embodiments according to the present invention contemplate systems and methods for remotely monitoring a person.

FIG. **1** illustrates an embodiment of a system and a method for remotely monitoring a person according to the present invention. A portable unit **100** is coupled to a person **110** that is to be monitored. The portable unit **100** is coupled to a satellite **130**. The satellite **130** may be, for example, a set or an array of satellites of an existing global positioning system (GPS). The portable unit **100** is coupled to a ground station **120**. The ground station **120** may be, for example, a part of an existing mobile phone grid or a radio communications array. The ground station **120** is coupled to a central unit **140**.

The portable unit **100** is adapted to monitor biological parameters of the person **100**. The portable unit, may monitor acoustic, thermal, mechanical, chemical, electrical and/or electromagnetic parameters, for example, related to human biological parameters including, for example, temperature, heart rate, blood flow rate, muscular activity, respiratory rate, and brain activity of the person being monitored.

Furthermore, the portable unit **100** is adapted to monitor the physical location of the person **110**. In an embodiment according to the present invention, the portable unit **100** receives GPS data transmitted by the satellite **130**. With the GPS data, information relating to a physical location of the person **110** may be determined.

In an embodiment according to the present invention, the central unit **140** makes a request for information to the ground station **120**, with which the central unit **140** is in two-way communication. The ground station **120** wirelessly transmits an interrogation signal to the portable unit **100**, with which the ground station **120** is in two-way wireless communication. In response to the interrogation signal, the portable unit **100** wirelessly transmits information relating to the physical location and/or the human biological parameters of the person **110** being monitored. Further information can be sent that is stored in the portable unit **100** such as, for example, identifying information, personal information or special medical information such as personal medical conditions. The ground station **120** sends information relating to information received from the portable unit **100** to the central unit **140**. The information received by the central unit **140** can ultimately be stored, displayed, printed, processed or sent to other central units in a network, for example.

The central unit **140**, which may be located in a hospital or a monitoring center, for example, may make the request for information periodically or aperiodically, for example, by manual intervention or a command triggered by a particular circumstance. Furthermore, the central unit **140** may be in wire-to-wire or wireless communication with the ground station **120**.

In another embodiment according to the present invention, the portable unit **100**, without the receipt of the interrogation signal from the ground station **120**, periodically sends information to the ground station **120**. Information relating to the received information is sent by the ground station **120** to the central unit **140**. In yet another embodiment according to the present invention, the portable unit **100** sends information to the ground station **120** in response to a particular circumstance monitored by the portable unit **100** or in response to a manual command by the person **110** being monitored. For example, the portable unit **100** may send information to the ground station **120** in response to a particular biological parameter which may be indicative of a dangerous medical condition. In another example, the portable unit **100** sends information to the ground station **120** in response to a manual actuation of a switch or a specifically programmed button by the person **110**.

The processing of data relating to, for example, the physical location and/or the human biological parameters of the person **110** being monitored may occur either in the portable unit **100**, the ground station **120**, the central unit **140** or some combination thereof. For example, the portable unit **100** may receive GPS data from the satellite. The GPS data is processed by the portable unit **100**, the portable unit **100** calculating the physical location of the person **110** before sending the calculated physical location to the ground station **120** and, subsequently, to the central unit **140**.

Alternatively, the GPS data received by the portable unit **100** may be sent to the ground station **120**, which processes the information and calculates the physical location of the person **110**, the calculated physical location of the person being sent to the central unit. In yet another alternative, the GPS data is sent to the portable unit **100** which sends the information to the ground station **120** which, in turn, sends the information to the central unit **140**. In this embodiment, it is the central unit **140** which processes the GPS data and calculates the physical location of the person **110**. Furthermore, the present invention contemplates a distributed processing scheme in which part of the processing of the information received by the portable unit **100** from the person **110** and/or the satellite **130** is processed, in part, by a combination of the portable unit **100**, the ground station **120** and/or the central unit **140**.

FIG. **2** illustrates an embodiment of a portable unit **100** according to the present invention. The portable unit **100** includes a microchip **210**, a transceiver **220**, a self-recharging battery **230** and at least one sensor **240**. The portable unit **100** may optionally include a receiver **250**. Furthermore, the microchip **210** includes a processing unit **260** and an information storage device **270**.

Although FIG. **2** illustrates some parts included on the microchip **210** and some parts coupled to the microchip **210**, one of ordinary skill in the art understands, and the present invention contemplates, that different levels of integration may be achieved by integrating any of the coupled parts as illustrated in FIG. **2** onto the microchip **210**.

The self-recharging battery **230**, the at least one sensor **240**, the transceiver **220** and, optionally, the receiver **250** are each coupled to the microchip **210**. In an embodiment according to the present invention, the at least one sensor **240**, the transceiver **220** and, optionally, the receiver **250** are each coupled to the processing unit **260**, which, in turn, is coupled to the information storage device. The self-recharging battery **230** powers the microchip **210**, including the processing unit **260** and the information storage device **270**. The self-recharging battery **230** may also power directly or indirectly the transceiver **220**, the at least one sensor **240** and/or, optionally, the receiver **250**.

In an embodiment according to the present invention, the transceiver **220** is adapted to be in two-way wireless communication with the ground station **120** and in one-way wireless communication with the satellite **130**. The transceiver **220** may be a single antenna or an antenna array, for example.

In another embodiment according to the present invention, the portable unit **100** includes the transceiver **220** and the receiver **250**. In this embodiment, the transceiver **220** is in two-way wireless communication with the ground