

TW 7383665



# THE UNITED STATES OF AMERICA

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November 08, 2012

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OF:

APPLICATION NUMBER: *09/400,413*  
FILING DATE: *September 21, 1999*  
PATENT NUMBER: *6,384,850*  
ISSUE DATE: *May 07, 2002*

By Authority of the  
Under Secretary of Commerce for Intellectual Property  
and Director of the United States Patent and Trademark Office



P. R. GRANT  
Certifying Officer

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and Director of the United States Patent and Trademark Office



P. R. GRANT  
Certifying Officer

36525 U.S. PTO  
09/400413



345	Class	810	Subclass	ISSUE CLASSIFICATION
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PATENT NUMBER  
**6384850**

6384850

### U.S. UTILITY PATENT APPLICATION

SCANNED	O.I.P.E. <i>[Signature]</i> C.A. CG	PATENT DATE 08/27/01
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SECTOR	CLASS 345	SUBCLASS 810	ART UNIT 2773	EXAMINER
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FILED WITH:  DISK (CRF)  FICHE  
(Attached in pocket on right inside flap)

### PREPARED AND APPROVED FOR ISSUE

ISSUING CLASSIFICATION					
ORIGINAL			CROSS REFERENCE(S)		
CLASS	SUBCLASS		CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)	
345	810		345	841	
INTERNATIONAL CLASSIFICATION					
G06F 3/00					

Continued on Issue Slip Inside File Jacket

<input type="checkbox"/> <b>TERMINAL DISCLAIMER</b>	<b>DRAWINGS</b>			<b>CLAIMS ALLOWED</b>	
	Sheets Drwg. 7	Figs. Drwg. 7	Print Fig. 7	Total Claims 16	Print Claim for O.G. 1
<input type="checkbox"/> a) The term of this patent subsequent to _____ (date) has been disclaimed.	<i>[Signature]</i> (Assistant Examiner)			<b>NOTICE OF ALLOWANCE MAILED</b>	
<input type="checkbox"/> b) The term of this patent shall not extend beyond the expiration date of U.S. Patent. No. _____	<i>[Signature]</i> CAD H. NEUZEN (Primary Examiner)			8-9-01	
<input type="checkbox"/> c) The terminal _____ months of this patent have been disclaimed.	<i>[Signature]</i> (Legal Instruments Examiner)			Amount Due 625.00	Date Paid
<b>WARNING:</b> The information disclosed herein may be restricted. Unauthorized disclosure may be prohibited by the United States Code Title 35, Sections 122, 181 and 368. Possession outside the U.S. Patent & Trademark Office is restricted to authorized employees and contractors only.				<b>ISSUE FEE</b>	
				<b>ISSUE BATCH NUMBER</b> K28	

Form PTO-436A (Rev. 6/98)

(LABEL AREA)

ISSUE FEE IN FILE

(FACE)

SERIAL NUMBER 09/400,413	FILING DATE 09/21/99	CLASS 707	GROUP ART UNIT 2776	ATTORNEY DOCKET NO. 3125-400
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APPLICANT  
 KEITH R. MCNALLY, SANTA CLARA, CA; WILLIAM H. ROOF, SAN DIEGO, CA;  
 RICHARD BERGFELD, CHATSWORTH, CA.

**\*\*CONTINUING DOMESTIC DATA\*\*\*\*\***  
 VERIFIED  
*None*

**\*\*371 (NAT'L STAGE) DATA\*\*\*\*\***  
 VERIFIED  
*None*

**\*\*FOREIGN APPLICATIONS\*\*\*\*\***  
 VERIFIED  
*None*

IF REQUIRED, FOREIGN FILING LICENSE GRANTED 10/14/99 \*\* SMALL ENTITY \*\*

Foreign Priority claimed 35 USC 119 (a-d) conditions met <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> Met after Allowance	STATE OR COUNTRY CA	SHEETS DRAWING 7	TOTAL CLAIMS 43	INDEPENDENT CLAIMS 5
Verified and Acknowledged Examiner's Initials _____ Initials _____				

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TITLE  
 INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS SYSTEM WITH MENU GENERATION

FILING FEE RECEIVED \$730	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT NO. _____ for the following:	<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit
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PATENT APPLICATION SERIAL NO. 09/400413

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

09/29/1999 SBAWIS 00000002 09400413

01 FC:201	380.00	OP
02 FC:202	78.00	OP
03 FC:203	207.00	OP

PTO-1556  
(5/87)

\*U.S. GPO: 1998-433-214/80404



Docket No. 3125-400

Express Mail Label No. EJ917774582US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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

ASSISTANT COMMISSIONER FOR PATENTS  
Box Patent Application  
Washington, D.C. 20231

Sir:

Transmitted herewith for filing is the patent application of

Named Inventor(s) and  
Address(es): Keith R. McNally, Santa Clarita, CA; William H. Roof, San Diego, CA; Richard Bergfeld, Chatsworth, CA

For: INFORMATION MANAGEMENT AND SYNCHRONOUS COMMUNICATIONS  
SYSTEM WITH MENU GENERATION

Enclosed are:

[X] 26 page(s) of specification, 1 page(s) of Abstract, 9 page(s) of claims

[X] 7 sheets of drawing [ ] formal [ x ] informal

[X] 6 page(s) of Declaration and Power of Attorney

- [X] Unsigned
- [ ] Newly Executed
- [ ] Copy from prior application

[ ] Deletion of inventors including Signed Statement under 37 C.F.R. § 1.63(d)(2)

[ ] 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.

[ ] 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

492242\_1

151250-2740450

- Claim for Priority
- Certified copy of Priority Document(s)
  - English translation documents
- Information Disclosure Statement
  - Copy of \_\_\_ cited references
  - Copy of PTO-1449 filed in parent application serial No. \_\_\_\_\_.
- Preliminary Amendment
- Return receipt postcard (MPEP 503)
- Assignment Papers (assignment cover sheet and assignment documents)
  - A check in the amount of \$40.00 for recording the Assignment.
  - Assignment papers filed in parent application Serial No. \_\_\_\_\_.
  - Certification of chain of title pursuant to 37 C.F.R. § 3.73(b).
- This is a  continuation  divisional  continuation-in-part (C-I-P) of prior application serial no. \_\_\_\_\_.
- 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 patent application to this application.
- Amend the specification by inserting before the first line the sentence:  
This is a  continuation  divisional  continuation-in-part of co-pending application Serial No. \_\_\_\_\_  
\_\_\_\_\_ filed \_\_\_\_\_.

I. CALCULATION OF APPLICATION FEE (For Other Than A Small Entity)

	Number Filed		Number Extra	Rate	Basic Fee
Total Claims	43	-20=	23	x\$18.00	\$414.00
Independent Claims	5	-3=	2	x\$78.00	\$156.00
Multiple Dependent Claims	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		Additional Fee =	\$260.00	\$0
			Add'l Fee =	NONE	

Total: \$ 1,330.00

- A statement claiming small entity status is attached or has been filed in the above-identified parent application and its benefit under 37 C.F.R. § 1.28(a) is hereby claimed. Reduced fees under 37 C.F.R. § 1.9(F) (50% of total) paid herewith \$ 665.00.
- A check in the amount of \$665.00 in payment of the application filing fees is attached.
- Charge Fee(s) to Deposit Account No. 13-4500. Order No. \_\_\_\_\_. A DUPLICATE COPY OF THIS SHEET IS ATTACHED.
- The Assistant Commissioner is hereby authorized to charge any additional fees which may be required for filing this application, or credit any overpayment to Deposit Account No. 13-4500, Order No. 3125-4002. A DUPLICATE COPY OF THIS SHEET IS ATTACHED.

Respectfully submitted,

MORGAN & FINNEGAN, L.L.P.

By: John W. Osborne  
 John W. Osborne  
 Registration No. 36,231

Dated: September 21, 1999

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FORM: UTL-TRAN.NY  
 Rev. 11/13/98

667250" E F 00460



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**Applicant(s)** : Keith R. McNally  
William H. Roof  
Richard Bergfeld  
**Group Art Unit :** TBA

**Serial No.** : TBA  
**Examiner:** TBA

**Filed** : September 21, 1999

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

**EXPRESS MAIL CERTIFICATE**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Express Mail Label No. EJ917774582US

Date of Deposit September 21, 1999

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

Application with 43 claims, 7 sheets of drawing figures; one (1) page abstract  
Application Fee Transmittal;  
Filing Fee in the amount of \$665.00;  
Combined Declaration and Power of Attorney (unsigned);  
Statement (Declaration) Claiming Small Entity Status; and  
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 the Assistant Commissioner for Patents, Washington,  
D.C. 20231.

Francisco Garcia  
(Typed or printed name of person  
mailing paper(s) and/or fee)

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

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661260" EFD00460

2700 INTERNAL TRANSFER REQUEST FOR S.N.

DATE: <u>2/15/00</u>	FROM: <u>BOURQUE</u> <del>STEPHEN HONG</del> / (print name) <u>PRINCIPAL EXAMINER</u> / <u>2776</u>
FORWARD TO: A. Art Unit: <u>2773</u> B. Class: <u>345</u> C Subclass: <u>353</u>	REASON(S): A. You had Parent <input type="checkbox"/> (check box) B. See Title <input type="checkbox"/> (check box) C. See Abstract <input checked="" type="checkbox"/> (check box) D. See Claim(s): <input checked="" type="checkbox"/>

FURTHER EXPLANATION IF NEEDED:

*User interface; sub-menus generally*

DATE: _____	FROM: _____ (print name)
FORWARD TO: A. Art Unit: _____ B. Class: _____ C Subclass: _____	REASON(S): A. You had Parent <input type="checkbox"/> (check box) B. See Title <input type="checkbox"/> (check box) C. See Abstract <input type="checkbox"/> (check box) D. See Claim(s): _____

FURTHER EXPLANATION IF NEEDED:

DATE: _____	FROM: _____ (print name)
FORWARD TO CLASSIFIER [REDACTED]	REASON(S): A. You had Parent <input type="checkbox"/> (check box) B. See Title <input type="checkbox"/> (check box) C. See Abstract <input type="checkbox"/> (check box) D. See Claim(s): _____

FURTHER EXPLANATION IF NEEDED:

DISPOSITION BY 2700 CLASSIFICATION

DATE: _____	CLASSIFIER: _____
FORWARD TO: A. Art Unit: _____ B. Class: _____ C Subclass: _____	REASON(S): A. You had Parent <input type="checkbox"/> (check box) B. See Title <input type="checkbox"/> (check box) C. See Abstract <input type="checkbox"/> (check box) D. See Claim(s): _____

FURTHER EXPLANATION IF NEEDED:

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**UNITED STATES PATENT APPLICATION**

**OF: KEITH R. McNALLY  
WILLIAM H. ROOF  
RICHARD BERGFELD**

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

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11

**FIELD OF THE INVENTION**

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647260 "ETHOETHO"

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

19

**BACKGROUND OF THE INVENTION**

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While computers have dramatically altered many aspects of modern life, pen and paper have prevailed in the hospitality industry, e.g., for restaurant ordering, reservations and wait-list management, because of their simplicity, ease of training and operational speed. For example, ordering prepared foods has historically been done verbally, either directly to a waiter or over the telephone, whereupon the placed order is recorded on paper by the recipient or instantly filled.

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

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

21           Many of the negatives prevalent in earlier devices have been eliminated, but, to  
22 date, there is still no integrated solution to the ordering/waitlist/reservation problem discussed  
23 above. With the advent of the Palm® and other handheld wireless devices, however, the efforts

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1 to make such devices ubiquitous have begun to bear fruit at least in some areas, e.g., personal  
2 calendars. However, substantial use of such devices in the restaurant and hospitality context has  
3 not occurred to date. As discussed above, at least one of the reasons PDAs have not been  
4 quickly assimilated into the restaurant and hospitality industries is that their small display sizes  
5 are not readily amenable to display of menus as they are commonly printed on paper or displayed  
6 on, e.g., large, color desktop computer screens. Another reason is that software for fully  
7 realizing the potential for wireless handheld computing devices has not previously been  
8 available. Such features would include fast and automatic synchronization between a central  
9 database and multiple handheld devices, synchronization and communication between a World  
10 Wide Web ("Web") server and multiple handheld devices, a well-defined application program  
11 interface ("API") that enables third parties such as point of sale ("POS") companies, affinity  
12 program companies and internet content providers to fully integrate with computerized  
13 hospitality applications, real-time communication over the internet with direct connections or  
14 regular modem dialup connections and support for batch processing that can be done periodically  
15 throughout the day to keep multiple sites in synch with the central database. A single point of  
16 entry for all hospitality applications to communicate with one another wirelessly has also  
17 previously been unavailable. Such a single point of entry would work to keep all wireless  
18 handheld devices and linked Web sites in synch with the backoffice server (central database) so  
19 that the different components are in equilibrium at any given time and an overall consistency is  
20 achieved. For example, a reservation made online would be automatically communicated to the  
21 backoffice server and then synchronized with all the wireless handheld devices wirelessly.  
22 Similarly, changes made on any of the wireless handheld devices would be reflected  
23 instantaneously on the backoffice server, Web pages and the other handheld devices.

4

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

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

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

21 A further object of the present invention is to provide an improved information  
22 management and synchronous communications system which is small, affordable and

1 lightweight yet incorporates a user-friendly operator interface and displays menus in a readily  
2 comprehensible format.

3 A further object of the present invention is to provide a synchronous information  
4 management and communications system which enables automatic updating of both wireless and  
5 internet menu systems when a new menu item is added, modified or deleted from any element of  
6 the system.

### 7 SUMMARY OF THE INVENTION

8 The foregoing and other objects of the present invention are provided by a  
9 synchronous information management and communications system and method optimized for  
10 simplicity of operation which incorporates menu generation for creation of menus to be used  
11 with wireless remote handheld computer and PDA devices, the internet or any application where  
12 simple and efficient generation of menus is appropriate. The menu generation approach of the  
13 present invention includes a desktop software application that enables the rapid creation and  
14 building of a menu and provides a means to instantly download the menu configuration onto,  
15 e.g., a handheld device or Web page and to seamlessly interface with standard point of sale  
16 ("POS") systems to enable automatic database updates and communication exchanges when a  
17 change or input occurs in any of the other system elements. To solve the above and other related  
18 problems, an information management and communications system is provided which results in  
19 a dramatic reduction in the amount of time, and hence cost, to generate and maintain  
20 computerized menus for, e.g., restaurants and other related applications that utilize non-PC-  
21 standard graphical formats, display sizes or applications.

22 The menu generation approach of the present invention has many advantages over  
23 previous approaches in solving the problem of converting paper-based menus or Windows® PC-

1 based menu screens to small PDA-sized displays and Web pages. In one embodiment, the  
2 present invention is a software tool for building a menu, optimizing the process of how the menu  
3 can be downloaded to either a handheld device or Web page, and making manual or automatic  
4 modifications to the menu after initial creation.

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

18           The information management and synchronous communications system of the  
19 present invention features include fast synchronization between a central database and multiple  
20 handheld devices, synchronization and communication between a Web server and multiple  
21 handheld devices, a well-defined API that enables third parties such as POS companies, affinity  
22 program companies and internet content providers to fully integrate with computerized  
23 hospitality applications, real-time communication over the internet with direct connections or



1 regular modem dialup connections and support for batch processing that can be done periodically  
2 throughout the day to keep multiple sites in synch with the central database.

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

15 **BRIEF DESCRIPTION OF THE DRAWINGS**

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

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

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

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

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

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

7           ~~FIG. 6~~ is a schematic representation of a communications control window in  
8 conformity with a preferred embodiment of the present invention.

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

12                           **DETAILED DESCRIPTION OF THE INVENTION**

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

1 including Windows CE® for handheld wireless devices and the like. Generally, a particular  
2 application program presents information to a user through a window of a GUI by drawing  
3 images, graphics or text within the window region. The user, in turn, communicates with the  
4 application by “pointing” at graphical objects in the window with a pointer that is controlled by a  
5 hand-operated pointing device, such as a mouse, or by pressing keys on a keyboard.

