US 20060136106A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2006/0136106 A1

(43) Pub. Date: Jun. 22, 2006

Patenaude et al.

(54) METHOD OF DETERMINING AND PREDICTING ENTERTAINMENT SELECTIONS FOR TELEMATICS UNITS

(75) Inventors: **Russell A. Patenaude**, Macomb Township, MI (US); **Patty Valerio Kogowski**, Macomb Township, MI (US); **Brad T. Reeser**, Lake Orion, MI (US); **Julianne Petschke**, Shelby Township, MI (US)

Correspondence Address:
ANTHONY LUKE SIMON
General Motors Corporation, Legal Staff
300 Renaissance Center, Mail Code 482-C23-B21
P.O. Box 300
Detroit, MI 48265-3000 (US)

(73) Assignee: **General Motors Corporation**

(21) Appl. No.: **11/021,446**

(22) Filed: **Dec. 22, 2004**

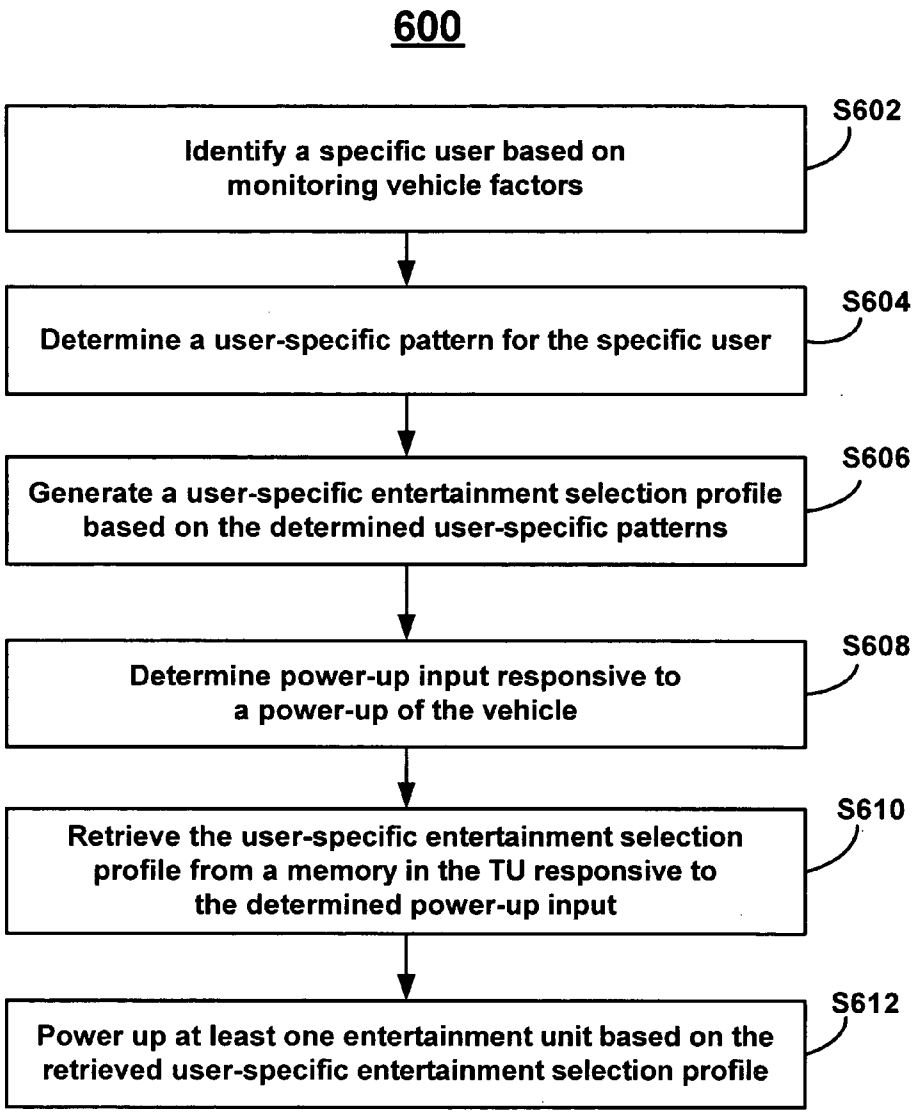
Publication Classification

(51) **Int. Cl.**
G06F 7/00 (2006.01)

(52) **U.S. Cl.** **701/36**; 307/10.1

(57) **ABSTRACT**

A method for providing entertainment in a vehicle, including monitoring entertainment selections at a telematics unit, determining at least one user entertainment selection profile based on the monitoring and activating entertainment units based on the profile.



TOYOTA EXHIBIT 1009

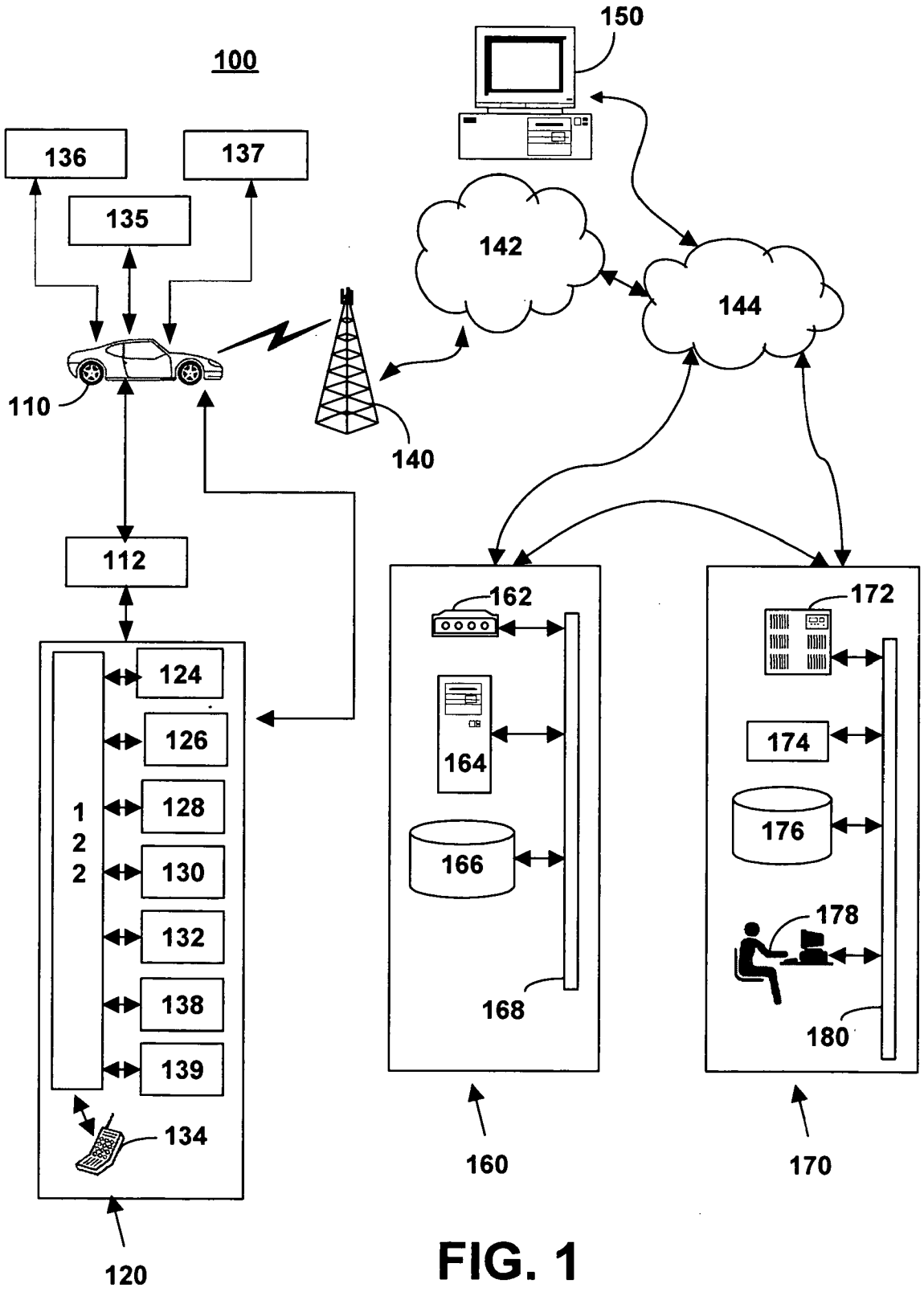

100
150
136
137
135
142
144
110
140
112
162
172
124
126
128
130
132
138
139
122
164
166
168
174
176
178
180
134
160
170
120

