



US007181192B2

(12) **United States Patent**  
**Panasik et al.**

(10) **Patent No.:** **US 7,181,192 B2**  
(45) **Date of Patent:** **Feb. 20, 2007**

(54) **HANDHELD PORTABLE AUTOMATIC  
EMERGENCY ALERT SYSTEM AND  
METHOD**

(75) Inventors: **Carl M. Panasik**, Garland, TX (US);  
**James F. Salzman**, Anna, TX (US)

(73) Assignee: **Texas Instruments Incorporated**,  
Dallas, TX (US)

(\* ) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 219 days.

(21) Appl. No.: **10/802,449**

(22) Filed: **Mar. 16, 2004**

(65) **Prior Publication Data**  
US 2005/0208925 A1 Sep. 22, 2005

(51) **Int. Cl.**  
**H04M 11/04** (2006.01)

(52) **U.S. Cl.** ..... **455/404.1**; 455/404.2;  
455/456.1; 455/456.3; 455/456.5; 455/456.6;  
455/521; 455/550.1; 701/207; 701/213; 701/216;  
340/436

(58) **Field of Classification Search** ..... 455/404.1,  
455/404.2, 456.1-457, 432.1, 521, 550.1,  
455/556.1-556.2, 569.1-569.2; 701/207,  
701/213-214, 216; 340/436; 342/357.1,  
342/357.06, 357.12, 450, 457  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

- 4,903,212 A \* 2/1990 Yokouchi et al. .... 701/216
- 5,742,666 A \* 4/1998 Alpert ..... 455/404.2
- 6,299,102 B2 \* 10/2001 Happ ..... 244/122 AG
- 6,549,792 B1 \* 4/2003 Cannon et al. .... 455/550.1
- 6,821,249 B2 \* 11/2004 Casscells et al. .... 600/300

- 2002/0013538 A1\* 1/2002 Teller ..... 600/549
- 2002/0098816 A1\* 7/2002 Dooley et al. .... 455/154.1
- 2002/0109600 A1\* 8/2002 Mault et al. .... 340/573.1
- 2002/0116080 A1\* 8/2002 Birnbach et al. .... 700/66
- 2002/0193091 A1\* 12/2002 Zmarthie ..... 455/404
- 2003/0071446 A1\* 4/2003 Haderer et al. .... 280/735
- 2003/0071766 A1\* 4/2003 Hartwell et al. .... 345/8
- 2005/0128062 A1\* 6/2005 Lundsgaard et al. .... 340/436

**OTHER PUBLICATIONS**

Cell Phone Accelerometers/Sensors, Commsdesign.com, Mar. 16,  
2004, pp. 1-3.\*

(Continued)

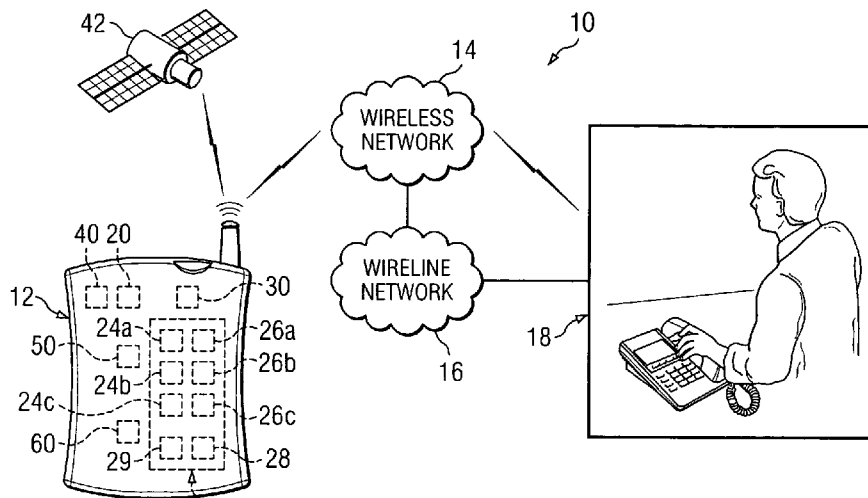
*Primary Examiner*—Steve M. D’Agosta

(74) *Attorney, Agent, or Firm*—J. Dennis Moore; W. James  
Brady; Frederick J. Telecky, Jr.

