold;">12 May 1998</p>	Date of mailing of the international search report <p style="text-align: center; font-weight: bold;">20/05/1998</p>	
Name and mailing address of the ISA 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	Authorized officer <p style="text-align: center; font-weight: bold;">Gardiner, A</p>	

Form PCT/ISA210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Inte. .onal Application No

PCT/US 98/00513

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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FR 2596605 A	02-10-87	NONE	

Form PCT/ISA/210 (patent family annex) (July 1992)



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Datum/Date
08.04.04

Zeichen/Ref./Réf. MNM/P33736EP-K	Anmeldung Nr./Application No./Demande n°/Patent Nr./Patent No./Brevet n°. 00965240.5-2201-US0025863
Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire Ameranth Wireless, Inc.	

COMMUNICATION

The European Patent Office herewith transmits as an enclosure the European search report for the above-mentioned European patent application.

If applicable, copies of the documents cited in the European search report are attached.

Additional set(s) of copies of the documents cited in the European search report is (are) enclosed as well.

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REFUND OF THE SEARCH FEE

If applicable under Article 10 Rules relating to fees, a separate communication from the Receiving Section on the refund of the search fee will be sent later.





European Patent Office

SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application Number
EP 00 96 5240

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 98 41936 A (FRANKEL & COMPANY ;MANDEBERG RICHARD D (US); MOLESKI DESMOND C J () 24 September 1998 (1998-09-24) * the whole document *	1, 12, 20, 31	G06F17/30 G06F17/60 G06F9/44
X	"GRAPHIC USER INTERFACE BUILDER MENU CONSTRUCTION USING A TREE-VIEW CONTAINER" IBM TECHNICAL DISCLOSURE BULLETIN, IBM CORP. NEW YORK, US, vol. 38, no. 9, 1 September 1995 (1995-09-01), pages 65-66, XP000540186 ISSN: 0018-8689 * the whole document *	1, 12, 31	
X	EP 0 779 759 A (UNWIRED PLANET INC) 18 June 1997 (1997-06-18) * the whole document *	40-43	
Y	US 5 912 743 A (KINEBUCHI TADASHI ET AL) 15 June 1999 (1999-06-15) * the whole document *	1-39	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
Y	WO 98 20434 A (VAYU WEB INC) 14 May 1998 (1998-05-14) * page 8 - page 10 * * page 15 * * page 19 - page 23 *	1-39	G06F H04N H04M
-/--			
The supplementary search report has been based on the last set of claims valid and available at the start of the search.			
Place of search MUNICH		Date of completion of the search 29 March 2004	Examiner Herry, T
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

3

EPO FORM 1503 03.92 (P04C04)



European Patent Office

SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application Number EP 00 96 5240

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	"ENTERTAINMENT INDUSTRY LEADER RICH FRANK TAKES HELM AT CYBERMEALS, WORLD'S LARGEST ONLINE MEAL ORDERING SYSTEM" FROM THE INTERNET, 15 September 1998 (1998-09-15), XP002946886 Retrieved from the Internet: <URL:HTTP://WWW.FOOD.COM/FOOD.SPH/SAISP...S/ABOUTUS/PRESSRELEASES.JSP?ID=228> 'retrieved on 2001-04-20! * the whole document *	1-43	
A	YOSHIKO HARA: "W3C putting Compact HTML, HDML to test for Net access- Mobile markup languages face off" FROM THE INTERNET, 6 April 1998 (1998-04-06), XP002114154 Retrieved from the Internet: <URL:http://www.techweb.com/se/directlink.cgi?EET19980406S0089> 'retrieved on 1999-09-02! * the whole document *	8,14,27	
TECHNICAL FIELDS SEARCHED (Int.Cl.7)			
The supplementary search report has been based on the last set of claims valid and available at the start of the search.			
Place of search MUNICH		Date of completion of the search 29 March 2004	Examiner Herry, T
CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document		T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons &: member of the same patent family, corresponding document	

3
EPO FORM 1503 03.82 (P04C04)

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 00 96 5240

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

29-03-2004

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9841936	A	24-09-1998	US 6038545 A	14-03-2000
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			JP 9146756 A	06-06-1997
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			WO 9820434 A2	14-05-1998



9173

Docket No. 3125-4002US1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): McNally et al.

Group Art Unit: 2173

Serial No.: 10/015,729

Examiner: TBA

Filed: November 1, 2001

For: INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS
SYSTEM WITH MENU GENERATION

CERTIFICATE OF MAILING (37 C.F.R. §1.8(A))

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

Sir:

I hereby certify that the attached:

1. Information Disclosure Statement;
2. Form PTO-1449;
3. Eleven (11) Cited References;
4. European Search Report; and
5. Return receipt postcard

along with any paper(s) referred to as being attached or enclosed and this Certificate of Mailing are being deposited with the United States Postal Service on date shown below with sufficient postage as first-class mail in an envelope addressed to the: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.

Dated: July 2, 2004

By: 

Angus R. Gill
Registration No. 51,133

Correspondence Address:

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(212) 751-6849 Facsimile



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): McNally et al.

Group Art Unit: 2173

Serial No.: 10/015,729

Examiner: TBA

Filed: November 1, 2001

For: INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS
SYSTEM WITH MENU GENERATION

INFORMATION DISCLOSURE STATEMENT

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Sir:

This Information Disclosure Statement is filed in accordance with 37 C.F.R. §§1.56, 1.97 and 1.98. The items listed on Form PTO-1449, a copy of which is enclosed, are made of record to assist the Patent and Trademark Office in its examination of this application. The Examiner is respectfully requested to fully consider the items and to independently ascertain their teaching.

1. For each of the following items listed on the enclosed copy of Form PTO-1449 that is not in the English language, an English language translation of that item or a portion thereof or a concise explanation of the relevance of that item is enclosed:

2. For each of the following items listed on the enclosed copy of Form PTO-1449 that is not in the English language, a concise explanation of the relevance of that item is incorporated in the specification of the above-identified application.

3. Any copy of the items listed on the enclosed copy of Form PTO-1449 that is not enclosed with this Information Disclosure Statement was previously cited by or submitted to the Patent and Trademark Office in application Serial No. _____, filed _____.

4. No fee is due under 37 C.F.R. §1.17(p) for this Information Disclosure Statement since it is being filed in compliance with:

- 37 C.F.R. §1.97(b)(1), within three months of the filing date of a national application other than a CPA; or
- 37 C.F.R. §1.97(b)(2), within three months of the date of entry into the national stage as set forth in §1.491 in an international application; or
- 37 C.F.R. §1.97(b)(3), before the mailing date of a first Office action on the merits; or
- 37 C.F.R. §1.97(b)(4) before the mailing date of a first office action after the filing of an RCE under §1.114.
5. No fee is due under 37 C.F.R. §1.17(p) for this Information Disclosure Statement since it is being filed in compliance with 37 C.F.R. §1.97(c), after the period specified in paragraph 4 above but before the mailing date of a final action or a Notice of Allowance (where there has been no prior final action), and is accompanied by one of the certifications pursuant to 37 C.F.R. §1.97(e) set forth in paragraph 9 below.
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- The Commissioner is hereby authorized to charge any additional fees which may be required for this Information Disclosure Statement, or credit any overpayment to Deposit Account No. 13-4500, Order No. 3125-4002US1. A DUPLICATE COPY OF THIS SHEET IS ATTACHED.

