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(54) REMOTELY CONFIGURABLE MULTIMEDIA ENTERTAINMENT AND INFORMATION SYSTEM WITH LOCATION BASED ADVERTISING

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(57) ABSTRACT

An internet radio for portable applications and uses such as in an automobile. The internet radio allows access to a host of audio, visual and other information. Normal radio channel function is provided along with programmable content and channel selection, as well as automatic content and channel updating by location and style. Internet access is also provided. Direct or targeted advertising, as well as electronic commerce is supported. Connection to the internet is through wireless communications. Programmability is achieved off-line via a web page and remote computer. Customized information is also communicated to the radio such as stock quotes, travel information, advertising, and e-mail. Onboard global positioning allows for channel updating by location, traffic information, geographic advertising and available similar content

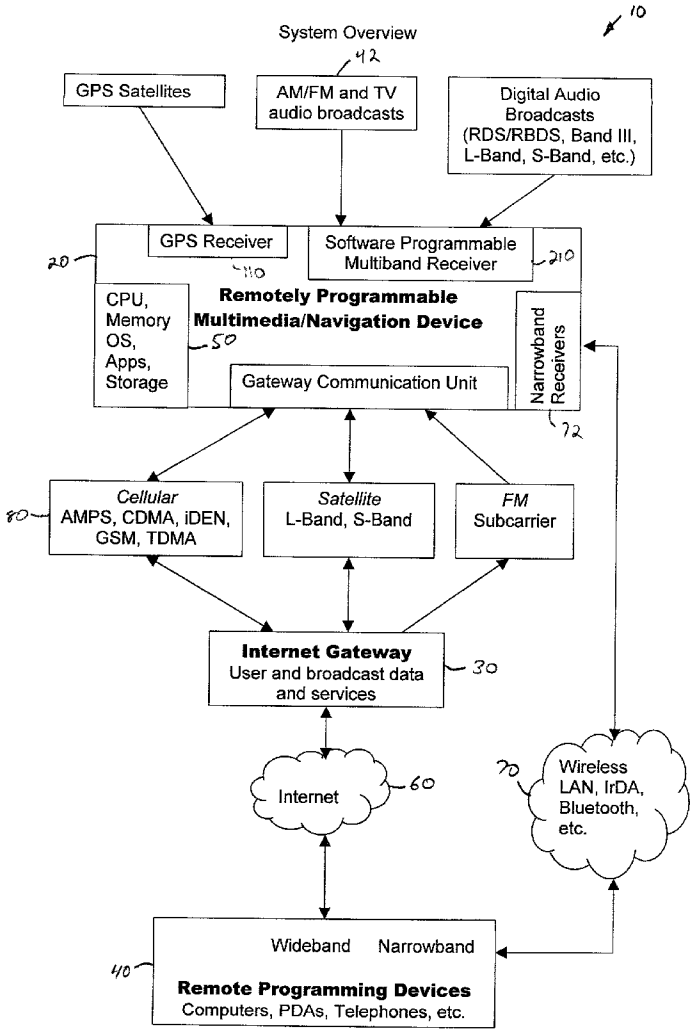

Figure 1
System Overview

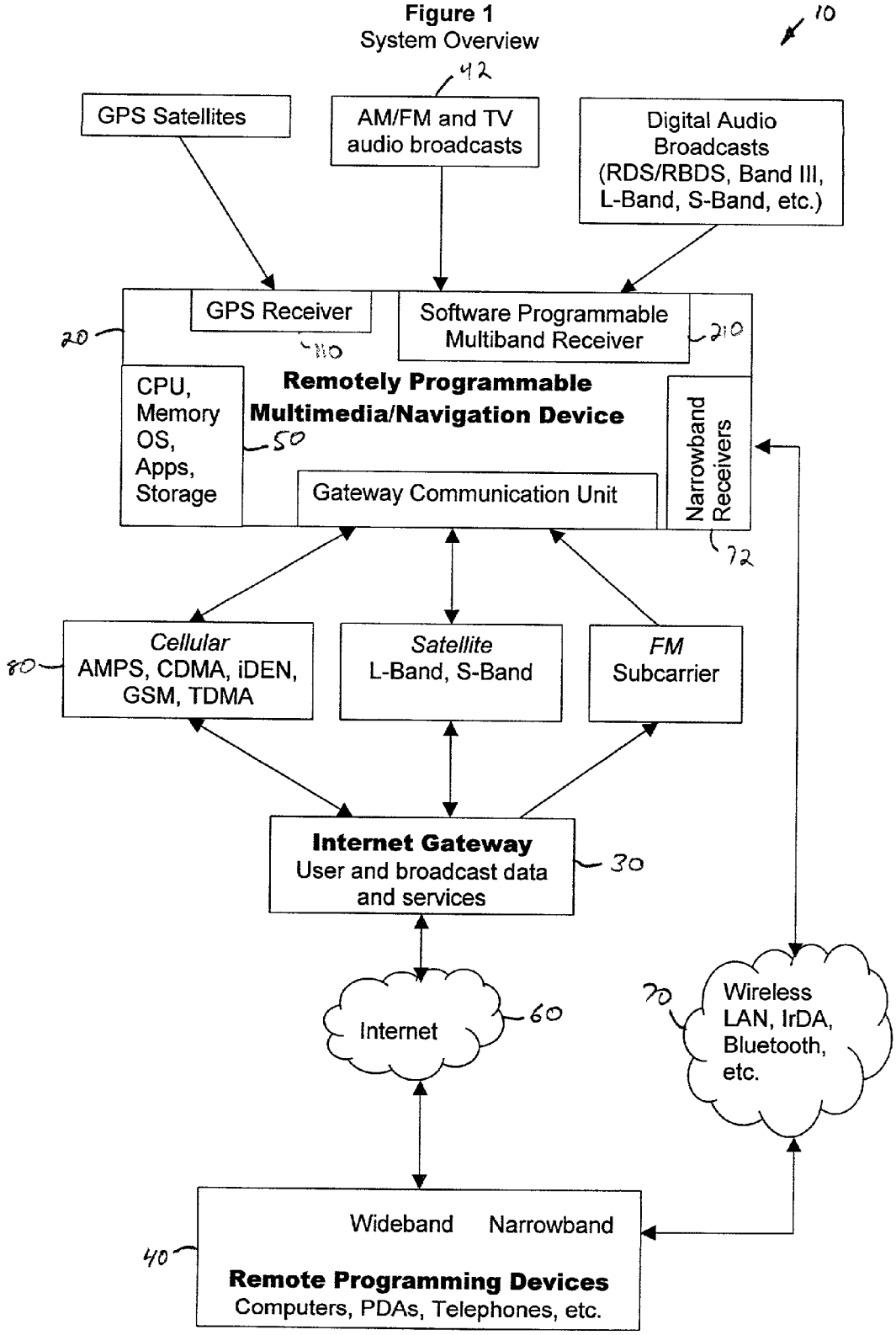

Figure 2
Vehicle Multimedia Receiver

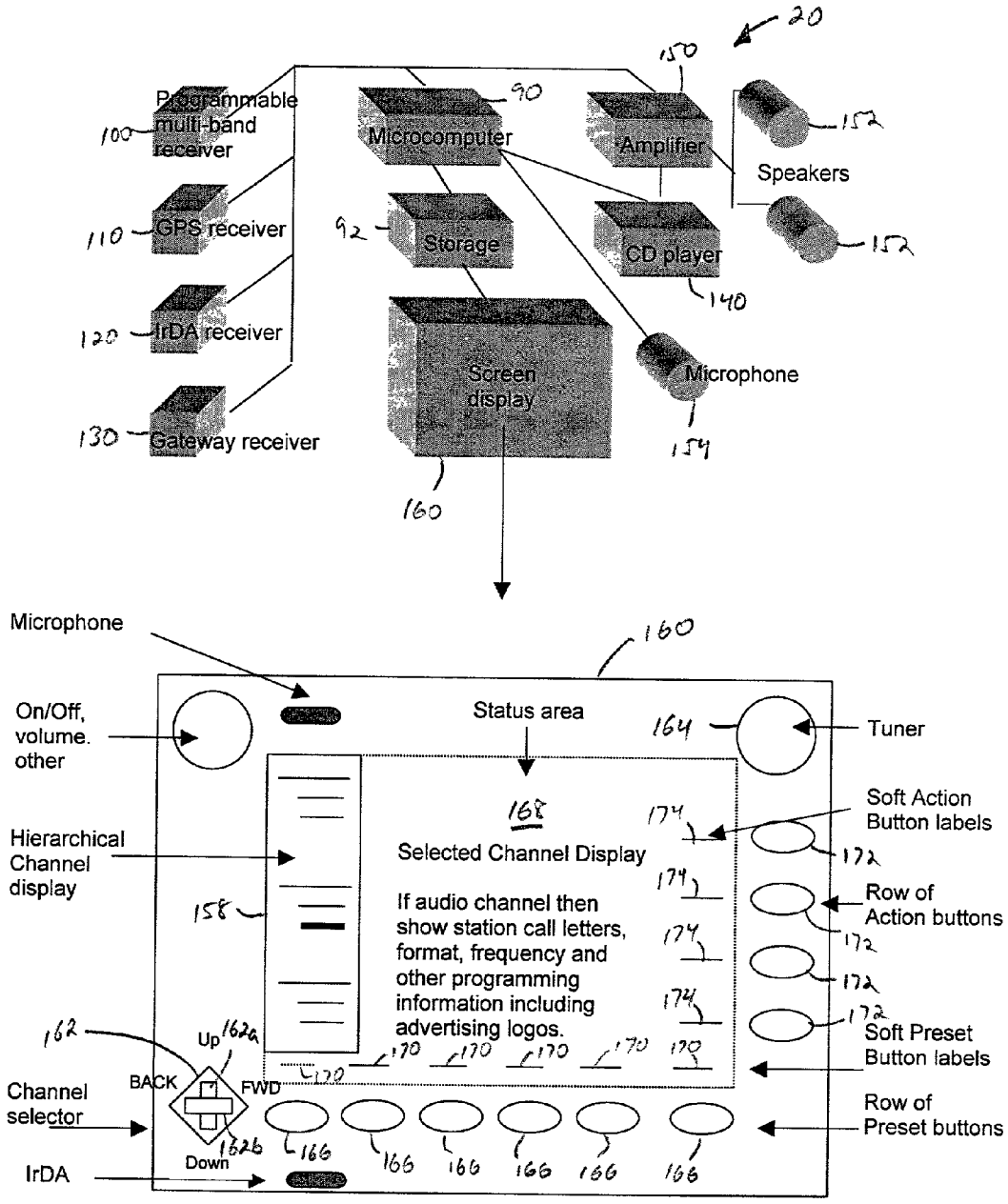

Figure 3
Internet Gateway Network

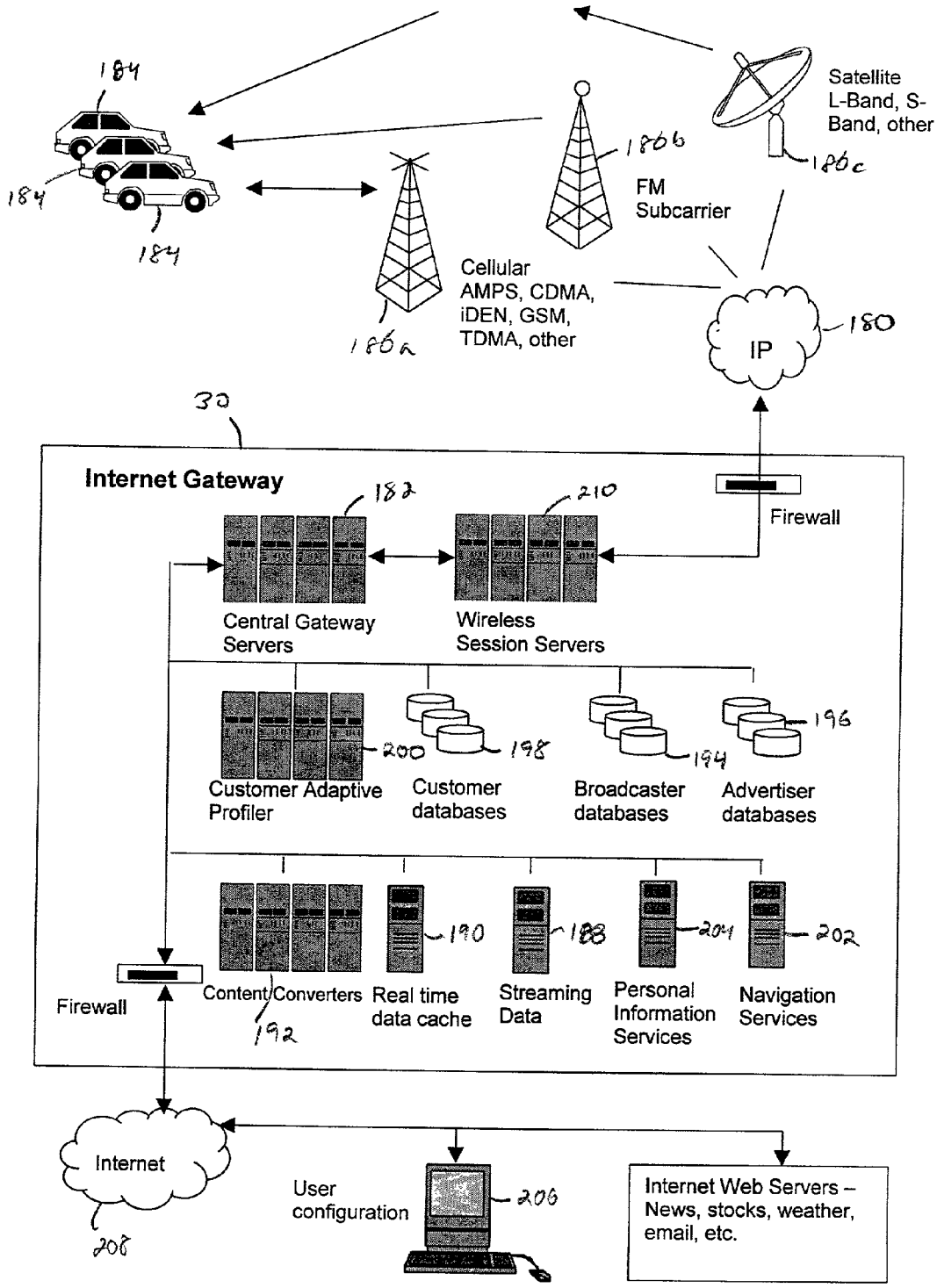

Figure 4

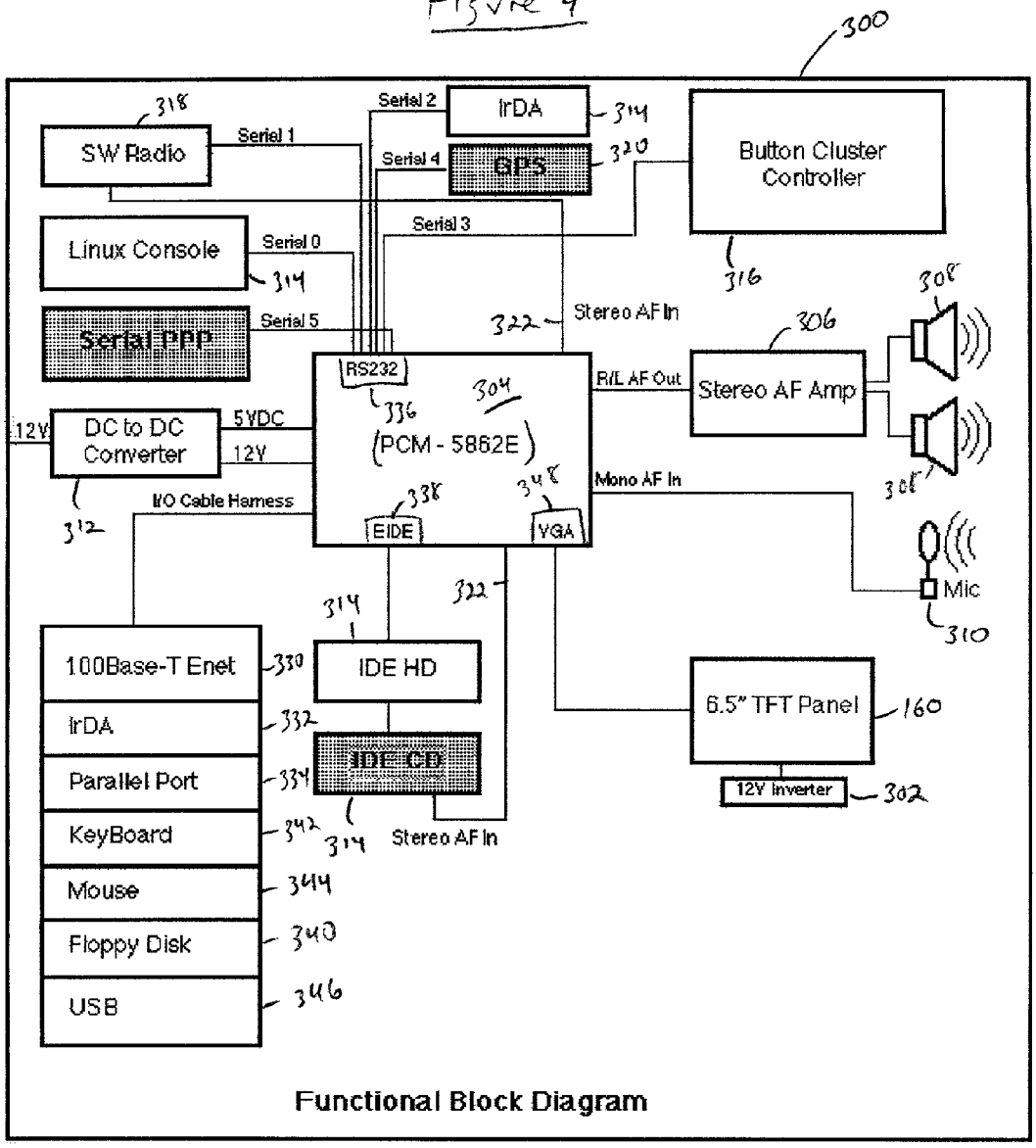
300
318
SW Radio
Serial 1
Serial 2
IrDA
314
Serial 4
GPS
320
Button Cluster Controller
316
Linux Console
Serial 0
314
Serial 3
Serial PPP
Serial 5
322
Stereo AF In
306
308
RS232
336
304
PCM - 5862E
R/L AF Out
Stereo AF Amp
12V
DC to DC Converter
5VDC
12V
312
I/O Cable Harness
338
EIDE
348
VGA
Mono AF In
308
Mic
310
314
322
100Base-T Enet
330
IDE HD
IrDA
332
IDE CD
Parallel Port
334
KeyBoard
342
314
Stereo AF In
Mouse
344
Floppy Disk
340
USB
346
6.5" TFT Panel
160
12V Inverter
302
Functional Block Diagram

Figure 5
Sample Web Configuration Elements

Audio Channels