(57) **ABSTRACT**

In one embodiment, an automated emergency alert system includes a handheld portable communication device operable to initiate communication over a wireless telecommunications network, a dynamic sensor operable to generate an acceleration profile for the device, and a memory operable to store one or more predefined acceleration profiles each associated with an emergency event. The system also includes one or more processors collectively operable to (1) receive from the dynamic sensor an acceleration profile for the device; (2) access one or more of the stored predefined acceleration profiles; (3) compare the received acceleration profile to the one or more stored predefined acceleration profiles to determine if the acceleration profile substantially matches a predefined acceleration profile; and (4) if it is determined that the acceleration profile substantially matches a stored predefined acceleration profile, initiate a communication using the network to one or more emergency call centers to notify the call center that the emergency event has occurred.

**9 Claims, 1 Drawing Sheet**



OTHER PUBLICATIONS

LEXSEE 14 FCCR 17388 In the Matter of Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Federal Communications Commission 14 FCC Rcd 17388; 1990 FCC LEXIS 4896; 16 Comm. Reg. (P&F) 739 Release No. FCC 99-245, Oct. 1, 1999 Released; Adopted Sep. 15, 1999 (37 pp).

NOKIA, <http://www.nokia.com> (19 pp.), print date Mar. 16, 2004. On Star, <http://www.onstar.com> (11 pp.), print date Mar. 16, 2004. Simon Fraser University, Centre for Systems Science, "Systems Specs: Activities of CSS Members," Update 15.3 Oct. 2003, avail-

able at <http://www.css.sfu.ca/update/vol15/15.3-systems-specs.html> (last visited Mar. 16, 2004) (2 pp.).

Byron Spice, "At CMU, Scientists are Building Sense into Cell Phones," *post-gazette.com* (Pittsburgh, Pa.), available at <http://www.post-gazette.com/pg/03245/217276.stm> (last visited Mar. 16, 2004) (3 pp.), Sep. 2, 2003.

"Cell Phone Accelerometers/Sensor," *CommsDesign.com*, available at [http://www.commsdesign.com/new\\_products/showArticle.jhtml?articleID=16504859](http://www.commsdesign.com/new_products/showArticle.jhtml?articleID=16504859) (last visited Mar. 16, 2004) (3 pp.), May 23, 2002.