FIG. 1

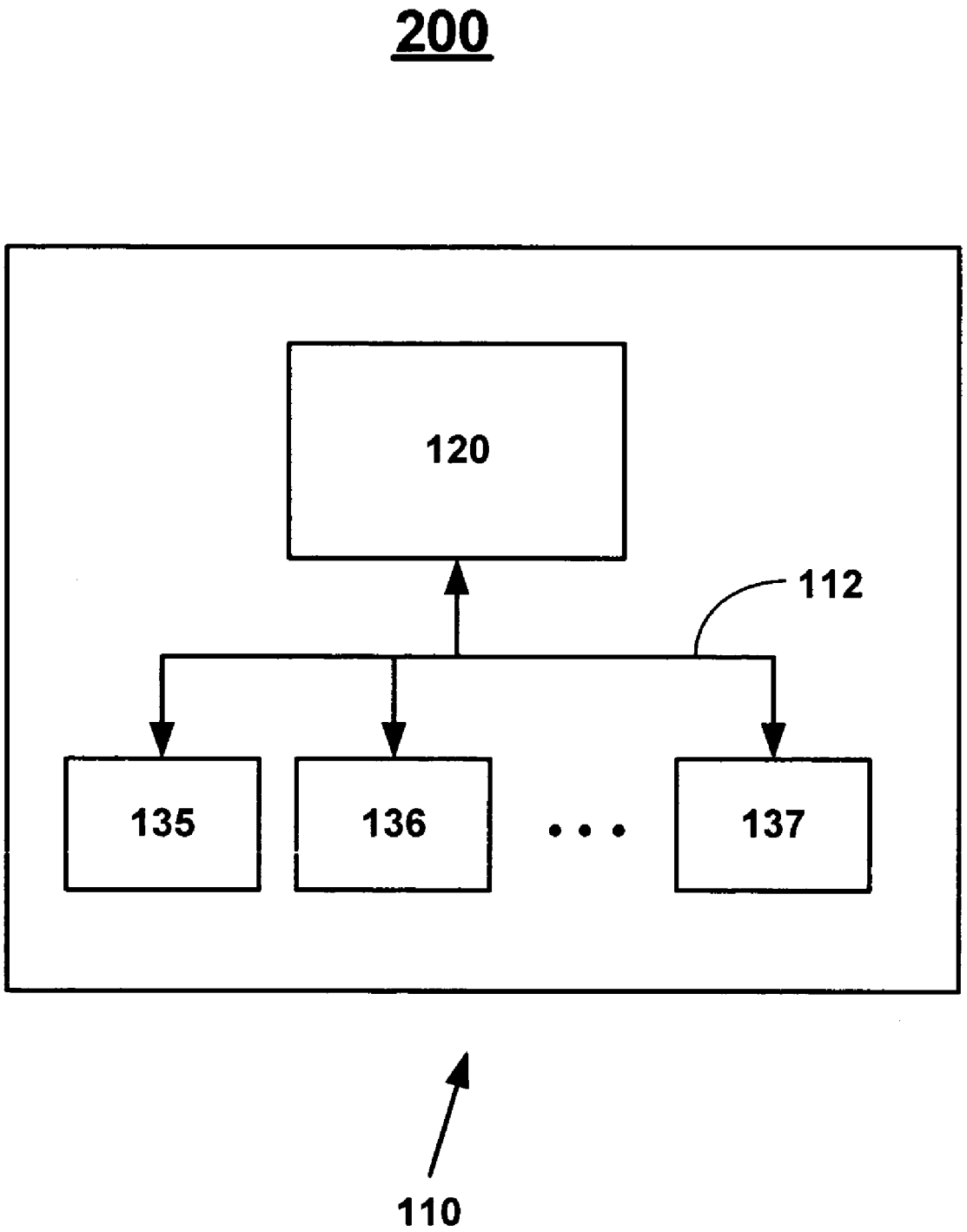


FIG. 2

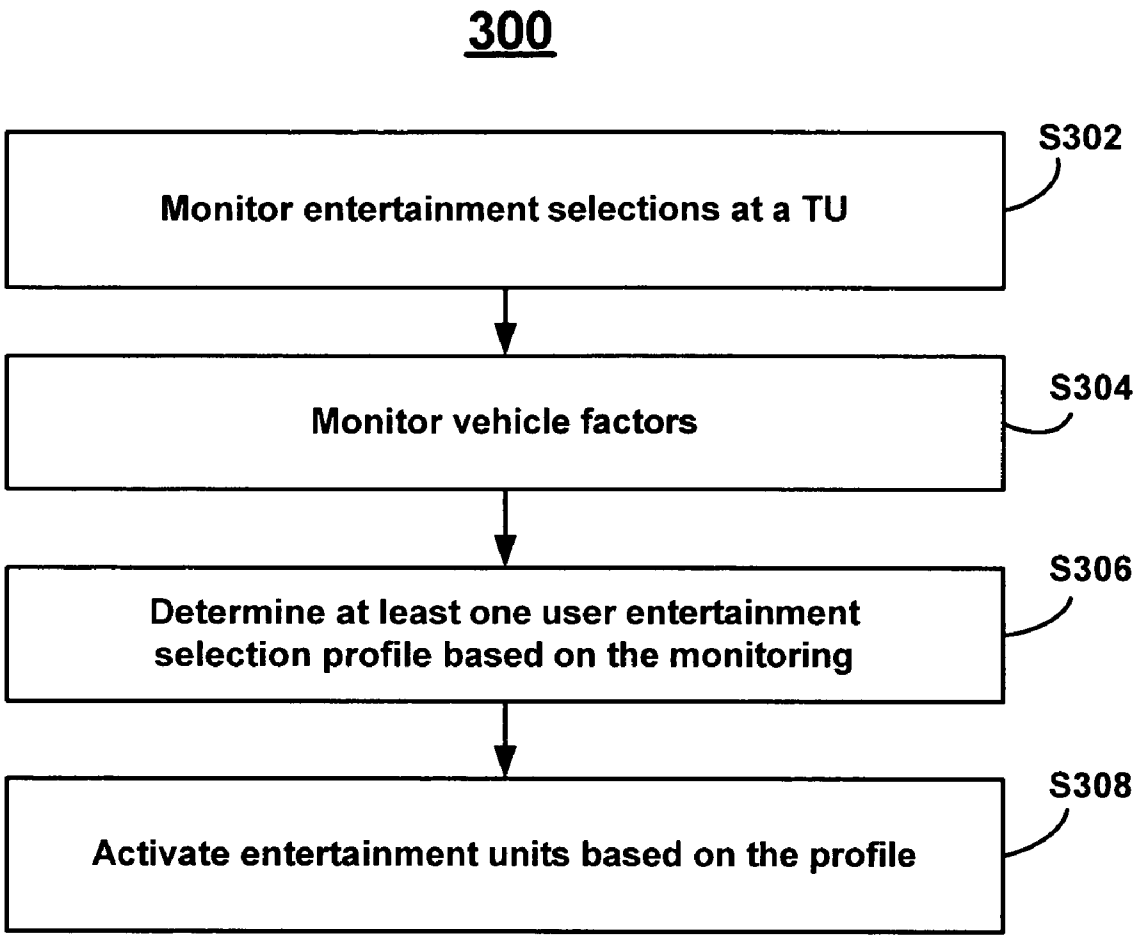

300
Monitor entertainment selections at a TU
S302
Monitor vehicle factors
S304
Determine at least one user entertainment selection profile based on the monitoring
S306
Activate entertainment units based on the profile
S308