- ☒ Music
  - ☒ Rock
    - ☒ WINS
    - ☒ WNEW
    - ☒ KSLX
    - ☒ KOLD
    - ☒ KROK
  - ☒ Jazz
    - ☒ KSAN
    - ☒ WORL
    - ☒ WIND
    - ☒ KJAZ
  - ☒ Country
    - ☒ KNTR
    - ☒ WKRP
    - ☒ KNIX
    - ☒ Camel
    - ☒ KOOL 95
  - ☒ Classical
    - ☒ KLAS
- ☒ Talk
  - ☒ News
    - ☒ WABC
    - ☒ CNN
    - ☒ KNOW
    - ☒ KFYI
    - ☒ CNET
  - ☒ Sports
    - ☒ ESPN
    - ☒ NFL Today
    - ☒ KTAR
  - ☒ Political
    - ☒ KRAP
- ☒ TV
  - ☒ ABC
  - ☒ CBS
  - ☒ CNN
  - ☒ NBC
  - ☒ FOX
  - ☒ ESPN
  - ☒ MTV
  - ☒ VH1

Data/Information Channels

- ☒ Directory
  - ☒ Personal
    - ☒ Boss
    - ☒ Mom
    - ☒ Doctor
  - ☒ Food
    - ☒ McD's
    - ☒ Taco Bell
    - ☒ Pizza Hut
    - ☒ IHOP
  - ☒ Fuel
    - ☒ Shell
    - ☒ Mobil
    - ☒ Exxon
  - ☒ Help
    - ☒ BMW
    - ☒ Motorola
    - ☒ AAA
- ☒ Recorded
  - ☒ CD
  - ☒ MP3
    - ☒ Hit Me ...
    - ☒ That Don't ...
- ☒ Information
  - ☒ Stocks — 400
  - ☒ Weather — 402
    - ☒ Phoenix
    - ☒ Chicago
    - ☒ Honolulu

Preset Selections

Preset #1 - ....Rock
Preset #2 - ....Jazz
Preset #3 - ....News
Preset #4 - TV
Preset #5 - Directory
Preset #6 - ....Help

404

Download Configuration to iRadio — 406

My iRadio Bookmark Collection.

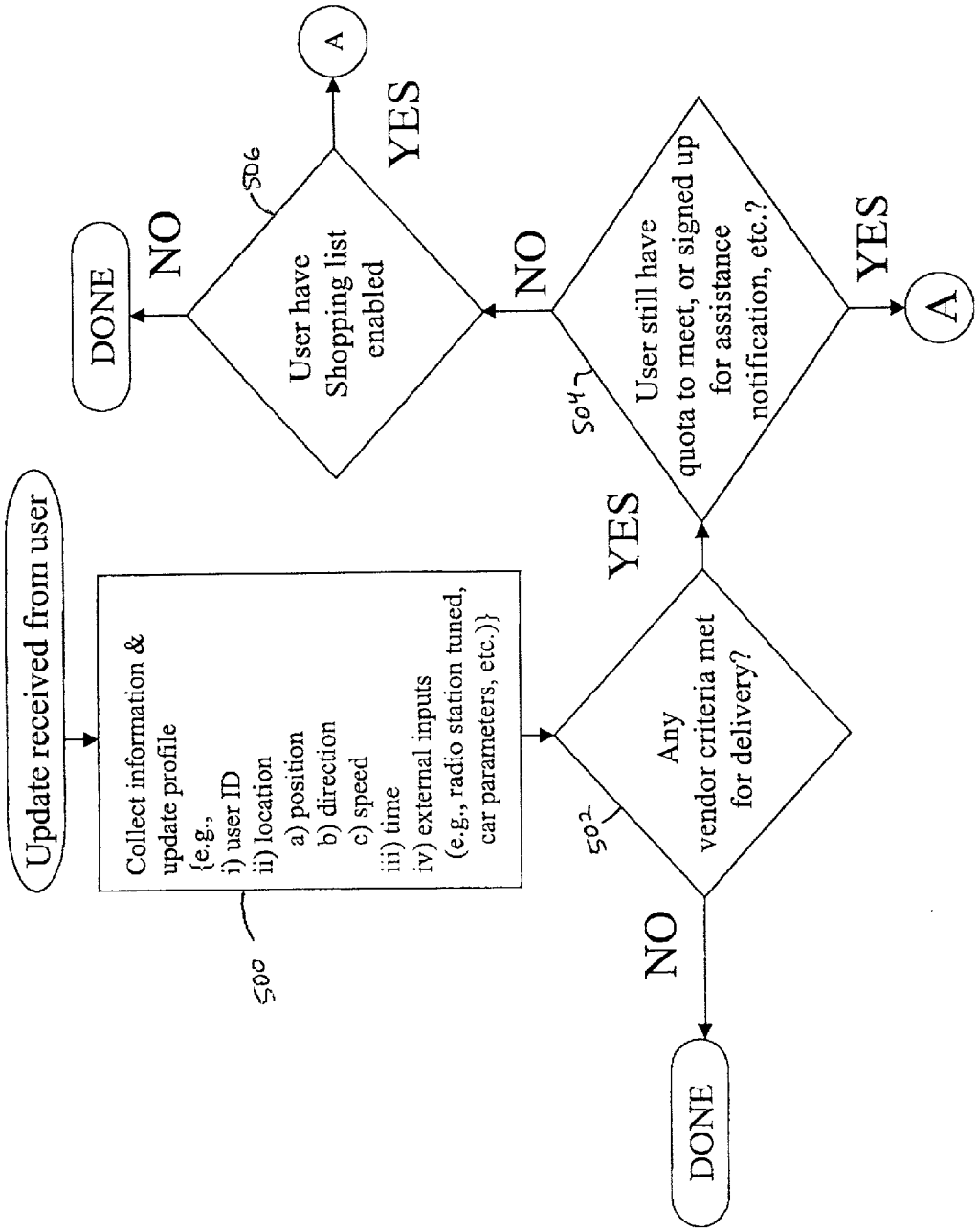
Update received from user
Collect information & update profile
{e.g.,
i) user ID
ii) location
a) position
b) direction
c) speed
iii) time
iv) external inputs
(e.g., radio station tuned, car parameters, etc.)}
500
Any vendor criteria met for delivery?
502
NO
DONE
YES
User still have quota to meet, or signed up for assistance notification, etc.?
504
NO
YES
A
User have Shopping list enabled
506
NO
DONE
YES
A

FIG. 6(A)

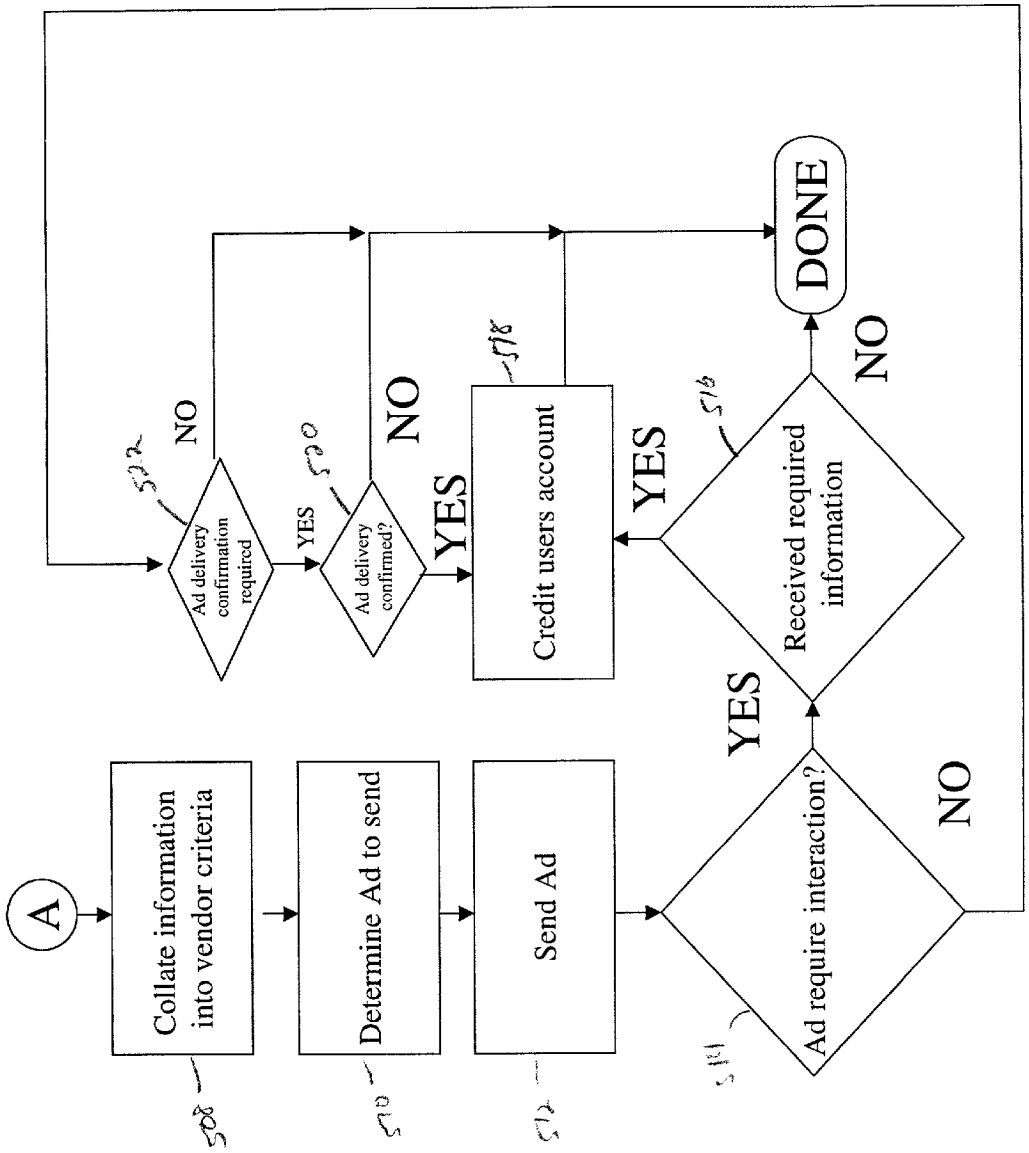
A
Collate information into vendor criteria
508
Determine Ad to send
510
Send Ad
512
Ad require interaction?
514
YES
NO
Received required information
516
YES
NO
Credit users account
518
Ad delivery confirmed?
520
YES
NO
Ad delivery confirmation required
522
YES
NO
DONE