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.

By: _____

Angus R. Gill
Registration No. 51,133

Dated: July 2, 2004

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FORM PTO-1449 INFORMATION DISCLOSURE CITATION	Attorney Docket: 3125-4002US1	Serial No.: 10/015,729
	Applicant: McNally et al.	
	Filing Date: November 1, 2001	Group Art Unit: 2173

U.S. PATENT DOCUMENTS

Examiner Initial	Patent Number	Issue Date	Name	Class	Sub-Class	Filing Date
	5,912,743	Jun. 15, 1999	Kinebuchi et al.			
	5,802,526	Sep. 1, 1998	Fawcett et al.			
	5,991,739	Nov. 23, 1999	Cupps et al.			
	5,724,069	Mar. 3, 1998	Chen			
	6,107,944	Aug. 22, 2000	Behr et al.			

FOREIGN PATENT DOCUMENTS

Examiner Initial	Patent Number	Publication Date	Country	Class	Sub-Class	Translation
	WO 98/41936	24 Sep. 1998	PCT			<input type="checkbox"/> Yes <input type="checkbox"/> No
	WO 98/20434	14 May 1998	PCT			<input type="checkbox"/> Yes <input type="checkbox"/> No
	EP 0 779 759 A2	18 Jun 1997	Europe			<input type="checkbox"/> Yes <input type="checkbox"/> No
						<input type="checkbox"/> Yes <input type="checkbox"/> No
						<input type="checkbox"/> Yes <input type="checkbox"/> No

OTHER DOCUMENTS (Including Author, Title, Date, etc.)

	European Search Report
	"Graphic User Interface Builder Menu Construction Using A Tree-View Container" IBM Technical Disclosure Bullentin, Vol. 38 No. 09 September 1995
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Examiner	Date Considered
----------	-----------------

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.

Docket No. 3125-4002US1
Serial No. 10/015.729

Extent of Interest

The extent of assignee's interest is in the whole of this invention.

Declaration Under 37 C.F.R. 3.73(b)

I, the undersigned, have reviewed all the documents in the chain of title of the patent application identified above and, to the best of my knowledge and belief, title is in the assignee identified above.

Disclaimer

The petitioner, through its Agent of Record, 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 defined in 35 U.S.C. 154 to 156 and 173, of United States Patent No. 6,384,850. Petitioner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and United States Patent 6,384,850 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, petitioner does not disclaim the terminal part 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 to 156 and 173 of U.S. Patent 6,384,850, in the event that U.S. Patent 6,384,850 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 C.F.R. 1.321, has all claims cancelled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

Docket No. 3125-4002US1
Serial No. 10/015,729

Fee Status

(37 C.F.R. 1.20(d) and 37 C.F.R. 1.321)

- large entity--fee \$110.00
- small entity--fee \$55.00

Fee Payment

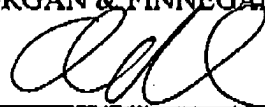
- Attached is a check in the sum of \$
- Charge Deposit Account 13-4500, Order No. 3125-4002US1 any fee required by this paper.

AUTHORIZATIONS:

The Commissioner is hereby authorized to charge any additional fees which may be required for timely consideration of this Terminal Disclaimer under 37 C.F.R. §§1.16 -§1.20 or credit any overpayment to Deposit Account No. 13-4500, Order No. 3125-4002US1. A

DUPLICATE COPY OF THIS DISCLAIMER IS ATTACHED.

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.



Dated: November 16, 2004

By: _____
Angus R. Gill
Registration No. 51,133

Correspondence Address:

MORGAN & FINNEGAN, L.L.P.
3 World Financial Center
New York, NY 10281-2101
(212) 415-8700 Telephone
(212) 415-8701 Facsimile

NOV 16 2004

MORGAN & FINNEGAN, L.L.P.

A Registered Limited Liability Partnership
345 Park Avenue
New York, NY 10154-0053
Telephone: (212) 758-4800
Facsimile: (212) 751-6849

FAX COVER SHEET

To	ORGANIZATION	FAX	PHONE
Examiner Kevin Nguyen Group 2173	Commissioner for Patents	(703) 872-9306	
FROM:	Angus Gill	DATE:	November 16, 2004
IF YOU DO NOT RECEIVE ALL PAGES, PLEASE CALL:	212-415-8746	CLIENT/MATTER:	3125-4002US1
CONFIRMATION:		PAGES (INCLUDING COVER):	4

COMMENTS:

TRANSMITTING TERMINAL DISCLAIMER IN APPLICATION SERIAL NO. 10/015,729.

PLEASE CONFIRM PROPER RECEIPT BY CALLING 212-415-8746

*Incomplete
Missing pages
3 & 4.*

THE DOCUMENT(S) ACCOMPANYING THIS FACSIMILE TRANSMISSION CONTAINS INFORMATION FROM THE LAW FIRM OF MORGAN & FINNEGAN, L.L.P. WHICH IS CONFIDENTIAL AND/OR LEGALLY PRIVILEGED. THE INFORMATION IS INTENDED ONLY FOR THE USE OF THE INDIVIDUAL OR ENTITY NAMED ON THIS TRANSMISSION SHEET. IF YOU ARE NOT THE INTENDED RECIPIENT, YOU ARE HEREBY NOTIFIED THAT ANY DISCLOSURE, COPYING, DISTRIBUTION OR THE TAKING OF ANY ACTION IN RELIANCE ON THE CONTENTS OF THIS FAXED INFORMATION IS STRICTLY PROHIBITED, AND THE DOCUMENT(S) SHOULD BE RETURNED TO THIS FIRM IMMEDIATELY. IF YOU HAVE RECEIVED THIS FACSIMILE IN ERROR, PLEASE NOTIFY US BY TELEPHONE IMMEDIATELY SO THAT WE CAN ARRANGE FOR THE RETURN OF THE ORIGINAL DOCUMENTS AT NO COST TO YOU.

881630 v1

NOV 16 2004

Docket No. 3125-4002US1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): McNally, et al.
Serial No.: 10/015,729
Filed: November 1, 2001
For: Information Management and Synchronous Communications System with Menu Generation

Group Art Unit: 2173
Examiner: Kevin Nguyen

**TERMINAL DISCLAIMER UNDER 37 C.F.R. §1.321(C)
TO OBVIATE PROVISIONAL DOUBLE PATENTING REJECTION**

VIA FACSIMILE – 703-872-9306
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:


Identity of Assignee

The petitioner, Ameranth Wireless, Inc, having a business address at 5375 Mira Sorrento Place, Suite 150, San Diego, California 92121 is the owner of the entire right, title and interest in the above-identified application, Serial No. 10/015,729, by virtue of an assignment recorded in parent application Serial No. 09/400,413 (now U.S. Patent No. 6,384,850) on December 17, 1999, at Reel/Frame No(s) 010460/0511. The petitioner is also the owner of the entire, right, title and interest in U.S. Patent No. 6,384,850.

Identification of Person(s) Making This Disclaimer

Name of disclaimant: Angus R. Gill. Disclaimant represents that he is a Registered Patent Agent, Registration No. 51,133, and an Agent of Record for the above-identified application, and authorized to sign on behalf of the assignee identified above.

881267 v1

Application Number 	Application No. 10/015,729	Applicant(s) MCNALLY ET AL.	