FIG. 3

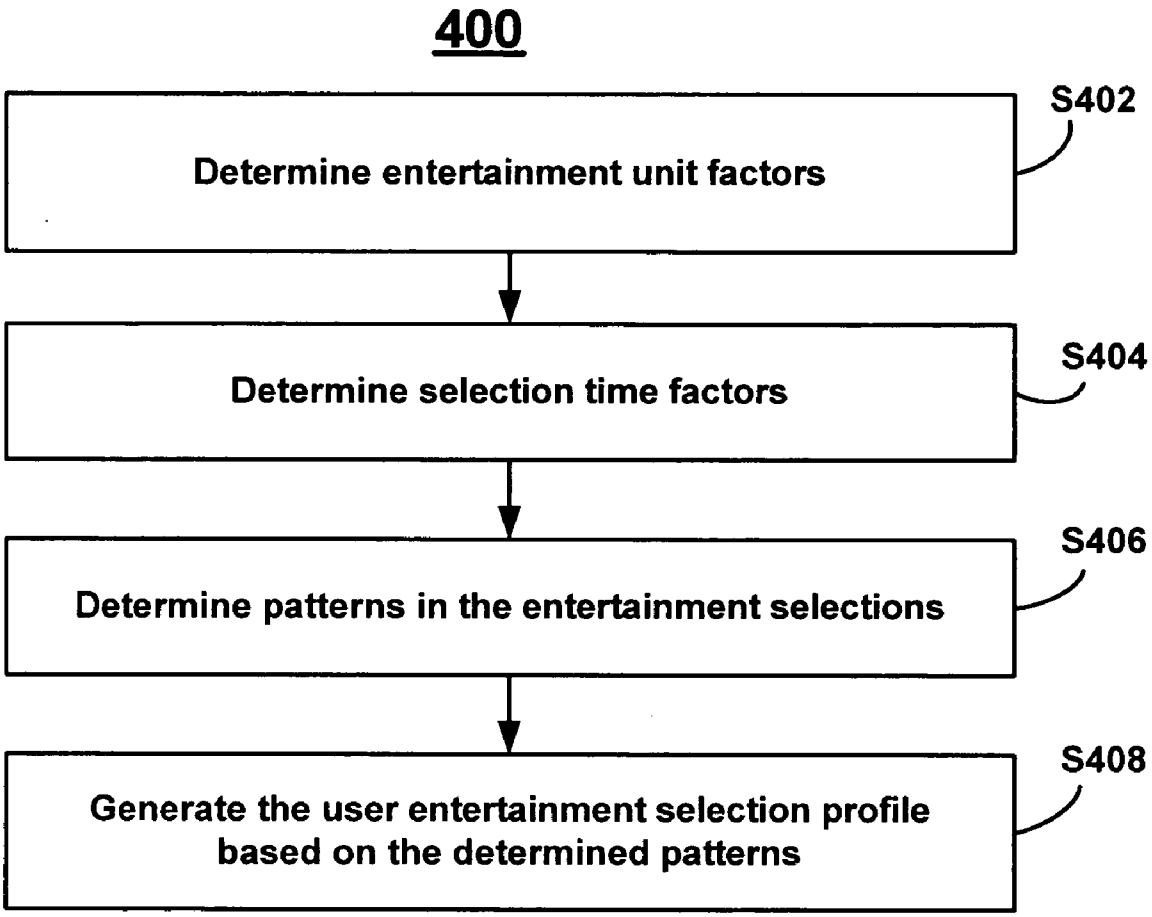

400
Determine entertainment unit factors
S402
Determine selection time factors
S404
Determine patterns in the entertainment selections
S406
Generate the user entertainment selection profile based on the determined patterns
S408

FIG. 4

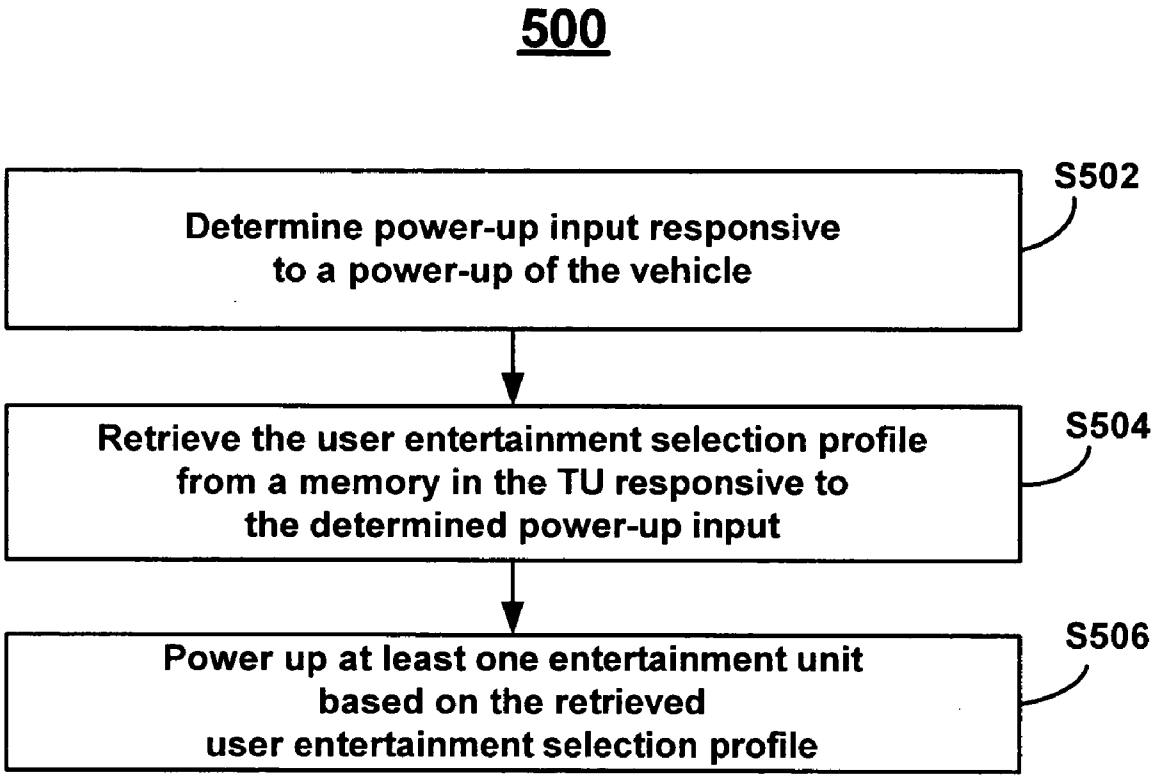

500
Determine power-up input responsive to a power-up of the vehicle
S502
Retrieve the user entertainment selection profile from a memory in the TU responsive to the determined power-up input
S504
Power up at least one entertainment unit based on the retrieved user entertainment selection profile
S506