FIG. 7

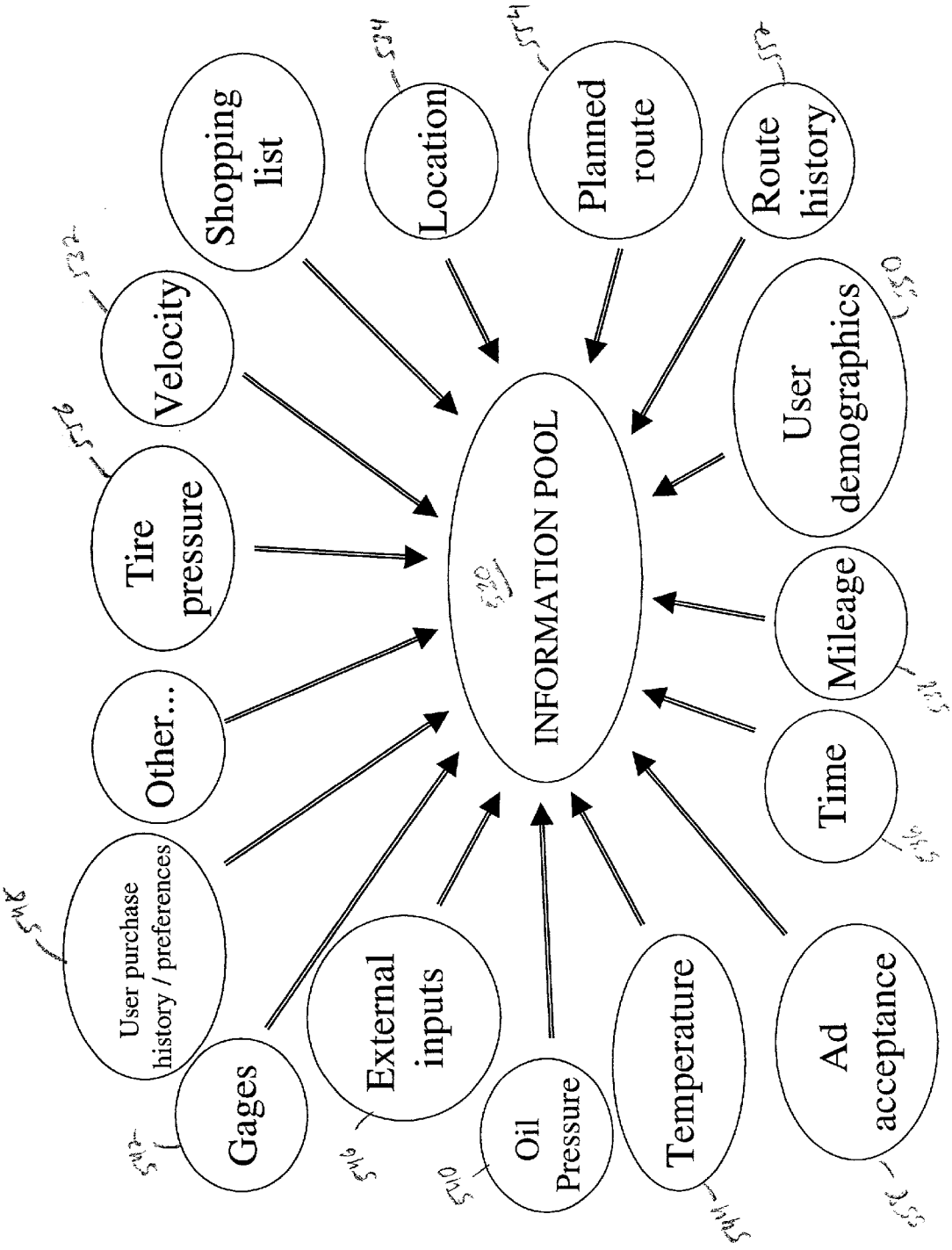
Shopping list
Location
Planned route
Route history
Velocity
Tire pressure
Other...
User purchase history / preferences
Gages
External inputs
Oil Pressure
Temperature
Ad acceptance
Time
Mileage
User demographics
INFORMATION POOL

FIG.

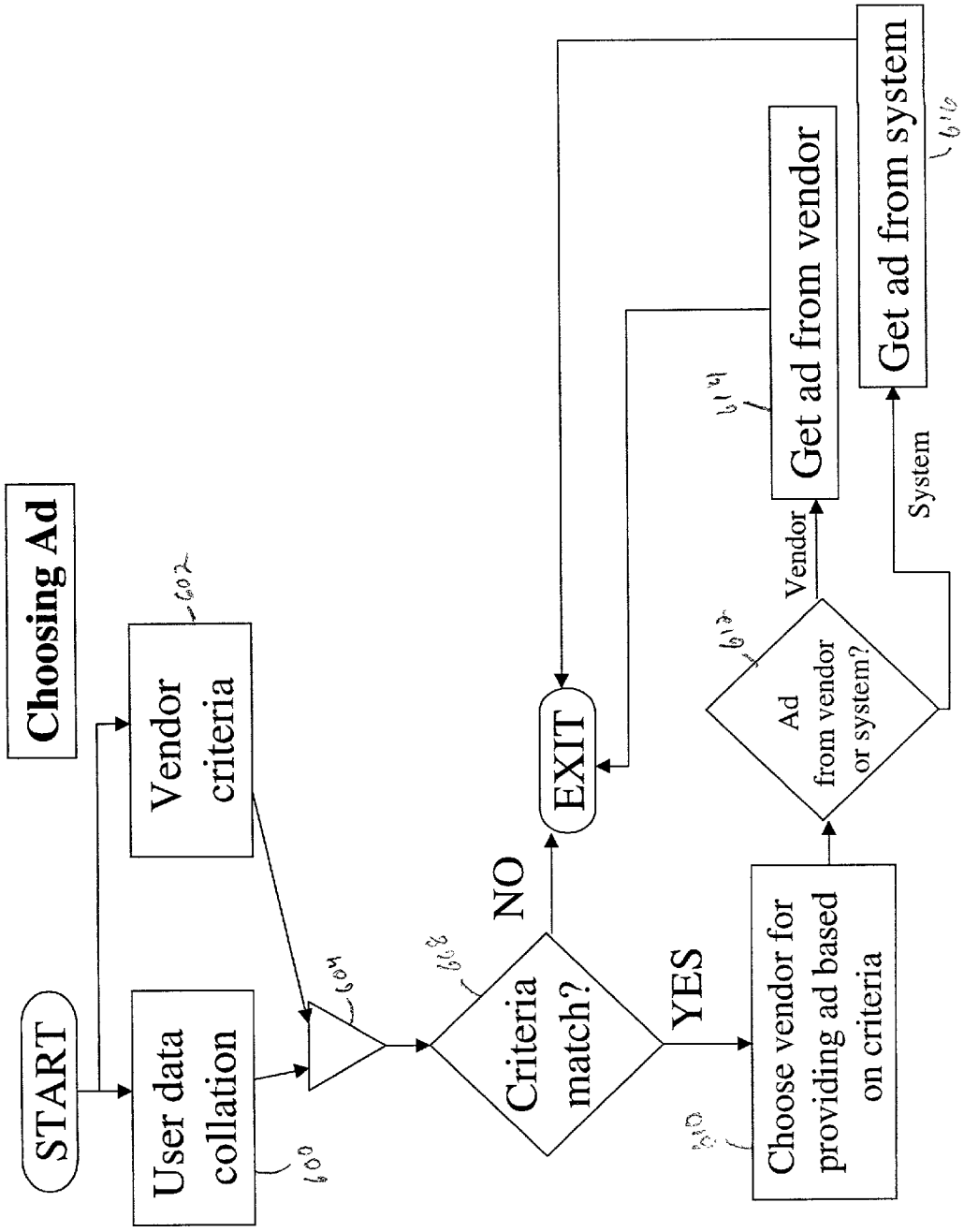
Choosing Ad
START
User data collation
Vendor criteria
Criteria match?
NO
EXIT
YES
Choose vendor for providing ad based on criteria
Ad from vendor or system?
Vendor
System
Get ad from vendor
Get ad from system

FIG.

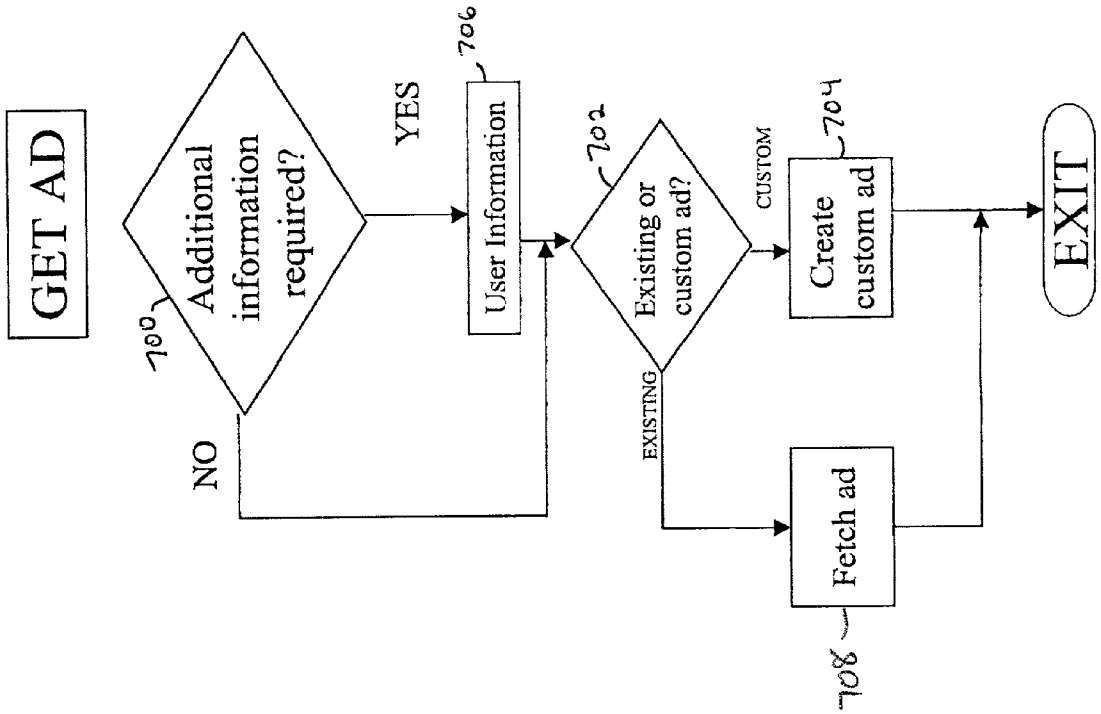
GET AD
Additional information required?
700
YES
NO
User Information
706
Existing or custom ad?
702
CUSTOM
EXISTING
Create custom ad
704
Fetch ad
708
EXIT