TERMINAL DISCLAIMER	<input checked="" type="checkbox"/> APPROVED	<input type="checkbox"/> DISAPPROVED
Document Code - DISQ	This patent is subject to a Terminal Disclaimer	
INTERNAL DOCUMENT – DO NOT MAIL		

U.S. Patent and Trademark Office

Notice of References Cited	Application/Control No. 10/015,729	Applicant(s)/Patent Under Reexamination MCNALLY ET AL.	
	Examiner Cao (Kevin) Nguyen	Art Unit 2173	Page 1 of 1

U.S. PATENT DOCUMENTS

*	Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A US-5,991,739	11-1999	Cupps et al.	705/26
*	B US-5,724,069	03-1998	Chen, Jack Y.	345/172
	C US-			
	D US-			
	E US-			
	F US-			
	G US-			
	H US-			
	I US-			
	J US-			
	K US-			
	L US-			
	M US-			


FOREIGN PATENT DOCUMENTS

*	Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N				
	O				
	P				
	Q				
	R				
	S				
	T				

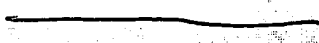


NON-PATENT DOCUMENTS

*	Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U
	V
	W
	X

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Issue Classification 	Application No. 10/015,729	Applicant(s) MCNALLY ET AL.	
	Examiner Cao (Kevin) Nguyen	Art Unit 2173	

ISSUE CLASSIFICATION										
ORIGINAL				CROSS REFERENCE(S)						
CLASS	SUBCLASS			CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					
715	810			715	841					
INTERNATIONAL CLASSIFICATION										
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		Total Claims Allowed: 15	
(Assistant Examiner) (Date)	CAO (KEVIN) NGUYEN PRIMARY EXAMINER (Primary Examiner)	11/24/09 (Date)	
		O.G. Print Claim(s)	O.G. Print Fig.
(Legal Instruments Examiner) (Date)		1	7

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant		<input type="checkbox"/> CPA		<input type="checkbox"/> T.D.		<input type="checkbox"/> R.1.47	
Final	Original	Final	Original	Final	Original	Final	Original
	1		31		61		91
	2		32		62		92
	3		33		63		93
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	14		44	6	74		104
	15		45	7	75		105
	16		46	8	76		106
	17		47	9	77		107
	18		48	10	78		108
	19		49	11	79		109
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BEST AVAILABLE COPY



FORM PTO-1449 INFORMATION DISCLOSURE CITATION	Attorney Docket: 3125-4002US1	Serial No.: 10/015,729
	Applicant: McNally et al.	
	Filing Date: November 1, 2001	Group Art Unit: 2173

U.S. PATENT DOCUMENTS							
Examiner Initial	Patent Number	Issue Date	Name	Class	Sub-Class	Filing Date	
OP	5,912,743	Jun. 15, 1999	Kinebuchi et al.	—	—		
AW	5,802,526	Sep. 1, 1998	Fawcett et al.	—	—		
AW	5,991,739	Nov. 23, 1999	Cupps et al.	—	—		
AW	5,724,069	Mar. 3, 1998	Chen	—	—		
AW	6,107,944	Aug. 22, 2000	Behr et al.	—	—		
AW							
AW							

FOREIGN PATENT DOCUMENTS							
Examiner Initial	Patent Number	Publication Date	Country	Class	Sub-Class	Translation	
AW	WO 98/41936	24 Sep. 1998	PCT			<input type="checkbox"/> Yes <input type="checkbox"/> No	
AW	WO 98/20434	14 May 1998	PCT			<input type="checkbox"/> Yes <input type="checkbox"/> No	
AW	EP 0 779 759 A2	18 Jun 1997	Europe			<input type="checkbox"/> Yes <input type="checkbox"/> No	
						<input type="checkbox"/> Yes <input type="checkbox"/> No	
						<input type="checkbox"/> Yes <input type="checkbox"/> No	

OTHER DOCUMENTS (Including Author, Title, Date, etc.)		
		European Search Report
AW		"Graphic User Interface Builder Menu Construction Using A Tree-View Container" IBM Technical Disclosure Bullentin, Vol. 38 No. 09 September 1995
AW		"Entertainment Industry Leader Rich Rank Takes Helm At Cybermeals, World's Largest Online Meal Ordering System" 15 September 1998, <URL:Http://www.food.com/food.sph/saisp...s/aboutus/pressrelease.jsp?id=228>, printed on 2001-04-20.
AW		"W3C Putting Compact HTML, HDML to Test for Net Access - Mobile Markup Languages Face Off", Yoshiko Hara, 6 April 1998, <URL:http://www.techweb.com/se/directlink.cgi?eet19980406s0089>, printed 1999-09-02.

Examiner <i>C. NG UICW</i>	Date Considered <i>11/02/04</i>
----------------------------	---------------------------------

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.

4

Notice of Allowability

Application No.

10/015,729

Examiner

Cao (Kevin) Nguyen

Applicant(s)

MCNALLY ET AL.

Art Unit

2173

-- 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 11/01/01.
- 2. The allowed claim(s) is/are 69-83.
- 3. The drawings filed on 01 November 2001 are accepted by the Examiner.
- 4. 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.**

- 5. 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.
 - 6. 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).
- 7. 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 Draftsperson's Patent Drawing Review (PTO-948)
- 3. Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 07/06/04
- 4. Examiner's Comment Regarding Requirement for Deposit of Biological Material
- 5. Notice of Informal Patent Application (PTO-152)
- 6. Interview Summary (PTO-413), Paper No./Mail Date _____.
- 7. Examiner's Amendment/Comment
- 8. Examiner's Statement of Reasons for Allowance
- 9. Other _____

**CAO (KEVIN) NGUYEN
PRIMARY EXAMINER**

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Angus Gill§ on 11/12/04.

The application has been amended as follows:

Claims 1-68 and 84-93 have been cancelled.

Allowable Subject Matter

2. Claims 69-83 are allowed over the prior art of record.

Applicant has claimed uniquely distinct features in the instant invention which are not found in the prior art either singularly or in combination. They are an information management and synchronous communications system for generating and transmitting menus comprising a central processing unit, a data storage device connected to central processing unit, an operating system including graphical user interface, a first menu consisting of menu categories, menu categories consisting of menu items, first menu stored on said data storage device and displayable in a window of graphical user interface in a hierarchical tree format, a modifier menu stored on said data storage device and displayable in window of graphical user interface, a sub-modifier menu stored on said data storage device and displayable in a window of graphical user

Art Unit: 2173

interface, and application software for generating a second menu from first menu and transmitting second menu to a wireless handheld computing device or Web page, wherein the application software facilitates the generation on the second menu by allowing selection of categories and items from the first menu, addition of menu categories to the second menu, addition of menu items to the second menu and assignment of parameters to items in the second menu using the graphical user interface of operating system, parameters being selected from the modifier and sub-modifier menus, wherein second menu is applicable to a predetermined type of ordering. These features are not found or suggested in the prior art.

The present invention is directed to an information management and synchronous communications system for generating and transmitting menus. Each independent claim is identified the uniquely distinct features “wherein the application software facilitates the generation on the second menu by allowing selection of categories and items from the first menu, addition of menu categories to the second menu, addition of menu items to the second menu and assignment of parameters to items in the second menu using the graphical user interface of operating system, parameters being selected from the modifier and sub-modifier menus, wherein second menu is applicable to a predetermined type of ordering”. The closest prior art, Cupps (US Patent No. 5,991,739) and Chen (US Patent No. 5,724,069) discloses convention of user interactive interface providing an on-line ordering distribution, either singularly or in combination, fail to anticipate or render the above underlined limitations obvious.