6 The use of menus is conventional in GUIs for software applications. Menus are  
7 typically utilized to provide end users of applications with available choices or processing  
8 options while using the applications. For example, in a typical desktop or interactive application,  
9 selection of a “file” from a menu bar may cause display of a context menu which provides “file”  
10 options. File options can have additional subordinate or child options associated with them. If a  
11 file option having subordinate options is selected, the child options are displayed in context in a  
12 child menu or submenu proximate to the selected parent option. One or more of the child  
13 options provided in the child menu may have further subordinate options. Thus, such a menu  
14 system comprises cascading sets of menus which are displayable in context to show the  
15 parent/child relationships between options of the context menu. A menu system of this type is  
16 incorporated into the preferred embodiment of the invention.

17 The preferred embodiment of the present invention uses typical hardware  
18 elements in the form of a computer workstation, operating system and application software  
19 elements which configure the hardware elements for operation in accordance with the present  
20 invention. A typical workstation platform includes hardware such as a central processing unit  
21 (“CPU”), e.g., a Pentium® microprocessor, RAM, ROM, hard drive storage in which are stored  
22 various system and application programs and data used within the workstation, modem, display  
23 screen, keyboard, mouse and optional removable storage devices such as floppy drive or a CD

1 ROM drive. The workstation hardware is configured by software including an operating system,  
2 e.g., Windows<sup>®</sup> 95, 98, NT or CE, networking software (including internet browsing software)  
3 and application software components. The preferred embodiment also encompasses a typical file  
4 server platform including hardware such as a CPU, e.g., Pentium<sup>®</sup> microprocessor, RAM, ROM,  
5 hard drive, modem, and optional removable storage devices, e.g., floppy or CD ROM drive. The  
6 server hardware is configured by software including an operating system, e.g., Windows<sup>®</sup> 95, 98,  
7 NT or CE, networking software (including Web server software) and database software.

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

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

21 An aspect of the preferred embodiment of the information management and  
22 communications system of the invention is shown in FIG. 1. FIG. 1 shows an example of the  
23 GUI provided by the operating system of the preferred embodiment of the present invention.

1 With reference to FIG. 1, the preferred embodiment includes an intuitive GUI 1 from which to  
2 build a menu on a desktop or other computer. A hierarchical tree structure 2 is used to show the  
3 different relationships between the menu categories 3 (e.g., soups, salads, appetizers, entrees,  
4 deserts, etc.), menu items 4 (e.g., green salad, chicken caesar salad, etc.), menu modifiers 5 (e.g.,  
5 dressing, meat temperature, condiments, etc.) and menu sub-modifiers 6 (e.g., Italian, French,  
6 ranch, bleu cheese, etc.).

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

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

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1 desired category and then clicking on Add Item; (3) highlighting the desired category, then  
2 typing Ctrl + N or (4) clicking on the Add icon on the toolbar.

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

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

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

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

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

29 To add modifiers, a user clicks on the inside of the Modifiers window, then (1)  
30 clicks on Edit>Add Modifier; (2) Presses Ctrl + N; (3) right mouse clicks in the Modifiers  
31 window, then clicks on Add Modifiers or (4) clicks on the Add icon from the toolbar. If a menu

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1 is being built from scratch, the procedure is to enter the Long Name, Short Name, Code and  
2 Price in the Modifier dialog box 10 shown in FIG. 2. The Long Name is the full descriptive  
3 name of the item. The Short Name is the abbreviated name that will be displayed on the  
4 handheld device. The Code is the numeric or alphanumeric code for the item. If there is an  
5 existing database, the existing database can be browsed and menu items retrieved from the  
6 database. Clicking on the Browse button will bring up the existing database of menu items. The  
7 item to be added is then selected and "OK" is clicked. The fields will then be filled with the  
8 information from the database. Clicking on OK again will add the item as a modifier. To delete  
9 a modifier, the modifier is selected and the Delete key pressed on the keyboard. To edit a  
10 modifier, either the modifier is double clicked or the Enter key is pressed.

11 Sub-modifiers represent the last level of modifiers that can be assigned to a menu  
12 tree. To add sub-modifiers, the modifier to which sub-modifiers are to be assigned is selected.  
13 Then, the focus is set on the sub-modifier window by clicking inside the Sub-Modifier window  
14 as follows: (1) clicking on Edit>Add Sub-Modifier; (2) pressing Ctrl + N; (3) right mouse  
15 clicking in the Sub-Modifiers window, then clicking on Add Sub-Modifiers or (4) clicking on the  
16 Add icon from the toolbar. If a menu is being built from scratch, the procedure is to enter the  
17 Long Name, Short Name, Code and Price in a Sub-Modifier dialog box similar to the Modifier  
18 dialog box shown in FIG. 2. As with modifiers, the Long Name is the full descriptive name of  
19 the item. The Short Name is the abbreviated name that will be displayed on the handheld device.  
20 The Code is the numeric or alphanumeric code for the item. As before, if there is an existing  
21 database, the existing database can be browsed and menu items retrieved from the database.  
22 Clicking on the Browse button will bring up the existing database of menu items. The item to be  
23 added is then selected and OK clicked. The fields will then be filled with the information from

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

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

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

1 will ask if the existing database should be replaced. Yes is clicked if existing database  
2 replacement is desired.

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

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

21 A communications control program monitors and routes all communications to  
22 the appropriate devices. It continuously monitors the wireless network access point and all other  
23 devices connected to the network such as pagers, remote devices, internet Web links and POS

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

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

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

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

21 The POS interface on the handheld device supports pricing in the database or  
22 querying prices from the POS server. The POS device also can be customized with respect to  
23 “look and feel” for the particular version. As can be seen in FIG. 7, the POS interface provides

1 for billing, status and payment with respect to orders. A myriad of options can be provided  
2 depending on the application.

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

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

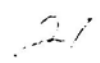
21 In the preferred embodiment, the menu generation approach of the present  
22 invention uses Windows CE® as the operating system for the handheld devices. Windows CE®  
23 provides the benefits of a familiar Windows 95/98/NT® look and feel, built-in synchronization

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1 between handheld devices, internet and desktop infrastructure, compatibility with Microsoft  
2 Exchange®, Microsoft Office 9® and TCP/IP quick access to information with instant-on feature.

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

15 The synchronous communications control module discussed above provides a  
16 single point of entry for all hospitality applications to communicate with one another wirelessly  
17 or over the Web. This communications module is a layer that sits on top of any communication  
18 protocol and acts as an interface between hospitality applications and the communication  
19 protocol. This layer can be easily updated to work with a new communication protocol without  
20 having to modify the core hospitality applications. The single point of entry works to keep all  
21 wireless handheld devices and linked Web sites in synch with the backoffice server (central  
22 database) so that the different components are in equilibrium at any given time and an overall  
23 consistency is achieved. For example, a reservation made online is automatically communicated



1 to the backoffice server which then synchronizes with all the wireless handheld devices  
2 wirelessly. Similarly, changes made on any of the wireless handheld devices will be reflected  
3 instantaneously on the backoffice server and the other handheld devices.

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

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

20 A further aspect of the invention is the use of the menus generated in accordance  
21 with the described technique to place orders from wireless remote handheld devices or from  
22 remote locations through the internet. The World Wide Web is a distributed hypermedia  
23 computer system that uses the internet to facilitate global hypermedia communication using

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specified protocols. One such protocol is the Hypertext Transfer Protocol (“HTTP”), which facilitates communication of hypertext. Hypertext is the combination of information and links to other information. In the context of the Web, hypertext is defined by the Hypertext Mark-up Language (“HTML”). The links or hyperlinks in a HTML document reference the locations of resources on the Web, such as other HTML documents. Another language used in creating documents for use on the Worldwide Web, to display on computer screens, or to create speech style sheets for use in, e.g., telephones, is the Extensible Mark-Up Language (“XML”). XML is a “metalanguage”, i.e., a language for describing languages which was developed to eliminate the restrictions of HTML.

The Web is a client-server system. The HTML documents are stored on Web server computers, typically in a hierarchical fashion with the root document being referred to as the home page. The client specifies a HTML document or other source on the server by transmitting a Uniform Resource Locator (“URL”) which specifies the protocol to use, e.g., HTTP, the path to the server directory in which the resource is located, and filename of the resource. Users retrieve the documents via client computers. The software running on the user’s client computer that enables the user to view HTML documents on the computer’s video monitor and enter selections using the computer’s keyboard and mouse is known as a browser. The browser typically includes a window in which the user may type a URL. A user may cause a URL to be transmitted by typing it in the designated window on the browser or by maneuvering the cursor to a position on the displayed document that corresponds to a hyperlink to a resource and actuating the mouse button. The latter method is commonly referred to simply as “clicking on the hot-spot” or “clicking on the hyperlink”. The hyperlink methodology is contemplated for use in accordance with the preferred embodiment to transmit orders via the internet.



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

15 Searching for items that the user is interested in purchasing is insufficient in prior  
16 merchandising systems. Database management programs use index searching to facilitate rapid  
17 searching of large amounts of data. The creator of the database may instruct the program to use  
18 specified fields in the database as indexed or key fields. The program locates all terms in the  
19 database that appear in the indexed fields and stores them in an index table. Each entry in the  
20 index table includes a term and corresponding pointer to the location in the database where the  
21 term is found. If a user initiates a search for a term that is present in the index table, the program  
22 can locate the instances of that term in the database with exceptional speed. Users who are  
23 familiar with the particular database they are searching will generally know which fields are



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

16 While the preferred embodiment of the invention is for the generation of  
17 restaurant menus and the like, the broad scope of the invention is far greater. For example,  
18 menus generated in accordance with the invention can be used in the desktop computing  
19 environment in association with the operating system or application programs. One such use is  
20 to facilitate the creation of user personalized file structures for general desktop use. Another use  
21 is to facilitate the location of customized menus from master menus for use in association with  
22 application software to make the execution of the application software more efficient by, e.g.,  
23 eliminating the necessity of querying or checking every tree branch in the master menu file

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1 structure in response to user input or other criteria and to create handheld/PDA compatible  
2 versions of the software.

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

10 It is also within the scope of the invention to generate menus automatically in  
11 response to predetermined criteria. For example, in the restaurant menu generation embodiment,  
12 a modified menu can be generated to comply with a particular specification or group of criteria  
13 such as, e.g., "dinner", "low cholesterol", "low fat", "fish", "chicken", or "vegetarian". In this  
14 embodiment, only items from the master menu that satisfy specified parameters will be included  
15 in the generated menu. The selection process could involve selection of master menu items  
16 based on tags or identifiers associated with the items or by checking every master menu item  
17 against a dictionary of items acceptable for inclusion in the modified menu. It should also be  
18 appreciated that the invention encompasses any combination of automatic and manual user  
19 selection of the items comprising the generated menu. For example, a user might specify criteria  
20 which would further control automatic selection or the user could manually select some items  
21 with automatic selection of others. The menu generation aspect of the invention is equally  
22 applicable to table-based, drive-thru, internet, telephone, wireless or other modes of customer  
23 order entry, as is the synchronous communications aspect of the invention.

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

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

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

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*Dubai*

That which is claimed is:

1. An information management and synchronous communications system for generating menus comprising:
  - a. a central processing unit,
  - b. a data storage device connected to said central processing unit,
  - c. an operating system including a graphical user interface,
  - d. a first menu stored on said data storage device,
  - e. application software for generating a second menu from said first menu,
 wherein the application software facilitates the generation of the second menu by allowing selection of items from the first menu, addition of items to the second menu and assignment of parameters to items in the second menu using the graphical user interface of said operating system.
2. An information management and synchronous communications system in accordance with claim 1, wherein the second menu is a restaurant menu.
3. An information management and synchronous communications system in accordance with claim 1, wherein the second menu is capable of being displayed on the display screen of a wireless computing device.
4. An information management and synchronous communications system in accordance with claim 3, wherein selections from the second menu are capable of being transmitted to a receiving computer by wireless link.

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- d. a data storage device for storing information and instructions entered through said data and instruction input means of information generated by said microprocessor,
- e. an operating system,
- f. a master menu stored on said data storage device for generating a modified menu, and
- g. application software,

wherein said microprocessor, operating system and application software are operative to display the master menu on the display device in response to instructions programmed into said microprocessor, operating system, application software and information and instructions entered through said data input device, and wherein said microprocessor, operating system and application software are operative to create the modified menu from said master menu in response to information and instructions entered through said data and instruction input device.

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

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

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

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

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1 17. The information management and synchronous communications system of  
2 claim 15, wherein the items comprising the modified menu are a subset of the items comprising  
3 the master menu.

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

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

13 20. An information management and synchronous communications system for  
14 generating and transmitting menus comprising:

- 15 a. a central processing unit,
- 16 b. a data storage device connected to said central
- 17 processing unit,
- 18 c. an operating system including a graphical user
- 19 interface,
- 20 d. a first menu consisting of menu categories, said menu
- 21 categories consisting of menu items, said first menu
- 22 stored on said data storage device and displayable in a
- 23 window of said graphical user interface in a hierarchical
- 24 tree format,
- 25 e. a modifier menu stored on said data storage device and
- 26 displayable in a window of said graphical user
- 27 interface,



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- f. a sub-modifier menu stored on said data storage device and displayable in a window of said graphical user interface, and
- g. application software for generating a second menu from said first menu and transmitting said second menu to a wireless handheld computing device or Web page,

wherein the application software facilitates the generation of 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 said operating system, said parameters being selected from the modifier and sub-modifier menus.

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22. An information management and synchronous communications system in accordance with claim 20, wherein the second menu is a restaurant menu.

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

42. An information management and synchronous communications system in accordance with claim 22, wherein selections from the second menu are capable of being transmitted to a receiving computer by wireless link.

62. An information management and synchronous communications system in accordance with claim 20, wherein the second menu is capable of being displayed on display screens of computers in a network.

72. An information management and synchronous communications system in accordance with claim 24, wherein the computer network is the internet.

1 <sup>5</sup>~~20~~. An information management and synchronous communications system in  
2 accordance with claim <sup>3</sup>~~22~~, wherein selections from the second menu are capable of being  
3 transmitted to a receiving computer via the internet.

4 <sup>8</sup>~~27~~. An information management and synchronous communications system in  
5 accordance with claim <sup>1</sup>~~28~~, wherein the second menu is created in conformity with hypertext  
6 markup language or extensible markup language.

7 <sup>9</sup>~~28~~. An information management and synchronous communications system in  
8 accordance with claim <sup>1</sup>~~20~~, wherein the second menu overwrites the first menu.

9 <sup>10</sup>~~29~~. The information management and synchronous communications system of  
10 claim ~~20~~, wherein the first menu and the second menu are both capable of being displayed in the  
11 same window on the display screen.

12 <sup>11</sup>~~30~~. The information management and synchronous communications system of  
13 claim ~~20~~, wherein the menu categories and items comprising the second menu are subsets,  
14 respectively, of the menu categories and items comprising the first menu.

15 <sup>31</sup>. In a computer system having an input device, a storage device, a video  
16 display, an operating system including a graphical user interface and application software, an  
17 information management and synchronous communications method comprising the steps of:

- 18 a. outputting at least one window on the video display;
- 19 b. outputting a first menu in a window on the video  
20 display;
- 21 c. displaying a cursor on the video display;
- 22 d. selecting items from the first menu with the input  
23 device or the graphical user interface;
- 24 e. inserting the items selected from the first menu into a  
25 second menu, the second menu being output in a  
26 window;

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f. optionally adding additional items not included in the first menu to the second menu using the input device or the graphical user interface; and

g. storing the second menu on the storage device.

32. The method of claim 31, further comprising the step of transferring data or instructions representative of the second menu to a remote digital device or Web page.

33. The method of claim 32, wherein said data or instructions representative of the second menu are transferred by a wireless link.