FIG. 9

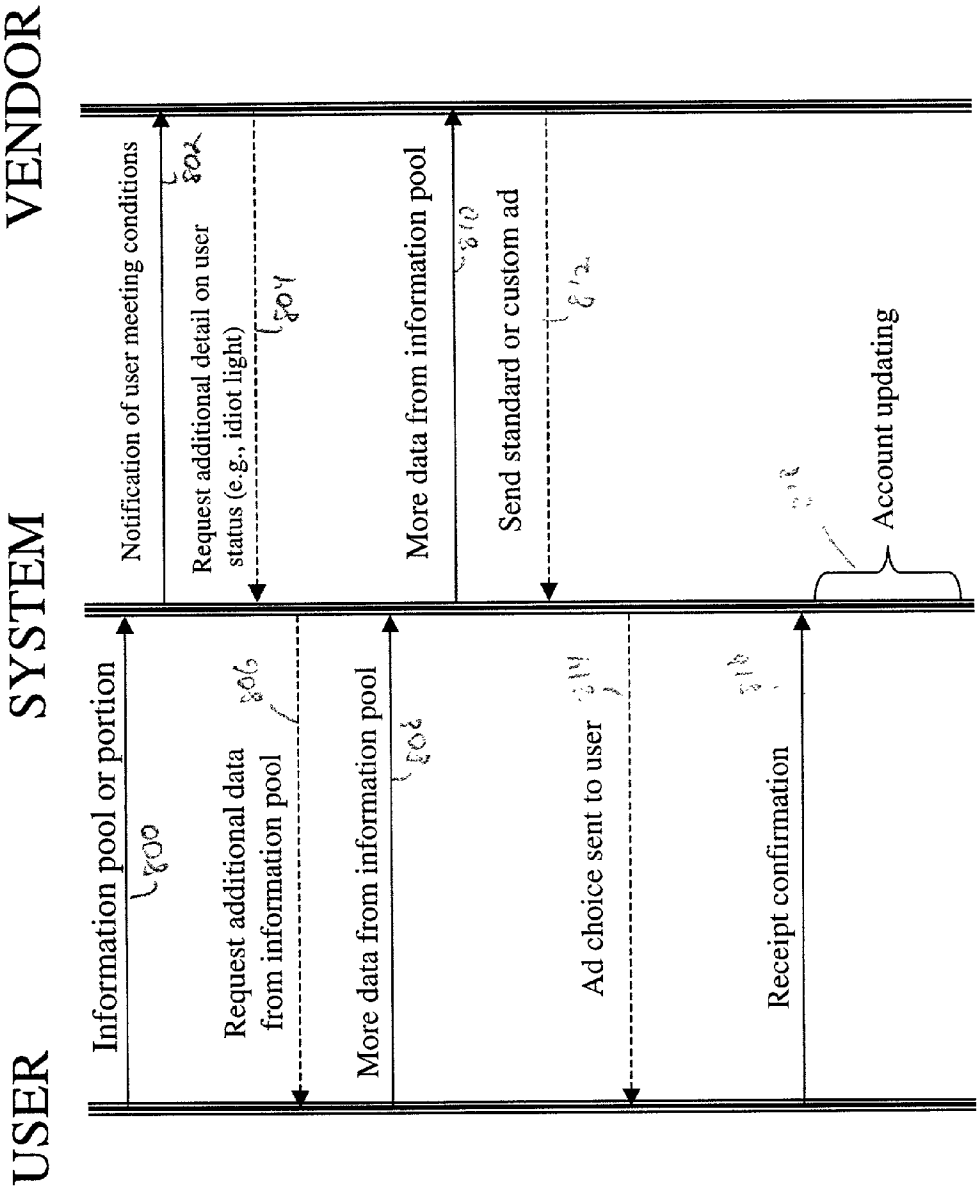
USER
SYSTEM
VENDOR
Information pool or portion
800
Notification of user meeting conditions
802
Request additional data from information pool
806
Request additional detail on user status (e.g., idiot light)
804
More data from information pool
808
More data from information pool
810
Ad choice sent to user
814
Send standard or custom ad
812
Receipt confirmation
818
Account updating

FIG.

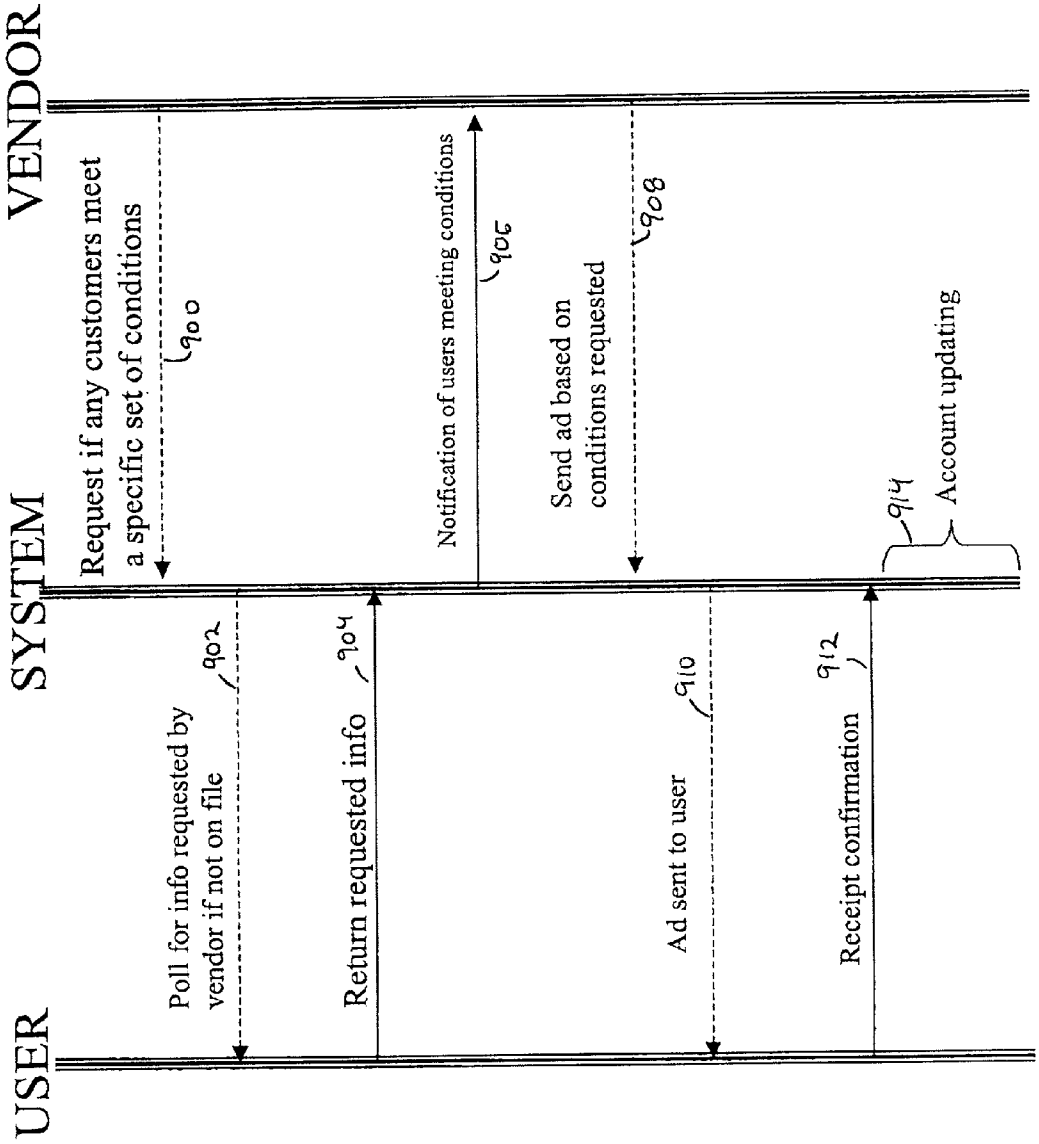
VENDOR
SYSTEM
USER
Request if any customers meet a specific set of conditions
900
Notification of users meeting conditions
906
Send ad based on conditions requested
908
Account updating
914
Poll for info requested by vendor if not on file
902
Return requested info
904
Ad sent to user
910
Receipt confirmation
912

FIG. 11

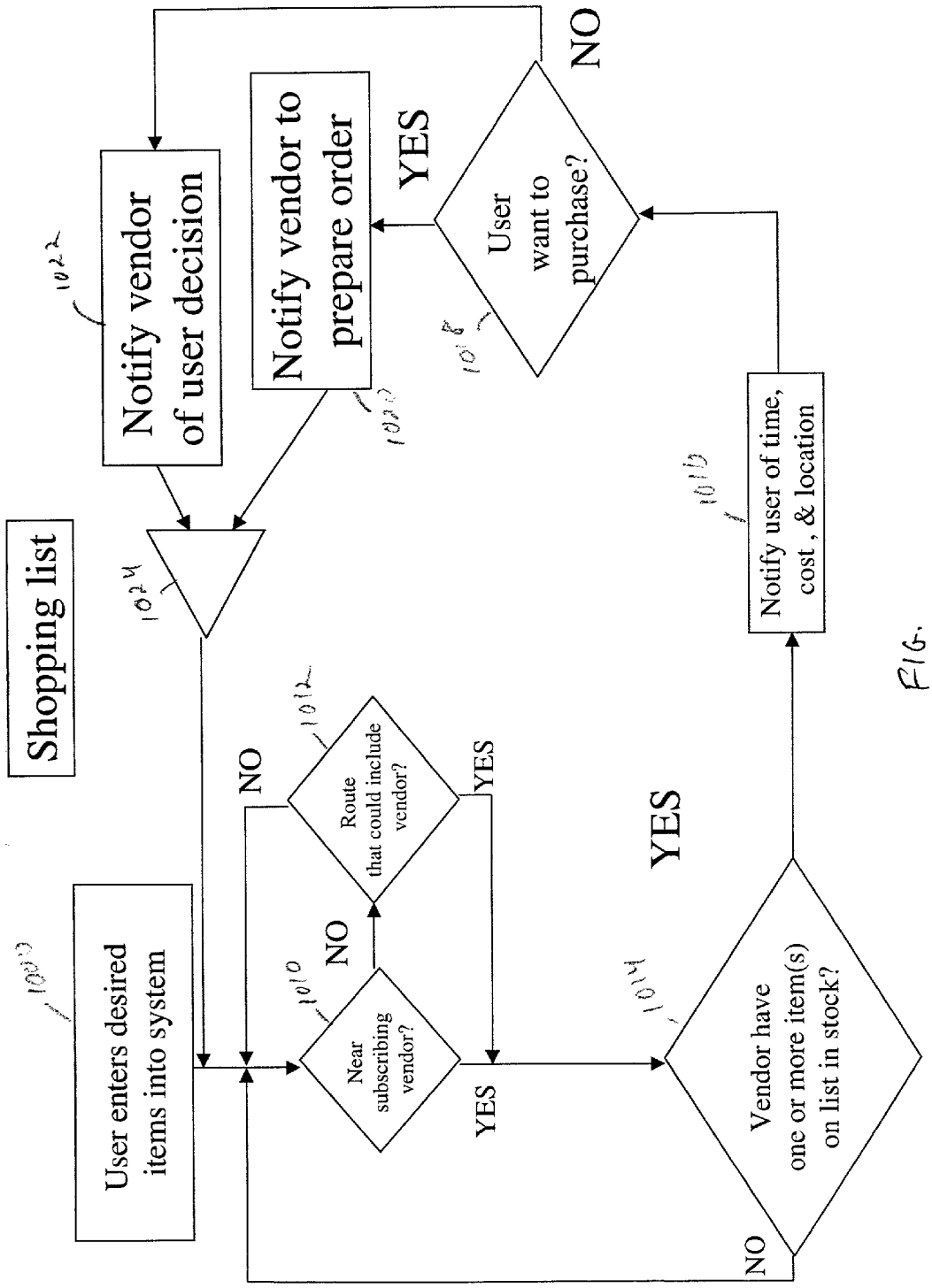
User enters desired items into system
1000
Shopping list
1024
Notify vendor of user decision
1022
Notify vendor to prepare order
1020
Near subscribing vendor?
1010
NO
YES
Route that could include vendor?
1012
NO
YES
Vendor have one or more item(s) on list in stock?
1014
YES
NO
User want to purchase?
1018
YES
NO
Notify user of time, cost , & location
1016

FIG.

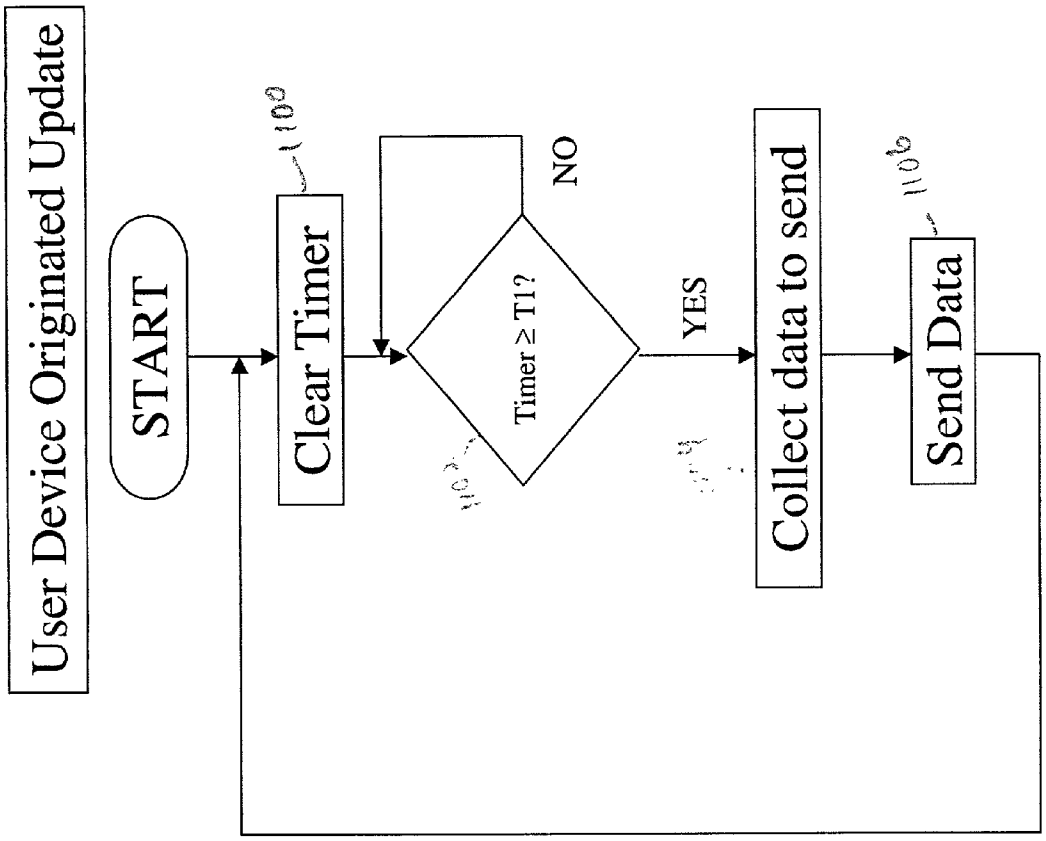
User Device Originated Update
START
Clear Timer
1100
Timer ≥ T1?
NO
YES
Collect data to send
Send Data
1106