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

Art Unit: 2173


fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cao (Kevin) Nguyen whose telephone number is (571)272-4053. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Cabeca can be reached on (571)272-4048. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Cao (Kevin) Nguyen
Primary Examiner
Art Unit 2173

11/24/04



NOTICE OF ALLOWANCE AND FEE(S) DUE

7590 12/07/2004
MORGAN & FINNEGAN, L.L.P.
345 Park Avenue
New York, NY 10154-0053

EXAMINER
NGUYEN, CAO H
ART UNIT PAPER NUMBER
2173
DATE MAILED: 12/07/2004

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/015,729 11/01/2001 Keith R. McNally 3125-4002US1 7758

TITLE OF INVENTION: INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS SYSTEM WITH MENU GENERATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional YES \$685 \$0 \$685 03/07/2005

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 REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

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 should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. 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.

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.

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 (703) 746-4000

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)

7590 12/07/2004

MORGAN & FINNEGAN, L.L.P.
 345 Park Avenue
 New York, NY 10154-0053

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 (703) 746-4000, on the date indicated below.

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/015,729	11/01/2001	Keith R. McNally	3125-4002US1	7758

TITLE OF INVENTION: INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS SYSTEM WITH MENU GENERATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$685	\$0	\$685	03/07/2005

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, CAO H	2173	345-810000

<p>1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).</p> <p><input type="checkbox"/> Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.</p> <p><input type="checkbox"/> "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.</p>	<p>2. For printing on the patent front page, list</p> <p>(1) the names of up to 3 registered patent attorneys or agents OR, alternatively, _____ 1</p> <p>(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. _____ 2</p> <p>_____ 3</p>
---	---

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

<p>4a. The following fee(s) are enclosed:</p> <p><input type="checkbox"/> Issue Fee</p> <p><input type="checkbox"/> Publication Fee (No small entity discount permitted)</p> <p><input type="checkbox"/> Advance Order - # of Copies _____</p>	<p>4b. Payment of Fee(s):</p> <p><input type="checkbox"/> A check in the amount of the fee(s) is enclosed.</p> <p><input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.</p> <p><input type="checkbox"/> The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).</p>
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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).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above. 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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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
10/015,729 11/01/2001 Keith R. McNally 3125-4002US1 7758

7590 12/07/2004
MORGAN & FINNEGAN, L.L.P.
345 Park Avenue
New York, NY 10154-0053

EXAMINER

NGUYEN, CAO H

ART UNIT PAPER NUMBER

2173

DATE MAILED: 12/07/2004

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 706 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 706 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 (703) 305-1383. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

Index of Claims



Application No.

10/015,729

Examiner

Cao (Kevin) Nguyen

Applicant(s)

MCNALLY ET AL.

Art Unit

2173

√	Rejected
=	Allowed

-	(Through numeral) Cancelled
+	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

Claim		Date			
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Bib Data Sheet

CONFIRMATION NO. 7758

Table with 5 columns: SERIAL NUMBER (10/015,729), FILING DATE (11/01/2001), CLASS (345), GROUP ART UNIT (2173), ATTORNEY DOCKET NO. (3125-4002US1)

APPLICANTS

Keith R. McNally, San Diego, CA;

William H. Roof, San Diego, CA;
Richard Bergfeld, Chatsworth, CA;

** CONTINUING DATA *****

This application is a CON of 09/400,413 09/21/1999 PAT 6,384,850 Yes NZ

** FOREIGN APPLICATIONS *****

IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** SMALL ENTITY **

** 01/03/2002

Table with 5 columns: Foreign Priority claimed, 35 USC 119 (a-d) conditions met, STATE OR COUNTRY (CA), SHEETS DRAWING (6), TOTAL CLAIMS (93), INDEPENDENT CLAIMS (13)


ADDRESS

MORGAN & FINNEGAN, L.L.P.
345 Park Avenue
New York, NY
10154-0053

TITLE

Information management and synchronous communications system with menu generation

Table with 2 columns: FILING FEE RECEIVED (1695), FEES: Authority has been given in Paper No. to charge/credit DEPOSIT ACCOUNT No. for following: (All Fees, 1.16 Fees, 1.17 Fees, 1.18 Fees)

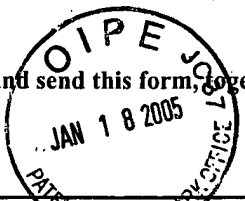
Application Number 	Application No. 10/015,729	Applicant(s) MCNALLY ET AL.	

TERMINAL DISCLAIMER	<input type="checkbox"/> APPROVED	<input type="checkbox"/> DISAPPROVED
Document Code - DISQ	This patent is subject to a Terminal Disclaimer	
INTERNAL DOCUMENT - DO NOT MAIL		

U.S. Patent and Trademark Office

1-21-05
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** **(703) 746-4000**



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)

7590 12/07/2004

MORGAN & FINNEGAN, L.L.P.
 345 Park Avenue
 New York, NY 10154-0053

01/24/2005 YPOLITE2 00000102 10015729

01 FC:2501 700.00 OP
 02 FC:8001 9.00 OP

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 (703) 746-4000, on the date indicated below.

Please see the attached	(Depositor's name)
Express Mail Certificate.	(Signature)
	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/015,729	11/01/2001	Keith R. McNally	3125-4002US1	7758

TITLE OF INVENTION: INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS SYSTEM WITH MENU GENERATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$685	\$0	\$685	03/07/2005

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, CAO H	2173	345-810000

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, Morgan & Finnegan, LLP
 (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.
 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)

Ameranth Wireless, Inc.

San Diego, CA

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 enclosed:

- Issue Fee
- Publication Fee (No small entity discount permitted)
- Advance Order - # of Copies 3

4b. Payment of Fee(s):

- A check in the amount of the fee(s) is enclosed.
- Payment by credit card. Form PTO-2038 is attached.
- The Director is hereby authorized by charge the any additional fee(s), or credit any overpayment, to Deposit Account Number 13-4500 (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).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above. 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 Angus R. Gill
 Typed or printed name Angus R. Gill

Date 1/18/05
 Registration No. 51,133

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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27123

CUSTOMER NUMBER↑

Confirmation No.: 7758

Date of Notice of Allowance: December 7, 2004

Serial No.: 10/015,729

Attorney Docket No.: 3125-4002US1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Keith R. McNally et al.

Group Art Unit: 2173

Serial No.: 10/015,729

Examiner: Cao H. Nguyen

Filed: November 1, 2001

For: INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS SYSTEM WITH MENU GENERATION

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ISSUE FEE TRANSMITTAL LETTER

Sir:

In response to the Notice of Allowability mailed December 7, 2004, Applicants submit herewith the Issue Fee Transmittal Form and a check for \$709.00 to cover the Issue Fee Due (\$700.00) and an advance order of 3 copies of the patent (\$9.00).

The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any over payment, to Deposit Account No. 13-4500, Order No. 3125-4002US1. A DUPLICATE COPY OF THIS SHEET IS ATTACHED.

