

CLAIMS

What is claimed is:

1. A wireless device comprising:
 - a body having a tapered shape including a front surface, a rear surface having a same shape as the front surface and a dimension greater than the front surface, and a peripheral side surface connecting the front and rear surfaces, the body defining a cavity therein that is enclosed by the front, the rear surface, and the peripheral side surfaces;
 - a processor disposed in the cavity;
 - at least one wireless communication antenna disposed in the cavity;
 - a device health sensor at least partially disposed within the cavity, the device health sensor being in communication with the processor and configured for measuring at least one health function of a user wearing the wireless device, the device health sensor including a thermal sensor disposed in the cavity and configured for measuring a temperature of the user in contact with the rear surface; and
 - a sensor printed circuit board (PCB) disposed in the cavity, coupled to the thermal sensor and electrically connected to the processor.
2. The wireless device of claim 1, wherein the at least one health function includes the temperature of the user;
 - wherein said device health sensor is disposed proximal to the rear surface; or
 - wherein the processor is configured to send, to a server via the wireless communication antenna, device health data associated with a measurement of the device health sensor.
3. The wireless device of claim 1 or claim 2, wherein said body includes a bottom assembly defining the rear surface and at least partially made of a thermally conductive material.

4. The wireless device of claim 3, wherein the bottom assembly includes a bottom cap that is thermally conductive, and the bottom cap is made of a plastic conductive material.

5. The wireless device of claim 3 or claim 4, wherein the bottom assembly includes:

a bottom cap defining an opening through the bottom cap; and

a bottom cap cover that covers at least part of the opening.

6. The wireless device of claim 5, wherein the bottom cap cover comprises a conductive material.

7. The wireless device of any one of claims 3-6, further comprising:

a printed circuit board assembly (PCBA) having the processor integrated thereon; and

a battery,

wherein the sensor PCB includes:

a first end region coupled to the PCBA; and

a second end region coupled to the thermal sensor, wherein said sensor PCB is bent such that the first and second end regions are distal from and proximal to the bottom assembly, respectively, the thermal sensor being bonded to the bottom assembly via a thermally conductive adhesive, wherein the battery is disposed between the first and second end regions of the sensor PCB.

8. The wireless device of any one of claims 3-6, further comprising:

a PCBA having the processor integrated thereon;

a battery disposed between the thermal sensor and the processor;

and

one or more conductive wires connecting said sensor PCB with said PCBA, wherein said PCBA and said sensor PCB are distal from and proximal to the bottom assembly,

respectively, the sensor PCB being bonded to the bottom assembly via a thermally conductive adhesive.

9. An accessory configured to releasably receive the wireless device of any one of claims 1-8 and be worn by a user on only a right arm or a left arm.

10. A guest engagement system comprising:
a plurality of wireless devices each being of any one of claims 1-8, the wireless devices provided to users of the guest engagement system to be carried by the users, each wireless device having a unique identifier and including first and second wireless communication antennas respectively configured for Bluetooth low energy (BLE) and near field communication (NFC) communications;

a sensor network comprising a plurality of sensors each mounted at a different location, wherein at least one sensor of the plurality of sensors is operative to detect the wireless devices that are proximate thereto and receive unique identifiers therefrom based on BLE communication with the wireless devices and at least another sensor of the plurality of sensors is operative to detect the wireless devices that are proximate thereto and receive unique identifiers therefrom based on NFC communication with the wireless devices;

a communication network connecting each of the plurality of sensors of the sensor network; and

a central server communicatively connected to each of the plurality of sensors of the sensor network via the communication network, and storing a log associating each unique identifier of a wireless device received using BLE or NFC communications by a sensor of the sensor network with a location of the sensor and a timestamp.

11. The guest engagement system of claim 10, wherein the central server is configured to:

receive, from the sensor, user health data associated with a user of the users that wears the wireless device; and

store the log associating the unique identifier of the wireless device with the user health data.

12. The guest engagement system of claim 11, wherein the central server is configured to determine a schedule for cleaning a venue based upon the user health data associated with each user of that users that visit the venue, a duration of visiting, a number of the users that visit the venue, or a combination thereof;

wherein the central server is configured to present a digital clone of each of the users, and the user health data thereof, on a user interface in connection with the location and the timestamp associated with the user health data;

wherein the user health data includes device health data based upon one or more measurements by said device health sensor of the wireless device; or

wherein the user health data are based upon one or more measurements of the health function of the user, the health function being associated with a symptom of an infectious disease.

13. The guest engagement system of claim 11 or claim 12, further including one or more system health sensors each associated with a sensor of the sensor network, respectively, each of the system health sensors being configured for measuring the at least one health function of the user wearing the wireless device and proximal to the associated sensor, the user health data including system health data based upon one or more measurements by the system health sensors, wherein at least one of the system health sensors includes a non-contact body temperature scanner for measuring the body temperature of the user wearing the wireless device and proximal to the associated sensor, the system health data including the body temperature measured by the non-contact body temperature scanner.

14. A method for making a wireless device, comprising:

providing a body having a tapered shape including a front surface, a rear surface having a same shape as the front surface and a dimension greater than the front surface, and a peripheral side surface connecting the front and rear surfaces, the body defining a cavity therein that is enclosed by the front, the rear surface, and the peripheral side surfaces;

disposing a processor in the cavity;

disposing at least one wireless communication antenna in the cavity; and

disposing a device health sensor at least partially within the cavity, the device health sensor being in communication with the processor and configured for measuring at least one health function of a user wearing the wireless device, the device health sensor including a thermal sensor disposed in the cavity and configured for measuring a temperature of the user in contact with the rear surface; and

disposing a sensor printed circuit board (PCB) in the cavity, the sensor PCB being coupled to the thermal sensor and electrically connected to the processor.