34. The method of claim 31, 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.

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35. The method of claim 32, comprising the further steps of selecting at least one item from the second menu and transmitting at least one item selected to another computer.

36. The method of claim 35, wherein at least one item selected from the second menu is transmitted to another computer by wireless link or the internet.

37. The method of claim 32, wherein the second menu is displayed on the remote digital device or Web page in page format.

38. The method of claim 31, wherein the second menu overwrites the first menu.

39. The method of claim 31, wherein the items comprising the second menu are a subset of the items comprising the first menu.

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

a. a central database containing hospitality applications and data,

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- b. at least one wireless handheld computing device on which hospitality applications and data are stored,
- c. at least one Web server on which hospitality applications and data are stored,
- d. at least one Web page on which hospitality applications and data are stored,
- e. an application program interface, and
- f. a communications control module,

wherein applications and data are synchronized between the central data base, at least one wireless handheld computing device, at least one Web server and at least one Web page; wherein the application program interface enables intergration of outside applications with the hospitality applications and wherein the communications control module is an interface between the hospitality applications and any other communications protocol.

<sup>13</sup>~~41~~. The information management and synchronous communications system of claim <sup>12</sup>~~40~~ wherein the communications control module provides a single point of entry for all hospitality applications and wherein the single point of entry allows the synchronization of at least one wireless handheld computing device and at least one Web page with the central database so that at least one handheld device, at least one Web page and central database are consistent.

<sup>14</sup>~~42~~. The information management and synchronous communications system of claim <sup>13</sup>~~41~~ wherein information entered on at least one Web page and transmitted over the internet is automatically communicated to the central database and at least one wireless handheld computing device.

3 3

1            <sup>15</sup>  
             13 ~~43~~    The information management and synchronous communications system of  
2 claim ~~41~~ wherein information entered on at least one wireless handheld computing device is  
3 automatically communicated to the central database and at least one Web page.

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**ABSTRACT**

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

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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. [ X ] is attached hereto
b. [ ] was filed on \_\_\_\_\_ as application Serial No. \_\_\_\_\_ 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.

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<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>
				[ ] YES [ ] NO
				[ ] YES [ ] NO
				[ ] YES [ ] NO

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

Provisional Application No.

Date of Filing (day, month, yr)

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>

[ ] 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),

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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. Lin (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\* \_\_\_\_\_ date \_\_\_\_\_

Residence 21567 Parvin Drive, Santa Clarita, CA 91350

Citizenship USA

Post Office Address \_\_\_\_\_

Full name of second joint inventor, if any William H. Roof

Inventor's signature\* \_\_\_\_\_ date \_\_\_\_\_

Residence 13429 Lockett Court, San Diego, CA 92130

Citizenship USA

Post Office Address \_\_\_\_\_

Full name of third joint inventor, if any Richard Bergfeld

Inventor's signature\* \_\_\_\_\_ date \_\_\_\_\_

Residence 20719 Nashville Court, Chatsworth, CA 91311

Citizenship USA

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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.

004004-002199

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 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 negatived 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

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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

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PATENT  
U.S. PTO  
09/400413  
09/21/99

Docket No. 3125-40

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) : Keith R. McNally et al. Group Art Unit: TBA

Serial No. : TBA Examiner: TBA

Filed : September 21, 1999

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

STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS  
37 CFR §1.97(f) AND §1.27 (c) – SMALL BUSINESS CONCERN

I hereby state that I am

- the owner of the small business concern identified below:
- an official of the small business concern empowered to act on behalf of the concern identified below

NAME OF CONCERN AMERANTH TECHNOLOGY SYSTEMS, INC.

ADDRESS OF CONCERN 12230 El Camino Real, Suite 330; San Diego, California 92130-2090

I hereby state that the above identified small business concern qualifies as a small business concern as defined in 13 CFR §§ 121.3-18, and reproduced in 37 CFR § 1.9(d), for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both. I hereby state that exclusive rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention entitled:

**INFORMATION MANAGEMENT AND SYNCHRONOUS  
COMMUNICATIONS SYSTEM WITH MENU GENERATION** by: Keith R. McNally  
William H. Roof;  
Richard Bergfeld

inventor(s)

described in

- the specification filed herewith
- application Serial No. \_\_\_\_\_, filed \_\_\_\_\_
- Patent No. \_\_\_\_\_, issued \_\_\_\_\_

Docket No. 3125-4002

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below and no rights to the invention are held by any person other than the inventor, who could not qualify as an independent inventor under 37 CFR 1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d), or a nonprofit organization under 37 CFR 1.9(e).

NAME N/A

ADDRESS  
 Individual  Small Business Concern  Nonprofit Organization

NAME \_\_\_\_\_

ADDRESS  
 Individual  Small Business Concern  Nonprofit Organization

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 C.F.R. 1.28(b))

NAME OF PERSON SIGNING Keith R. McNally

TITLE OF PERSON IF OTHER THAN OWNER Chief Executive Officer

ADDRESS OF PERSON SIGNING

21567 Parvin Drive, Santa Clarita, California 91350

SIGNATURE *Keith R. McNally* DATE 9-20-99

FORM: SMALLBUS  
Rev. 05/26/98

NOTE: Separate statements are required from each name person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27).

PRINT OF DRAWINGS  
AS ORIGINALLY FILED

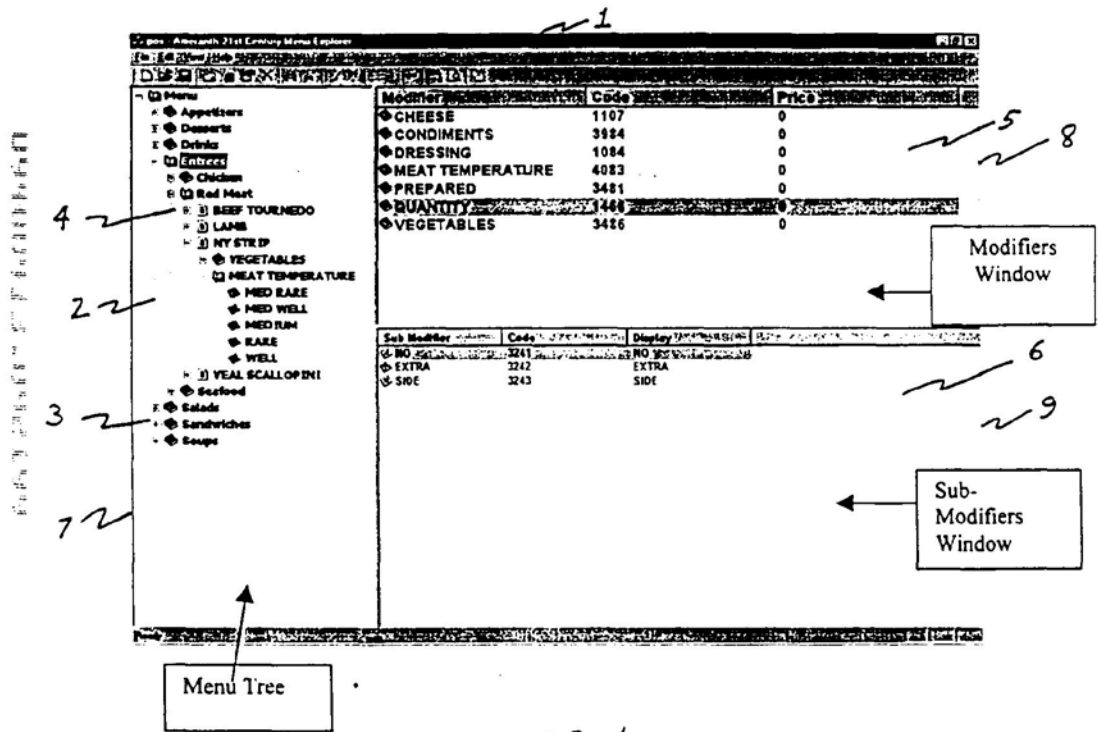


FIGURE 1

PRINT OF DRAWINGS  
AS ORIGINALLY FILED

Vertical text on the left margin, likely a page identifier or reference number.

The image shows a graphical user interface dialog box titled "Modifier". It 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 handwritten number "2-10" is located to the right of the dialog box.

FIGURE 2



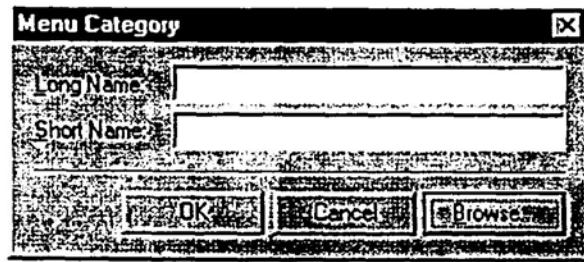


FIGURE 3

The screenshot shows a 'Menu Item' dialog box with the following fields and content:

Long Name	Code	
Chicken Alaska	5612	
Short Name	Price	Prep Time
ChwAls	12.95	12

**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.

Handwritten '12' is present to the right of the recipe text area.

Buttons: OK, Cancel, Browse

FIGURE 4

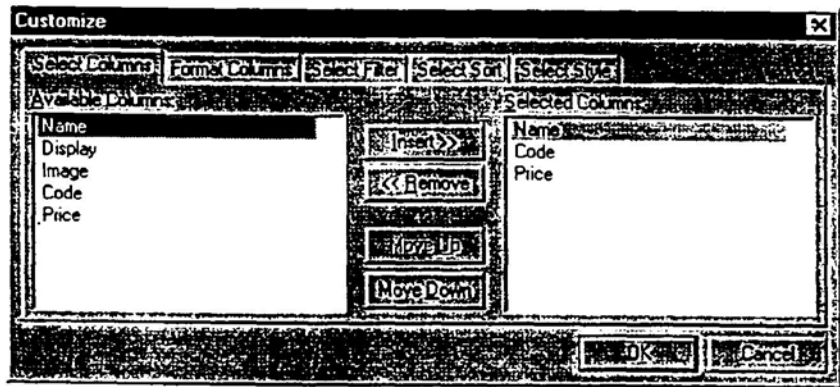


FIGURE 5



FIGURE 6

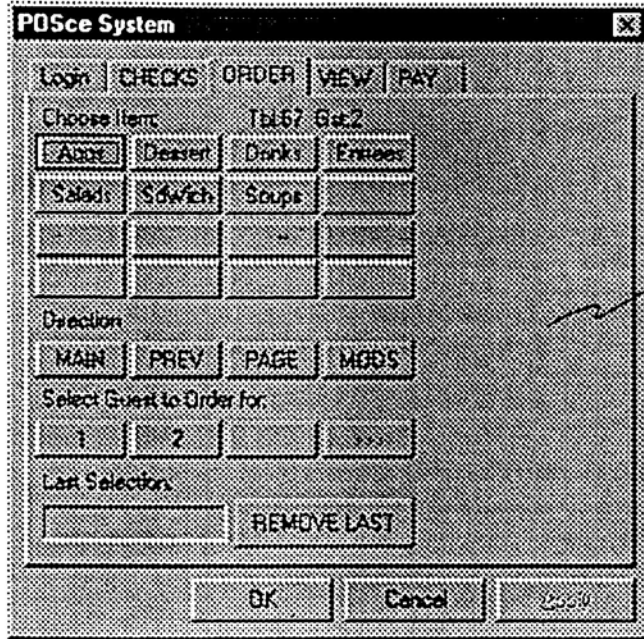


FIGURE 7



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

#2

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO./TITLE
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09/400,413	09/21/99	MONALLY	3145-400
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0912/1014

MORGAN & FINNIGAN LLP  
1775 EYE STREET STE 400  
WASHINGTON DC 20006

NOT SIGNED

DATE MAILED: 0775

10/14/99

**NOTICE TO FILE MISSING PARTS OF APPLICATION**  
**Filing Date Granted**

An Application Number and Filing Date have been assigned to this application. The items indicated below, however, are missing. Applicant is given TWO MONTHS FROM THE DATE OF THIS NOTICE within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a). If any of items 1 or 3 through 5 are indicated as missing, the SURCHARGE set forth in 37 CFR 1.16(e) of  \$65.00 for a small entity in compliance with 37 CFR 1.27, or  \$130.00 for a non-small entity, must also be timely submitted in reply to this NOTICE to avoid abandonment.

If all required items on this form are filed within the period set above, the total amount owed by applicant as a  small entity (statement filed)  non-small entity is \$ 15.00.

- 1. The statutory basic filing fee is:
  - missing.
  - insufficient.

Applicant must submit \$ \_\_\_\_\_ to complete the basic filing fee and/or file a small entity statement claiming such status (37 CFR 1.27).

- 2. The following additional claims fees are due:

\$ \_\_\_\_\_ for \_\_\_\_\_ total claims over 20.

\$ \_\_\_\_\_ for \_\_\_\_\_ independent claims over 3.

\$ \_\_\_\_\_ for multiple dependent claim surcharge.

Applicant must either submit the additional claim fees or cancel additional claims for which fees are due.

- 3. The oath or declaration:

is missing or unsigned.

does not cover the newly submitted items.

An oath or declaration in compliance with 37 CFR 1.63, including residence information and identifying the application by the above Application Number and Filing Date is required.

- 4. The signature(s) to the oath or declaration is/are by a person other than inventor or person qualified under 37 CFR 1.42, 1.43 or 1.47.

A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.

- 5. The signature of the following joint inventor(s) is missing from the oath or declaration:

An oath or declaration in compliance with 37 CFR 1.63 listing the names of all inventors and signed by the omitted inventor(s), identifying this application by the above Application Number and Filing Date, is required.

- 6. A \$50.00 processing fee is required since your check was returned without payment (37 CFR 1.21(m)).

- 7. Your filing receipt was mailed in error because your check was returned without payment.

- 8. The application was filed in a language other than English.

Applicant must file a verified English translation of the application, the \$130.00 set forth in 37 CFR 1.17(k), unless previously submitted, and a statement that the translation is accurate (37 CFR 1.52(d)).

- 9. OTHER: \_\_\_\_\_

Direct the reply and any questions about this notice to "Attention: Box Missing Parts."

**A copy of this notice MUST be returned with the reply.**

Customer Service Center  
Initial Patent Examination Division (703) 308-1202



sector  
~~#~~  
#3

Docket No. 3125-4002

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant : Keith R. McNally Group Art Unit: 2776  
William H. Roof  
Richard Bergfeld  
Serial No. : 09/400,413 Examiner: To Be Assigned  
Filed : September 21, 1999  
For : INFORMATION MANAGEMENT AND SYNCHRONOUS  
COMMUNICATIONS SYSTEM WITH MENU GENERATION

**RESPONSE TO NOTICE TO FILE MISSING PARTS OF APPLICATION**

Assistant Commissioner for Patents  
Box Missing Parts  
Washington, D.C. 20231

Sir:

In response to the Notification of Missing Requirements Under 35 U.S.C. §371, enclosed are: 1) a copy of the Notification of Missing Requirements Under 35 U.S.C. §371 dated October 14, 1999; 2) an executed Declaration and Power of Attorney; and 3) a check in the amount of \$65.00 for the surcharge.

Applicants have previously filed a Statement (Declaration) Claiming Small Entity Status.

In the event that an extension of time is required, or which may be 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

507015\_1



Docket No. 3125-4002

authorized to charge any fee for such an extension of time or credit any over payment for an extension of time to Deposit Account No. 13-4500, Order No. 3125-4002. A DUPLICATE COPY OF THIS PAPER IS ENCLOSED.