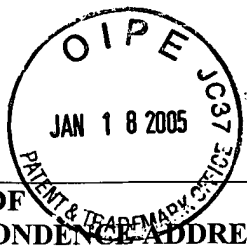
Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.

Dated: January 18, 2005

By: _____


Angus R. Gill
Registration No. 51,133

Correspondence Address:
MORGAN & FINNEGAN, L.L.P.
3 World Financial Center
New York, NY 10281-2101
(212) 415-8700 Telephone
(212) 415-8701 Facsimile



CHANGE OF CORRESPONDENCE ADDRESS <i>of Application</i> Address to: Mail Stop <u>Issue Fee</u> Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450	Application Number	10/015,729
	Filing Date	November 1, 2001
	First Named Inventor	Keith R. McNally
	Group Art Unit	2173
	Examiner Name	Nguyen, Cao H.
	Attorney Docket No.	3125-4002US1

Please change the Correspondence Address for the above-identified application to:

Customer Number [27123]
Type Customer Number here

<input checked="" type="checkbox"/> Firm or Individual Name	MORGAN & FINNEGAN L.L.P.				
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Address					
City	New York	State	New York	ZIP	10281-2101
Country	USA				
Telephone	(212) 415-8700	FAX	(212) 415-8701		

I am the:

Applicant

Assignee of record of the entire interest.

Certificate under 37 CFR 3.73(b) is enclosed.

Attorney or agent of record.

Typed or Printed Name	Angus Gill	Registration No.	51,133
Signature			
Date	January 18, 2005		



Docket No. 3125-4002US1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Keith R. McNally et al.

Group Art Unit: 2173

Serial No.: 10/015,729

Examiner: Cao H. Nguyen

Filed: November 1, 2001

For: INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS SYSTEM WITH MENU GENERATION

EXPRESS MAIL CERTIFICATE

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Express Mail Label No.: EV 455194602 US

Date of Deposit: January 18, 2005

Sir:

I hereby certify that the attached:

1. Fee(s) Transmittal (PTOL-85)- 1 page (in duplicate);
2. Issue Fee Transmittal Letter - 1 page (in duplicate);
3. Change of Correspondence Address of Application - 1 page;
4. Check for \$709.00 (issue fee & 3 adv. copies of patent); and
5. Postcard for Receipt Acknowledgement

is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. §1.10 on the date indicated above and is addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Albert Isles

(Typed or printed name of person mailing papers(s) and/or fee)

(Signature of person mailing paper(s) and/or fee)

Correspondence Address:

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3 World Financial Center
New York, NY 10281-2101
(212) 415-8700 Telephone
(212) 415-8701 Facsimile



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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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Bib Data Sheet

CONFIRMATION NO. 7758

Table with 5 columns: SERIAL NUMBER (10/015,729), FILING DATE (11/01/2001), CLASS (345), GROUP ART UNIT (2173), ATTORNEY DOCKET NO. (3125-4002US1)

APPLICANTS

Keith R. McNally, San Diego, CA;

William H. Roof, San Diego, CA;
Richard Bergfeld, Chatsworth, CA;

** CONTINUING DATA *****

This application is a CON of 09/400,413 09/21/1999 PAT 6,384,850

** FOREIGN APPLICATIONS *****

IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** SMALL ENTITY **

** 01/03/2002

Table with 5 columns: Foreign Priority claimed, 35 USC 119 (a-d) conditions, Verified and Acknowledged, STATE OR COUNTRY (CA), SHEETS DRAWING (6), TOTAL CLAIMS (93), INDEPENDENT CLAIMS (13)

ADDRESS

27123
MORGAN & FINNEGAN, L.L.P.
3 WORLD FINANCIAL CENTER
NEW YORK, NY
10281-2101

TITLE

INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS SYSTEM WITH MENU GENERATION

Table with 2 columns: FILING FEE RECEIVED, FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following: (All Fees, 1.16 Fees (Filing), 1.17 Fees (Processing Ext. of time)

1695

1.18 Fees (Issue)

Other _____

Credit

Electronic Acknowledgement Receipt

EFS ID:	1571216
Application Number:	10015729
International Application Number:	
Confirmation Number:	7758
Title of Invention:	INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS SYSTEM WITH MENU GENERATION
First Named Inventor/Applicant Name:	Keith R. McNally
Customer Number:	27123
Filer:	Angus Robert Gill/Jacqueline Revander
Filer Authorized By:	Angus Robert Gill
Attorney Docket Number:	3125-4002US1
Receipt Date:	07-MAR-2007
Filing Date:	01-NOV-2001
Time Stamp:	12:04:39
Application Type:	Utility

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part /.zip	Pages (if appl.)
1	Request for Certificate of Correction	3125-4002US1_Certificate_of_Correction.pdf	64846	no	2

Warnings:

Information:	
Total Files Size (in bytes):	64846
<p>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.</p> <p><u>New Applications Under 35 U.S.C. 111</u> 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.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> 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.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> 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.</p>	

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Keith McNally

Patent No.: 6,871,325 (Formerly U.S. Serial No. 10/015,729)

Issued: March 22, 2005

For: INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS
SYSTEM WITH MENU GENERATION

REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT

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

Sir:

Attached in duplicate is Form PTO-1050, with at least one copy being suitable for printing.

- The error was the fault of the Patent and Trademark Office, no fee is required.
- The error was not the fault of the Patent and Trademark Office, please charge the requisite fee of \$100 to Deposit Account No. **13-4500**, Order No. _____.
- The Commissioner is hereby authorized to charge any additional fees which may be required by this paper, or credit any overpayment to Deposit Account No. **13-4500**, Order No. 3125-4002US1. A DUPLICATE COPY OF THIS SHEET IS ATTACHED.

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.

Dated: March 7, 2007

By: _____

Angus R. Gill
Registration No. 51,133

Correspondence Address:
MORGAN & FINNEGAN, L.L.P.
3 World Financial Center
New York, NY 10281-2101
(212) 415-8700 Telephone
(212) 415-8701 Facsimile

**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**Page 1 of 1

PATENT NO. : 6,871,325

APPLICATION NO.: 10/015,729

ISSUE DATE : March 22, 2005

INVENTOR(S) : Keith R. McNally, William H. Roof and Richard Bergfeld

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Claims:

In claim 7 (col. 15, line 57), please replace "device of Web page" with --device or Web page--.

In claim 8 (col. 16, line 22), please replace "device of Web page" with --device or Web page--.

In claim 9 (col. 16, line 56), please replace "device of Web page" with --device or Web page--.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

MORGAN & FINNEGAN, L.L.P.
3 World Financial Center
New York, New York 10281-2101

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. 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 1.0 hour 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: Attention Certificate of Corrections Branch, 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.

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,871,325 B1
APPLICATION NO. : 10/015729
DATED : March 22, 2005
INVENTOR(S) : Keith R. McNally, William H. Roof and Richard Bergfeld

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

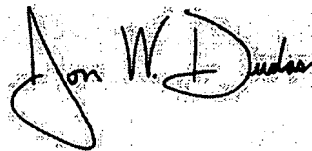
In claim 7 (col. 15, line 57), please replace "device of Web page" with --device or Web page--.

In claim 8 (col. 16, line 22), please replace "device of Web page" with --device or Web page--.

In claim 9 (col. 16, line 56), please replace "device of Web page" with --device or Web page--.