\* cited by examiner

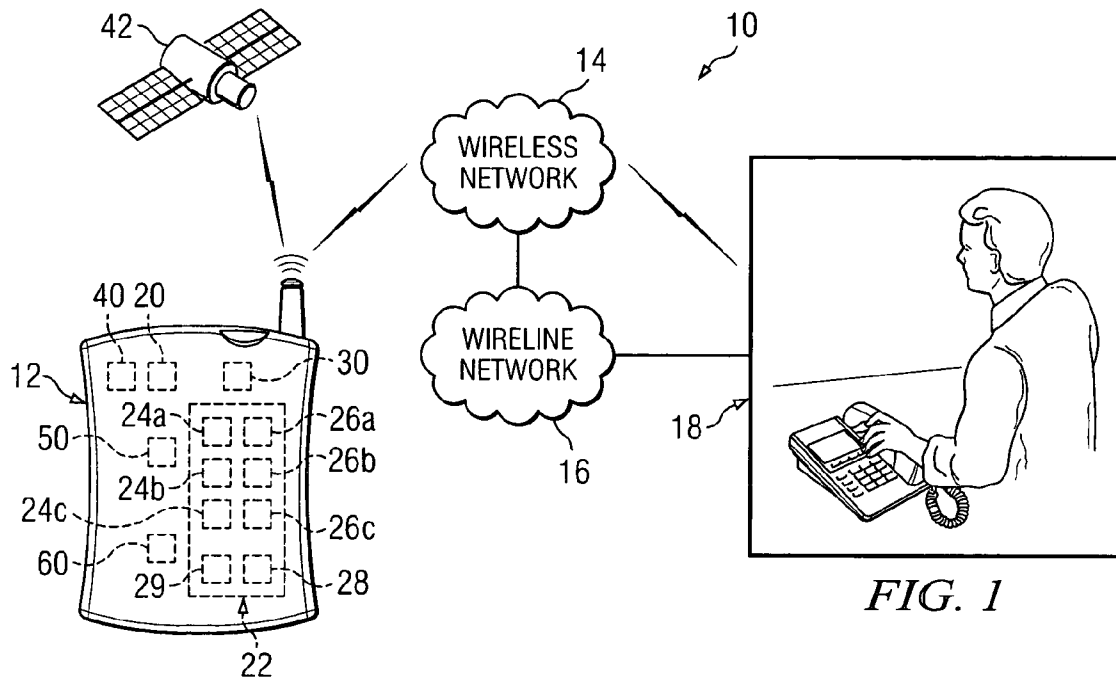
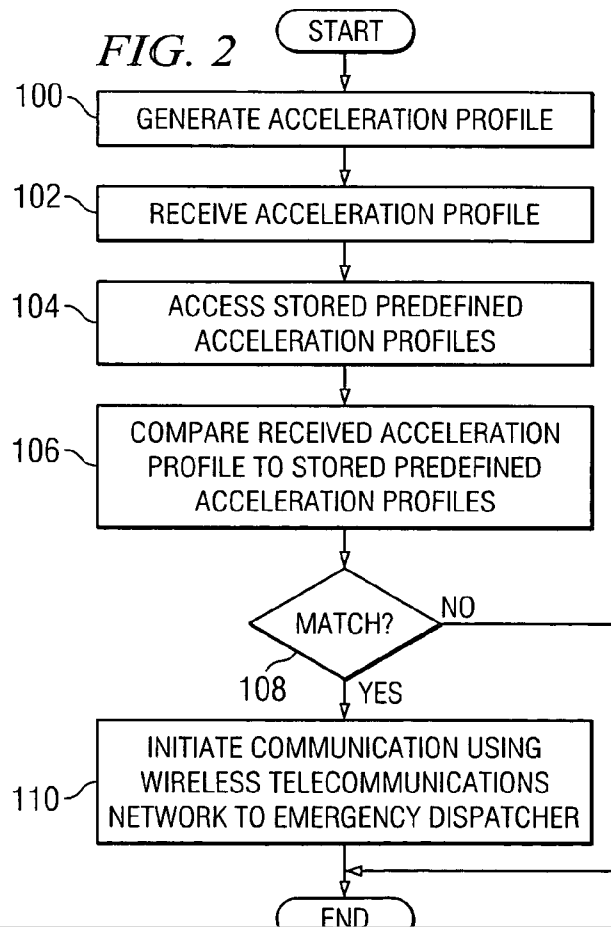


FIG. 1



1

## HANDHELD PORTABLE AUTOMATIC EMERGENCY ALERT SYSTEM AND METHOD

### TECHNICAL FIELD OF THE INVENTION

This invention relates generally to emergency alert communication and more particularly to a handheld portable automatic emergency alert system and method.

### BACKGROUND

Persons involved in automobile accidents, medical emergencies, or other sorts of incidents requiring an emergency response are often incapacitated or otherwise unable to place a telephone call to appropriate emergency personnel, using the emergency "911" service for example. As an illustration, a person involved in a car accident may be knocked unconscious when his or her head collides with the steering wheel as a result of the impact. In the event that an emergency occurs in an automobile, current solutions for notifying emergency personnel include the ONSTAR™ system, which may be used to summons emergency personnel if the driver or another person presses an appropriate button. Of course, if the driver is incapacitated or otherwise cannot press the button, the authorities may not be notified of the accident as quickly as desired. A related solution includes using ONSTAR™ or a similar system to automatically call an emergency dispatcher in response to the airbag in an automobile being deployed. However, these solutions are limited to automobile-based implementations and are only able to summons help in response to certain emergency events.

### SUMMARY OF THE INVENTION

According to the present invention, certain disadvantages and problems associated with previous techniques for emergency alert communication.