FIG. 5

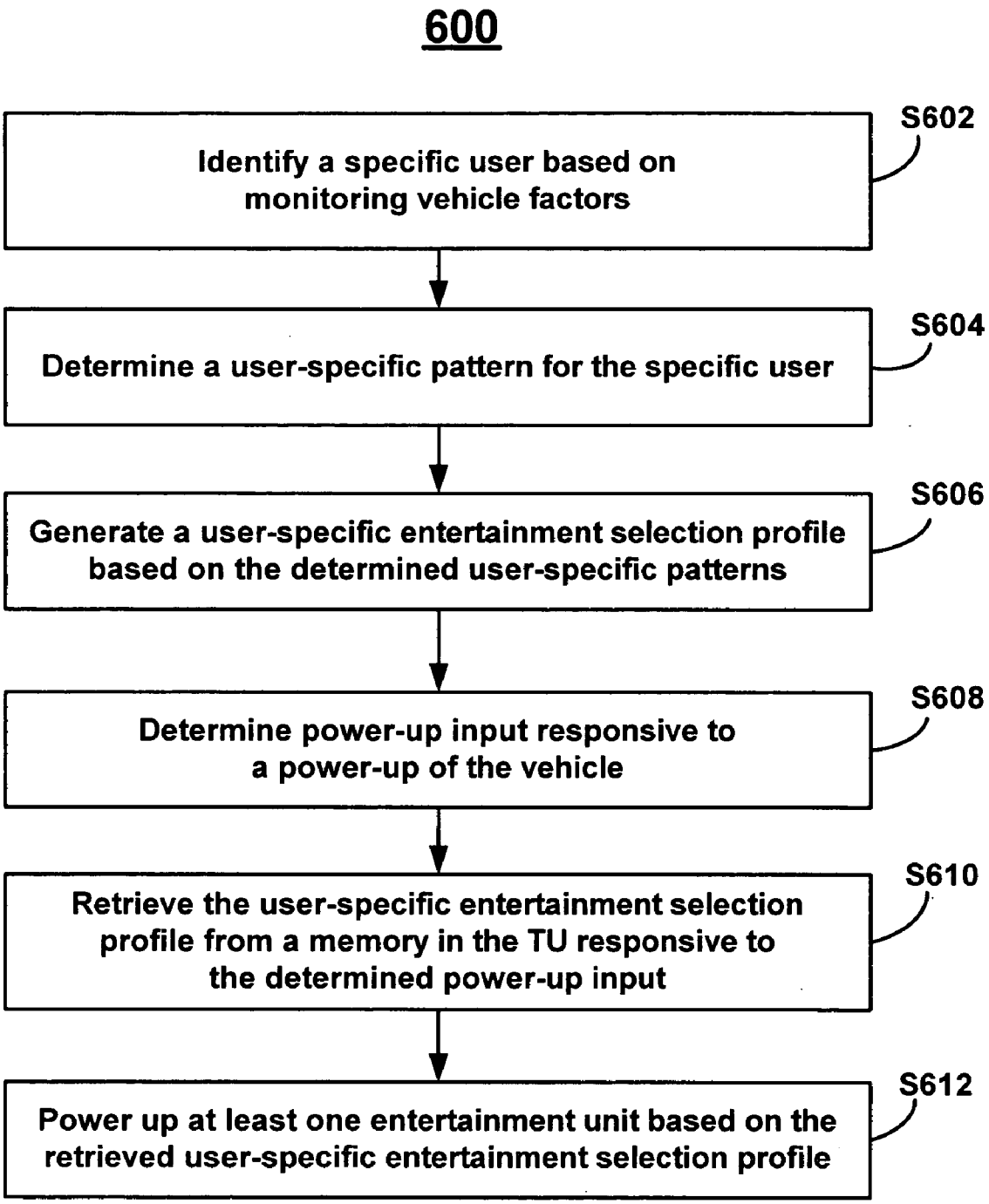

600
Identify a specific user based on monitoring vehicle factors
S602
Determine a user-specific pattern for the specific user
S604
Generate a user-specific entertainment selection profile based on the determined user-specific patterns
S606
Determine power-up input responsive to a power-up of the vehicle
S608
Retrieve the user-specific entertainment selection profile from a memory in the TU responsive to the determined power-up input
S610
Power up at least one entertainment unit based on the retrieved user-specific entertainment selection profile
S612

FIG. 6

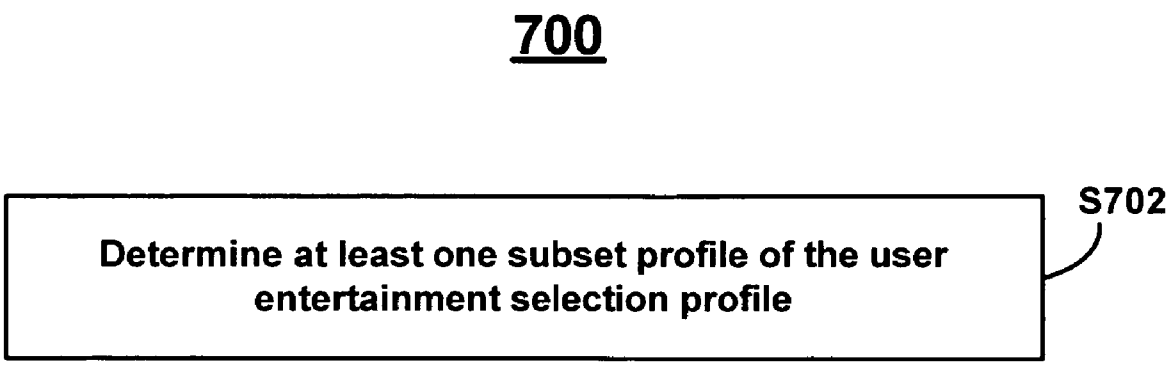

700
S702
Determine at least one subset profile of the user entertainment selection profile

FIG. 7

METHOD OF DETERMINING AND PREDICTING ENTERTAINMENT SELECTIONS FOR TELEMATICS UNITS

FIELD OF THE INVENTION

[0001] This invention relates generally to a strategy to determine and predict entertainment selections. In particular, the invention relates to providing entertainment in a vehicle by determining an entertainment selection profile.

BACKGROUND OF THE INVENTION

[0002] The opportunity to personalize features in a mobile vehicle is ever increasing as the automobile is being transformed into a communications and entertainment platform as well as a transportation platform. Many new cars will be installed with some type of telematics unit to provide wireless communication and location-based services. These services may be accessed through interfaces such as voice-recognition computer applications, touch-screen computer displays, computer keyboards, or a series of buttons on the dashboard or console of a vehicle.

[0003] Currently, telematics service call centers, in-vehicle compact disk (CD) or digital video display (DVD) media, web portals, and voice-enabled phone portals provide various types of location services, including driving directions, stolen vehicle tracking, traffic information, weather reports, restaurant guides, ski reports, road condition information, accident updates, street routing, landmark guides, and business finders.

[0004] The current telematics services available in vehicles do not provide a method to determine and predict a user's entertainment selections, such as a radio station on an FM radio or a compact disc track of a CD in a CD player. Additionally, current telematics services are not available to turn on entertainment units during power-up of a vehicle, based on the predicted entertainment selections.

[0005] It is desirable, therefore, to provide a method, computer usable medium and system that overcomes the limitations described above by providing a method to monitor entertainment selections to determine a user entertainment selection profile.

SUMMARY OF THE INVENTION

[0006] One aspect of the present invention is a method for providing entertainment in a vehicle including monitoring entertainment selections at a telematics unit, determining at least one user entertainment selection profile based on the monitoring and activating entertainment units based on the profile.

[0007] A second aspect of the present invention is a system for providing entertainment in a vehicle including means for monitoring entertainment selections at a telematics unit, means for determining at least one user entertainment selection profile based on the monitoring and means for activating entertainment units based on the profile.

[0008] A third aspect of the present invention provides a computer readable medium storing a computer program having computer readable code for monitoring entertainment selections at a telematics unit, computer readable code for determining at least one user entertainment selection profile based on the monitoring and computer readable code for activating entertainment units based on the profile.

[0009] The foregoing and other features and advantages of the invention will become further apparent from the following detailed description of the presently preferred embodiment, read in conjunction with the accompanying drawings. The detailed description and drawings are merely illustrative of the invention rather than limiting, the scope of the invention being defined by the appended claims and equivalents thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Various embodiments of the present invention are illustrated by the accompanying figures, wherein:

[0011] **FIG. 1** is a schematic diagram of a system for providing access to a telematics system in a mobile vehicle;

[0012] **FIG. 2** is a schematic diagram of one embodiment of transmission paths for the monitored entertainment units;

[0013] **FIG. 3** illustrates a method representative of a first embodiment of a method of providing entertainment in a vehicle in accordance with the present invention;

[0014] **FIG. 4** illustrates a method representative of a first embodiment of a method of determining a user entertainment selection profile in accordance with the present invention;

[0015] **FIG. 5** illustrates a method representative of a first embodiment of a method of activating entertainment units in accordance with the present invention;

[0016] **FIG. 6** illustrates a method representative of a second embodiment of a method of determining a user entertainment selection profile in accordance with the present invention; and

[0017] **FIG. 7** illustrates a method representative of a third embodiment of a method of determining a user entertainment selection profile in accordance with the present invention.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

[0018] **FIG. 1** illustrates one embodiment of system for data transmission over a wireless communication system, in accordance with the present invention at **100**. Mobile vehicle communication system (MVCS) **100** includes a mobile vehicle communication unit (MVCU) **110**, a vehicle communication network **112**, a telematics unit **120**, one or more wireless carrier systems **140**, one or more communication networks **142**, one or more land networks **144**, one or more client, personal or user computers **150**, one or more web-hosting portals **160**, and/or one or more call centers **170**. In one embodiment, MVCU **110** is implemented as a mobile vehicle equipped with suitable hardware and software for transmitting and receiving voice and data communications. MVCS **100** may include additional components not relevant to the present discussion. Mobile vehicle communication systems and telematics units are known in the art.

[0019] MVCU **110** may also be referred to as a mobile vehicle throughout the discussion below. In operation, MVCU **110** may be implemented as a motor vehicle, a

marine vehicle, or as an aircraft. MVCU **110** may include additional components not relevant to the present discussion.

[**0020**] MVCU **110**, via a vehicle communication network **112**, sends signals to various units of equipment and systems (detailed below) within MVCU **110** to perform various functions such as unlocking a door, opening the trunk, setting personal comfort settings, and calling from telematics unit **120**. In facilitating interactions among the various communication and electronic modules, vehicle communication network **112** utilizes network interfaces such as controller-area network (CAN), International Organization for Standardization (ISO) Standard **9141**, ISO Standard 11898 for high-speed applications, ISO Standard 11519 for lower speed applications, and Society of Automotive Engineers (SAE) Standard J1850 for high-speed and lower speed applications.

[**0021**] MVCU **110**, via telematics unit **120**, sends and receives radio transmissions from wireless carrier system **140**. Wireless carrier system **140** is implemented as any suitable system for transmitting a signal from MVCU **110** to communication network **142**.

