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Tran

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(54) **MESH NETWORK STROKE MONITORING APPLIANCE**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 478 days.

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Related U.S. Application Data

(63) Continuation of application No. 11/439,631, filed on May 24, 2006, now Pat. No. 7,558,622.

(51) **Int. Cl.**
A61N 5/04   (2006.01)

(52) **U.S. Cl.** **600/509**; 600/513

(58) **Field of Classification Search** 600/485, 600/509, 513, 528; 128/903
See application file for complete search history.

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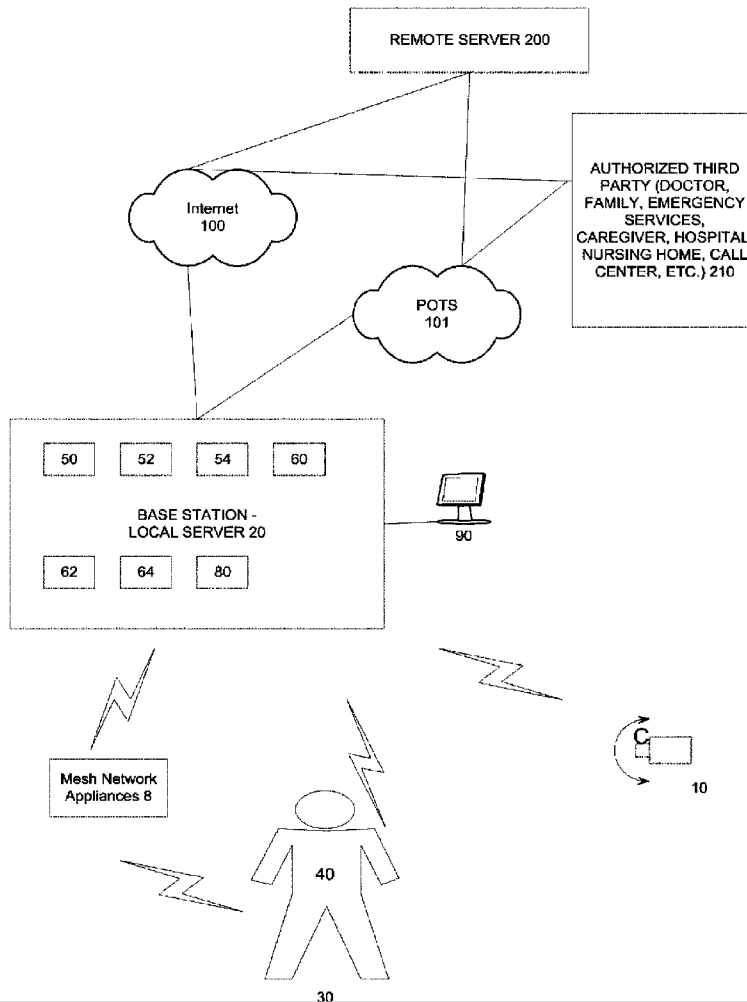|			
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(57)   **ABSTRACT**