FIG. 12

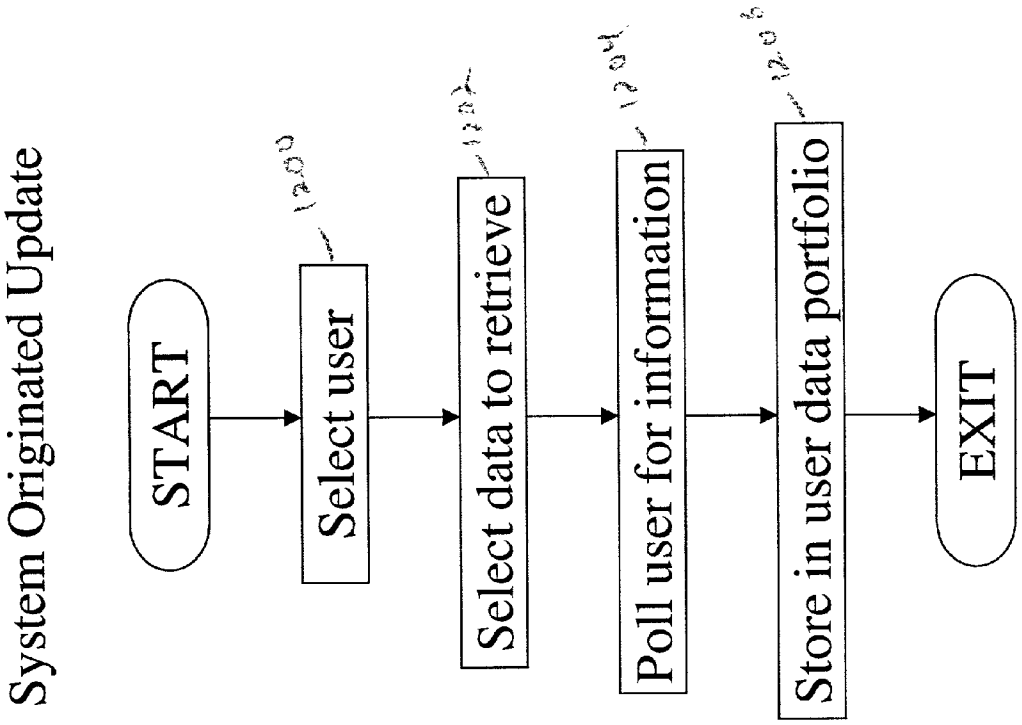
System Originated Update
START
1200
Select user
1202
Select data to retrieve
1204
Poll user for information
1206
Store in user data portfolio
EXIT

FIG. 14

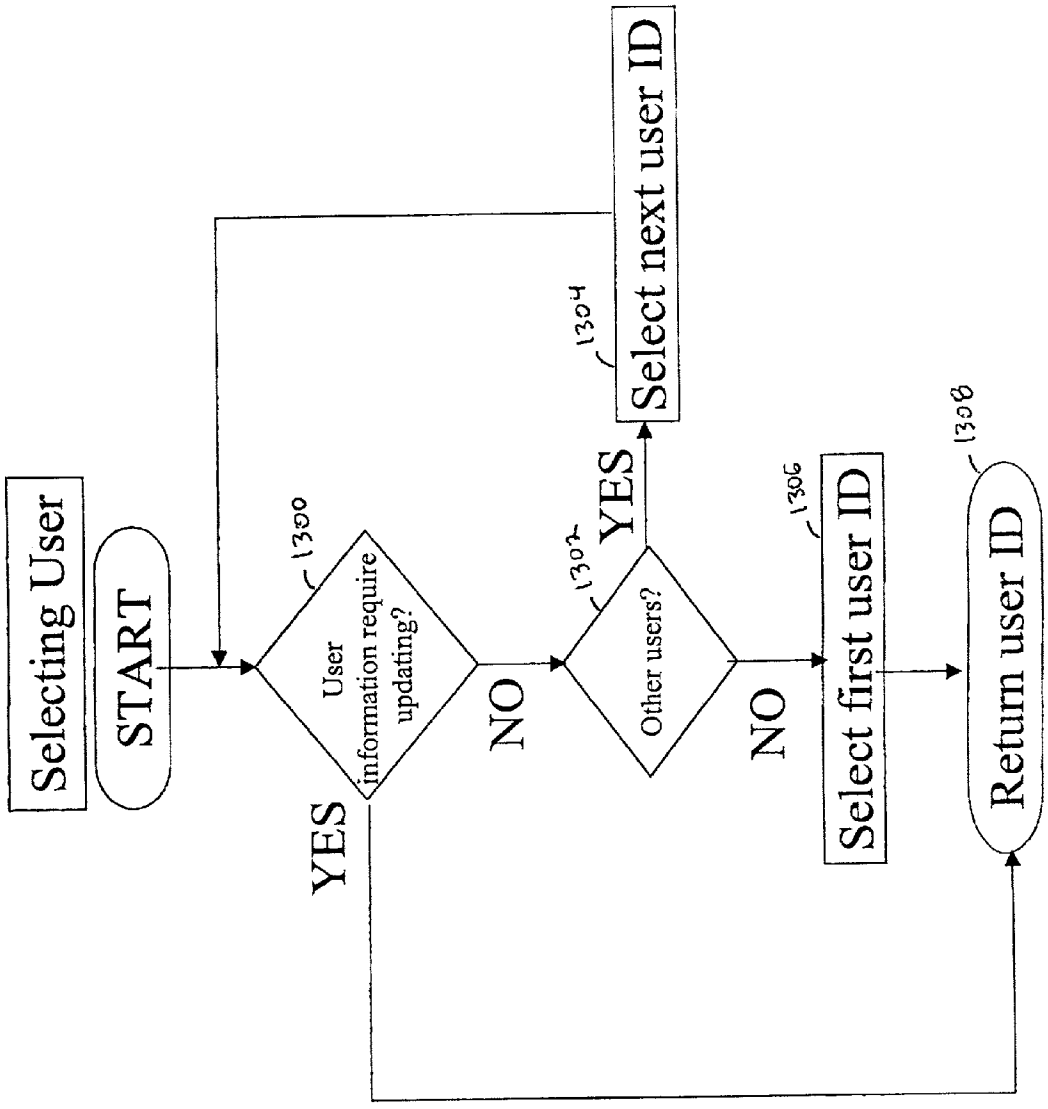
Selecting User
START
1300
User information require updating?
YES
NO
1302
Other users?
YES
1304
Select next user ID
NO
1306
Select first user ID
1308
Return user ID

FIG. 15

REMOTELY CONFIGURABLE MULTIMEDIA ENTERTAINMENT AND INFORMATION SYSTEM WITH LOCATION BASED ADVERTISING

BACKGROUND OF THE INVENTION

[0001] As wireless communication systems have become more popular, the demand for services has increased. However, the cost of services still remains high for many individual subscribers for service. Some network providers have offered services through the use of prepaid services. Although the use of such services prevents overspending by a user, the user ultimately must incur the cost of the usage of the network. Accordingly, there is a need for alternative service offerings of network providers to enable usage on the network.

BRIEF DESCRIPTION OF THE DRAWINGS

[0002] **FIG. 1** shows a block diagram of a system overview.

[0003] **FIG. 2** shows a block diagram of a vehicle multimedia receiver.

[0004] **FIG. 3** shows a system diagram of an internet gateway network.

[0005] **FIG. 4** is a block diagram of one presently preferred hardware platform.

[0006] **FIG. 5** illustrates sample Web configuration elements.

[0007] **FIG. 6** is a flow chart of the update information flow of the location based advertising of the invention, where **FIG. 6**(A) is a first half of the flow chart, and **FIG. 6**(B) is a second half of the flow chart.

[0008] **FIG. 7** illustrates one presently preferred information pool used with the invention.

[0009] **FIG. 8** is a flow chart showing the choosing of an advertisement.

[0010] **FIG. 9** is a flow chart showing obtaining an advertisement.

[0011] **FIG. 10** is a ladder diagram showing a user initiated update request.

[0012] **FIG. 11** is a ladder diagram showing a vendor initiated update request.

[0013] **FIG. 12** is a flow chart showing the shopping list feature of the invention.

[0014] **FIG. 13** is a flow chart showing a user originated update.

[0015] **FIG. 14** is a flow chart showing a system originated update.

[0016] **FIG. 15** is a flow chart showing the process of selecting a user.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS OF THE INVENTION

[0017] Referring to the drawings, where like elements receive like reference numerals throughout, the invention generally is a computer controlled multimedia entertainment and information system **10**. The invention offers information enriched audio broadcasts, personalized information services, integrated access to personal and recorded data, enhanced navigation services and other software expandable services in a vehicle through the use of a wireless Internet connection to an enabling Internet gateway network. As shown in **FIG. 1**, the invention consists of (1) a remotely programmable, microcomputer controlled multimedia device **20** in a vehicle with a wireless IP address for Internet access, (2) an Internet gateway network **30** that provides programming, information and Internet access to the multimedia device **20**, and (3) one or more remote programming devices **40**.

[0018] The multimedia device **20** includes a computer **50** that preferably runs an operating system and series of applications that control the operation of the device **20**. A user operates an application by tuning to a "channel" in keeping with the known radio paradigm and its user friendly operations. The two types of channels preferably available are audio broadcasts (e.g., AM, FM, TV, digital, Internet audio broadcasts and recorded material) and personal information services (e.g., navigation, email, traffic alerts, etc.). Channels are organized in a hierarchy **158** so any one can be easily selected on screen (see **FIG. 2**). Audio broadcast channels **42** are organized by the format of the broadcast (i.e., country, rock, talk, etc.) and not by the band or frequency of the station. The listener configures the organization of the channels through a remote device **40** via the Internet gateway network **30**.

[0019] The Internet gateway network **30** is designed to transmit and receive critical information to and from a multimedia device **20** in the vehicle **184** (**FIG. 3**). Information transmitted preferably includes broadcaster identification that allows the multimedia device **20** to tune to stations by their formats, direct Internet access for streaming audio broadcasts and other Internet content, broadcast advertising database lookup for direct response to advertisements heard in a vehicle, navigation services, delayed digital personalized broadcasts, personal information event notices, and application downloads to create new personal information channels.

[0020] Remote programmable devices **40**, such as a computer connected to the Internet **60**, are used to download information from the Internet gateway network **30** to the multimedia device **20** in the vehicle **184**. From a remote device **40**, a user can customize the way audio broadcasts and personal information service channels are organized in the vehicle's multimedia device **20**, can request new personal information services be downloaded from the Internet gateway **30** to the multimedia device **20**, and can retrieve information from the gateway **30** that he has stored there from the vehicle **184**. The user can also access his custom profile and billing information records.

[0021] **FIG. 1** shows many possible wireless communication methods between the vehicle device and the gateway. As those skilled in the art will appreciate, the methods illustrated in **FIG. 1** are meant to be representative and do not reflect all possible wireless communication methods that may be employed.

[0022] It is thus an object of the invention to allow any AM, FM, TV audio, or digital audio broadcast or any Internet audio broadcast to be easily selected by format (i.e.,

country, classical, news, rock, talk, etc.) in a vehicle. The user will not need to know the band or frequency of any station to select a broadcast as all types of broadcasts are simply ordered by format. The multimedia device **20** will make the appropriate band and frequency selection when a listener selects a station hierarchically organized under a format category.

[**0023**] It is also an object of the invention to automatically tune to comparable station formats when a vehicle travels out of an area where the existing stations are known to the listener.

[**0024**] It is a further object of the invention that, when a vehicle travels out of an area such that a currently broadcast program fades out, to automatically tune to another station or recorded broadcast playing the same program or at least the same program type.

[**0025**] It is yet a further object of the invention to remotely configure the multimedia device **20** using an Internet gateway network **30** database to download information about all the audio formats and audio broadcasters (e.g., AM/FM/TV/DAB/Internet) possible in a geographic area. The user will choose to show on the radio only those formats and stations he/she desires, blocking out from view all unwanted formats and stations.

[**0026**] It is yet a further object of the invention to add new personal information services (e.g., email, stock quotes, interactive audio games, etc.) to the multimedia device **20** from a wireless Internet connection **60** by downloading applications. Such services are called personal information or data channels in keeping with radio nomenclature as their applications can be used by simply selecting them as you would an audio channel in the main menu or with a preset button.

[**0027**] It is still another object of the invention to remotely configure the system **10** using an Internet gateway network **30** database to present all the personal information services available to the user (i.e., navigation, email, stock quotes, etc.). The user may select only those services he/she desires to use in the vehicle **184**.

[**0028**] It is still another object of the invention to allow event driven personal information services to verbalize time specific (e.g., your stock hits new high) or location specific (e.g., traffic incident warning) information using speech synthesis.

[**0029**] It is still another object of the invention to allow recorded compressed audio files and other large data files to be downloaded into the multimedia device **20** from a high speed local area **70** wireless receiver **72**. Such downloads may occur at the listener's home or business, or at designated resale locations for such types of data (e.g., record stores, gas stations, etc.).

[**0030**] It is still another object of the invention to allow previously recorded audio broadcasts (usually talk or news oriented programming) to be played back at desired times by recording such broadcasts at a network location and then transmitting these files over a wireless Internet cellular connection **80** at off peak hours to the vehicle **184**. Since talk broadcasts result in small compressed files, they can be easily dribbled over a relatively slow speed wide band connection without long delays.

[**0031**] It is still another object of the invention to save enhanced information about selected broadcasts with the press of a button. The information is wirelessly transmitted to a server on the Internet gateway network **30** that can be later retrieved from the user's home or office computer with an Internet connection and web browser.

[**0032**] It is still another object of the invention to allow the selection of live and recorded audio material by format in a vehicle as well as select information services (i.e., phone book, navigation, etc.) by using a combination of a hierarchical menu along with presets that chose a broadcast station or run a selected service application. Selection can be done by pressing directional and preset buttons or by using voice navigation.

[**0033**] It is another object of the invention to present a unique configuration of the system **10** for any number of users so that each user will see only their preferred radio stations and information services when they select their profile at the multimedia device **20**.