[**0022**] Telematics unit **120** includes a processor **122** connected to a wireless modem **124**, a global positioning system (GPS) unit **126**, an in-vehicle memory **128**, a microphone **130**, one or more speakers **132**, an embedded or in-vehicle mobile phone **134** and sensors **138**. The sensors **138** include position and pressure sensors in the seats of the MVCU **110** and gyroscopes in the rear view mirrors. In other embodiments, telematics unit **120** may be implemented without one or more of the above listed components, such as, for example GPS unit **126** or speakers **132**. The telematics **120** unit may contain a speech recognition unit **139** used to act on commands annunciated by a user. Telematics unit **120** may include additional components not relevant to the present discussion.

[**0023**] In one embodiment, processor **122** is a digital signal processor (DSP). Processor **122** is implemented as a microcontroller, microprocessor, controller, host processor, or vehicle communications processor. In an example, processor **122** is implemented as an application specific integrated circuit (ASIC). In another embodiment, processor **122** is implemented as a processor working in conjunction with a central processing unit (CPU) performing the function of a general purpose processor. GPS unit **126** provides longitude and latitude coordinates of the vehicle responsive to a GPS broadcast signal received from one or more GPS satellite broadcast systems (not shown). In-vehicle mobile phone **134** is a cellular-type phone, such as, for example an analog, digital, dual-mode, dual-band, multi-mode or multi-band cellular phone.

[**0024**] Processor **122** executes various computer programs that control programming and operational modes of electronic and mechanical systems within MVCU **110**. Processor **122** controls communications (e.g. call signals) between telematics unit **120**, wireless carrier system **140**, and call center **170**. In one embodiment, a voice-recognition application is installed in processor **122** that can translate human voice input through microphone **130** to digital signals. Processor **122** generates and accepts digital signals transmitted between telematics unit **120** and a vehicle communication network **112** that is connected to various entertainment units **135**, **136**, and **137** in the MVCU **110**. The entertainment units **135**, **136**, and **137** may include a compact disk (CD) player, an AM radio, an FM radio, a satellite radio, televisions and other electronic entertainment. In one embodiment, these digital signals activate the operation modes of the entertainment units **135**, **136**, and **137**, as well as provide for data transfers between the telematics unit **120** and the entertainment units **135**, **136**, and **137**.

[**0025**] Communication network **142** includes services from one or more mobile telephone switching offices and wireless networks. Communication network **142** connects wireless carrier system **140** to land network **144**. Communication network **142** is implemented as any suitable system or collection of systems for connecting wireless carrier system **140** to MVCU **110** and land network **144**.

[**0026**] Land network **144** connects communication network **142** to client computer **150**, web-hosting portal **160**, and call center **170**. In one embodiment, land network **144** is a public-switched telephone network (PSTN). In another embodiment, land network **144** is implemented as an Internet protocol (IP) network. In other embodiments, land network **144** is implemented as a wired network, an optical network, a fiber network, other wireless networks, or any combination thereof. Land network **144** is connected to one or more landline telephones. Communication network **142** and land network **144** connect wireless carrier system **140** to web-hosting portal **160** and call center **170**.

[**0027**] Client, personal or user computer **150** includes a computer usable medium to execute Internet browser and Internet-access computer programs for sending and receiving data over land network **144** and optionally, wired or wireless communication networks **142** to web-hosting portal **160**. Personal or client computer **150** sends user preferences to web-hosting portal through a web-page interface using communication standards such as hypertext transport protocol (HTTP), and transport-control protocol and Internet protocol (TCP/IP). In one embodiment, the data includes directives to change certain programming and operational modes of electronic and mechanical systems within MVCU **110**. In operation, a client utilizes computer **150** to initiate setting or re-setting of user-preferences for MVCU **110**. User-preference data from client-side software is transmitted to server-side software of web-hosting portal **160**. User-preference data is stored at web-hosting portal **160**.

[**0028**] Web-hosting portal **160** includes one or more data modems **162**, one or more web servers **164**, one or more databases **166**, and a network system **168**. Web-hosting portal **160** is connected directly by wire to call center **170**, or connected by phone lines to land network **144**, which is connected to call center **170**. In an example, web-hosting portal **160** is connected to call center **170** utilizing an IP network. In this example, both components, web-hosting portal **160** and call center **170**, are connected to land network **144** utilizing the IP network. In another example, web-hosting portal **160** is connected to land network **144** by one or more data modems **162**. Land network **144** sends digital data to and from modem **162**, data that is then transferred to web server **164**. Modem **162** may reside inside web server **164**. Land network **144** transmits data communications between web-hosting portal **160** and call center **170**.

[**0029**] Web server **164** receives user-preference data from user computer **150** via land network **144**. In alternative

embodiments, computer **150** includes a wireless modem to send data to web-hosting portal **160** through a wireless communication network **142** and a land network **144**. Data is received by land network **144** and sent to one or more web servers **164**. In one embodiment, web server **164** is implemented as any suitable hardware and software capable of providing web services to help change and transmit personal preference settings from a client at computer **150** to telematics unit **120** in MVCU **110**. Web server **164** sends to or receives from one or more databases **166** data transmissions via network system **168**. Web server **164** includes computer applications and files for managing and storing personalization settings supplied by the client, such as door lock/unlock behavior, radio station preset selections, climate controls, custom button configurations and theft alarm settings. For each client, the web server potentially stores hundreds of preferences for wireless vehicle communication, networking, maintenance and diagnostic services for a mobile vehicle.

[**0030**] In one embodiment, one or more web servers **164** are networked via network system **168** to distribute user-preference data among its network components such as database **166**. In an example, database **166** is a part of or a separate computer from web server **164**. Web server **164** sends data transmissions with user preferences to call center **170** through land network **144**.

[**0031**] Call center **170** is a location where many calls are received and serviced at the same time, or where many calls are sent at the same time. In one embodiment, the call center is a telematics call center, facilitating communications to and from telematics unit **120** in MVCU **110**. In an example, the call center is a voice call center, providing verbal communications between an advisor in the call center and a subscriber in a mobile vehicle. In another example, the call center contains each of these functions. In other embodiments, call center **170** and web-hosting portal **160** are located in the same or different facilities.

[**0032**] Call center **170** contains one or more voice and data switches **172**, one or more communication services managers **174**, one or more communication services databases **176**, one or more communication services advisors **178**, and one or more network systems **180**.

[**0033**] Switch **172** of call center **170** connects to land network **144**. Switch **172** transmits voice or data transmissions from call center **170**, and receives voice or data transmissions from telematics unit **120** in MVCU **110** through wireless carrier system **140**, communication network **142**, and/or land network **144**. Switch **172** receives data transmissions from and sends data transmissions to one or more web-hosting portals **160**. Switch **172** receives data transmissions from or sends data transmissions to one or more communication services managers **174** via one or more network systems **180**.

[**0034**] Communication services manager **174** is any suitable hardware and software capable of providing requested communication services to telematics unit **120** in MVCU **110**. Communication services manager **174** sends to or receives from one or more communication services databases **176** data transmissions via network system **180**. Communication services manager **174** sends to or receives from one or more communication services advisors **178** data transmissions via network system **180**. Communication services database **176** sends to or receives from communication services advisor **178** data transmissions via network system **180**. Communication services advisor **178** receives from or sends to switch **172** voice or data transmissions.

[**0035**] Communication services manager **174** provides one or more of a variety of services, including enrollment services, navigation assistance, directory assistance, roadside assistance, business or residential assistance, information services assistance, emergency assistance, and communications assistance. Communication services manager **174** receives service-preference requests for a variety of services from the client via computer **150**, web-hosting portal **160**, and/or land network **144**. Communication services manager **174** transmits user-preference and other data to telematics unit **120** in MVCU **110** through wireless carrier system **140**, communication network **142**, land network **144**, voice and data switch **172**, and network system **180**. Communication services manager **174** stores or retrieves data and information from communication services database **176**. Communication services manager **174** may provide requested information to communication services advisor **178**.

[**0036**] In one embodiment, communication services advisor **178** is implemented as a real advisor. In an example, a real advisor is a human being in verbal communication with a user or subscriber (e.g. a client) in MVCU **110** via telematics unit **120**. In another embodiment, communication services advisor **178** is implemented as a virtual advisor. In an example, a virtual advisor is implemented as a synthesized voice interface responding to requests from telematics unit **120** in MVCU **110**.