In one embodiment, an automated emergency alert system includes a handheld portable communication device operable to initiate communication over a wireless telecommunications network, a dynamic sensor operable to generate an acceleration profile for the handheld portable communication device, and a memory operable to store one or more predefined acceleration profiles, each predefined acceleration profile associated with an emergency event. The system also includes one or more processors collectively operable to (1) receive from the dynamic sensor an acceleration profile for the handheld portable communication device; (2) access one or more predefined acceleration profiles stored in the memory; (3) compare the acceleration profile received from the dynamic sensor to the one or more predefined acceleration profiles stored in the memory to determine if the acceleration profile substantially matches a predefined acceleration profile in the one or more predefined acceleration profiles; and (4) if it is determined that the acceleration profile received from the dynamic sensor substantially matches a predefined acceleration profile in the one or more predefined acceleration profiles stored in the memory, initiate a communication using the wireless telecommunications network to one or more emergency call centers to notify the emergency call center that the emergency event has occurred.

Particular embodiments of the present invention may provide one or more technical advantages. In certain

2

automated emergency alert services. In addition, the handheld portable communication device may accompany an associated user at all times and thus is not limited to emergencies occurring in a particular automobile. In addition, particular embodiments may provide alerts for types of emergencies unrelated to automobile accidents. In certain embodiments, the handheld portable communication device may identify itself and/or its associated user associated, along with location information and the information from the one or more sensors, to the emergency call center, possibly shaving precious minutes from the time it takes for emergency medical or other personnel to arrive at the scene.

In certain embodiments, the handheld portable communication device may include one or more sensors for monitoring the environment of the user associated with the handheld portable communication device. For example, the handheld portable communication device may include a temperature sensor for possible detection of a fire. As another example, the handheld portable communication device may include a water sensor, which may detect whether the handheld portable communication device (and possibly the user associated with the device) is under water (e.g., because the car is under water). Therefore, particular embodiments may be able to detect many different types of emergency events.

Certain embodiments of the present invention may provide some, all, or none of the above technical advantages. Certain embodiments may provide one or more other technical advantages, one or more of which may be readily apparent to those skilled in the art from the figures, descriptions, and claims included herein.

### BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention and features and advantages thereof, reference is now made to the following description, taken in conjunction with the accompanying drawings, in which:

FIG. 1 illustrates an automated cellular alert system for automatically notifying emergency personnel of an emergency, according to an embodiment of the present invention; and

FIG. 2 illustrates an exemplary method according to an embodiment of the present invention for automated emergency alert using a handheld portable communications device operable to initiate communication over a wireless telecommunications network.

For a more complete understanding of the present invention and features and advantages thereof, reference is now made to the following description, taken in conjunction with the accompanying drawings, in which:

FIG. 1 illustrates an automated cellular alert system for automatically notifying emergency personnel of an emergency; and

FIG. 2 illustrates an example method for automated emergency alert using a handheld portable communications device operable to initiate communication over a wireless telecommunications network.

### DESCRIPTION OF EXAMPLE EMBODIMENTS

FIG. 1 illustrates an automated cellular alert system 10 for automatically notifying emergency personnel of an emergency. In certain embodiments, system 10 includes a handheld portable communication device 12, a cellular or other

system 10 may be used without departing from the scope of this description. In general, handheld portable communication device 12 is operable to monitor the acceleration of device 12, to automatically detect the occurrence of an emergency event based at least on one or more acceleration profiles, and to automatically contact an emergency dispatcher associated with emergency call center 18 by making a wireless communication via wireless network 14. The term “automatically,” as used herein, generally means that the appropriate processing is substantially performed by device 12 or other suitable components of system 10. It should be understood that automatically further contemplates any suitable user interaction with system 10, if appropriate.

Handheld portable communication device 12 may include any suitable device capable of engaging in wireless communication. For example, handheld portable communication device 12 may include a mobile phone, a personal digital assistant (PDA), a pager, or any other suitable handheld portable communication device capable of engaging in wireless communication. Typically, handheld portable communication device 12 is a device that a user would likely keep near his or her person when the user is mobile, or that the user could reasonably keep on his or her person under most circumstances if desired. The use of the term “handheld” to describe handheld portable communication device 12 is not meant in a literal sense and is not meant to limit handheld portable communication device 12 to those devices that can be held in a user’s hand. Handheld portable communication device 12 may include one or more suitable input devices, output devices, storage media, processors, memory, or other components for receiving, processing, storing, and communicating information according to the operation of system 10. Furthermore, although the present invention focuses primarily on an embodiment in which wireless calls are automatically made by handheld portable communication device 12, the present invention contemplates handheld portable communication device 12 automatically communicating wireless emails, text messages, or any other suitable type of wireless communication according to particular needs.