[**0034**] It is another object of the invention to allow accommodated devices such as notebook computers, PDAs and cellular phones to wirelessly download personal information (i.e., phone numbers, addresses, to-do lists, etc.) into the multimedia device **20**.

[**0035**] It is yet another object of the invention to allow phone numbers and addresses downloaded from accommodated devices to be used for navigation and for direct calling.

[**0036**] It is yet another object of the invention to allow purchases to be made of an advertised on air product with the touch of a button.

[**0037**] It is still another object of the invention to listen to advertising customized for listener preferences when playing recorded broadcast programs.

[**0038**] It is still another object of the invention to provide navigation services from the Internet gateway network **30** so maps can remain accurate as they can be centrally updated when highway changes occur.

[**0039**] It is still another object of the invention to provide navigation services from the Internet gateway **30** so that vehicle positions reported by in vehicle GPS devices can be used by personal information services to provide location dependent alerts to the driver.

[**0040**] It is still another object of the invention to allow input of destination addresses for navigation routing from phone numbers or names by doing reverse address lookups from an Internet gateway **30** server and then automatically entering the returned address for the destination.

[**0041**] It is still another object of the invention to allow input of destination addresses for navigation routing from enhanced advertisements that include location information in a data sidecast.

[**0042**] These and other features and advantages of the invention will become apparent to those skilled in the art upon a review of the following detailed description of the presently preferred embodiments of the invention, when viewed in conjunction with the appended drawings.

[**0043**] Following is a description of the system **10** components and configuration.

[0044] Multimedia Device **20**

[0045] As **FIGS. 1 and 2** show, the multimedia device **20** consists of a computer **50** preferably having a microprocessor and memory **90**, and storage devices **92** that contain and run an operating system and applications to control and communicate with four onboard receivers: (1) a software controlled multi-band AM, FM, TV audio and digital audio broadcast receiver **100**; (2) a GPS receiver **110** that continuously reports the vehicle's longitude, latitude and altitude; (3) one or more high-speed, narrow band wireless transceivers **120** for fast transmission and reception of large amounts of data from accommodated devices; and (4) a wide band wireless Internet addressable gateway transceiver **130** to receive Internet protocol based audio broadcasts, new applications known as information or data channels, and configuration data from a gateway network **30** created to service the multimedia devices **20**. The in-vehicle wireless gateway transceiver **130** can also send information to the gateway network **30** such as requests for navigation data, advertisement responses, purchase requests, etc. The multimedia device **20** also controls attached conventional multimedia storage equipment such as a CD/DVD player **140** or cassette player (not shown). Sound is output through an industry standard amplifier **150** and speakers **152**. A microphone **154** allows for voice recognition commands to be given and received by the multimedia device **20**.

[0046] The multimedia device **20** preferably also contains and controls one or more digital storage devices **92** to which real-time broadcasts can be digitally recorded. The storage devices **92** may be hard drives, flash disks, or other automotive grade storage media. The same storage devices **92** can also preferably store digital data that is wirelessly transferred to the vehicle in faster than real time mode. Examples of such digital materials are MP3 audio files or nationally syndicated radio shows that can be downloaded from the gateway network **30** and played back when desired rather than when originally broadcast.

[0047] As **FIG. 2** shows, the multimedia device also uses a LCD, LED or similar suitable display screen **160** for an automotive environment to present information to the user and to control the multimedia device **20**. Controls shown on the LCD in **FIG. 2** are one possible embodiment for control types and location. Those skilled in the art will appreciate that control types and locations may vary in different implementations of the invention. In one presently preferred embodiment, for example, the display screen **160** includes a 5½ inch 640×480, 216 color VGA LCD display **168**. In an alternate embodiment, the display can display as little as two lines of text, whereas an upper limit of the screen display **168** can be as large as the intended application may dictate.

[0048] The channel selector **162**, tuner **164** and preset button **166** controls shown in **FIG. 2** allow the user to broadly navigate all the channels of audio broadcasts and information services available on the multimedia device **20**. The channel selector **162** allows a user to manually access and select any of the audio and information channels available by browsing through them (up, down, forward, back) in a hierarchical tree.

[0049] A display **158** of a portion of the hierarchical tree is shown on the screen display **168**.

[0050] The root of the tree, the leftmost part, preferably contains major categories of channels. Possible types of major channel categories could include music, talk, TV audio, recorded audio, personalized directory services and information services. As is explained in detail below, the user can configure the presentation of major categories and subcategories so that he/she sees only those categories of interest.

[0051] Under each major channel category, there are preferably subcategories. To see these subdivisions, the user would select the desired major category by pressing the up or down channel selector buttons **162***a* and then press the forward button **162***b* when the category desired is highlighted. The user could then see all the channels available under that subcategory in similar fashion and select any of them to play.

[0052] For example, under the category of music channels, commercial audio broadcasts could be subdivided into 30+ radio industry standard formats (e.g., blues, classical, county, dance, jazz, rock, sports, talk, etc.). To hear a particular country music radio station in a particular geographic area, a user would select the "Music" category by pressing the up or down channel selector buttons **162***a* and then press the forward channel selector **162***b* when positioned on "Music." Next, the user would use the up or down channel selector buttons **162***a* to highlight "Country" and would then press the forward button **162***b*. The user would then see all the country music channels available in that specific area. Moving the channel selector **162** up or down over each channel preferably causes each audio station to play.

[0053] Once a user has moved forward in the hierarchical tree, the subcategory or channels displayed will remain visible until the user presses the back channel selection button **162***b* that moves the user back up the tree one level. For example, to move back from country broadcasts to select other music formats, the user would press the back button **162***b* and then select another music format. The multimedia device **20** may be preferably configured so that the last hierarchical display and selection the user made is presented when the device is next turned on.

[0054] Preset buttons **166** on the display screen **160** are user configurable buttons that allow the user to select any one channel, group of channels or even channels from different categories that can be played or displayed with the press of a single button. For example, a user could configure a preset button **166** to simply play a favorite country station when pressed. The user could also configure a preset button **166** to display all the country stations in a specific area. The user could even configure a preset button **166** to display their favorite blues, country and rock stations at one time on one screen display **168**. Once these groups of channels are displayed, the user can play the radio stations by using the channel selector buttons **166**. A preset button **166** can also be assigned to any personal information channel application. For example, assigning a new channel (application) that shows all hospitals in an area would result in a map showing the nearest hospitals to the vehicle's current position when the preset is pushed. User defined labels **170** for preset buttons **166** preferably appear on the screen **168** above the preset buttons **166** to indicate their purpose.

[0055] The tuner control **164** shown in **FIG. 2** flattens the hierarchical tree. Rather than having to step through categories and subcategories to play a channel, by turning the tuner

control **164** the user can play each channel one after the other in the order they appear in the hierarchy **158**. If a user has configured the device to show only a few categories of channels, this allows fast sequencing through a channel list. Pressing the tuner control **164** preferably causes the device to scan through the channels as a traditional radio would do, playing a few seconds of each station before moving to the next in the hierarchy **158**.

[**0056**] Computer programs running in the multimedia device **20** control the action buttons **172** shown in **FIG. 2**. Action buttons labels **174** and purposes may change from program to program. A button's label **174** indicates its current function. Some examples of action buttons **172** could be: "INFO" to save extended information on something that is being broadcast (e.g., the Internet web address of a band currently playing); "CALL" to call a phone number from an advertisement; "NAV" to navigate to an address from an electronic address book; or "BUY" to purchase an item currently being advertised.

[**0057**] A microphone input **176** on the face of the display **160** allows users to control the multimedia device **20** verbally rather than through the control buttons. Key word recognition software allows the user to make the same channel selections that could be made from any of the button controls. Audio feedback through speech synthesis allows the user to make selections and hear if any other actions are required. Software or hardware based voice recognition and speech synthesis may be used to implement this feature.

[**0058**] Internet Gateway Network **30**

[**0059**] **FIG. 3** shows a system drawing of the Internet Gateway Network **30**. The Internet gateway network **30** preferably consists of standard Internet TCP/IP protocol communications equipment **180** and computers **182** that serve multiple functions. The gateway **30** is designed to provide wireless Internet access to the multimedia device **20** in the vehicle **184**, enhance regular audio broadcasts with extended information, and provide personalized broadcast, information and applications to the vehicle **184**.

[**0060**] The gateway **30** serves as an Internet Service Provider to vehicles **184** through various forms of wireless transmission **186**. Cellular access is expected to provide the initial form of wireless transmission with satellite transmissions to follow. In some implementations, requests from the vehicle **184** may come through the cellular network **186***a* while responses may be routed through FM sub-carriers **186***b* or faster satellite networks **186***c*. Wireless session servers **210** are preferably dedicated to maintaining connections with the rest of the gateway network **30** no matter what form of transmission is used.

[**0061**] To insure adequate throughput to vehicles **184**, the gateway network **30** will cache most requested Internet data in a real time data cache **190**, as well as convert retrieved Internet content through content converts **192** for appropriate display or verbalization on the multimedia device **20**. Dedicated streaming data servers **188** will be used to broadcast personalized audio broadcasts to the vehicle **184**, as well as rebroadcast other Internet audio broadcasts.

[**0062**] The Internet gateway network **30** also maintains a database management system to control several important system databases. The gateway **30** provides a broadcaster relational database **194** containing information about all AM, FM and TV analog audio broadcasts that can be received in a vehicle **184** within the host nation of the gateway network **30** (e.g., radio station call letters, programming format, frequency assignment, program listing, etc.). Related databases (not shown) may maintain similar information for new digital broadcasters such as satellite radios who transmit over large geographic areas and for international Internet audio broadcasts. Information in the database concerning constantly changing program listings (e.g., song play lists, etc.) are preferably continuously updated throughout a day.

[**0063**] Advertising databases **196** provide information about advertisements (e.g., advertiser name, ad content, time of ad run, etc.) that are inserted into real-time radio broadcasts and into digital personalized broadcasts. In one embodiment of the system **10**, when a user wishes to purchase a product or get more information about a product while in the vehicle **184**, the user can press a "BUY" or "INFO" button on the multimedia device **20**, which transmits to the gateway network **30** the location of his vehicle **184** (GPS derived), the date and time of the button press, and the channel selected. The advertised item is then looked up in the database **196**, and the user is charged for its delivery or is sent more information about the product. In an alternative embodiment, enhanced advertising information for short periods of time may be pushed to the multimedia device **20** from the gateway **30** at set intervals. Only those ads offering immediate purchase or additional information will preferably show indicators for these actions.

[**0064**] User profile databases **198** contain information about the user's system preferences (e.g., channels selected), billing information and a purchasing interest profile. Information in advertising databases can be compared against a user's purchasing interest profile through an adaptive profiler **200** so that advertisements inserted into delayed personalized digital broadcasts mesh with that individual's buying interests. If there are multiple users on one account (e.g., family members) then each user will preferably have a unique profile in the user database **198**.

[**0065**] Users are also allocated storage space on the gateway's servers for their own use. Enhanced live or recorded broadcasts that contain information the user may want to reference later (e.g., the web address of the band currently playing) allow the listener to press a button on the multimedia device **20** to transmit and store that information on their user pages on the gateway **30**.

[**0066**] The gateway **30** also provides navigation services through a dedicated computer **202** to the vehicle **184**. The vehicle **184** provides location information from its GPS receiver **110** (**FIG. 2**) to the gateway **30**, and the gateway **30** in turn provides mapping services to the vehicle showing travel routes or locations of interest. Coupled with the advertising database **196**, drivers can see map locations related to recent advertisements and get navigation guidance to these locations. For example, the driver could get directions to the nearest chain restaurant whose commercial just played offering a lunch special.

[**0067**] The gateway **30** also transmits other software applications to the vehicle **184** for use in the multimedia device **20**. These applications are referred to as channels and comprise the personal information services of the system **10** (navigation, email, etc.). These applications or channels can

be downloaded to the vehicle **184** from a computer **204** at any time to instantly add to the features of the multimedia device **20**.

[**0068**] The gateway **30** further transmits events to the vehicle based on preferences provided by the user in a user profile stored on a stand alone personal computer **206**. Such events could be, for example, stock market alerts (i.e., set an alert when a stock reaches a set value), traffic alerts based upon the user's route (notifies of any delays as they happen in real time on the route), email messages, or the like.

[**0069**] Remote Programming Devices **40**

[**0070**] Several types of remote programming devices **40** may send different types of data to the multimedia device **20**, as shown in **FIG. 1**. Such devices **40** can also receive different types of data from the multimedia device **20** through the Internet gateway **30**. Configuration data determines which formats of audio broadcasts (i.e., AM, FM, DAB, Internet broadcast) and information services (i.e., applications for navigation, stock reports, weather reports, etc.) can be received by the remote device **40**, as well as what channels are associated with preset buttons **172** (**FIG. 2**).

[**0071**] Configuration data is preferably sent to the multimedia device **20** through a computer **206** with an Internet connection **208** using a web browser, as shown in **FIG. 3**. Due to the large number of possible analog, digital and Internet based broadcasts available for reception by the multimedia receiver **210** (**FIG. 1**), choosing from the huge variety of broadcasts is less complicated if it is preprogrammed or preconfigured in advance by the user through a remote computer **206** rather than from the multimedia device **20** itself. The user would log onto the Internet **208** in a manner generally known in the art and then access the configuration web page of the Internet gateway network **30**. Once the user has configured the web page selections as desired, he/she could submit the changes. The new configuration could then be transmitted to the multimedia device **20** in the vehicle **184** from the gateway network **30**.

[**0072**] Personal directory data could be transferred locally to the computer **206** using such local wireless technology as IrDA or Bluetooth. Examples of such remote devices **40** include notebook computers, PDAs or cellular phones. Examples of data transferred include phone books, address books and to-do lists. Those skilled in the art will appreciate that other remote devices **40** and data transferred are contemplated without departing from the essential spirit and scope of the invention. The computer's I/O controller (not shown) would constantly scan for transmission types it recognizes and once one is found it would initiate a data transfer.