[**0037**] Communication services advisor **178** provides services to telematics unit **120** in MVCU **110**. Services provided by communication services advisor **178** include enrollment services, navigation assistance, real-time traffic advisories, directory assistance, roadside assistance, business or residential assistance, information services assistance, emergency assistance, and communications assistance. Communication services advisor **178** communicate with telematics unit **120** in MVCU **110** through wireless carrier system **140**, communication network **142**, and/or land network **144** using voice transmissions, or through communication services manager **174** and switch **172** using data transmissions. Switch **172** selects between voice transmissions and data transmissions.

[**0038**] **FIG. 2** is a schematic diagram **200** of one embodiment of transmission paths for a plurality of monitored entertainment units **135**,**136** and **137** in the MVCS **100** in accordance with the present invention. The monitoring transmission paths provide electrical communication between the telematics unit **120** and the entertainment units **135**, **136** and **137**. The monitoring transmission paths are a part of the vehicle communication network **112**.

[**0039**] In one embodiment, the entertainment units **135**, **136** and **137** and the telematics unit **120** incorporate a short-range wireless communication chip, such as a WiFi chip or a Bluetooth chip. In this embodiment, the entertainment units **135**, **136** and **137** transmit the entertainment unit factor to the telematics unit **120** via a wireless connection (not shown).

[**0040**] The entertainment units **135**, **136**, and **137** can be compact disc (CD) players, digital video devices (DVD),

tape players, game units, radios including satellite radio, AM radios, and FM radios and televisions including digital TVs and high density televisions (HDTV).

[0041] **FIG. 3** illustrates a method **300** representative of a first embodiment of a method of providing entertainment in an MVCU **110** in accordance with the present invention. The telematics unit **120**, the processor **122**, the entertainment units **135**, **136**, and **137**, and sensors **138** within the MVCU **110**, have stored in computer readable medium at least one computer program including computer readable code to perform the operations described with reference to method **300**.

[0042] During stage S**302**, the telematics unit **120** monitors entertainment selections in the MVCU **110**. When a user of the MVCU **110** turns on or turns-off a monitored entertainment unit **135**, **136** and **137**, data is transmitted via the transmission paths described with respect to **FIG. 2** to the telematics unit **120**.

[0043] In one embodiment, the monitored entertainment units **135**, **136** and **137** are configured to transmit an entertainment unit factor upon power-up of the entertainment units **135**, **136** and **137**. In another embodiment, the telematics unit **120** is configured to request the entertainment unit factor upon power-up of the entertainment units **135**, **136** and **137**.

[0044] During stage S**304**, the telematics unit **120** monitors vehicle factors. Vehicle factors may include, for example, one or more of the following: the number of passengers, locations of passengers, location of the MVCU **110** at power-up, a location of the MVCU **110** when the entertainment selection occurs, the key used to power-up the vehicle, the rear view mirror position, and the driver seat position. The telematics unit **120** receives the data via the vehicle communication network **112**. Vehicle factors are transmitted from sensors **138** in various locations in the MVCU **110**.

[0045] Pressure sensors under each seat send a signal to the telematics unit **120** at power-up to indicate if a passenger is in a given seat. In an alternative embodiment, operation of a seat belt triggers transmission of a signal from a seat belt sensor to the telematics unit **120** to indicate if a passenger in a given seat is using a seat belt. In one embodiment, a change in pressure on a pressure sensor in a seat indicates if a passenger is in a given seat. A change in pressure can be used to determine if a child is placed in a semi-permanently installed car seat.

[0046] The GPS unit **126** transmits data to the telematics unit **120** at power-up and each time a new entertainment selection is made by the user. Key fobs can include an identifying chip, which includes identifying data. In some embodiments, two users, who regularly drive an MVCU **110**, have their own separate identified key fob which they use every time they drive. The identifying data is transmitted to the telematics unit **120** during power-up to indicate if the key which powered-up the MVCU **110** is generally used by a first driver, a second driver or an nth driver.

[0047] The rear view mirror position data can be obtained from an internal gyroscope in the rear view mirror. Two different drivers may position the rear view mirror in different angles and that data is transmitted to the telematics unit **120** each time the position is altered. Additionally, the same driver may position the rear view mirror differently if there is a child in a back seat. The rear view mirror position is transmitted from the gyroscope in the rear view mirror to the telematics unit **120** at power-up and each time the position is changed.

[0048] Two different drivers may position the driver's seat differently. The driver seat position is transmitted from one or more sensors **138** in the driver's seat to the telematics unit **120** at power-up and each time the seat position is changed.

[0049] During stage S**306**, the telematics unit **120** determines at least one user entertainment selection profile based on the monitoring of entertainment selections and vehicle factors. There is more than one embodiment to determine a user entertainment selection profile. Method **400**, method **600** and method **700** are three possible embodiments of the method of determining at least one user entertainment selection profile. Method **400**, method **600** and method **700** are described below with reference to **FIG. 4**, **FIG. 6** and **FIG. 7**, respectively.

[0050] During stage S**308**, the telematics unit **120** activates the entertainment units based on the determined user entertainment selection profile. Method **500** described below with reference to **FIG. 5** describes the stages required for the telematics unit **120** to activate the entertainment units based on the determined user entertainment selection profile.

[0051] **FIG. 4** illustrates a method **400** representative of a first embodiment of a method of determining a user entertainment selection profile in accordance with the present invention. The telematics unit **120**, the processor **122**, the entertainment units **135**, **136**, and **137**, and sensors **138** within the MVCU **110**, have stored in computer readable medium at least one computer program including computer readable code to perform the operations described with reference to method **400**.

[0052] During stage S**402**, the telematics unit **120** determines entertainment unit factors. The entertainment unit factors include one or more of the following: a satellite radio unit code, an AM radio unit code, an FM radio unit code, a received satellite signal frequency, a received AM signal frequency, a received FM signal frequency, a CD player unit code, a CD identifier code, a CD track number, a DVD unit code, a DVD identifier code, a DVD track number, a game unit code, a tape player unit code, a tape identifier code, a television unit code, and a received television signal frequency. A game unit code is comprised of an identifier that distinguishes a particular game unit.

[0053] The entertainment units **135**, **136**, and **137** include an embedded code that is transmitted via network **112** to the telematics unit **120** when the entertainment unit **135**, **136**, or **137** is powered-up as described above with respect to stage S**302** in method **200** of **FIG. 2**. When the telematics unit **120** receives the entertainment unit factors, the processor **122** determines if additional related entertainment unit factors are needed. For example, if an FM unit code is received, the processor **122** determines that a received FM signal frequency is also required. The processor **122** determines if the received FM signal frequency was transmitted along with the FM unit code. If the FM unit code was not received, the processor **122** requests the received FM signal frequency. When the telematics unit **120** receives the received FM signal frequency, the processor **122** links the received FM

signal frequency with the FM unit code. In one embodiment, the FM unit code and the received FM signal frequency are both sent from the FM radio upon power-up of the FM radio. The updating entertainment unit factors are saved in the in-vehicle memory **128**.

[**0054**] During stage S**404**, the telematics unit **120** determines selection time factors. The selection time factors include the time of day of the entertainment selection, a day of week of the entertainment selection, a week of month of the entertainment selection, and a date of the entertainment selection. When the telematics unit **120** receives one or more entertainment unit factors, the processor **122** retrieves the date, time of day, day of week and week of the month from a clock and calendar internal to the telematics unit **120** and links them to the received entertainment unit factors. The selection time factors linked to the entertainment unit factors are saved in the in-vehicle memory **128**. In one embodiment, software in the processor **122** establishes a table within the in-vehicle memory **128** and adds a new row to the table each time an entertainment unit factor is linked to the selection time factors.

[**0055**] During stage S**406**, the telematics unit **129** determines patterns in the entertainment selections. After a minimum number of entertainment unit factors and selection time factors are stored in the in-vehicle memory **128**, the processor **122** applies an algorithm to the stored entertainment unit factors and selection time factors. The algorithm is operable to search for one or more patterns in the entertainment selections.

[**0056**] In one embodiment, the algorithm determines an FM radio is turned more than one time. The algorithm searches the acquired data to determine if the FM radio is tuned to the same received FM frequency signal within a twenty minute time frame each weekday. Next, the algorithm searches to determine if the FM radio is tuned to the same received FM frequency signal within a forty minute time frame each weekday. If more than one pattern is determined in a given time frame the algorithm narrows the time frame, to determine if more than one specific pattern falls within the twenty minute time frame.