Wireless network 14 includes any suitable communications network operable to facilitate wireless communication. Additionally, wireless network 14 represents any suitable collection and arrangement of equipment and infrastructure for supporting and providing wireless services to subscribers. Wireless network 14 may be associated with one or more wireless service providers. Although a single wireless network 14 is illustrated, wireless network 14 may encompass any number of wireless networks supporting any number of suitable protocols. For example, wireless network 14 may encompass both digital and cellular wireless telephone networks.

In general, wireless network is operable to facilitate wireless communication between handheld portable communication device 12 and one or more emergency dispatchers associated with emergency call center 18 in any suitable manner (or with any automated dispatch devices associated with emergency call center 18). In certain embodiments, wireless network 14 facilitates communication between handheld portable communication device 12 and one or more emergency dispatchers associated with emergency call center 18 that is wireless from end to end. For example, one or more emergency dispatchers associated with emergency call center 18 may be able to receive wireless communications from wireless network 14 or another suitable wireless

tion to one or more emergency dispatchers associated with emergency call center 18 using wireline network 16. For example, one or more emergency dispatchers associated with emergency call center 18 may use communications equipment coupled to wireline network 16.

Wireline network 16 may include any suitable communications network operable to facilitate wireline communication. Additionally, wireline network 16 represents any suitable collection and arrangement of equipment and infrastructure for supporting and providing wireline services to subscribers. Wireline network 16 may be associated with one or more wireline service providers. Although a single wireline network 16 is illustrated, wireline network 16 may encompass any number of wireline networks supporting any number of suitable protocols or types of wireline communication (e.g., optical). In certain embodiments, wireline network 16 includes a public switched telephone network (PSTN).

Emergency call center 18 may include one or more emergency dispatchers. Although referred to as a “call center,” emergency call center 18 may include any suitable individuals, entities, or machines for receiving communications for reporting emergencies. In certain embodiments, emergency call center 18 includes an emergency 911 emergency call center. For example, emergency call center may include what is typically referred to as a Public Safety Answering Point (PSAP), which may include a dispatch office that receives 911 calls from the public. A PSAP may include a local fire or police department, an ambulance service, a regional office covering numerous services, or any other suitable office or department. In certain embodiments, emergency call center 18 may be a local dispatch call center processing emergency communications in a localized area, a regional call center processing emergency communications in a regional area, or a central call center processing calls for any number of areas having any suitable size. Additionally, although emergency dispatchers are typically humans, the present invention contemplates emergency dispatchers being automated. Emergency call center may be operable to engage in communication with wireless network 14, wireline network 16, both, or any other suitable communications network operable to facilitate wireless communication.

Handheld portable communication device 12 includes a dynamic sensor 20 operable to measure acceleration, deceleration, or other suitable movement of handheld portable communication device 12. In certain embodiments, dynamic sensor 20 includes an accelerometer operable to generate an acceleration profile for handheld portable communication device 12. In certain embodiments, dynamic sensor 20 includes a silicon-based accelerometer such as an “on-chip” accelerometer. As just one example, dynamic sensor 20 may include an accelerometer such as those manufactured by ANALOG DEVICES, INC. In certain embodiments, it is desirable for dynamic sensor 20 to be a multi-axis accelerometer such that it is capable of detecting acceleration in multiple directions. Dynamic sensor 20 may be mounted on a printed circuit board within handheld portable communication device 12, although the present invention contemplates incorporating dynamic sensor 20 in handheld portable communication device 12 in any suitable manner.

Dynamic sensor 20 may output data representing the measured acceleration, deceleration, or lack thereof. An acceleration profile generated by dynamic sensor 20 may represent acceleration (or deceleration) as measured over time. In certain embodiments, the acceleration profile

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.