[**0073**] Larger recorded audio files could be transmitted to the multimedia device **20** from embedded computers with fast, high bandwidth local area connections. An example of such a transfer would be the purchase of an MP3 audio file from a retail reseller such as a record store or gasoline station. Another example would be the transfer of personal MP3 files from the user's home computer **206** connected to the vehicle multimedia device **20** through an IEEE 802.11 standard wireless LAN.

[**0074**] Hardware Platform Description

[**0075**] Referring now to **FIG. 4**, one presently preferred hardware platform **300** is shown broken up into the various sections that make up the multimedia device **20** itself. Following is a description of the functions of the platform **300**, as well as a functional description of one presently preferred front panel display **160**. The front panel **160** is designed by Prisma Design International, Inc. In one embodiment, the front panel **160** may be a 6½ inch TFT flat panel displays powered by a 12 volt inverter **302**.

[**0076**] The hardware platform **300** includes the components implementing the multimedia device **20**. The multimedia device **20** is preferably built on an IBM PC compatible platform, running the RedHat version 5.1 (Manhattan) Linux operating system. Many portions of the operating environment are implemented in the Java language running in a VM process.

[**0077**] As shown in **FIG. 4**, the hardware platform **300** includes the following sub-assemblies or components. Principally, the hardware platform **300** includes a motherboard **304**, a flat panel display **160**, a stereo amplifier **306** and speakers **308**, a microphone **310** and audio inputs **322**, a power supply **312**, peripheral devices **314**, a button controller **316**, a shortwave radio **318**, and a global positioning system receiver **320**. Each of these components is described in further detail below.

[**0078**] Multimedia Motherboard **304**—The motherboard preferably comprises a PCM-5862E Intel Pentium motherboard sold by Advantech Co., Ltd. The motherboard **304** preferably also includes most of the hardware devices required for the hardware platform **300**, such as:

[**0079**] 100 Base-T **330**

[**0080**] IrDA **332**

[**0081**] Parallel Port **334**

[**0082**] 4 RS232 serial ports **336**

[**0083**] IDE **338**

[**0084**] Floppy disk **340**

[**0085**] Keyboard and Mouse **342**, **344**

[**0086**] USB **346**

[**0087**] CRT/TFT VGA controller **348**

[**0088**] Sound (not shown)

[**0089**] PC/**104** expansion (not shown)

[**0090**] 1 PCI slot (not shown)

[**0091**] TFT panel **160**—The platform **300** display preferably is a 4" 640×480 256 color VGA panel. The LCD display preferably runs from 12V DC.

[**0092**] Stereo AF Amplifier **306** and Speakers **308**—The platform **300** preferably includes an after market car stereo amplifier **306** capable of driving 5 speakers **308**. The speakers **308** selected and placement is done by Prisma Design. The amplifier **306** has outputs for 2 right channels, 2 left channels, and a sub woofer.

[**0093**] Microphone **310** and Audio **322** inputs—The microphone **310** and audio **322** inputs will feed into the sound subsystem of the computer **304**. Some type of mixer is preferred. The presently preferred embodiment uses the

Mic input, and Computer **304** sound out. Additional hardware may be required for Microphone audio preprocessing.

[**0094**] DC to DC converter **312**—The system runs on nominal 12 V DC (up to 13.8 volts actual). The computer **304** requires 7 Amps at nominal 5 Volts.

[**0095**] IDE devices—A 2.5 inch laptop 4 Gigabyte drive is used. Cabling is also provided for a CDROM hookup.

[**0096**] Button Cluster Controller **316**—A microcontroller that takes the button events and turns them into serial codes.

[**0097**] Linux Console—The first serial port **366** is preferably assigned to the Linux console.

[**0098**] SW Radio **318**—A radio capable of tuning the radio spectrum under RS232 computer control. The radio preferably provides stereo output when in the domestic FM band.

[**0099**] GPS **320**—Serial input from a GPS receiver **110** (**FIG. 2**).

[**0100**] Multimedia Device **20** Configuration and Operation

[**0101**] While the multimedia device **20** can be operated with default settings, it should be preferably configured by the user after purchase for best use. Using a remote computer **206** with an Internet connection **208**, the user preferably logs into the Internet gateway network **30** in a known manner. If the user has never created an account before, he/she will first answer a series of questions to create a user profile. The user registers information about the multimedia device **20** itself (e.g., identification number, model, etc.), provide billing information, provide information about the vehicle **184** if the device is an OEM installation, and complete the purchase interest profile so that advertisements can be directed to his vehicle **184** that meet the user's buying needs.

[**0102**] Next, the user indicates where the multimedia unit **20** is currently located. This information will be used to access the broadcaster database **194** and retrieve tuning and other related information about those local stations that may be received in this area. If the user subscribes to a digital satellite broadcast service, that broadcaster's channels will also be retrieved. Internet audio broadcasts will also be shown.

[**0103**] The user will then see a web page that will be dynamically created. It will contain all audio channels available in his area organized by format. **FIG. 5** shows examples of the types of information that may be seen. By default, all formats and stations are selected. The user will then be able to check on or off which formats and individual stations he/she prefers to see on the device **20**. Any format or station that is turned off will not appear on the radio display.

[**0104**] The user will also select those personal information channels (applications) such as stock reports **400**, weather reports **402**, traffic reports (not shown), etc. that the user wishes to use. These applications will be downloaded to the multimedia device **20** once the configuration session ends. The services shown will preferably grow over time as new features are added.

[**0105**] As shown in **FIG. 5**, the user can also configure the preset buttons **166** on the multimedia device **20** to select one or more channels **404** when a button **166** is pressed. Last, the user presses an option button **406** to configure the device **20** with his settings. All the formats and stations selected are transferred to the user's profile pages on the Internet gateway **30**. The gateway **30** will next awaken the multimedia device **20** and then transfer the configuration data to the multimedia device's local database **198** and also download any new service applications to the device **20**.

[**0106**] When the device **20** is instructed to tune to a particular local or satellite station in the vehicle **184**, its tuning program will retrieve the band and frequency information contained in its local database of stations **194**, and then tune the software programmable receiver **100** (**FIG. 2**) with this information. If the channel is an Internet audio broadcast, the tuning program will create a wireless Internet connection with the gateway **30** using the designated URL in its local database **194** as the source of the streaming broadcast, and will then run an appropriate application to play the broadcast.

[**0107**] If the vehicle **184** moves out of the geographic area used in the original configuration and so loses signal from its local stations, several corrective possibilities may happen. The user may manually request from the multimedia device **20** a recalibration of local audio stations. The location of the vehicle **184** from the GPS receiver **110** is sent to the gateway **30** and a new set of local stations are transferred back to the device **20** from the gateway broadcaster database **194**. Another possibility is that if the playing station experiences a set amount of drift, that event will automatically trigger a request for a local station recalibration. It could also request from the broadcaster database **194** at the gateway **30** a list of any other receivable stations that are currently broadcasting the same programming as the fading station.

[**0108**] Location Based Advertising Business Method

[**0109**] Using the computer controlled multimedia entertainment and information system **10** described above or some other suitable network, a method for transmission of location based advertising is provided. Although the following description refers to multimedia entertainment and information system **10** and multimedia device **20**, the location based advertising methods described in this application could apply to any communications system or any wireless communication device, including without limitation, pagers, cellular phones, two-way radios, PDAs, laptops, etc. The key aspect of this method is trading location based consumer preference or behavior profile information on various products or services for a number of advertisements transmitted to the system **10**. Such a method is based upon advertisement selection criteria, user location information, and proximity of users and vendors.

[**0110**] In particular, the present invention contemplates a method of providing service or products in a communication network comprising the steps of providing a plurality of service or product options to an end user; consumers will receive services or products in exchange for receiving ads. The plurality of service or product options could include such things as location based services (roadside assistance, navigation, etc.), news updates, sports, weather, stock quotes, e-commerce transactions, web surfing minutes, discounts on products, frequent flier miles, free products (CD's,

electronic equipment, gasoline), etc. in exchange for the end user receiving ads (voice, text or other medium) to a communication device. Alternatively, a plan could include a predetermined set of services or products provided to the end user in exchange for receiving a predetermined number of ads during a predetermined time frame or a number of ads within a predetermined range fitting said user's profile. The ads could be required to be received over a predetermined time frame to encourage more system usage.

[0111] Referring first to **FIG. 6, a** flow chart of the update information flow of the location based advertising method of the invention is provided, where **FIG. 6**(A) is a first half of the flow chart, and **FIG. 6**(B) is a second half of the flow chart. What triggers this diagram is an update received from the user. An example of such a request would include a message received by the system **10**, where the message was transmitted from the multimedia device **20**. This message could be sent by the system **10**, or sent automatically by the device **20** or manually by the user interacting with device **20** or some other device communicating with system **10**. In connection with **FIG. 6**, it doesn't matter how the system **10** received the message; **FIG. 6** illustrates the processing of the message—the mechanics of how the message was caused to be generated, is addressed in greater detail below.

[0112] The first step **500** shown in **FIG. 6**(A) performed by the method is to collect information relative to the user. This information can come from the message that was received from the user. For example, the information can include a user identification number associated with a remote location; location-related information, such as position, direction and speed of the user; time (this data can come internally from the system **11**); and potentially other external information that the system **11** may request from the user. Examples of this additional information is described in greater detail below. System refers to the electronic system which can create or forward messages to users. In some embodiments this could be a computer, an interconnected system of computers and trans actors, or just software residing on an existing computer system. System is also used to refer to the provider of this service.

[0113] The next step **502** performed by the method is to access a database of vendor criteria (not shown) to determine if data exists to compare to the user information received by the system **11**. An example of such vendor criteria is whether the vendor is looking for customers who meet certain demographics. Another example might be a particular vendor that the system is going to be sending an ad for may be looking for potential customers that are within a defined (e.g., one mile) radius of a retail location and is also presently driving in a vehicle. These are but a few examples of the criteria that a vendor may be looking to place adverstisements on, and those skilled in the art will appreciate than many other examples and criteria exist without departing from the essential spirit and scope of the invention.

[0114] This step **502** thus determines if the information that has been received by the system **11** from the user falls in line with any of the vendor criteria. So, the system **11** compares each of the vendor's criteria that subscribe to the service provided, for this particular update that was received from a user, and determines whether the vendor criteria match the user information. If not, there is nothing else for the system to do with this particular user update, and the method terminates. In an alternate embodiment of the invention, the system **11** may go back and update the user's profile (described above) with any newly received information contained in the user update.

[0115] If a match is generated for one of the vendor's criteria, then the system **11** next determines at step **504** if the user needs to receive some ads to meet his or her preferably required quota of advertisements for subscribing to the system **11**. If the answer to that question is yes, then program flow moves onto the second half of the flowchart (**FIG. 6**(B)). At step **508**, the system **11** formulates the information in a format where it can be matched against the vendor criteria. With that, the system **11** can proceed to step **511** to determining which advertisement to send to a user in response to the user update. With a given vendor, there may be multiple ads that can be sent in response to a particular user update. Examples of these ads are described in greater detail below.

[0116] At this point, the system **11** determines that an ad exists that is ready to be transmitted to the user. At step **512**, the ad is sent to the user. In the preferred embodiment, the system **11** also determines at step **514** whether interaction from the user is necessary in order to obtain further information. This is done to ensure, for example, the user is in fact reading the ad and the ads delivered aren't just going by while the system **11** is turned on overnight just to make sure the user meets his quota. So, on some of the ads if they require interaction, the system **11** determines if it has received the required information from the user yet or not.

[0117] Assuming that the system **11** has received the required user information (step **516**), the method proceeds to credit the user's account at step **518** and then terminates. If the particular ad selected did not require any user interaction, however, then the method checks to ensure that a confirmation that the ad was delivered is necessary or required by the vendor at step **522**. On certain messaging systems that can be used as remote programming devices **40**, the confirmation may be transmitted back to such a device **40**. If no confirmation is required, the method terminates. If a confirmation is required, then the method determines if the ad was in fact delivered at step **520** and, once confirmation is received, the program credits the user's account at step **518** from a running tally of ads received, and then terminates.

[0118] Returning to **FIG. 6**(A), if the user still needs to receive a certain number of ads to meet his or her periodic quota, the system **11** repeats the above procedures. If the user has received all the ads that were needed to be received to meet the subscription quota, in the preferred embodiment of the invention the method proceeds on the assumption that the user is not interested in receiving any more ads during this interval, whatever it is. However, in the preferred embodiment, the system **11** allows for an override feature where the user has engaged the shopping list feature shown in step **506**. In that embodiment, the system **11** still allows the user to receive ads because that provides a benefit to the user as opposed to something the user is doing just to get this service. The shopping list feature is described in greater detail below in connection with **FIG. 12**.

[0119] As those skilled in the art will appreciate, the received user information may come at a different point in

time. So, when that information comes in, because it is coming from a different part of the system **11**, the method still needs to credit the user's account when the information is received.

[**0120**] Referring next to **FIG. 7, a** listing of presently preferred information that is received from a user to form an information pool **530** is illustrated. Some things already mentioned include velocity **532** and position/location **534** of the user, time of day **536** and mileage **538**. If the system **11** is tied into an automobile **184**, the information pool may further include oil pressure **540**, gauge data **542**, and interior car temperature **544**. Outside temperature could be obtained either from the vehicle or from some external input **546** like a weather channel web site. Those skilled in the art will appreciate that myriad different kinds of information can come into the information pool **530**.

[**0121**] An example of how the information pool **530** is used by the system **11** would include, in the case where a chain of automotive oil change retail stores subscribe as a registered vendor for the system, the vendor may want to push an ad anytime anybody is within one mile of a retail location. Some of the triggers the system **11** can provide to the retailer in the form of user information thus includes whether the user's oil pressure light is on. If so, then the vendor may want to send the potential customer an oil change ad. Likewise, if the vendor obtains information on the interior temperature of the vehicle and that information is coupled with information about outside temperature—and the outside temperature, for example, is 115° while the interior temperature of the car is 95°—instead of sending an oil change ad, same vendor may prefer to send an air conditioner recharge ad. Similarly, if tire pressure **556** is low, a vendor may want to send an ad that tells a potential customer to come in and get their tires checked.