Respectfully submitted,

By: John W. Osborne  
John W. Osborne  
Registration No. 36,231

Date: December 13, 1999

Morgan & Finnegan L.L.P.  
345 Park Avenue  
New York, NY 10154  
(212) 758-4800





#3

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.  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>

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. Lin (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  
Residence 5104 Seagrave Cove, San Diego CA 92130 date  
21567 Parvin Drive, Santa Clarita, CA 91350  
Citizenship USA  
Post Office Address \_\_\_\_\_

Full name of second joint inventor, if any William H. Roof  
Inventor's signature\* *William H. Roof* 10/25/99  
Residence 13429 Lockett Court, San Diego, CA 92130 date  
Citizenship USA  
Post Office Address \_\_\_\_\_

Full name of third joint inventor, if any Richard Bergfeld  
Inventor's signature\* *Richard Bergfeld* 10/25/99  
Residence 20719 Nashville <sup>Street</sup> 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 or 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

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PATENT

Docket No. 3125-4002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) : Keith R. McNally Group Art Unit: 2776  
 William H. Roof  
 Richard Bergfeld

Serial No : 09/400,413 Examiner: TBA

Filed : September 21, 1999

For : INFORMATION MANAGEMENT AND SYNCHRONOUS  
 COMMUNICATIONS SYSTEM WITH MENU GENERATION

TRANSMITTAL OF DECLARATION PURSUANT TO C.F.R. § 1.53

ASSISTANT COMMISSIONER FOR PATENTS  
Washington, D.C. 20231

Sir:

Transmitted herewith is a declaration for the above-identified application.

The surcharge, pursuant to 37 C.F.R. § 1.16(e), for filing a declaration on a date later than the filing date of the application is as follows:

- Filing by a small entity  
\$65.00
- Filing by other than a small entity  
\$130.00
- Charge surcharge fee to Deposit Account No. 13-4500. Order No. \_\_\_\_\_  
A DUPLICATE COPY OF THIS SHEET IS ATTACHED.
- A check in the amount of \$ 65.00 to cover the surcharge fee is enclosed.


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[X] The Assistant 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.3125-4002. A DUPLICATE COPY OF THIS SHEET IS ATTACHED.

Respectfully submitted,

MORGAN & FINNEGAN, L.L.P.

Dated: December 13, 1999

By:   
John W. Osborne  
Registration No. 36,231

CORRESPONDENCE ADDRESS:

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





PATENT  
Docket No. 3125-4002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) : Keith R. McNally Group Art Unit: 2776  
William H. Roof  
Richard Bergfeld  
Serial No : 09/400,413 Examiner: TBA  
Filed : September 21, 1999  
For : INFORMATION MANAGEMENT AND SYNCHRONOUS  
COMMUNICATIONS SYSTEM WITH MENU GENERATION

CERTIFICATE OF MAILING (37 C.F.R. 1.8a)

ASSISTANT COMMISSIONER FOR PATENTS  
Washington, D.C. 20231

Sir:

I hereby certify that the attached:

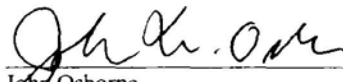
1. Transmittal of Declaration Pursuant to C.F.R. §1.53;
2. Combined Declaration and Power of Attorney;
3. Response to Notice To File Missing Parts of Application;
4. Notice To File Missing Parts of Application;
5. Check in the amount of \$65.00; and
6. Return postcard.

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: Assistant Commissioner for Patents, Washington, D.C. 20231.

Respectfully submitted,

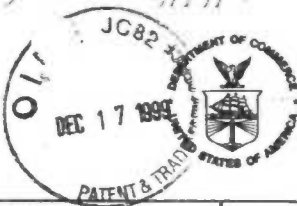
MORGAN & FINNEGAN, L.L.P.

Dated: December 13, 1999

  
John Osborne  
Registration No. 36,231

CORRESPONDENCE ADDRESS:  
MORGAN & FINNEGAN LLP  
345 Park Avenue  
New York, New York 10154  
(212) 758-4800  
(212) 751-6849 Facsimile

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UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO./TITLE
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09/400,413	09/21/99	MCNALLY	K 3125-400
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0212/1014

MORGAN & FINNEGAN LLP  
1775 EYE STREET STE 400  
WASHINGTON DC 20006

NOT ASSIGNED

DATE MAILED: 2776

10/14/99

NOTICE TO FILE MISSING PARTS OF APPLICATION

Filing Date Granted

An Application Number and Filing Date have been assigned to this application. The items indicated below, however, are missing. Applicant is given TWO MONTHS FROM THE DATE OF THIS NOTICE within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a). If any of items 1 or 3 through 5 are indicated as missing, the SURCHARGE set forth in 37 CFR 1.16(e) of  \$65.00 for a small entity in compliance with 37 CFR 1.27, or  \$130.00 for a non-small entity, must also be timely submitted in reply to this NOTICE to avoid abandonment.

If all required items on this form are filed within the period set above, the total amount owed by applicant as a  small entity (statement filed)  non-small entity is \$ 05.00.

- 1. The statutory basic filing fee is:
  - missing.
  - insufficient.
 Applicant must submit \$ \_\_\_\_\_ to complete the basic filing fee and/or file a small entity statement claiming such status (37 CFR 1.27).

- 2. The following additional claims fees are due:
  - \$ \_\_\_\_\_ for \_\_\_\_\_ total claims over 20.
  - \$ \_\_\_\_\_ for \_\_\_\_\_ independent claims over 3.
  - \$ \_\_\_\_\_ for multiple dependent claim surcharge.
 Applicant must either submit the additional claim fees or cancel additional claims for which fees are due.

- 3. The oath or declaration:
  - is missing or unsigned.
  - does not cover the newly submitted items.
 An oath or declaration in compliance with 37 CFR 1.63, including residence information and identifying the application by the above Application Number and Filing Date is required.

- 4. The signature(s) to the oath or declaration is/are by a person other than inventor or person qualified under 37 CFR 1.42, 1.43 or 1.47.
 

A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.

- 5. The signature of the following joint inventor(s) is missing from the oath or declaration:
 

\_\_\_\_\_

An oath or declaration in compliance with 37 CFR 1.63 listing the names of all inventors and signed by the omitted inventor(s), identifying this application by the above Application Number and Filing Date, is required.

- 6. A \$50.00 processing fee is required since your check was returned without payment (37 CFR 1.21(m)).
- 7. Your filing receipt was mailed in error because your check was returned without payment.
- 8. The application was filed in a language other than English.
 

Applicant must file a verified English translation of the application, the \$130.00 set forth in 37 CFR 1.17(k), unless previously submitted, and a statement that the translation is accurate (37 CFR 1.52(d)).

- 9. OTHER: \_\_\_\_\_

Direct the reply and any questions about this notice to "Attention: Box Missing Parts."

**A copy of this notice MUST be returned with the reply.**

Customer Service Center  
Initial Patent Examination Division (703) 308-1202

12/21/1999 09400413 00000038 09400413 65.00 OF 01 FC1205



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s) : Keith R. McNally  
 William H. Roof  
 Richard Bergfeld  
 Group Art Unit: 2776

Serial No : 09/400,413  
 Examiner: TBA

Filed : September 21, 1999

For : INFORMATION MANAGEMENT AND SYNCHRONOUS  
 COMMUNICATIONS SYSTEM WITH MENU GENERATION

*R. Ward*  
*3/17/00*  
*#4 Change*  
*Address*

*TC 2776 UNIT - 18011*

Assistant Commissioner for Patents  
 Washington, D.C. 20231

**REQUEST TO CHANGE CORRESPONDENCE ADDRESS**

Sir.:

Please change the correspondence address of record in the above-identified application  
 and direct all future correspondence to:

**John W. Osborne**  
**MORGAN & FINNEGAN, L.L.P.**  
 345 Park Avenue  
 New York, New York 10154  
 Telephone No.: (212) 758-4800  
 Facsimile No.: (212) 751-6849

*TECH CENTER 2700*  
*DEC 21 1999*  
*RECEIVED*

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

Dated: December 13, 1999

By: *John W. Osborne*  
 John W. Osborne  
 Reg. No. 36,231

MORGAN & FINNEGAN, L.L.P.  
 345 Park Avenue  
 New York, New York 10154  
 Tel.(212) 758-4800  
 Fax.(212) 751-6849



0210

GP2776 #4

Docket No. 3125-4002

PATENT  
TECHNICAL UNIT 2700  
DEC 21 1999  
RECEIVED

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) : Keith R. McNally Group Art Unit: 2776  
 William H. Roof  
 Richard Bergfeld

Serial No : 09/400,413 Examiner: TBA

Filed : September 21, 1999

For : INFORMATION MANAGEMENT AND SYNCHRONOUS  
 COMMUNICATIONS SYSTEM WITH MENU GENERATION

CERTIFICATE OF MAILING (37 C.F.R. 1.8a)

ASSISTANT COMMISSIONER FOR PATENTS  
Washington, D.C. 20231

Sir:

I hereby certify that the attached:

1. Request To Change Correspondence Address; and
2. Return 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: Assistant Commissioner for Patents, Washington, D.C. 20231.

Respectfully submitted,

MORGAN & FINNEGAN, L.L.P.

  
 John Osborne  
 Registration No. 36,231

Dated: December 13, 1999

CORRESPONDENCE ADDRESS:  
 MORGAN & FINNEGAN LLP  
 345 Park Avenue  
 New York, New York 10154  
 (212) 758-4800  
 (212) 751-6849 Facsimile

509073\_1



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/27/00, 213    09/21/97    MURPHY    K    3125-400

EXAMINER

TW02/1129

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MORGAN & FINNEGAN, LLP  
345 PARK AVENUE  
NEW YORK NY 10154

ART UNIT    PAPER NUMBER

DATE MAILED:

11/29/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.  
09/400,413

Applicant(s)  
McNally et al.

Examiner  
Cao "Kevin" Nguyen

Group Art Unit  
2173



Responsive to communication(s) filed on 9/21/99

This action is **FINAL**.

Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

### Disposition of Claim

Claim(s) 1-43 is/are pending in the ap

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consider

Claim(s) 20-30 and 40-43 is/are allowed.

Claim(s) 1-19 and 31-39 is/are rejected

Claim(s) \_\_\_\_\_ is/are objected

Claims \_\_\_\_\_ are subject to restriction or election requirem

### Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

The proposed drawing correction, filed on \_\_\_\_\_ is  approved  disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All  Some\*  None of the CERTIFIED copies of the priority documents have been  
 received.

received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

### Attachment(s)

Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

Interview Summary, PTO-413

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

Art Unit: 2173

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(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© of this title before the invention thereof by the applicant for patent.

2. Claims 1-19 and 31-39 are rejected under 35 U.S.C. 102(e) as being anticipated by Cupps et al. (5,991,739).

Regarding claim 1, Cupps discloses an information management and synchronous communications system for generating menus comprising: a central processing unit, a data storage device connected to said central processing unit, an operating system including a graphical user interface (see figure 2), a first menu stored on said data storage device, application software for generating a second menu from said first menu, wherein the application software facilitates the generation of the second menu by allowing selection of items from the first menu, addition of items to the second menu and assignment of parameters to items in the second menu using the graphical user interface of said operating system (see col. 9, lines 42-67).

Art Unit: 2173

Regarding claim 2, Cupps discloses an information management and synchronous communications system, wherein the second menu is a restaurant menu (see col. 5, lines 27-67).

Regarding claim 3, Cupps discloses an information management and synchronous communications system, wherein the second menu is capable of being displayed on the display screen of a wireless computing device (see col. 4, lines 1-55).

Regarding claims 4 and 5, Cupps discloses an information management and synchronous communications system, wherein selections from the second menu are capable of being transmitted to a receiving computer by wireless link.(see figures 1-2).

Regarding claims 6 and 7, Cupps discloses an information management and synchronous communications system in, wherein the computer network is the internet; and selections from the second menu are capable of being transmitted to a receiving computer via the internet (see col. 9, lines 16-65 and figure 8-10).

Regarding claims 8-11, Cupps discloses an information management and synchronous communications system, wherein the second menu is created in conformity with hypertext markup language or extensible markup language (see col. 10, lines 8-56 and figures 7-10).

As claims 12-19 and 31-39 are analyzed as previously discussed with respect to claims 1-11 above.



Art Unit: 2173

*Allowable Subject Matter*

3. Claims 20-30 and 40-43 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 a sub-modifier menu stored on data storage device and displayable in a window of graphical user 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. 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 claims 20 and 40 are identified the uniquely distinct features "a sub-modifier menu stored on data storage device and displayable in a window of graphical user 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". 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.

Art Unit: 2173

*Conclusion*

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and provided on the attached Form 892.

*Response*

5. Responses to this action should be mailed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. If applicant desires to fax a response, (703) 308-6306 may be used for formal communications.

Please label "PROPOSED" or "DRAFT" for informal facsimile communications. For after final responses, please label "AFTER FINAL" or "EXPEDITED PROCEDURE" on the document.

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA. Sixth Floor (Receptionist).

*Inquires*

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cao (Kevin) Nguyen whose telephone number is (703) 305-3972. The examiner can normally be reached on Monday-Friday from 8:30 am to 6:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W. Cabeca, can be reached on (703) 308-3116. The fax number for this group is (703) 308-6360.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.

**PATENT EXAMINER**

**Art Unit 2173**



Cao "Kevin" Nguyen  
November 27, 2000

# Notice of References Cited

Application No. 09/400,413	Applicant/ McNally et al.
Examiner Cao "Kevin" Nguyen	Group Art Unit 2173
Page 1 of 1	

## U.S. PATENT DOCUMENTS

	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS
A	5,724,069	3/98	CHEN	345	156
B	5,991,739	11/99	CUPPS et al.	705	26
C	5,912,734	6/99	Kinebuchi et al.	345	348
D	5,802,526	4/1/98	Fawcett et al.	707	104
E					
F					
G					
H					
I					
J					
K					
L					

## FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS
M						
N						
O						
P						
Q						
R						

## NON-PATENT DOCUMENTS

	DOCUMENT (Including Author, Title, Source, and Pertinent Pages)	DATE
U		
V		
W		
X		



US005724069A

# United States Patent [19] Chen

[11] Patent Number: **5,724,069**  
[45] Date of Patent: **Mar. 3, 1998**

[54] **SPECIAL PURPOSE TERMINAL FOR INTERACTIVE USER INTERFACE**  
[76] Inventor: **Jack Y. Chen, 3773 Fox Pointe Rd., Rockford, Ill. 61114**

5,177,328	1/1993	Ito et al.	345/173
5,185,628	2/1993	Wilson et al.	355/209
5,202,817	4/1993	Koenck et al.	361/393
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5,302,969	4/1994	Kuroda et al.	345/168
5,305,014	4/1994	Mutschler et al.	345/173

[21] Appl. No.: **275,847**

[22] Filed: **Jul. 15, 1994**

[51] Int. Cl.<sup>6</sup> ..... **G09G 5/00**

[52] U.S. Cl. .... **345/172; 345/173**

[58] Field of Search ..... **345/156, 168, 345/169, 173, 901, 903, 905, 172; 364/708, 709.01, 709.02, 709.11, 709.12, 709.15**

### [56] References Cited

#### U.S. PATENT DOCUMENTS

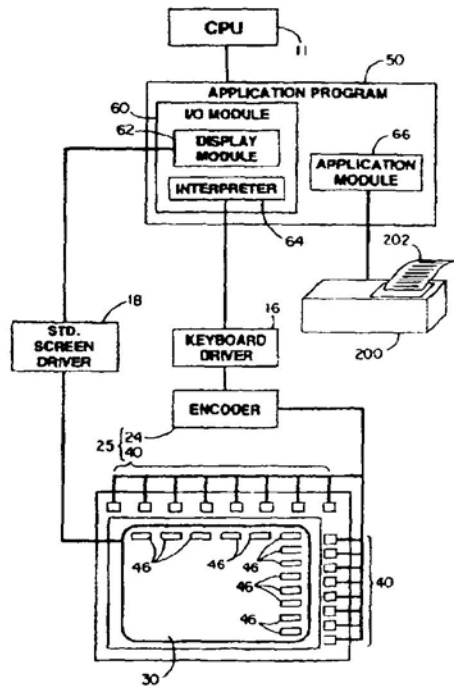
D. 287,969	1/1987	Kusanagi	D14/106
D. 310,662	9/1990	Fellma et al.	D14/106
D. 345,351	3/1994	Wingate	D4/115
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4,964,018	10/1990	Mallory et al.	361/391
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5,121,477	6/1992	Koopmans et al.	395/156

Primary Examiner—Mark R. Powell  
Assistant Examiner—Matthew Luu  
Attorney, Agent, or Firm—Leydig, Voit & Mayer, Ltd.