[**0057**] In one example, if the algorithm determines that a first FM radio station and a second FM radio station are selected every weekday between 7:25 AM and 7:45 AM the algorithm narrows the time frame to distinguish that the first radio station is selected between 7:25 AM and 7:35 AM, a second FM radio station is selected between 7:35 and 7:40 and the first radio station is reselected between 7:40 and 7:45. This type of entertainment selection patterns a driver who listens to a local traffic report that is announced every weekday at about 7:40 on the second FM radio station and listens to the first FM radio station the remainder of the time spent driving to work. The telematics unit **120** can determine that a third FM radio station is selected every weekday between 5:15 PM and 5:50 PM.

[**0058**] During stage S**408**, the telematics unit **120** generates a user entertainment selection profile based on the determined patterns. The algorithm outputs one or more determined patterns to the processor **122**. The processor **122** stores the user entertainment selection profile in the in-vehicle memory **128**. In another embodiment, the user entertainment selection profile is stored at the call center **170**. In one embodiment, the processor **122** programs a programmable chip to embed the determined patterns in the telematics unit **120**. The embedded user entertainment selection profile is operable to activate one or more of the entertainment units **135**, **136** and **137**.

[**0059**] **FIG. 5** illustrates a method **500** representative of a first embodiment of a method of activating entertainment units in accordance with the present invention. The telematics unit **120**, the processor **122**, the entertainment units **135**,**136**, and **137**, and sensors **138** within the MVCU **110**, have stored in computer readable medium at least one computer program including computer readable code to perform the operations described with reference to method **500**.

[**0060**] During stage S**502**, the telematics unit **122** determines a power-up input responsive to the power-up of the MVCU **110**. Each time the MVCU **110** is started, the processor **122** determines if a user entertainment selection profile is stored in the in-vehicle memory **128**. If a user entertainment selection profile is stored in the in-vehicle memory **128**, a power-up input is generated instructing the processor **120** to retrieve the user entertainment selection profile from the in-vehicle memory **128**.

[**0061**] During stage S**504**, processor **122** retrieves the user entertainment selection profile stored in the in-vehicle memory **128** and the current time, day of week, week of the month and date from a clock and calendar internal to the telematics unit **120**. The processor **122** then determines if the current time, day of week, week of the month and date is within the time frame of one the determined patterns of the user entertainment selection profile. If there is a match in the time frame, the processor **122** determines which entertainment selection is linked to the time frame in the user entertainment selection profile. Specifically, the processor **122** determines which entertainment units **135**, **136**, and **137** are typically turned on during this time frame.

[**0062**] During stage S**506**, the telematics unit **120** powers-up at least one entertainment unit **135**, **136**, or **137** based on the retrieved user entertainment selection profile. The processor **122** transmits a power-up signal to the one or more entertainment units **135**, **136**, and **137** operable to turn on the entertainment units **135**, **136**, and **137**.

[**0063**] **FIG. 6** illustrates a method **600** representative of a second embodiment of a method of determining a user entertainment selection profile in accordance with the present invention. The telematics unit **120**, the processor **122**, the entertainment units **135**, **136**, and **137**, and sensors **138** within the MVCU **110**, have stored in computer readable medium at least one computer program including computer readable code to perform the operations described with reference to method **600**.

[**0064**] During stage S**602**, the telematics unit **120** identifies a specific user based on monitoring vehicle factors in the MVCU **110** as described above with respect to stage S**304** of method **300** in **FIG. 3**. If each key used to power-up the MVCU **110** is assigned to a specific driver, who consistently uses the assigned key when driving the MVCU **110**, and if the assigned key fob includes an identifying chip, then the key can indicate which driver powers-up the vehicle. In one embodiment, the rear view mirror position is in one position for a first driver and a second position for a second driver. A gyroscope in the rear view mirror can transmit a data

signal to the processor **120** via the vehicle communication network **112**, when the position of the rear view mirror is adjusted. In another embodiment, a position sensor and/or a pressure sensor in the driver's seat can transmit a positional signal and pressure signal via the vehicle communication network **112** when the position and/or pressure sensors in the driver's seat detect a change in position and/or pressure.

[**0065**] In one embodiment, the telematics unit **120** identifies the specific user based on a combination of the key used to power-up the MVCU **110**, the rear view mirror position, the driver's seat position, pressure on the driver's seat, and other vehicle factors such as number of passengers, locations of passengers, a location of the vehicle at power-up, and a location of the vehicle when the entertainment selection occurs. For example, the first driver may almost always drive with a passenger in a specific back seat location, such a baby in a car seat that is installed in one seat location.

[**0066**] When a specific user of the MCVCU **110** turns on or off a monitored entertainment unit **135**, **136** and **137**, data is transmitted via the transmission paths described with respect to **FIG. 2** to the telematics unit **120**.

[**0067**] During stage S**604**, the telematics unit **120** determines a user-specific pattern for the specific user identified during stage S**602**.

[**0068**] In one embodiment, the monitored entertainment units **135**, **136** and **137** are configured to transmit an entertainment unit factor upon power-up of the entertainment units **135**, **136** and **137**. In another embodiment, the telematics unit **120** is configured to request the entertainment unit factor upon power-up of the entertainment units **135**, **136** and **137**.

[**0069**] After a minimum number of entertainment unit factors and selection time factors are stored in the in-vehicle memory **128** for the specific user, the processor **122** applies an algorithm on the stored entertainment unit factors and selection time factors, as described above with respect to stages S**402** and S**404** in method **400** of **FIG. 4**, for the specific user. The algorithm is operable to search for one or more patterns in the time frame in which an entertainment unit is selected by the specific user.

[**0070**] In one embodiment, the algorithm searches the acquired data to determine if the FM radio is tuned to the same received FM frequency signal within a specified time frame each weekday for the specific user. The algorithm searches to determine if the entertainment factors are correlated to a number and/or location of passengers. In one example, the algorithm can determine a pattern in which a first specific driver turns on a CD player to play a CD of children's songs when a passenger is in a location in the back seat within the time frame of 8:00 AM to 8:15 AM. The algorithm can also determine a pattern in which the first specific driver turns on a FM radio station after the MVCU **110** is powered-up within the time frame of 8:30 AM to 8:45 AM and there is no passenger in the MVCU **110**. Such a pattern is possible if, for example, the first driver drops a child off at day-care center on the way to work.

[**0071**] During stage S**606**, the telematics unit **120** generates a user-specific entertainment selection profile based on the determined user-specific patterns. The algorithm outputs one or more determined patterns for the specific user to the processor **122**. The processor **122** stores the user-specific entertainment selection profile in the in-vehicle memory **128**. In one embodiment, the processor **122** programs a programmable chip to embed the determined patterns in the telematics unit **120** and stores the user-specific entertainment selection profile in the in-vehicle memory **128**. The embedded user entertainment selection profile is operable to activate one or more of the entertainment units **135**, **136** and **137**.

[**0072**] During stage S**608**, the telematics unit **120** determines a power-up input responsive to the power-up of the MVCU **110**. Each time the MVCU **110** is started, the processor **122** determines if a user-specific entertainment selection profile is stored in the in-vehicle memory **128**. If a user-specific entertainment selection profile is stored in the in-vehicle memory, a power-up input is generated instructing the processor **120** to retrieve the user-specific entertainment selection profile from the in-vehicle memory **128**.

[**0073**] During stage S**610**, processor **122** in the telematics unit **120** retrieves the user-specific entertainment selection profile stored in the in-vehicle memory **128** and the current time, day of week, week of the month and date from a clock and calendar internal to the telematics unit **120**. The processor **122** then determines if the current time, day of week, week of month and date is within the time frame of one the determined patterns of the user-specific entertainment selection profile. If there is a match in the time frame, the processor **122** determines which entertainment selection is linked to the time frame in the user-specific entertainment selection profile. Specifically, the processor **122** determines which entertainment units **135**, **136**, and **137** are typically turned on during this time frame by the specific.

[**0074**] During stage S**612**, the telematics unit **120** powers-up at least one entertainment unit **135**, **136**, or **137** based on the retrieved user-specific entertainment selection profile. The processor **122** transmits a signal to the one or more entertainment units **135**, **136**, and **137** operable to power-up the entertainment units **135**, **136**, and **137**.

[**0075**] **FIG. 7** illustrates a method **700** representative of a third embodiment of a method of determining a user entertainment selection profile in accordance with the present invention. The telematics unit **120**, the processor **122**, the entertainment units **135**, **136**, and **137**, and sensors **138** within the MVCU **110**, have stored in computer readable medium at least one computer program including computer readable code to perform the operations described with reference to method **700**.

[**0076**] During stage S**702**, the telematics unit **120** determines at least one subset profile of the user entertainment selection profile. The subset profile is determined based on monitoring a subset of the entertainment selections.