[**0122**] In addition, the information pool **530** need not always exist by pinging or polling the user. For example, a user's purchase history preferences **548** can also be included. This information, however, is not information that can be readily obtained from the user. Rather, this is information that the system **11** can compile over time and keep resident in a memory. An example of the method of accumulating historical purchasing data may be that a user historically responds to 50% of ads sent so the system **11** can start getting ratings on how valuable is this person to the program, as well as what target advertising seem to work better for a particular user. Most suppliers/vendors look for a particular type of customer, so such ad acceptance information **558** is valuable.

[**0123**] Some of the information contained in the pool **530** may relate back to some of the demographics **550** of the individual. If the user has small children, then the system **11** can send the user a McDonalds' ad when the user is within range of a McDonald's store. Alternatively, a negative database con be compiled so that McDonalds may choose to not target a childless person with an ad and not waste the time and expense if the demographics do not support the ad. This type of information also overlaps with the location data **534**. If, for example, the system **11** knows that a particular user is parked outside of a school for a period of time (e.g., two minutes), the method can draw the conclusion there that that user must have some children that are in that school. Again, that conclusion would be one of the criteria used in selecting which ad to send. The system **11** can also look at the history of that type of information. If the system **11** sees the user stop outside a school every day for 10-20 minutes, the system **11** can use that kind of information for route history data **552** or route planning **554**.

[**0124**] As mentioned above, target advertising can be temporal rather than spatial in nature. The system **11** could use time of day information to decide whether to send an ad. For example, a coffee shop may want to send ads between the hours of 7 a.m. and 11 a.m. only. If a user's route everyday is through a certain district or area, the system **11** has a statistical chance of knowing where the user is going to be and a what time. The system **11** can start feeding the user ads ahead of this time period without even knowing a precise location. Again, the system **11** monitors the user's route history everyday and sees that the user pulls into a donut shop, so the system **11** concludes that the user is probably stopping for a donut and a coffee. A competing coffee shop may want to start pinging that user with an ad as soon as he or she is pulling out of the driveway everyday.

[**0125**] **FIG. 8** is a flow chart showing the steps of choosing the ad, which is shown generally at step **510** in **FIG. 6**(B). First, the method proceeds to collate user data at step **600**. This information is combined together at step **604** with the vendor criteria (step **602**) again matching the appropriate types of information. The system **11** determines at step **606** if there is a criteria match, as set forth above. If not, the method terminates as indicated above. There is thus no vendor, and no ad to choose from.

[**0126**] If there is a match, there may be one or more ads that match, so the method proceeds to choose the vendor providing the ad based on the criteria at step **610**. Some of the criteria here again relates to the different vendors. Part of the information may also include the relationship the service provider has with the vendor. For example, if a specific vendor is guaranteed a certain number of ads per month and because of the narrowness of this vendor's criteria, even though they don't buy very many ads per month, their criteria is so narrow that the system **11** has to let them bubble to the top for a particular user.

[**0127**] The next step **612** the method performs is to determine if the ad will be coming from the system or is it actually going to come directly from the vendor. The invention contemplates four sources for ads. Static ads are resident on the system **11**. There may be multiple different ads for a different vendor that are chosen by a given criteria, but the ads themselves are static. These ads could also be updated at some point possibly in time, but they remain on system **11**. In contrast, dynamic ads are created on the system **11** using some of the criteria to actually change the content of the ad. For example, instead of just sending an ad that says: "Come into Dunkin Donuts", a dynamic ad may read: "Bob, come into Dunkin Donuts, come and get a cup of coffee."

[**0128**] Likewise, the same type of mechanism is available back at the vendor where, instead of hosting the ads themselves on the system **11**, the ads actually come directly from the vendor's system (not shown). The method thus sends the vendor criteria that was deemed a match to its criteria. Information is sent back and forth. Ultimately, the vendor sends the ad to be sent to the user.

[**0129**] Referring next to **FIG. 9, a** flow chart of the method of getting an ad is provided If there is no additional

information required from the user (step **700**), the system **11** determines if this is an existing ad or a custom ad at step **702**. If it is an existing ad, the method retrieves and returns the ad at step **708**. If it is a custom ad, then the method proceeds to create the custom ad at step **704** based on the update information (**FIG. 6**) and possibly some additional information. The custom ad is then created.

[**0130**] Backing up to the additional information required step **700**, if the system **11** needs more information from the user is proceeds to obtain that information at step **706**. For example, perhaps gauge information from the vehicle is required, but that information was not supplied in the original update message. The system **11** requests and retrieves the additional user information.

[**0131**] **FIGS. 10 and 11** are ladder diagrams that show alternate preferred paths for sending and receiving information over the system **10**. In **FIG. 10**, the user autonomously sends **800** in the information to the system **11**. The user thus sends in information to the information pool, or more likely a portion of the pool since the pool is preferably very large and transmission of all pool information may tie the system **11** down. Then, once the information is received and collated by the system **11**, the system **11** notifies the vendor **802** that there is a user that meets their requirements. The vendor may then respond and request additional detail **804**, such as what is the mileage, temperature, or gauge information related to the user. The system **11** can then poll the user **806** for that information requesting specifically that type of information. As a result, more data from the pool gets sent back **808** to the system **11**. Or, more data to add to the pool is sent back from the user. That data is then sent on to the vendor **810** by the system **11**. The vendor can then decide what they want to do with it, and send a standard or custom ad. The vendor then notifies the system **812**, the system sends the ad to the user **814**, and the user, preferably, sends a receipt or a confirmation of the receipt back to the system **11**. Finally, some accounting steps are performed **818** on or at the system **11**.

[**0132**] Alternatively, **FIG. 11** shows that the vendor or the system **11** itself can send a request to the user. Either way, it can be requested if anybody needs a product or service **900**. The information requested can include, for example, whether the user is listening to a certain station on the radio, whether their gas tank is empty, whatever information the vendor wants. They can send that request out **902**. The desired information will be returned **904**. The information returned can then be sent on to the vendor if specified **906**, or to a selection of vendors if it was initiated by the system **11**. The vendor can then send back an indication what it would like to do based on the received information **908**. That is sent down to the user **910**, if the receipt exists, the receipt is returned to the system **912**, and then some internal accounting occurs **914**.

[**0133**] **FIG. 12** illustrates the program flow for the shopping list feature referred to earlier in connection with **FIG. 6**. The user first enters desired items into the system at step **1100**, whether it is wireless or done through a computer, as described above. It can be fairly diverse information, such as a need to get wiper blades, a gallon of milk, and a lawnmower, for example. Those details are entered by the user and the shopping list feature is activated. A subscribing vendor can then offer to provide that product to the user. The method proceeds to check if the user is geographically near a subscribing vendor at step **1010**. If not, the system checks to see if a route can be calculated to place the shopper by a subscribing vendor at step **1012**. The method then checks to see if the vendorS have one or more of the items on the person's shopping list in stock at step **1014**. If they don't, then method flow returns to a point where it waits until some vendor does.

[**0134**] If the answer is yes, that product can be offered to the user. The system **11** then notifies the user of the time, the cost and the location of getting the listed item at step **1016**. The time is important because some vendors may have the item up front, with somebody waiting for the user to stop by. The user then has the information needed to decide to make the purchase or to wait until another time in the future (step **1018**). Since the request was sent to the vendor if they had these items, the system **11** lets the vendor know if that the user decided not to make a purchase at this time at step **1022**. If the user decided to make a purchase, the system **11** notifies the vendor at step **1020** to prepare the order. The method then proceeds to attempt to fill up the rest of the person's shopping list.

[**0135**] The ability of a customer to receive information can be a benefits-based service. The ad is sent when a portion of the user information pool indicates it would be useful for the user (e.g., running out of gas, oil is in need of a change, your run flat tire has low air pressure).

[**0136**] Another application is a person will accept ads at any time for any reason, but limits the number in a time period (e.g., no more than 5 ads per day forming a quota). The limit may be set so large as to approach a free flow of ads based on the user's information pool. A shopping list can also be used to provide a positive service to the user. The event-based service ads should be viewed positively.

[**0137**] Alternatively, the system could present time, availability, and price information on all purchases, and a purchasing decision could be made on all items on the shopping list at one time. Multiple vendors may respond to a user's list. These responses can be forwarded to the user for the user to pick and choose among the vendors for each item. The user could choose or automatic choices could be made based on the user's preference for a route, price, time, or past experiences with different vendors. After the choices have been made, the vendors are informed of the user's choices. An alternative is if price is the main driver, a bidding loop could occur on each item, or for groups of items. This auctioning for the business of a person who is known to be ready to buy items on their shopping list provides vendors with an opportunity to reach a customer ready to make a purchase

[**0138**] In **FIG. 13, a** flow chart of the user originated update process is shown. The program starts and the method clears an event timer at step **1100**. Again, the timer doesn't necessarily need to measure time. The measured data alternatively could be miles, or it could be uses of something or product. If the timer has exceeded the value looked for at step **1102**, then the system **11** collects the data that is going to be sent out at step **1104** and the data is sent at step **1106**. If the answer is no, the method loops back and keeps waiting for the timer to time out. This process correlates to steps **800** and **808** in the ladder diagram shown in **FIG. 10**.

[**0139**] Now, referring to **FIG. 14, a** system originated update program flow is described. First, a user is selected at

step **1200**. Then, the system **11** selects the data you want to retrieve at step **1202**. The system **11** then polls the user base for that information at step **1204**. Once the requested data is received, the system **11** stores it into the portfolio for a particular user at step **1206** and exits. Again, the process shown in **FIG. 14** could be based on a time or alternate criteria.

[**0140**] In **FIG. 15, a** flow chart for selecting a user is illustrated. The method starts by determining at step **1300** if any user information require updating at this time. If the answer is yes, then the system **11** returns that user ID to go out and proceeds to obtain the information from the particular user. If there are other users that also require updating, that is determined at step **1302** and the method selects the next user ID at step **1304**. If not, the user ID is returned at step **1308** and the method terminates.

[**0141**] As described in detail above, if there is a navigation planning system that is part of the user's vehicle **184**, the information from that system can be used to determine where the vehicle **184** is going to be in the future and that route, or the sequence of locations, could be used when comparing against the criteria in the database. So in the oil change example, if the vendor is interested in anybody within a mile radius, the system **11** can predict that the user will be within a mile and that might be sufficient to satisfy their criteria that runs in the retailer's ad.

[**0142**] Alternatively, location could be obtained from a dead reckoning system rather than a GPS system. For example, current cellular systems can provide ID of the cellular tower that users are near at any point in time. Some of the geography data also may not need a lot of precision. Resolution down to part of a city may be sufficient in certain instances.

[**0143**] The location information can also be dynamic. It can change over time. This allows the vendors to pick different criteria, and different ads. The location information is associated with a particular user, so it is not a static location like zip code or area code. Rather, it is the location of this particular user at this time and over time. As mentioned above, the ad is delivered to the user when the system **11** decides to deliver it and not necessarily when the user is interested in seeing the ad.

[**0144**] As mentioned above, in the preferred embodiment, an override for emergencies or special situations is provided, so the user can respond to the system **11** that it does not want to receive advertising For example, in the process of driving a child who is bleeding to the hospital, the user can respond automatically "please don't bother me with that ad."

[**0145**] In another aspect of the invention, ads can be tied to services, for example, if a user is going to request a sports update, an ad is delivered and then the sports update or then the weather. In situations like emergency situations, the user can override that feature. For example, a tornado is coming and the user really needs to see the weather. The user does not want to see the ad for what's on t.v. this weekend, however, at that time.

[**0146**] Other ideas for advertising delivery include, for example, delivery of content specific advertising depending upon what information or data the user is receiving on his device. For example, if a user is listening to the football game on the radio, the system **11** may want to send the user a relevant ad, such as an ad for team apparel or tickets to future games of the home team. The system **11** could use a change in status, one of these sensors to trigger an ad to be sent. For example, rather than waiting for the polling or the time to expire, if the oil light turns on, that would send an update back to the system **11** and the system **11** would respond with an oil change advertisement.

[**0147**] The user preferably can input their own advertising preferences, as described above. So, if users are interested in seeing ads for McDonalds but not in seeing ads for a high end steak place, then that is accounted for by the system **11**. The system **11** can look at previous purchasing behavior to help identify which ads should be sent. For a given criteria area, the system **11** can ask what is the probability the person will make a purchase? The vendor may want to limit it to a certain level. A 50% or higher probability, for example, and a vendor may then definitely want to send them an ad.

[**0148**] There might be certain stores or certain types of products vendors are more interested in than others. The system **11** could look at a user's wireless device usage and habits, and use some of that information to try and decide when is it more opportune to send advertisements. Some of the spending habits is just feedback from vendors, perhaps, as to what is the likelihood that the user may purchase upon seeing an ad. If that information is recorded by vendors as the reason a customer is buying this product today, the vendor may want to take that into account.

[**0149**] In choosing an ad for a given merchant which might have more than one ad the system **11** can look at several different things to determine which ad to send, or create the ad that would be sent. The system **11** can look at the activity of the user, spending habits, demographics, time of day, time/location history of the user, and at a planned route if navigation is tied in. Regarding spending habits, if a user is going into a store, why send an ad for $0.50 off a sandwich at the deli when a person typically spends $1,000 on jewelry. The system **11** optimises advertising by including other purchase history, and helps build the demographics, or the spending habits of this person. The method of delivery of an ad may be a short textual message. Other data protocols can be used, such as voice ads.

[**0150**] It is to be understood that a wide range of changes and modifications to the embodiments described above will be apparent to those skilled in the art and are contemplated. It is therefore intended that the foregoing detailed description be regarded as illustrative, rather than limiting, and that it be understood that it is the following claims, including all equivalents, that are intended to define the spirit and scope of the invention.

We claim:

1. A method of providing service in a wireless communication network comprising the steps of:

providing a plurality of service options to an end user;

providing products or services to said end user in response to the subscription to one of said service options; and

providing ads to the end user as compensation for the service.

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