### [57] ABSTRACT

A special purpose microcomputer-based terminal for interactive user interface. The terminal includes a general purpose microcomputer and an interface module made up of a general purpose display screen and an array of pushbuttons positioned along the sides of the screen. Actuating a pushbutton causes the interface module to generate a standard keystroke signal which is transmitted to the microcomputer through the keyboard port. The input elements of the user interface thus make use of the standard keyboard drivers normally available in a general purpose microcomputer to communicate with the application program. The application program in the computer memory displays on-the-screen selection indicators for available options coordinated to the positions of the pushbuttons, and actuating a button serves to select an option. The application program may present to a user options organized in hierarchal menu tree fashion, and the user may select a path through the menu tree by consecutively actuating the buttons.

18 Claims, 11 Drawing Sheets



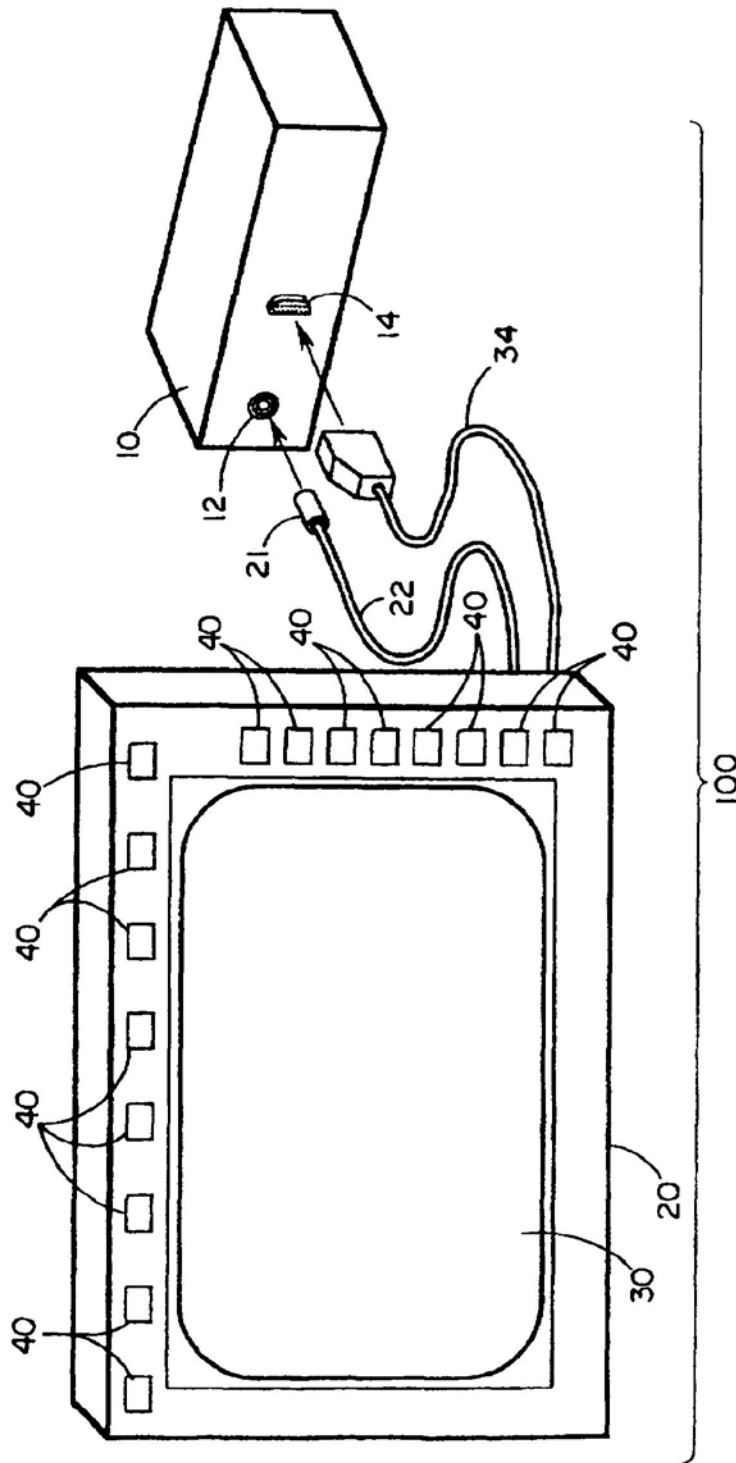
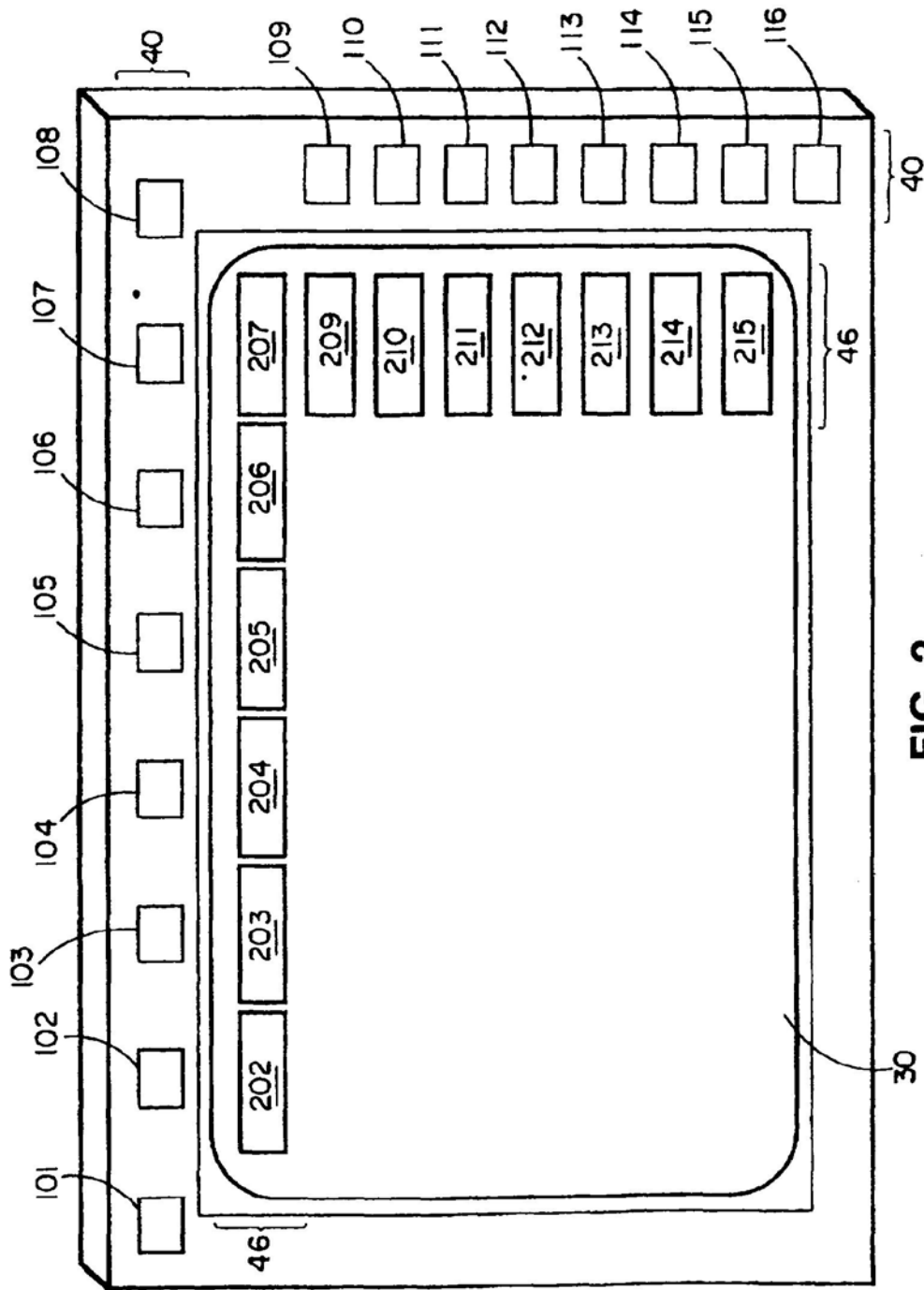