[**0077**] The subset profile can be used for a periodic trip that a specific user takes on a given day of the week or a given day of the week within a given week of the month. In an exemplary case, a user drives to a distant city every third Tuesday of the month, and chooses to operate the CD player when the MVCU **110** reaches a location that is fifty miles outside the originating city and the initially selected FM radio signal has become too weak to be received at the MVCU **110**. In this case, the subset profile is set to power-up a CD player when the MVCU **100** is in a GPS location that

is fifty miles outside the originating city on the third Tuesday of the month. In one embodiment of this case, the subset profile powers-up the FM radio when the MVCU **110** is powered-up within a ten minute range of 6:30 AM on the third Tuesday of the month and then turns off the FM radio and turns on the CD player when the MVCU **100** reaches a GPS location that is fifty miles outside the originating city.

[**0078**] Upon power-up of an entertainment unit **135**, **136**, or **137**, the user pushes a button on the telematics unit **120** to indicate that this selection of an entertainment unit **135**, **136**, or **137** is to be part of a subset profile. The user can indicate more than one subset profile by an additional button push. The telematics unit **120** then requests data from the various sensors **138** in the MVCU **110**. The processor **122** determines patterns within the entertainment selections, the vehicle factors and the selection time factors and generates the subset profile, which is saved in the in-vehicle memory **128**. The processor **122** in the telematics unit **120** checks for changes in the patterns every time additional data is received for the specific subset profile.

[**0079**] In another embodiment, the user may annunciate selections of an entertainment unit **135**, **136**, or **137** via the speech recognition system **139** embodied within the telematics unit **120**. The annunciated selections are included in a subset profile. The user can indicate more than one subset profile by additional annunciations.

[**0080**] In one embodiment, the user indicates the subset profile by telling a communication services advisors **178** the time frame of the subset profile and the telematics unit **120** then incorporates all entertainment unit selections within that time frame within the subset profile. In an alternate embodiment of this case, the user can indicate the subset profile by inputting a sequence of keystrokes on a keyboard on a personal or user computer **150**. If the user inputs a sequence to a personal or user computer **150**, the data is transmitted to the processor **122** via one or more wireless carrier systems **140**, one or more communication networks **142**, one or more land networks **144**, one or more web-hosting portals **160**, and/or one or more call centers **170**.

[**0081**] When the MVCU **110** is powered-up within the time frame or location of the subset profile of the user entertainment selection profile, the telematics unit **120** activates entertainment units **135**, **136**, and **137** based on the determined subset profile in the same manner that the telematics unit **120** activates entertainment units based on the determined user entertainment selection profile as described above in reference to stage S**308** of method **300** in **FIG. 3**.

[**0082**] While the embodiments, of the invention disclosed herein are presently considered to be preferred, various changes and modifications can be made without departing from the spirit and scope of the invention. The scope of the invention is indicated in the appended claims, and all changes that come within the meaning and range of equivalents are intended to be embraced therein.

1. A method for providing entertainment in a vehicle, comprising:

monitoring entertainment selections at a telematics unit;

determining at least one user entertainment selection profile based on the monitoring; and

activating entertainment units based on the profile.

2. The method of claim 1, further comprising:

monitoring vehicle factors;

wherein the determination of the entertainment selection profile is based on the monitored vehicle factors and monitored entertainment selection factors.

3. The method of claim 2, wherein the vehicle factors are selected from the group consisting of a number of passengers, locations of passengers, a location of the vehicle at power-up, a location of the vehicle when the entertainment selection occurs, a key used to power-up the vehicle, a rear view mirror position, a driver seat position, and combinations thereof.

4. The method of claim 2, further comprising:

identifying a specific user based on monitoring vehicle factors.

5. The method of claim 4, wherein the determining at least one user entertainment selection profile based on the monitoring comprises:

determining a user-specific pattern for the specific user; and

generating a user-specific entertainment selection profile based on the determined user-specific patterns.

6. The method of clam **5**, wherein activating entertainment units based on the profile comprises:

determining power-up input responsive to a power-up of the vehicle;

retrieving the user-specific entertainment selection profile from a memory in the telematics unit responsive to the determined power-up input; and

powering up at least one entertainment unit based on the retrieved user-specific entertainment selection profile.

7. The method of claim 1, wherein determining at least one user entertainment selection profile based on the monitoring comprises:

determining entertainment unit factor; and

determining selection time factors.

8. The method of claim 7, wherein the selection time factors are selected from a group consisting of a time of day for the entertainment selection, a day of week for the entertainment selection, a week of the month for the entertainment selection, a date of the entertainment selection, and combinations thereof.

9. The method of claim 7, wherein the entertainment unit factors are selected from a group consisting of a satellite radio unit code, an AM radio unit code, an FM radio unit code, a received satellite signal frequency, a received AM signal frequency, a received FM signal frequency, a CD player unit code, a CD identifier code, a CD track number, a DVD unit code, a DVD identifier code, a DVD track number, a game unit code, a tape player unit code, a tape identifier code, a television unit code, a received television signal frequency, and combinations thereof.

10. The method of claim 1, wherein the determining at least one user entertainment selection profile based on the monitoring comprises;

determining patterns in the entertainment selections; and

generating the user entertainment selection profile based on the determined patterns.

11. The method of clam **1**, wherein activating entertainment units based on the profile comprises:

determining power-up input responsive to a power-up of the vehicle;

retrieving the user entertainment selection profile from a memory in the telematics unit responsive to the determined power-up input; and

powering up at least one entertainment unit based on the retrieved user entertainment selection profile.

12. The method of claim 1, wherein determining at least one user entertainment selection profile based on the monitoring comprises determining at least one subset profile of the user entertainment selection profile wherein the subset profile is determined based on monitoring a subset of the entertainment selections.

13. A system for providing entertainment in a vehicle, comprising:

means for monitoring entertainment selections at a telematics unit;

means for determining at least one user entertainment selection profile based on the monitoring; and

means for activating entertainment units based on the profile.

14. The system of claim 13, further comprising:

means for monitoring vehicle factors;

wherein the determination of the entertainment selection profile is based on the monitored vehicle factors and monitored entertainment selection factors.

15. The system of claim 1, further comprising:

means for identifying a specific user based on monitoring entertainment selections.

16. A computer readable medium storing a computer program, comprising:

computer readable code for monitoring entertainment selections at a telematics unit;

computer readable code for determining at least one user entertainment selection profile based on the monitoring; and

computer readable code for activating entertainment units based on the profile.

17. The medium of claim 16, further comprising:

computer readable code for monitoring vehicle factors;

wherein the determination of the entertainment selection profile is based on the monitored vehicle factors and monitored entertainment selection factors.

18. The medium of claim 16, wherein computer readable code for determining at least one user entertainment selection profile based on the monitoring comprises:

computer readable code for determining entertainment unit factor; and

computer readable code for determining selection time factors.

19. The medium of claim 16, wherein the computer readable code for determining at least one user entertainment selection profile based on the monitoring comprises;

computer readable code for determining patterns in the entertainment selections; and

computer readable code for generating the user entertainment selection profile based on the determined patterns.

20. The medium of clam **16**, wherein computer readable code for activating entertainment units based on the profile comprises:

computer readable code for determining power-up input responsive to the power-up of the vehicle;

computer readable code for retrieving the user entertainment selection profile from a memory in the telematics unit responsive to the determined power-up input; and

computer readable code for powering up at least one entertainment unit based on the retrieved user entertainment selection profile.

21. The medium of claim 16, further comprising:

computer readable code for identifying a specific user based on monitoring entertainment selections.

22. The medium of claim 21, wherein the computer readable code for determining at least one user entertainment selection profile based on the monitoring comprises:

computer readable code for determining a user-specific pattern for the specific user; and

computer readable code for generating a user-specific entertainment selection profile based on the determined user-specific patterns.

23. The medium of clam **22**, wherein computer readable code for activating entertainment units based on the profile comprises:

computer readable code for determining power-up input responsive to the power-up of the vehicle;

computer readable code for retrieving the user-specific entertainment selection profile from a memory in the telematics unit responsive to the determined power-up input; and

computer readable code for powering up at least one entertainment unit based on the retrieved user-specific entertainment selection profile.

24. The medium of claim 16, wherein computer readable code for determining at least one user entertainment selection profile based on the monitoring comprises computer readable code for determining at least one subset profile of the user entertainment selection profile wherein the subset profile is determined based on monitoring a subset of the entertainment selections.

* * * * *