Signed and Sealed this

Seventeenth Day of April, 2007



JON W. DUDAS
Director of the United States Patent and Trademark Office



UNITED STATES PATENT AND TRADEMARK OFFICE

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Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	PATENT NUMBER	GROUP ART UNIT	FILE WRAPPER LOCATION
10/015,729	6871325	2173	9200



Correspondence Address/Fee Address Change

The following fields have been set to Customer Number 85775 on 02/10/2009

- Correspondence Address
- Power of Attorney Address

The address of record for Customer Number 85775 is:

85775
 Locke Lord Bissell & Liddell LLP
 Attn: IP Docketing
 Three World Financial Center
 New York, NY 10281-2101

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:11-cv-01810-JLS -NLS	8/15/11	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Pizza Hut, Inc., et al.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 6384850	6.	11.
2. 6871325	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	Amendment	Answer
	Cross Bill	Other Pleading
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK W. Samuel Hamrick, Jr.	(BY) DEPUTY CLERK	DATE
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IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLORADO

Civil Action No.

PROFITSTREAMS LLC,

Plaintiff,

v.

AMERANTH, INC.,

Defendants.

**PROFITSTREAMS, LLC'S COMPLAINT FOR DECLARATORY RELIEF
(JURY TRIAL DEMANDED)**

ProfitStreams LLC ("ProfitStreams") for its Complaint for Declaratory Relief against Ameranth, Inc. ("Ameranth") alleges as follows:

PARTIES

1. ProfitStreams is a Colorado limited liability company. ProfitStreams maintains its offices at 1123 Auraria Parkway, Suite 300, Denver, CO 80204.

2. On information and belief, Ameranth is a Delaware corporation which maintains its offices at 5820 Oberlin Drive, Suite 202, San Diego, CA 92121.

JURISDICTION AND VENUE

3. This action arises under the patent laws of the United States, 35 U.S.C. §§ 1 *et seq.* and the Declaratory Judgment Act, 28 U.S.C. §§ 2201 and 2202.

4. This Court has subject matter jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338.

5. This Court has personal jurisdiction over Ameranth because Ameranth transacts business and/or offers to transact business within this judicial district (directly or through intermediaries) and because ProfitStreams is being damaged in the State of Colorado.

6. Venue is proper in the United States District Court for the District of Colorado pursuant to 28 U.S.C. § 1391(b)(2).

FACTUAL BACKGROUND

The Licensed Patents

7. On May 7, 2002, the United States Patent and Trademark Office issued United States Patent No. 6,384,850 (the “850 patent”), entitled *Information Management and Synchronous Communications System with Menu Generation* to Keith R. McNally, William H. Roof, and Richard Bergfeld. According to the information on the face of the patent, it was assigned to Ameranth Wireless. A copy of the ‘850 patent is attached hereto as **Exhibit A**.

8. On March 22, 2005, the United States Patent and Trademark Office issued United States Patent No. 6,871,325 (the “325 patent”), entitled *Information Management and Synchronous Communications System with Menu Generation* to Keith R. McNally, William H. Roof, and Richard Bergfeld. According to the information on the face of the patent, it was assigned to Ameranth Wireless, Inc. A copy of the ‘325 patent is attached hereto as **Exhibit B**.

9. On January 17, 2006, the United States Patent and Trademark Office issued United States Patent No. 6,982,733 (the “733 patent”), entitled *Information Management and Synchronous Communications System with Menu Generation, and Handwriting and Voice Modification of Orders* to Keith R. McNally, Ken Rogers, and Paul Rubin. According to the

information on the face of the patent, it was assigned to Ameranth Wireless, Inc. A copy of the '733 patent is attached hereto as **Exhibit C**.

10. On information and belief, Ameranth offered for sale products that are prior art, as defined by 35 U.S.C. §§ 102 and 103, to the '850 patent, the '325 patent, and/or the '733 patent.

11. On information and belief, in 1996, 1997, and 1998, Ameranth attended the Foodservice Technology Exposition ("FS/TEC").

12. On information and belief, in 1996, Ameranth publicly demonstrated, used, and offered for sale products, including "Intrapad™," that are prior art, as defined by 35 U.S.C. §§ 102 and 103, to the '850 patent, the '325 patent, and/or the '733 patent.

13. On information and belief, in 1997, Ameranth publicly demonstrated, used, and offered for sale products, including "TransPad™" and "PadLink™," that are prior art, as defined by 35 U.S.C. §§ 102 and 103, to the '850 patent, the '325 patent, and/or the '733 patent.

14. On information and belief, in 1998, Ameranth publicly demonstrated, used, and offered for sale products, including "21st Century Restaurant," that are prior art, as defined by 35 U.S.C. §§ 102 and 103, to the '850 patent, the '325 patent, and/or the '733 patent.

15. On information and belief, companies other than Ameranth, such as MICROS Systems, Inc., offered for sale products that are prior art, as defined by 35 U.S.C. §§ 102 and 103, to the '850 patent, the '325 patent, and/or the '733 patent.

16. On information and belief, the claims of the '850 patent, the '325 patent, and the '733 patent are invalid as anticipated by, among other things, the foregoing prior art, as defined by 35 U.S.C. §§ 102 and 103, as well as other prior art, and for obviousness.

The Texas Litigation

17. In July 2007, Ameranth sued Menusoft Systems Corporation (“Menusoft”) and Cash Register Sales & Service of Houston, Inc. (d/b/a CRS Texas) (“CRS”) in the United States District Court for the Eastern District of Texas, Marshall Division, Case No. 2:07-CV-271-CE (the “Texas Litigation”) for infringement of the Licensed Patents.

18. On or about September 4, 2007, Menusoft and CRS asserted counterclaims against Ameranth for, among other things, declaratory judgment that the ‘850 patent, the ‘325 patent, and the ‘733 patent are invalid.

19. On or about September 20, 2010, a jury found each claim of the ‘850 patent, the ‘325 patent, and the ‘733 patent asserted by Ameranth in the Texas Litigation to be invalid both as anticipated by prior art and for obviousness.

20. On May 26, 2011, Magistrate Judge Charles Everingham denied Ameranth’s motions in the Texas Litigation for a new trial and for judgment as a matter of law that the ‘850 patent, the ‘325 patent, and/or the ‘733 patent were not anticipated, not obvious and not invalid.

The License Agreement

21. On or about August 27, 2008, ProfitStreams and Ameranth entered into a Second Amended and Restated License Agreement (the “License Agreement”). The License Agreement was the latest in a series of agreements between ProfitStreams, which is headquartered in Colorado, and Ameranth.

22. Under the terms of the License Agreement, ProfitStreams received, among other things, licenses to the ‘850 patent, the ‘325 patent, and the ‘733 patent, and all reissues and

reexaminations of any of the foregoing patents, and all patents claiming priority from any application from which any of the foregoing patents issues.

23. ProfitStreams also received a licensed copy of the software code and related documentation for Ameranth's Magellan System product (the "Licensed Product"). Ameranth delivered a copy of the Licensed Product to ProfitStreams in Colorado. ProfitStreams paid to Ameranth all fees due under the License Agreement related to the Licensed Product.

24. The License Agreement calls for ProfitStreams to pay an annual fee on or before July 1 for its license to the '850 patent, the '325 patent, and/or the '733 patent.