FIG. 1



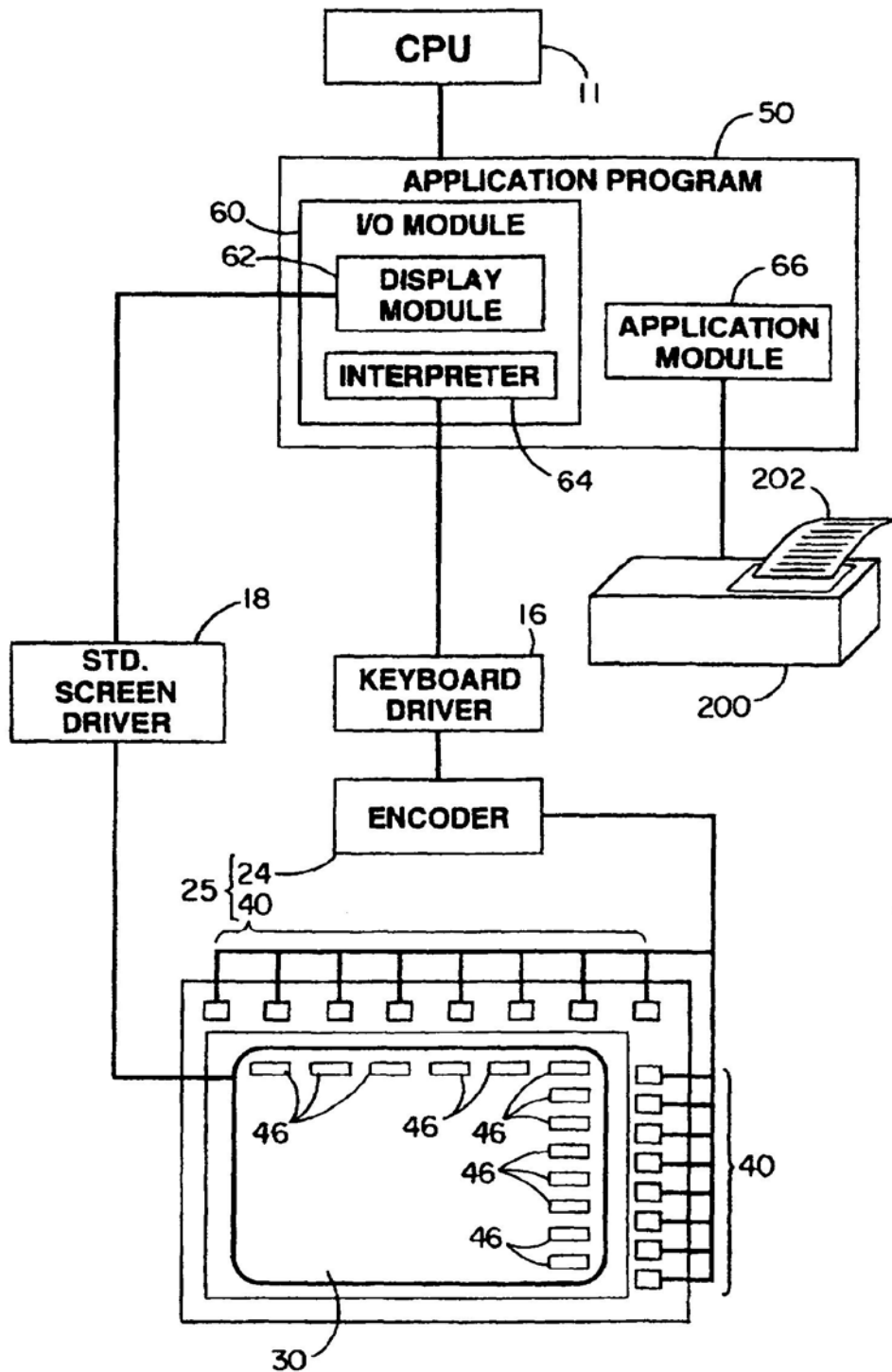


FIG. 3



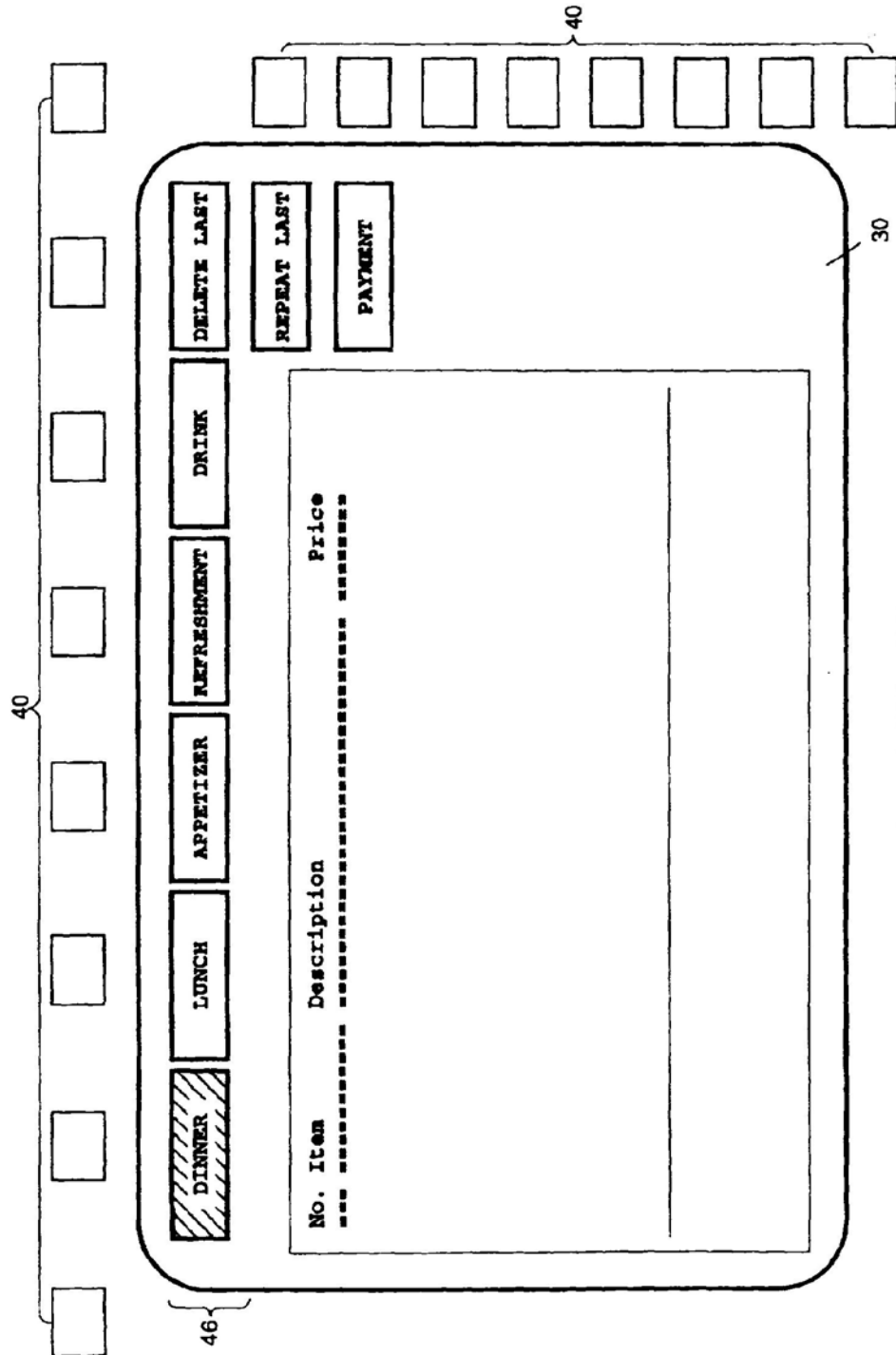


FIG. 4A

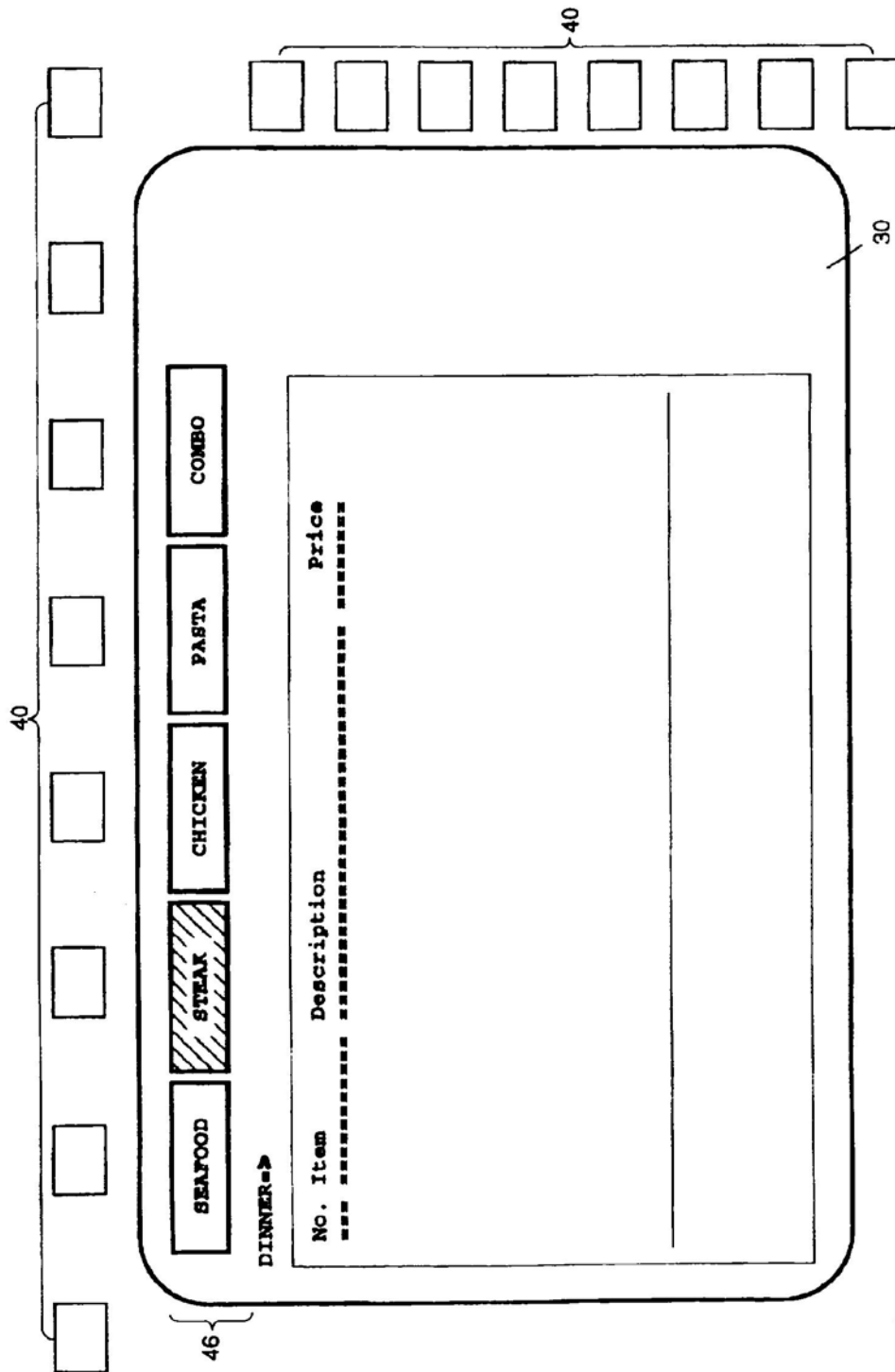


FIG. 4B

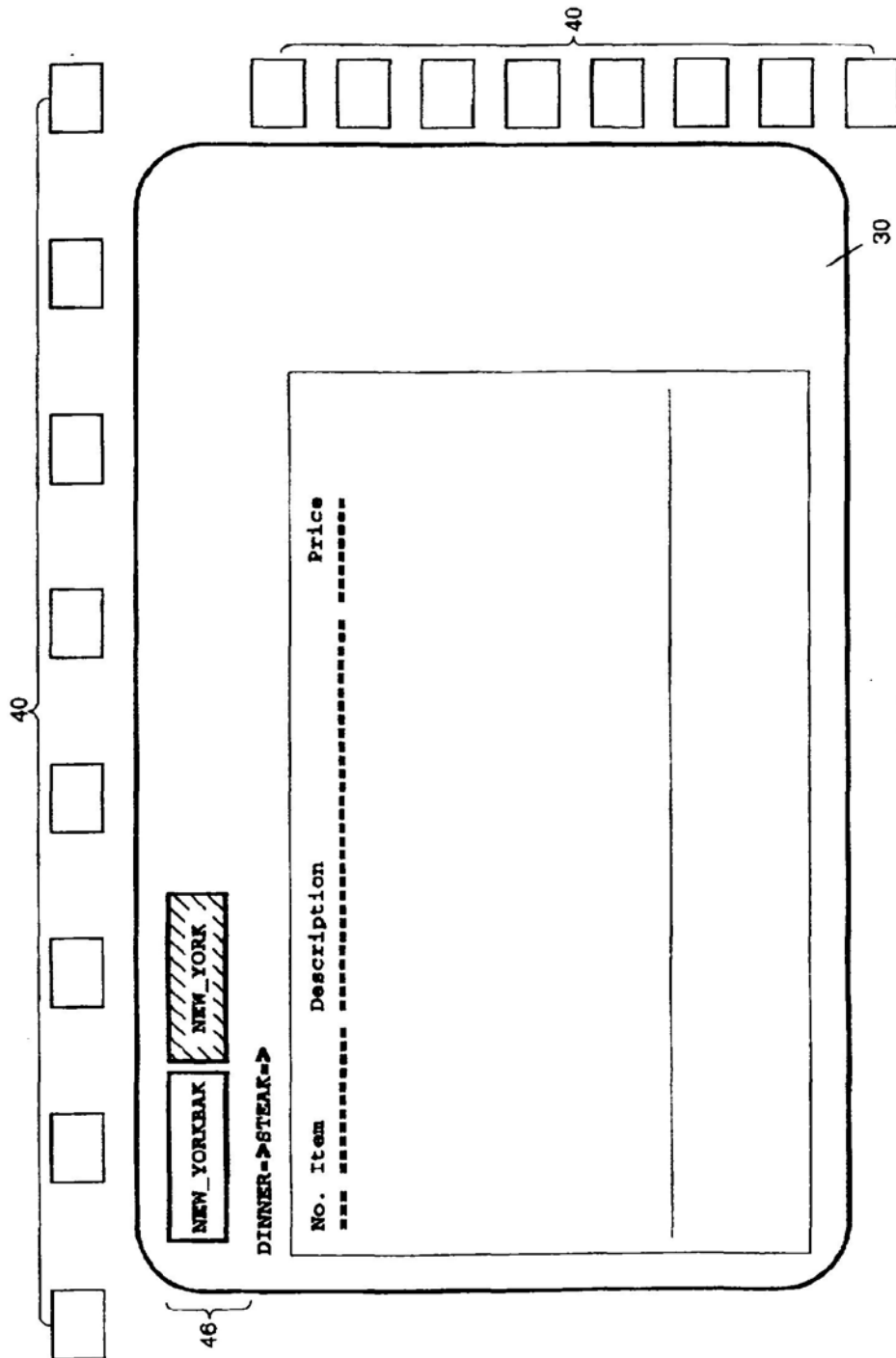


FIG. 4C

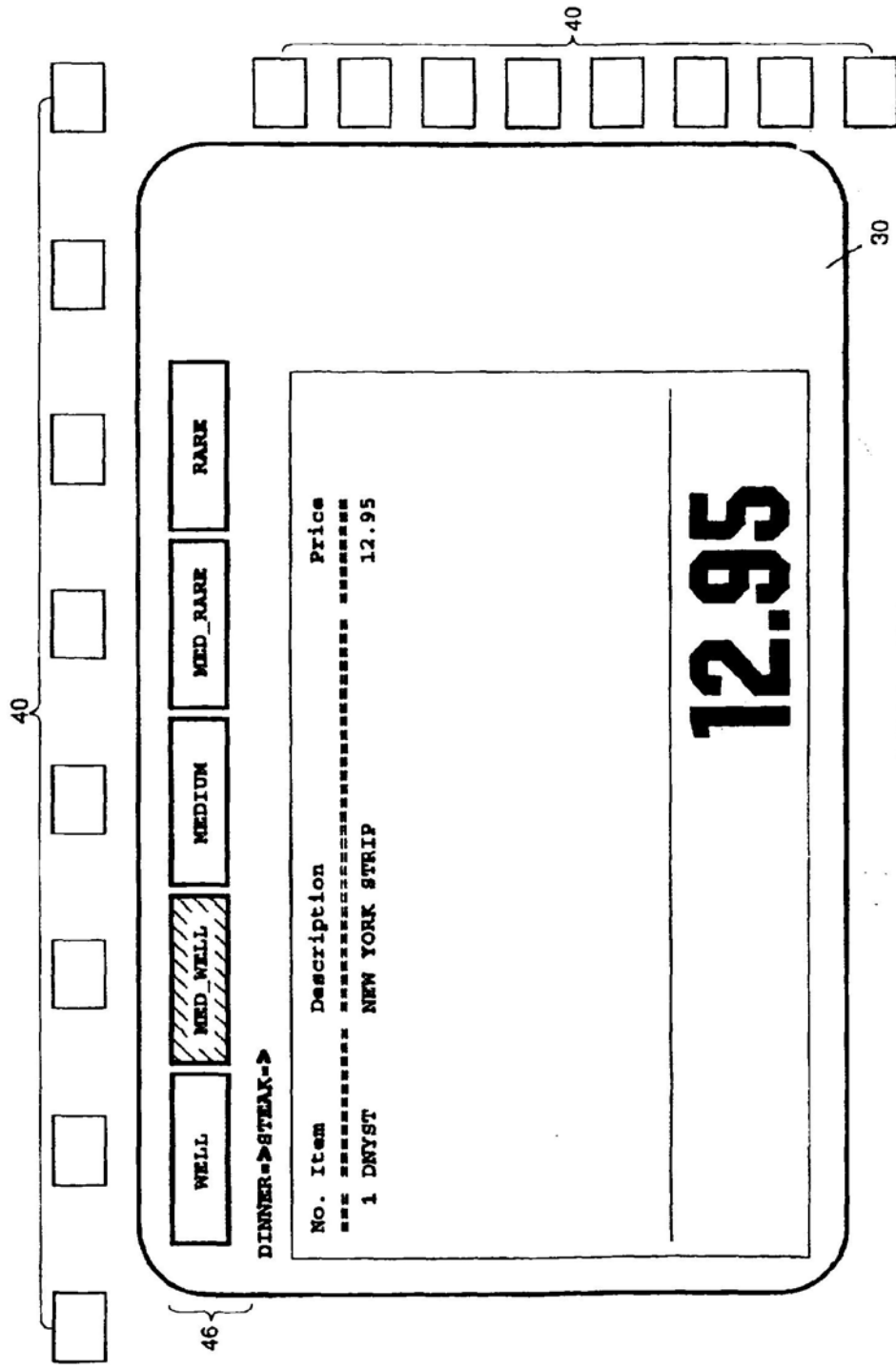


FIG. 4D

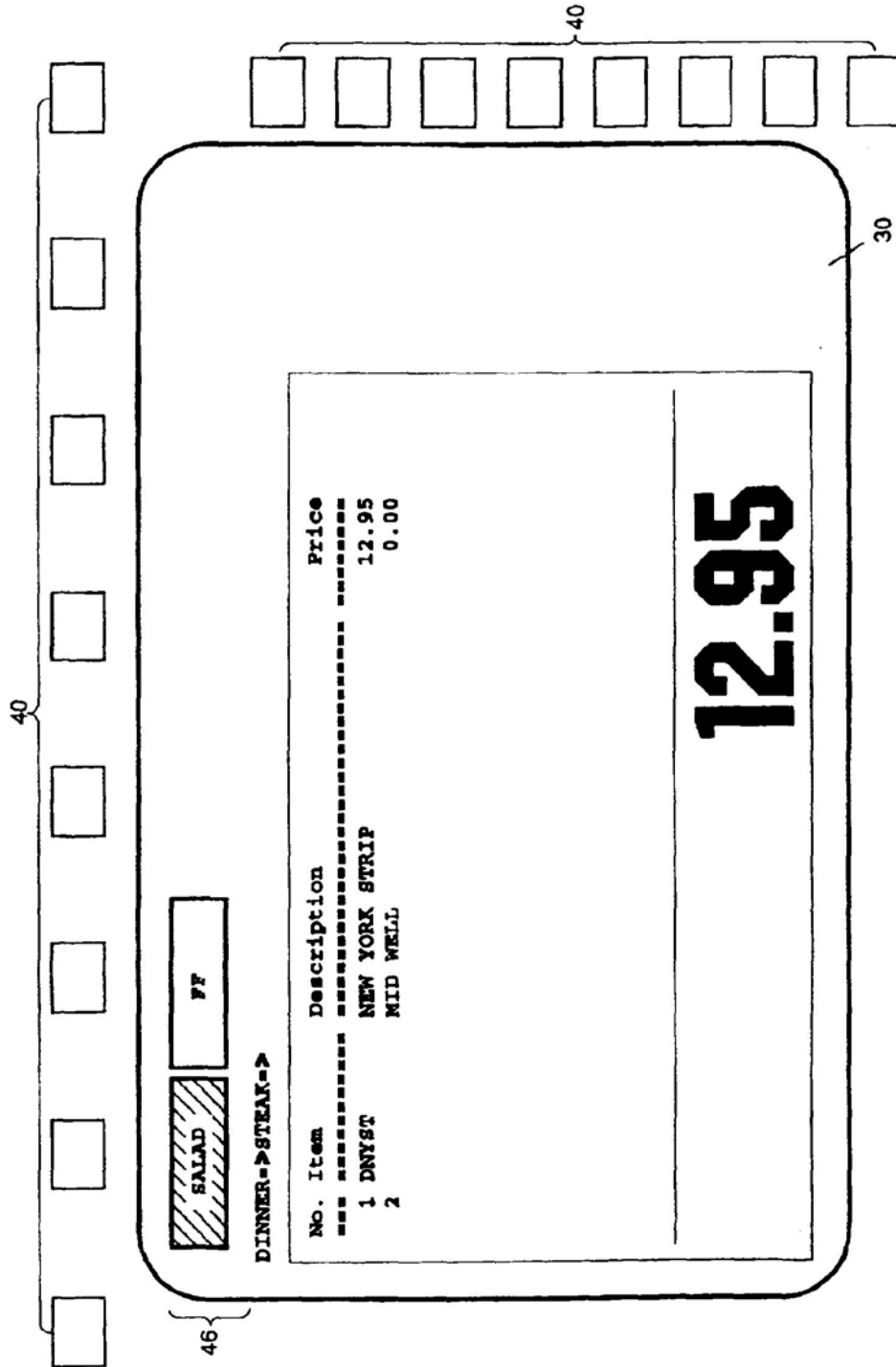


FIG. 4E

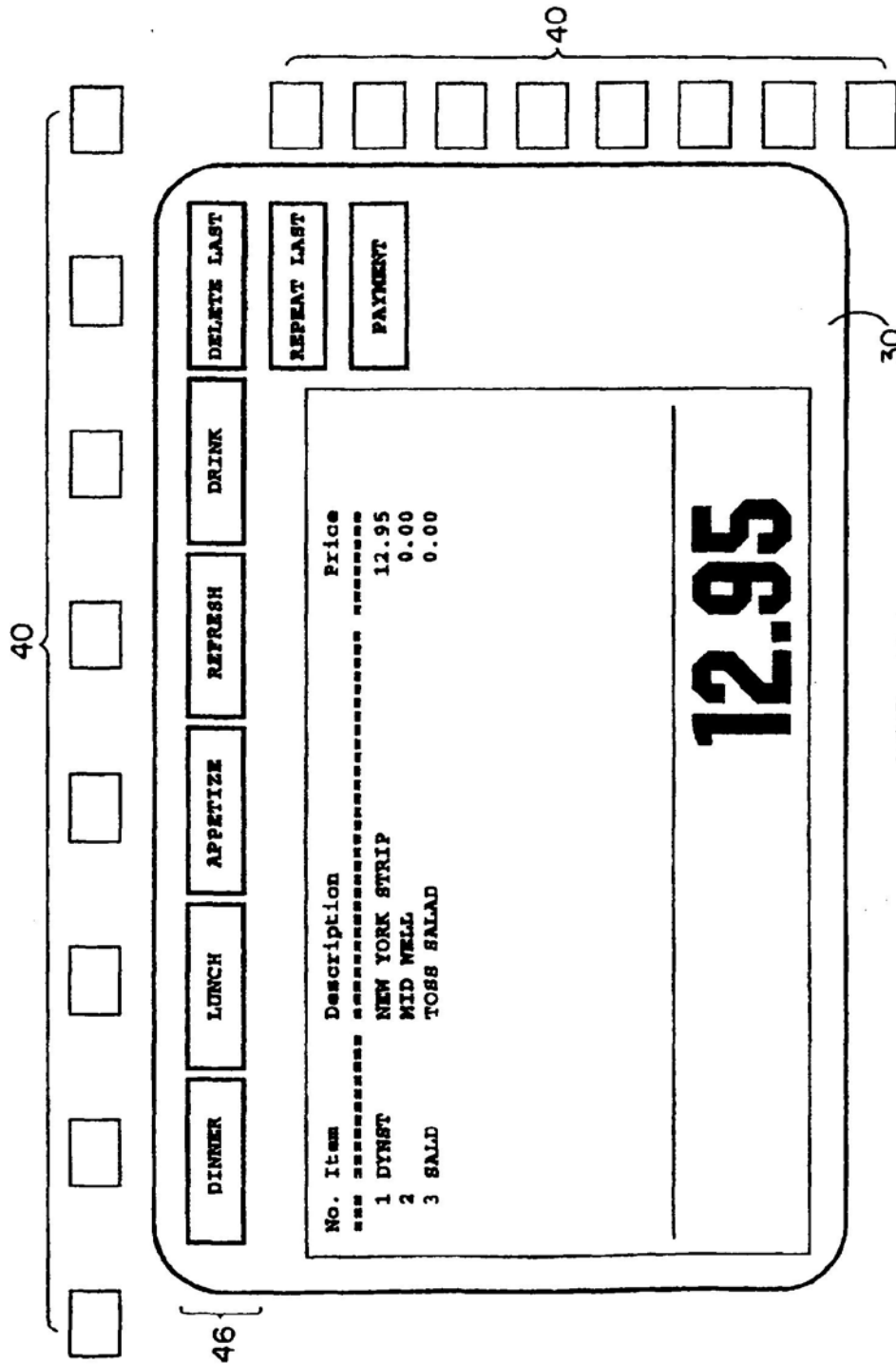


FIG. 4F

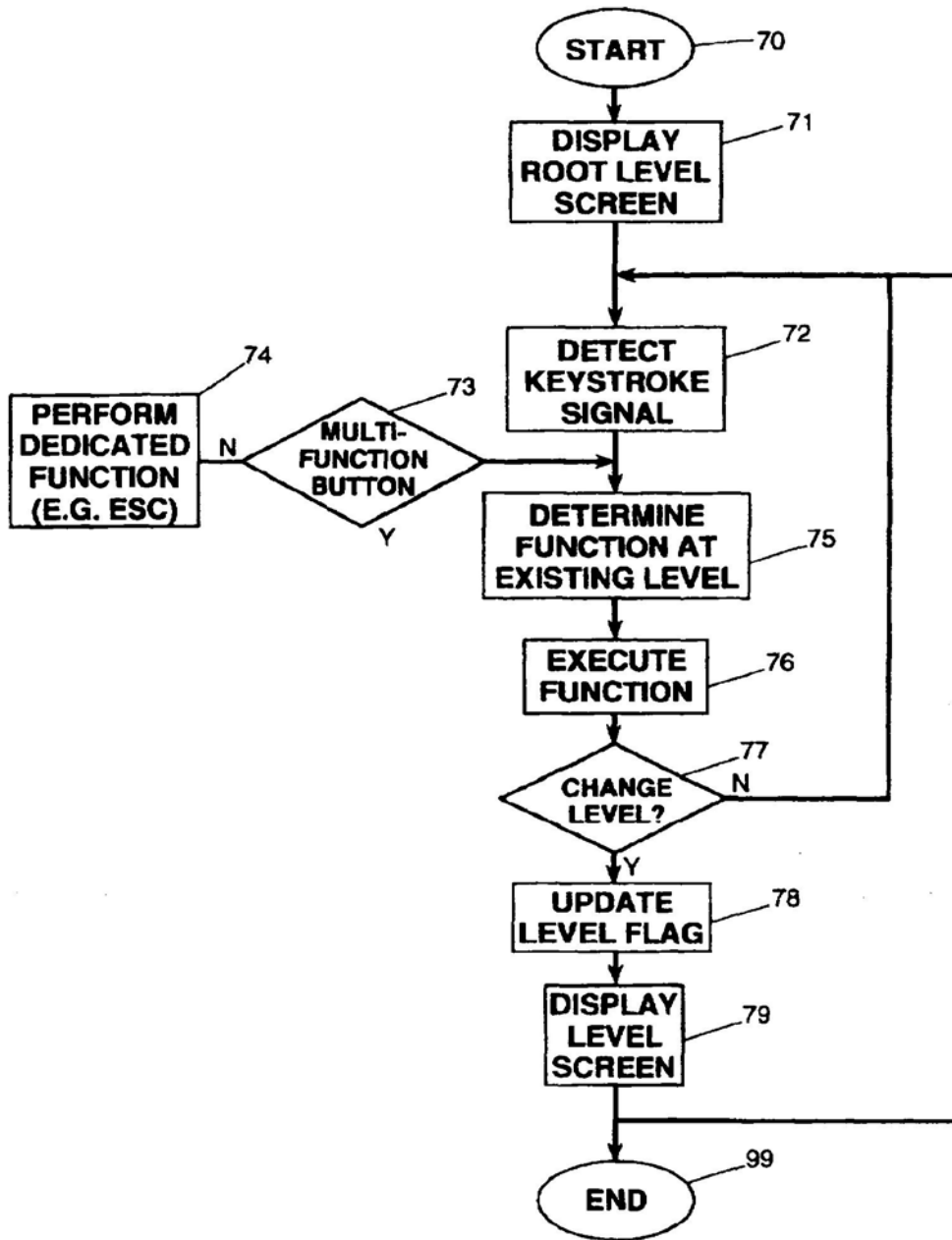


FIG. 5

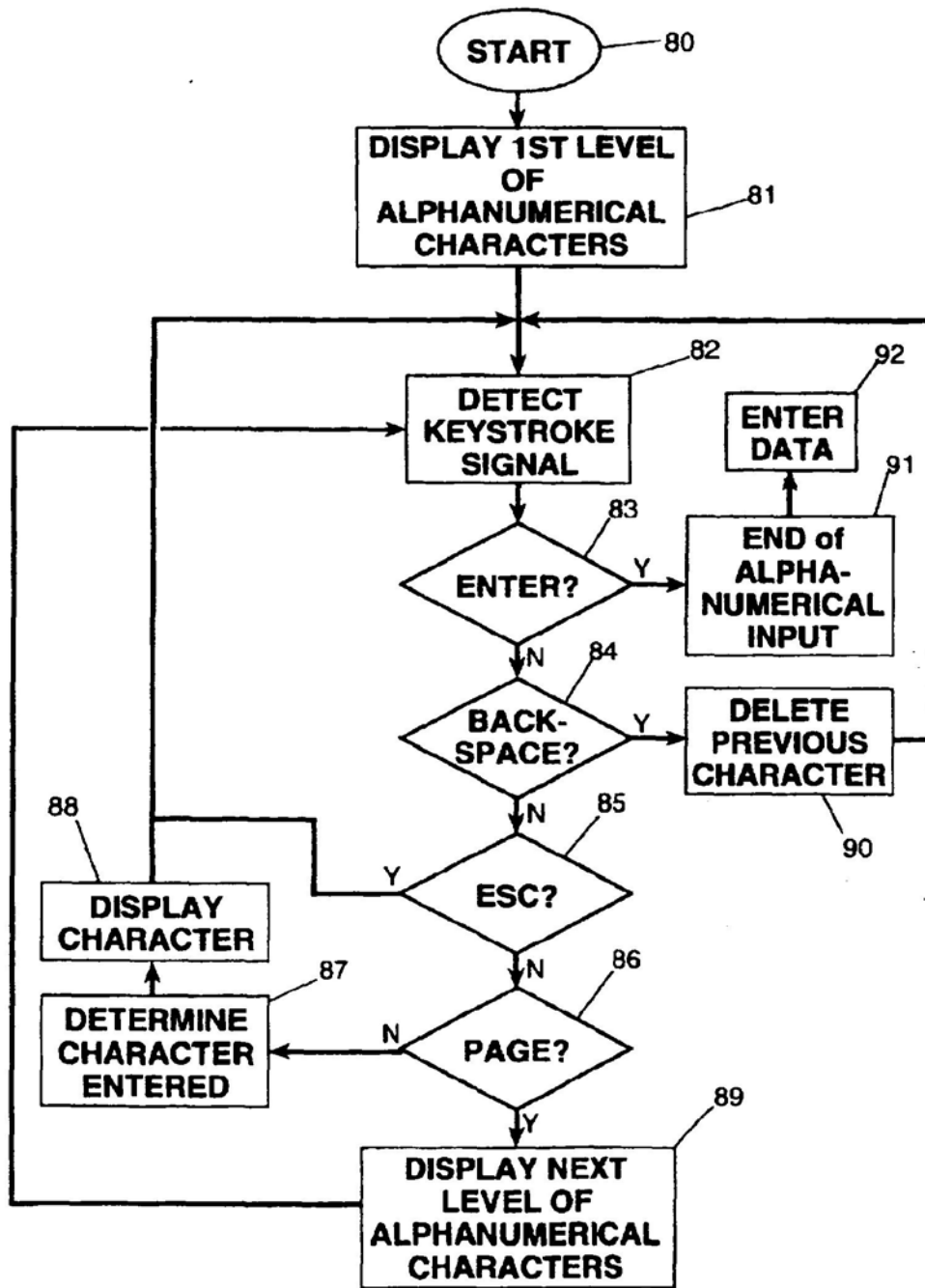


FIG. 6



## SPECIAL PURPOSE TERMINAL FOR INTERACTIVE USER INTERFACE

### FIELD OF THE INVENTION

The present invention relates generally to a microcomputer-based terminal, and more particularly to a special purpose terminal based on a general purpose microcomputer, and having a simplified user interface.

### BACKGROUND OF THE INVENTION

Special purpose microcomputer-based terminals have been widely used in consumer service applications. For example, a department store can use an interactive terminal to provide a customer with information about the prices and selections of goods in the store, or a restaurant can use an interactive terminal for taking orders from a customer. Generally the terminal-user interactive interface is accomplished by the terminal presenting available options on an output device to a user, and the user indicating through an input device the option selected. Many different types of input and output devices may be used. For example, the output device may be a printer or a display screen, and the input device may be a standard keyboard or a mouse. A touch screen may also be used to serve both the input and output (I/O) functions.

Using a standard keyboard in the user interface is quite acceptable for a general purpose terminal, where some computer familiarity is expected, but for a special purpose terminal for the non-computer experienced user, the standard keyboard interface is less than desirable. It may present too many options, it may trigger a computer-phobic reaction, and indeed it may present too many opportunities for a user to affect the computer terminal beyond the intended limited special purpose functions intended.

Heretofore, a particularly attractive user interface for special purpose terminals has been the touch screen. When a touch screen is used as the I/O device of an interface terminal, the application program can be designed to display selection indicators on the screen, and a touch of a selection indicator on the screen will be detected and interpreted by the program as the selection of that option. A touch screen is often preferred to a keyboard or a mouse as the input device because the user actions for using a touch screen, i.e. looking and pointing, are often considered to be simple and intuitive. It is also often desirable to have one device serving both input and output functions instead of using physically separate input and output devices.

A touch screen, however, is not without disadvantages. Special construction and electronics are required for sensing a touch and determining the location of the touch on the screen. Feeding such information into the microcomputer also requires specially designed driver circuits and a specially designed computer interface. These special circuits not only increase the cost of the touch screen interface, but also increase the difficulty of software development because the software must be specially designed to communicate with the driver circuit. The system portability of the interface terminal is also reduced because the touch screen cannot be used with another microcomputer which does not have the special drivers. The special design of the front end (interface and drivers), typically demands that a special purpose terminal with touch screen interface be available for development or modification of application programs.