A heart monitoring system for a patient includes one or more wireless nodes forming a wireless mesh network; a wearable appliance having a wireless transceiver adapted to communicate with the one or more wireless nodes; and a statistical analyzer to determine heart attack or stroke attack, the statistical analyzer coupled to the wireless transceiver to communicate patient data over the wireless mesh network.
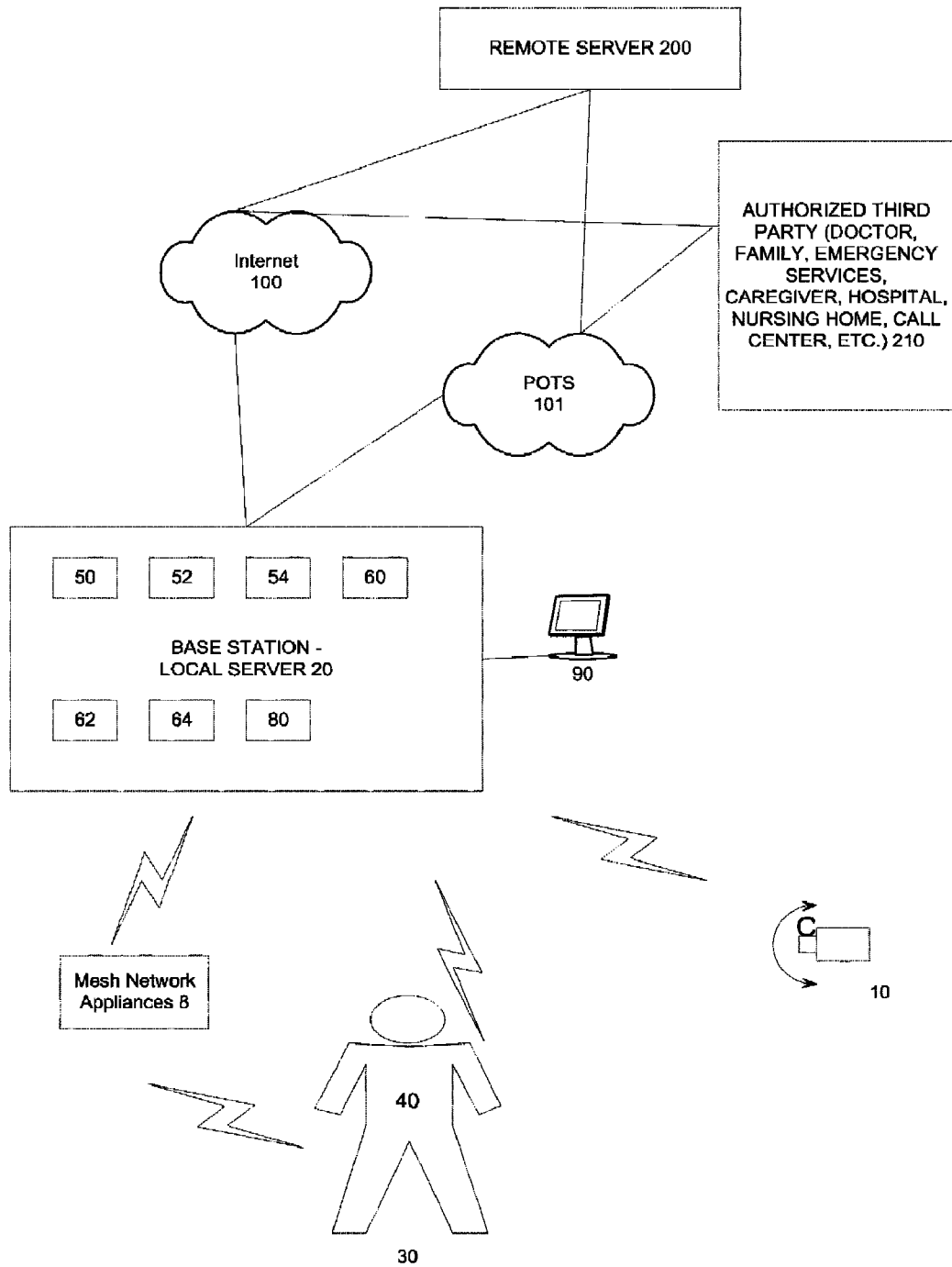
20 Claims, 22 Drawing Sheets

FIG. 1

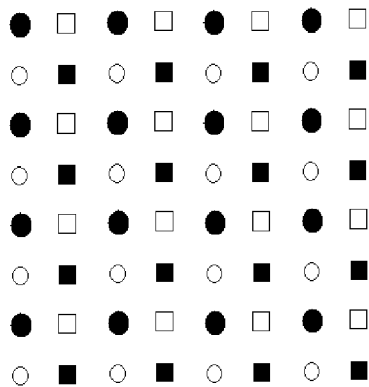| |
|---|
| Place a calibration sheet with known dots at a known distance and perpendicular to a camera view |
| Take snap shot of the sheet, and correlate the position of the dots to the camera image |
| Place a different calibration sheet that contains known dots at another different known distance and perpendicular to camera view. |
| Take snap shot of the sheet and correlate the position of the dots to the camera image |
| Smooth the dots to the pixels to minimize digitization errors |
| For each pixel, draw a line from Dot1(x,y,z) to Dot2 (x, y, z) defining a cone center where the camera can view |

FIG. 2A

FIG. 2B

Find floor space area
Define camera view background 3D scene
Calculate patient's key features
Detect fall

FIG. 3

Find floor space area
Define camera view background 3D scene
Calculate patient's key features
Extract facial objects
Detect facial orientation
Detect facial expression

FIG. 4

Set up mesh network appliances (1000)
Determine patient position using in-door positioning system (1002)
Determine patient movement using accelerometer output (1004)
Determine vital parameter including patient heart rate (1006)
Determine if patient needs assistance based on in-door position, fall detection and vital parameter (1008)
Confirm prior to calling third party (1010)
If confirmed or non-responsive, make connection with third party and send voice over mesh network to appliance worn by the patient (1012)
If needed, call emergency personnel to get medical care (1014)

FIG. 5

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