25. To date, ProfitStreams has paid all patent license fees due under the License Agreement.

26. On or about June 7, 2011, Ameranth sent ProfitStreams an invoice for the annual patent license fee called for in the Agreement. A copy of the invoice and accompanying cover email are attached hereto as **Exhibit D**. In the covering email, Ameranth stated that payment was due no later than June 30, 2011.

27. On June 30, 2011, ProfitStreams provided Ameranth with written notice of its intention not to pay the annual patent license fee invoiced by Ameranth on the grounds that the '850 patent, the '325 patent, and the '733 patent are invalid.

28. Ameranth has demonstrated its intention to protect and enforce the '850 patent, the '325 patent, and the '733 patent through litigation, as evidenced by Ameranth's filing of multiple actions in Federal court related to the '850 patent, the '325 patent, and the '733 patent.

29. Upon information and belief, Ameranth believes that one or more products currently being developed by ProfitStreams may infringe the claims of the '850 patent, the '325 patent, and/or the '733 patent.

30. ProfitStreams reasonably believes and apprehends that Ameranth will file suit against ProfitStreams.

31. Based on (1) the existence of prior art, as defined by 35 U.S.C. §§ 102 and 103, to the '850 patent, the '325 patent, and/or the '733 patent., (2) the jury verdict invalidating claims of the '850 patent, the '325 patent, and the '733 patent in the Texas Litigation, (3) Judge Everingham's post-trial orders upholding the jury verdict, (4) Ameranth's demand for payment of the annual patent license fee called for in the Agreement, and (5) Ameranth's demonstrated litigiousness, an actual and justiciable controversy exists between ProfitStreams and Ameranth regarding the validity of the '850 patent, the '325 patent, and the '733 patent.

FIRST CLAIM FOR RELIEF
(Declaratory Judgment of Invalidity of the '850 Patent)

32. ProfitStreams hereby incorporates by reference each and every allegation set forth in paragraphs 1 through 31 of this Complaint.

33. The '850 patent, and each claim thereof, is invalid for failing to comply with the requirements of the patent laws of the United States, particularly with regard to one or more of the requirements specified in Sections 101, 102, 103, and/or 112 of Title 35 of the United States Code.

34. There exists an actual controversy between Ameranth and ProfitStreams regarding the validity of the '850 patent, and a judicial declaration of invalidity is necessary and appropriate at this time.

SECOND CLAIM FOR RELIEF
(Declaratory Judgment of Invalidity of the '325 Patent)

35. ProfitStreams hereby incorporates by reference each and every allegation set forth in paragraphs 1 through 34 of this Complaint.

36. The '325 patent, and each claim thereof, is invalid for failing to comply with the requirements of the patent laws of the United States, particularly with regard to one or more of the requirements specified in Sections 101, 102, 103, and/or 112 of Title 35 of the United States Code.

37. There exists an actual controversy between Ameranth and ProfitStreams regarding the validity of the '325 patent, and a judicial declaration of invalidity is necessary and appropriate at this time.

THIRD CLAIM FOR RELIEF
(Declaratory Judgment of Invalidity of the '733 Patent)

38. ProfitStreams hereby incorporates by reference each and every allegation set forth in paragraphs 1 through 37 of this Complaint.

39. The '733 patent, and each claim thereof, is invalid for failing to comply with the requirements of the patent laws of the United States, particularly with regard to one or more of the requirements specified in Sections 101, 102, 103, and/or 112 of Title 35 of the United States Code.

40. There exists an actual controversy between Ameranth and ProfitStreams regarding the validity of the '733 patent, and a judicial declaration of invalidity is necessary and appropriate at this time.

COURT REPORTER
AND VIDEO SERVICES

DEMAND FOR JURY TRIAL

ProfitStreams demands a trial by jury of any and all issues triable as of right by a jury in this action.

PRAYER FOR RELIEF

WHEREFORE, ProfitStreams asks the Court to enter judgment in its favor and grant the following relief:

1. Declare every claim of the '850, '325, and '733 patents invalid;
2. Find this an exceptional case and award ProfitStreams its costs, attorneys' fees, and expenses pursuant to 35 U.S.C. § 285; and
3. Grant such other and further relief as the Court may deem just and proper.

Respectfully submitted this 30th day of June, 2011.

KUTAK ROCK LLP

s/ Chad T. Nitta

Chad T. Nitta

Blair E. Kanis

1801 California St., Suite 3100

Denver, CO 80202

Tel: 303-297-2400

Fax: 303-292-7799

chad.nitta@kutakrock.com

blair.kanis@kutakrock.com

ATTORNEYS FOR PLAINTIFF

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-00858-H-MDD	4/6/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Agilysys, Inc.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 6,384,850	6.	11.
2. 6,871,325	7.	12.
3. 8,146,077	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	Amendment <u> </u> Answer <u> </u> Cross Bill <u> </u> Other Pleading <u> </u>	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01201-DMS-JMA	5/18/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		ChowNow, LLC
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 6,384,850	6.	11.
2. 6,871,325	7.	12.
3. 8,146,077	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY		
	Amendment ___ Answer ___ Cross Bill ___ Other Pleading ___		
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	
1.	6.	11.	
2.	7.	12.	
3.	8.	13.	
4.	9.	14.	
5.	10.	15.	

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01656-DMS-NLS	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		ATX Innovation, Inc.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 6,384,850	6.	11.
2. 6,871,325	7.	12.
3. 8,146,077	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	Amendment <u> </u> Answer <u> </u> Cross Bill <u> </u> Other Pleading <u> </u>	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

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DECISION/JUDGMENT

CLERK W. Samuel Hamrick, Jr.	(BY) DEPUTY CLERK	DATE
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To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01654-CAB-RBB	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Expedia, Inc.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. US 6,384,850 B1	6.	11.
2. US 6,871,325 B1	7.	12.
3. US 8,146,077 B2	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	___ Amendment ___ Answer ___ Cross Bill ___ Other Pleading	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK W. Samuel Hamrick, Jr.	(BY) DEPUTY CLERK	DATE
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To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01650-CAB-BLM	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Usablenet, Inc.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 6,384,850	6.	11.
2. 6,871,325	7.	12.
3. 8,146,077	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	Amendment <input type="checkbox"/> Answer <input type="checkbox"/> Cross Bill <input type="checkbox"/> Other Pleading <input type="checkbox"/>	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK W. Samuel Hamrick, Jr.	(BY) DEPUTY CLERK	DATE
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To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01652-JAH-DHB	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Wanderspot LLC
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 6,384,850	6.	11.
2. 6,871,325	7.	12.
3. 8,146,077	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	Amendment <u> </u> Answer <u> </u> Cross Bill <u> </u> Other Pleading <u> </u>	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
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5.	10.	15.

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK W. Samuel Hamrick, Jr.	(BY) DEPUTY CLERK	DATE
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To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01659-MMA-RBB	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		EMN8, Inc.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. US 6,384,850 B1	6.	11.
2. US 6,871,325 B1	7.	12.
3. US 8,146,077 B2	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	Amendment <u> </u> Answer <u> </u> Cross Bill <u> </u> Other Pleading <u> </u>	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
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DECISION/JUDGMENT

CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

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DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01634-WQH-BLM	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Hotels.com, LP
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 6,384,850	6.	11.
2. 6,871,325	7.	12.
3. 8,146,077	8.	13.
4.	9.	14.
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01633-LAB-JMA	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Hotel Tonight, Inc.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. US 6,384,850 B1	6.	11.
2. US 6,871,325 B1	7.	12.
3. US 8,146,077 B2	8.	13.
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	<u>Amendment</u>	<u>Answer</u>	<u>Cross Bill</u>
		<u>Other Pleading</u>	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	
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W. Samuel Hamrick, Jr.		