Another problem with the touch screen is that the screen can get contaminated from contact with hands rather quickly. This problem is especially serious in a restaurant

setting where the device is used for menu selection, because the user of the terminal may also have to handle foods. Devices using a keyboard or a mouse are also not suitable for restaurant applications due to the danger of accidental damage caused by, for example, spilling drink on the keyboard.

### SUMMARY OF THE INVENTION

In view of the foregoing, it is a general aim of this invention to provide a special purpose terminal using general purpose computer hardware, to achieve simplicity and directness like that of a touch screen, but to avoid the disadvantages of a touch screen.

In accomplishing that aim, it is an object of the present invention to provide a special purpose terminal using general purpose computer hardware to the maximum extent possible, and to achieve a user interface like that of a touch screen, but without the complication or expense of special purpose drivers or interface circuits normally associated with a touch screen. It is a related object to use the drivers normally associated with a general purpose computer to interface a special purpose user-friendly input device to the general purpose computer.

According to a particular application of the invention, it is an object to provide a user interface device which is suitable for use in an environment like a restaurant where contamination of the device is a concern.

It is a feature of the invention that a standard general purpose microcomputer is operated without a standard keyboard, and a special purpose user interface is connected to the keyboard port of the general purpose computer, the application software of the system serving to assign functions to an array of pushbuttons of the user interface, and to interpret pushbutton actuations according to the assigned functions.

It is a subsidiary feature of the invention that the application programs for the special purpose terminals are designed in several levels, preferably nested in hierarchical menu tree fashion, and the functions are assigned by displaying, on a general purpose display, the functions for the respective pushbuttons, with at least some of the functions changing with changing level. The application then interprets an actuation of a pushbutton according to the level existing at the time of the actuation.

Thus, it is a resulting feature of the invention that an array of conventional pushbuttons can be interfaced to the general purpose microcomputer via a keyboard port, the display driven by the application software to provide touch screen like functionality to the pushbuttons, with the multiple levels of the application assigning multiple functions to the pushbuttons depending on the level. It is a significant feature that this is all accomplished without the need for any special purpose interface boards in the computer and without the need for specially design screens capable of sensing touch.

These and other features of the invention are achieved by providing a special purpose microcomputer-based terminal for interactive user interface. The terminal utilizes a general purpose microcomputer having a display port and a keyboard port. The keyboard port is interfaced to a microcomputer keyboard driver of the type responsive to interpret keystroke signals in a standard format transmitted from a standard alphanumeric keyboard. However, the microcomputer-based terminal does not have a standard alphanumeric keyboard connected to the keyboard port. Instead, a user input module includes a plurality of electrical pushbuttons arranged along at least one side of the display

and an encoder circuit for detecting the actuation of each pushbutton and producing a keystroke signal identifying the actuated pushbutton and compatible with the standard format of the keyboard driver. The user input module is connected to the microcomputer via the keyboard port. A standard general purpose display screen is connected to the display port of the microcomputer. A program memory in the microcomputer contains instructions which (a) assign specific input functions to the pushbuttons, and (b) display pushbutton function assignments on the display screen in positions coordinated to the positions of the pushbuttons. The program memory also contains instructions which respond to signals received from the keyboard driver initiated by actuation of a pushbutton by determining the function specified by the pushbutton actuation and executing the determined function.

In a more particular embodiment, a program memory in the microcomputer contain an input/output module having multiple levels for assigning level-specific functions to the pushbuttons. The input/output module includes a display module for displaying on-the-screen representations of the pushbuttons and the functions assigned to the pushbuttons at each level. The input/output module also includes an interpreter for interpreting a keystroke signal in accordance with the function assigned to the actuated pushbutton at the associated level. The program memory, in addition to the input/output module, also contains an application module for executing the interpreted function assigned to the pushbutton at the interpreted level.

In a particular application, the special purpose terminal is a waiter's terminal for a restaurant in which the multiple levels of the input/output module include a stored series of nested menus including root level menus branching to elemental level menus. The root level menu is adapted to assign the courses of a meal to the function keys, a mid-level menu is adapted to assign selections to the courses specified in the root level menu, and sub-level menus are adapted to refine the selections in the mid-level menus. The application module is adapted to guide the user through the menus in completing a selection of a meal, and to produce, at a printout station, an itemized check.

Other objects and advantages will become apparent from the following detailed description when taken in conjunction with the drawings, in which:

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a presently preferred embodiment of the interface terminal of the present invention;

FIG. 2 shows an embodiment of the interface module according to the present invention and graphic representations of the pushbuttons displayed on the screen of the interface module;

FIG. 3 shows a schematic illustration of the functional organization of the terminal of the present invention;

FIGS. 4A-4F illustrate a sequence of screen displays for a restaurant application which presents menu selections organized in a hierarchal menu tree fashion;

FIG. 5 shows a flow chart illustrating the sequence of operation of an application program having multiple levels of functions; and

FIG. 6 shows a flow chart illustrating the process of entering alphanumeric information into a terminal of the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

While the invention will be described in connection with certain preferred embodiments, there is no intention to limit

it to those embodiments. On the contrary, the intent is to cover all alternatives, modifications, and equivalents included within the spirit and scope of the invention as defined by the appended claims.

Turning now to the drawings, FIG. 1 shows an embodiment of the interactive interface terminal 100 of the present invention, which comprises an interface module 20 and a microcomputer 10. The microcomputer 10 is a general purpose computer comprising a microprocessor-based CPU. The phrase "general purpose" as used herein means that the microcomputer is of the type generally available for interfacing with a variety of devices and capable of operating a wide range of software applications. It is to be contrasted with "special purpose", which connotes a microcomputer system specially adapted for a limited specific purpose. An example of the former is the wide range of DOS-based computers available from a large number of manufacturers, while an example of the latter might be a terminal dedicated to dispensing lottery tickets.

The general purpose microcomputer 10 conventionally has a keyboard port 12 and a display port 14. A standard alphanumerical keyboard is typically connected to the microcomputer through the keyboard port, often to serve as the primary input device. The general purpose computer used in the terminal of the present invention, however, does not have a standard keyboard connected to the keyboard port 12. The display port 14 allows a standard display screen 30 to be connected to and driven by the microcomputer. The display 30 is illustrated as a CRT, although other forms such as the LCD display can be used.

Internally to the microcomputer 10, the keyboard port 12 is interfaced to a keyboard driver 16 (FIG. 3). The keyboard driver is compatible with a standard alphanumerical keyboard, and includes hardware and software elements. The hardware elements include the necessary integrated circuits and the like which accept signals from the keyboard and process them to produce data words recognizable by the microcomputer system. The software elements include keyboard driver elements, typically resident within the input/output system (e.g., the BIOS), which process the keyboard signal to produce data words which serve as inputs to the microprocessor within the computer system. Both the hardware and software elements are resident in the typical general purpose microcomputer 10 such that it is only necessary to plug a keyboard into the port 12, the hardware and software elements of the keyboard driver being available to immediately accept input from the keyboard.

Generally, a keyboard functions by converting a keystroke into an electrical signal, generally a binary code. To that end, the conventional keyboard itself usually includes a keyboard encoder which performs the ordinary tasks of scanning the keyboard, detecting actuations of any keys, and producing binary coded signals indicating the identity of the key which had been depressed. The code which is produced by the encoder is transmitted to the microcomputer through a signal bus terminated with a connector 21 connected to the keyboard port 12. The keyboard driver 16 (FIG. 3) within the microcomputer receives the code and produces data words accessible to the microcomputer system for determining which key has been actuated, and responding according to the program in operation at the time. Because a keyboard is a standard input device for general purpose microcomputers, most general purpose microcomputers contain a keyboard driver as a standard feature.

In accordance with an important aspect of the present invention, the special purpose interface module 20 makes

full use of the keyboard port 12 and its associated drivers in integrating the special purpose user interface of the present invention with a general purpose microcomputer 10. In addition, the interface module 20 of the present invention makes use of a general purpose display screen 30, such as the illustrated CRT, driven from the standard display port 14 through a connection cable 34. It will thus be appreciated that the only truly special purpose features of the present invention are the input interface elements themselves, the remainder being elements which are integral to the readily available, and generally inexpensive available, standard microcomputer system.

Turning in greater detail to the input aspects of the invention, the input module 25 (FIG. 3) comprises a plurality of pushbuttons 40 mounted on a bezel 41 surrounding the screen 30. Preferably, the pushbuttons 40 are arranged in lines along two or more sides of the display screen 30. The interface module 20 in FIG. 1 has eight buttons above the screen 30 and eight buttons along the right side of the screen, forming an inverted "L" shaped array. The number of the pushbuttons and their locations alongside the screen can be varied according to the needs of a specific application. For instance, the pushbuttons can be located along only one side of the screen 30. It is preferred, however, to arrange the pushbuttons 40 in an inverted L-shape forming two lines, one along the top and the other along the right-hand side of the screen 30. In conjunction with the display which is utilized in the assignment of functions to the pushbuttons, the inverted L as illustrated in the figures is most readily suited for ease of operation by a right-handed person. In order to produce signals which are readily interpreted by the keyboard driver of the standard microcomputer, the input module includes an encoder circuit 24 (FIG. 3) which senses the actuation of the pushbuttons and generate keystroke signals which are identical in form to the keystroke signals generated by a standard keyboard. The keystroke signals are transmitted through a signal bus 22 terminated with a connector 21 connected to the keyboard port 12. Because the keystroke signals are compatible with the standard format of the keyboard driver, they can be handled by the keyboard driver, and processed by the BIOS to be made available to the application software being operated in the microcomputer. As a result, no specially designed drivers (either hardware or software) are needed for handling the input from the interface module.

There are significant advantages to using an interface module which can be driven by a general purpose microcomputer without any specially designed drivers. The cost of the terminal system is lower and installation of the system is simpler because no special drivers are required. The interface module is also more portable in the sense that it can be matched with different microcomputers without having to install special drivers. Because the method of interfacing a keyboard to a general purpose microcomputers is fairly standardized, developing an application program which receives input from the keyboard port generally requires less testing and debugging than developing a program receiving input from a specially designed driver circuit. Furthermore, new applications can be developed or existing applications can be modified without the need for a special purpose terminal. Indeed, software development can be performed on a standard microcomputer using a standard keyboard, so long as the software developer knows the particular codes of the keyboard signals which will be used for each of the buttons 40 in the special purpose terminal 100.

In practicing the invention, there is provided, in combination with the array of pushbuttons around the display,

means for assigning particular functions to the pushbuttons, and changing the assignment of functions at different levels of the application program. Because the number of pushbuttons should be quite limited in order to keep the user interface reasonably simple and intuitive, it will usually be desirable to assign multiple functions to at least some of the pushbuttons. It is therefore necessary to indicate to a user which function has been assigned to a pushbutton.

FIG. 2 illustrates a preferred means for accomplishing that. The interface module 20 as shown in FIG. 2 has an array of pushbuttons 40 which are individually numbered 101-116. As shown in FIG. 2, the application software operated within the microprocessor causes the display on the screen 30 of a group of graphic representations 46 individually numbered 202-207, 209-215. A graphic representation is a graphic image suggestive of a pushbutton. The graphic representations 46 are positionally juxtaposed to the pushbuttons 40, and indicating the function which is currently assigned to each of the pushbuttons. To further assist the user in selecting a function, information about the functions may also be displayed on the screen. By coordinating representations 46 on the screen 30 to the positions of the pushbuttons 40 along the sides of the screen, the user can clearly tell which pushbutton 40 is assigned to which graphic representation.

FIG. 2 shows the preferred embodiment of the interface module of the present invention which has the pushbuttons 40 arranged in an inverted "L" shape. Because the representations 46 of the pushbuttons are positionally coordinated to the pushbuttons 40, the center of the screen 30 is free for display of application information.

When the user actuates a pushbutton 40, a keystroke signal is sent to the keyboard driver 16 (FIG. 3). The program uses the signal received through the keyboard driver to determine which pushbutton has been actuated, thereby determining which function has been selected. For example, when the pushbutton 202 is actuated, the function assigned to it by the program is selected.

Besides being used to select functions, the pushbuttons can be used for entering alphanumeric data. For example, the function assigned to pushbutton 202 in FIG. 2 may be to input the digit "1". Pressing that button then interpreted by the program as that the digit "1" has been entered.

It may be desirable in some situations to assign permanent functions to some of the pushbuttons, and those functions can either be assigned, insofar as the user interface is concerned, by indicators on the screen 30, or by permanent markings on the buttons 40. In the preferred embodiment of the interface module as shown in FIG. 2, the three pushbuttons 101, 108, 116 located at the upper left, upper right, and lower right corners of the bezel 41 surrounding the screen 40 are generally reserved for those fixed special functions.

FIG. 3 illustrates schematically the functional organization of the terminal of the present invention. The application program 50 in the memory can generally be viewed as functionally comprising two major modules. The first module is the I/O module 60 which is responsible for controlling the course of the computer-user interaction. The course of interaction may be viewed as comprising many levels, and at each level the user is required to make one choice. The operation of the program correspondingly has many levels. At each level the I/O module 60 performs the output function of presenting to the user a set of functions for the user to choose from, and the input function of receiving a keystroke signal from the user indicating which function has been selected. The functions presented to the user are

level-specific, meaning that which functions are presented depends on the level of operation. The I/O module 60 also assigns the level specific functions to the pushbuttons 40 so that the user can press one button to select its assigned function.

The second module in the application program is the application module 66. This module is responsible for carrying out the functions selected by the user. For instance, a selected function can be printing out a check 202 on an attached printer 200, or displaying a road map on the display screen 30.

Based on the input or output functions, The I/O module 60 can be further viewed as comprising a display module 62 and an interpreter 64. The display module 62 performs the output function of displaying on the screen graphic representations 46 of pushbuttons and their respectively assigned level-specific functions. The interpreter 64 performs the input function. The interpreter 64 receives from the keyboard driver 16 a signal identifying the pushbutton 40 that has been pressed, and checks the level-specific function assignments of the pushbuttons 40 to determine which function has been selected by the user. It will be appreciated that each level of interaction involves the operation of the display module 62 and the interpreter 64.

Operating the terminal of the present invention requires simply looking at the screen 30 and pressing a button 40. Due to the visual connection between the buttons and the graphic representations 46, these actions are relatively simple and intuitive, and are very similar to the looking and pointing actions for a touch screen.

While providing ease of operation similar to that of touch screens, the interface module of the present invention has several advantages over a touch screen. First, unlike touch screens which requires special construction and electronic circuits for detecting a touch, electrical pushbuttons are simple devices which are inexpensive and easy to maintain. Second, the present invention utilizes the already existing drivers in the microcomputer, thereby eliminating the need of a specially designed drivers or interfaces.

In many applications, the instructions in the application memory of the microcomputer can be programmed to present to a user functions organized in a hierarchical menu tree fashion. At a given time the program displays on the screen selection indicators for options on one level of the menu tree. After the user selects an option by pressing a button, the program responds by presenting new functions on the next level of the menu tree to the user. Which new options are presented depends on which option has been selected. By consecutive actuations of the buttons, a user can select a path through the menu tree.

Inputting and processing orders from a customer in a restaurant, that is functioning as a special purpose waiter's terminal, represents a currently preferred application for a microcomputer-based terminal according to the present invention. The terminal of the present invention is well suited for such an application, because its interface module is less sensitive to contamination than a touch screen, and is not as susceptible to accidental damage as a standard keyboard. Its simplicity of operation also makes it superior to a interface terminal using a keyboard or a mouse.

When a terminal of the present invention is used as a waiter's terminal for entering orders from customers, the multiple levels of input/output module may include a stored series of nested menus containing options available from a regular restaurant menu. The menus are nested to provide a basic or root level menu branching to elemental level menus,

the elemental menus including, at least in some cases, mid-level menus followed by sub-level menus. This nesting is convenient in order to automatically move from a selection at a root level to the options available at a mid-level, to refinements to the selected options available at sub-level menu. The user need not be concerned with how to get from level to level in order to make the selections. Simply making a selection at one of the higher level menus indexes the level to the next sequential appropriate level, based on the selection already made, so that the sub-items and refinements can be selected.

In greater detail, FIGS. 4A-4F illustrate a series of screens forming at least one branch of a series of nested menus in a waiter's terminal according to the present invention. These figures each show a display screen 30 illustrated at one level of the application software. They also illustrate the multi-function pushbuttons 40 arranged on the bezel 41 surrounding the screen 30, and demonstrate a sequence of steps for selecting a path through the hierarchal menu tree of options.

Beginning with FIG. 4A, the screen 30 shows graphic representations 46 in rectangular boxes for options on the root level of the menu tree, indicating that the user can order dinner, lunch, appetizer, refreshments or drink. The graphic representation labeled DINNER in FIG. 4A is shaded to indicate that it is selected by the user. The same convention is used in FIGS. 4B-4F. The representations labeled DELETE LAST and REPEAT LAST allow the user to change the last selected item, or to duplicate it. Moving now to FIG. 4B, after the user selects the dinner option, the screen shows different types of entree, and steak is selected. FIGS. 4C & 4D show screen displays allowing the user to select the type of steak and how it is cooked. FIG. 4E shows that the user can choose between salad and French fries (FF), and the user chooses salad. After choosing salad the order for dinner is complete, and the screen display in FIG. 4F shows again representations 46 for the options on the root level. The waiter can then enter other selections such as a drink order or another dinner or, alternatively, can actuate the enter pushbutton which enters the order for processing. Displays in the kitchen and other related aspects of the system are not directly related to the present invention and therefore will not be described.

While the I/O module 60 (FIG. 3) of the program for the waiter's terminal handles menu selection, the application module of the program is preferably configured to help guide the user through the menus in completing a selection for a meal. For example, the application program can display on the screen the descriptions of items ordered, their individual and total costs, etc. After the selection for a meal is completed, as illustrated in FIG. 4F, the application module may produce, as illustrated in FIG. 3, a detailed check 202 on a printout station 200 showing the selections, their individual costs and the total cost, etc.

An application program for a waiter's terminal can, of course, have many more levels than the levels illustrated in FIG. 4A-4F. The menu tree formed by the levels shown in FIG. 4A-4B which is can be only a branch of a much larger menu tree structure, with levels above and below it. For instance, before entering the order entry sequence shown in FIG. 4A-4F the program may require the user to indicate whether he is taking a new order or adding a new item to an existing order.

FIG. 5 presents a flow chart illustrating the sequence of operation when using an application program which configures the terminal system as a waiter's terminal. The program