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DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01633-LAB-JMA	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Hotel Tonight, Inc.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. US 6,384,850 B1	6.	11.
2. US 6,871,325 B1	7.	12.
3. US 8,146,077 B2	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY			
	Amendment	Answer	Cross Bill	Other Pleading
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.			11.
2.	7.			12.
3.	8.			13.
4.	9.			14.
5.	10.			15.

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DECISION/JUDGMENT

CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01627-LAB-KSC	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Hyatt Hotels Corporation, et al.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. US 6,384,850 B1	6.	11.
2. US 6,871,325 B1	7.	12.
3. US 8,146,077 B2	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY			
	Amendment	Answer	Cross Bill	Other Pleading
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.			11.
2.	7.			12.
3.	8.			13.
4.	9.			14.
5.	10.			15.

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01630-JAH-BGS	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Best Western International, Inc.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. US 6,384,850 B1	6.	11.
2. US 6,871,325	7.	12.
3. US 8,146,077 B2	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	___ Amendment ___ Answer ___ Cross Bill ___ Other Pleading	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01631-JAH-JMA	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Marriott International, Inc., et al.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. US 6,384,850 B1	6.	11.
2. US 6,871,325 B1	7.	12.
3. US 8,146,077 B2	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY		
	Amendment	Answer	Cross Bill
	Other Pleading		
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.	
2.	7.	12.	
3.	8.	13.	
4.	9.	14.	
5.	10.	15.	

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK W. Samuel Hamrick, Jr.	(BY) DEPUTY CLERK	DATE
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To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01655-AJB-WVG	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Micros Systems, Inc
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 6,384,850	6.	11.
2. 6,871,325	7.	12.
3. 8,146,077	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	Amendment <u> </u> Answer <u> </u> Cross Bill <u> </u> Other Pleading <u> </u>	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01643-JAH-MDD	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		NAAMA Networks, Inc., et al.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 6,384,850	6.	11.
2. 6,871,325	7.	12.
3. 8,146,077	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY		
	Amendment <u> </u> Answer <u> </u> Cross Bill <u> </u> Other Pleading <u> </u>		
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.	
2.	7.	12.	
3.	8.	13.	
4.	9.	14.	
5.	10.	15.	

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01647-AJB-JMA	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Amernath, Inc.		Subtledata, Inc.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 6,384,850	6.	11.
2. 6,871,325	7.	12.
3. 8,146,077	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY		
	Amendment	Answer	Cross Bill
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.	
2.	7.	12.	
3.	8.	13.	
4.	9.	14.	
5.	10.	15.	

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01646-DMS-JMA	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Stubhub, Inc.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. US 6,384,850 B1	6.	11.
2. US 6,871,325 B1	7.	12.
3. US 8,146,077 B2	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	Amendment ___ Answer ___ Cross Bill ___ Other Pleading ___	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

In the above--entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01644-AJB-BGS	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Orbitz, LLC
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 6,384,850	6.	11.
2. 6,871,325	7.	12.
3. 8,146,077	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	Amendment <u> </u> Answer <u> </u> Cross Bill <u> </u> Other Pleading <u> </u>	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

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DECISION/JUDGMENT

CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01653-MMA-BGS	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Amernath, Inc.		Hotwire, Inc.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 6,384,850	6.	11.
2. 6,871,325	7.	12.
3. 8,146,077	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	Amendment <u> </u> Answer <u> </u> Cross Bill <u> </u> Other Pleading <u> </u>	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01651-DMS-WMC	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Fandango, Inc.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 6,384,850	6.	11.
2. 6,871,325	7.	12.
3. 8,146,077	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	<input type="checkbox"/> Amendment <input type="checkbox"/> Answer <input type="checkbox"/> Cross Bill <input type="checkbox"/> Other Pleading	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

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W. Samuel Hamrick, Jr.		

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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 San Diego on the following Patents or Trademarks:

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
12CV1642-BEN-BLM	6/29/2012	Southern District of California
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Mobo Systems, Inc.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1 6,384,850	6	11
2 6,871,325	7	12
3 8,146,077	8	13
4	9	14
5	10	15

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

DATE INCLUDED	INCLUDED BY		
	<input type="checkbox"/> Amendment	<input type="checkbox"/> Answer	<input type="checkbox"/> Cross Bill <input type="checkbox"/> Other Pleading
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	
1	6	11	
2	7	12	
3	8	13	
4	9	14	
5	10	15	

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DECISION/JUDGMENT		
CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

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

DOCKET NO. 12CV1647-AJB-JMA	DATE FILED 6/29/2012	U.S. DISTRICT COURT Southern District of California
PLAINTIFF Ameranth, Inc.		DEFENDANT Subtledata, Inc.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1 6,384,850	6	11
2 6,871,325	7	12
3 8,146,077	8	13
4	9	14
5	10	15

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

DATE INCLUDED	INCLUDED BY <input type="checkbox"/> Amendment <input type="checkbox"/> Answer <input type="checkbox"/> Cross Bill <input type="checkbox"/> Other Pleading		
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	
1	6	11	
2	7	12	
3	8	13	
4	9	14	
5	10	15	

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT		
CLERK W. Samuel Hamrick, Jr.	(BY) DEPUTY CLERK	DATE

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01648-WQH-JMA	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Ticketmaster, LLC, et al.
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 6,384,850	6.	11.
2. 6,871,325	7.	12.
3. 8,146,077	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	Amendment <u> </u> Answer <u> </u> Cross Bill <u> </u> Other Pleading <u> </u>	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT

CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01649-JAH-WMC	6/29/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		Travelocity.com, LP
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. US 6,384,850 B1	6.	11.
2. US 6,871,325 B1	7.	12.
3. US 8,146,077 B2	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	Amendment ___ Answer ___ Cross Bill ___ Other Pleading ___	
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

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DECISION/JUDGMENT

CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.		

To:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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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 Southern District of California on the following: X Patents or Trademarks:

DOCKET NO.	DATE FILED	US District Court Southern District of California
3:12-cv-01201-DMS-IMA	5/18/12	San Diego, CA
PLAINTIFF		DEFENDANT
Ameranth, Inc.		ChowNow, LLC
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1. 6,384,850	6.	11.
2. 6,871,325	7.	12.
3. 8,146,077	8.	13.
4.	9.	14.
5.	10.	15.

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

DATE INCLUDED	INCLUDED BY	
	<input type="checkbox"/> Amendment	<input type="checkbox"/> Answer
	<input type="checkbox"/> Cross Bill	<input type="checkbox"/> Other Pleading
PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.	PATENT OR TRADEMARK NO.
1.	6.	11.
2.	7.	12.
3.	8.	13.
4.	9.	14.
5.	10.	15.

In the above-entitled case, the following decision has been rendered or judgment issued:

DECISION/JUDGMENT	<i>Attended</i>
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CLERK	(BY) DEPUTY CLERK	DATE
W. Samuel Hamrick, Jr.	<i>[Signature]</i>	7/4/2012