

(54) **CELLULAR ARCHITECTURE AND DATA TRANSFER METHODS FOR REAL TIME PATIENT MONITORING WITHIN MEDICAL FACILITIES**

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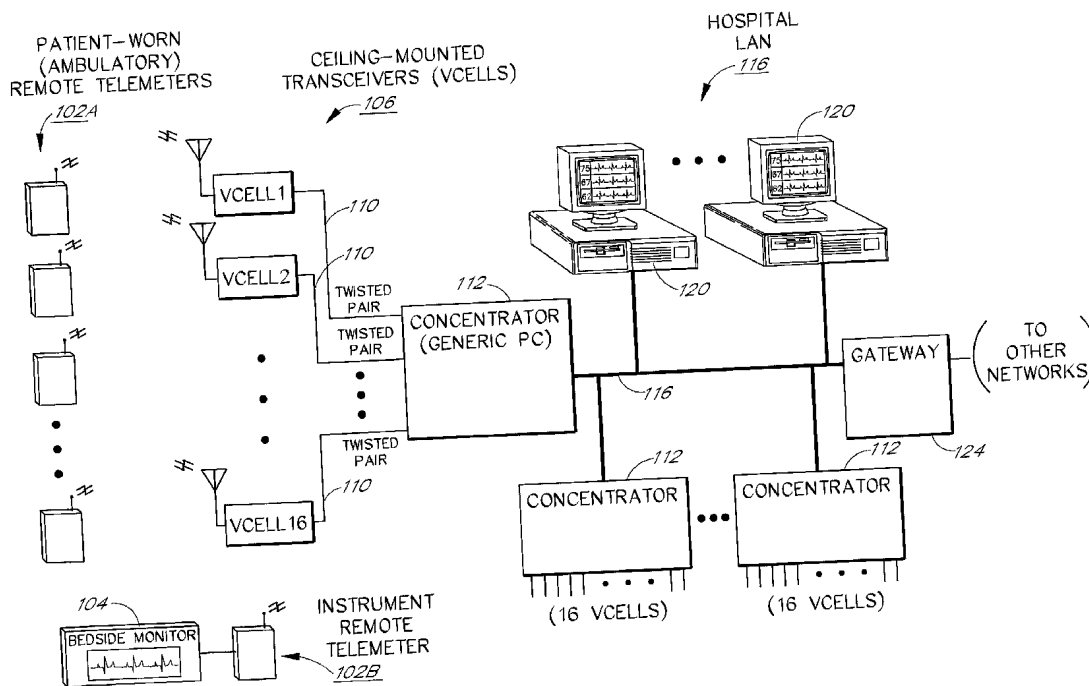
(60) Continuation of application No. 09/315,254, filed on May 20, 1999, now Pat. No. 6,213,942, which is a division of application No. 08/675,594, filed on Jul. 3, 1996, now Pat. No. 5,944,659 and which is a non-provisional of provisional application No. 60/006,600, filed on Nov. 13, 1995.

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(57) **ABSTRACT**

A medical telemetry system is provided for collecting the real-time physiologic data of patients (including ambulatory patients) of a medical facility, and for transferring the data via RF to a real-time data distribution network for monitoring and display. The system includes battery-powered remote telemeters which attach to respective patients, and which collect and transmit (in data packets) the physiologic data of the patients. The remote telemeters communicate bi-directionally with a number of ceiling-mounted RF transceivers, referred to as "VCELLs," using a wireless TDMA protocol. The VCELLs, which are hardwire-connected to a LAN, forward the data packets received from the telemeters to patient monitoring stations on the LAN. The VCELLs are distributed throughout the medical facility such that different VCELLs provide coverage for different patient areas. As part of the wireless TDMA protocol, the remote telemeters continuously assess the quality of the RF links offered by different nearby VCELLs (by scanning the frequencies on which different VCELLs operate), and connect to those VCELLs which offer the best link conditions. To provide a high degree of protection against multi-path interference, each remote telemeter maintains connections with two different VCELLs at-a-time, and transmits all data packets (on different frequencies and during different timeslots) to both VCELLs; the system thereby provides space, time and frequency diversity on wireless data packet transfers from the telemeters. The telemeters and VCELLs also implement a patient location protocol for enabling the monitoring of the locations of individual patients. The architecture can accommodate a large number of patients (e.g., 500 or more) while operating within the transmission power limits of the VHF medical telemetry band.



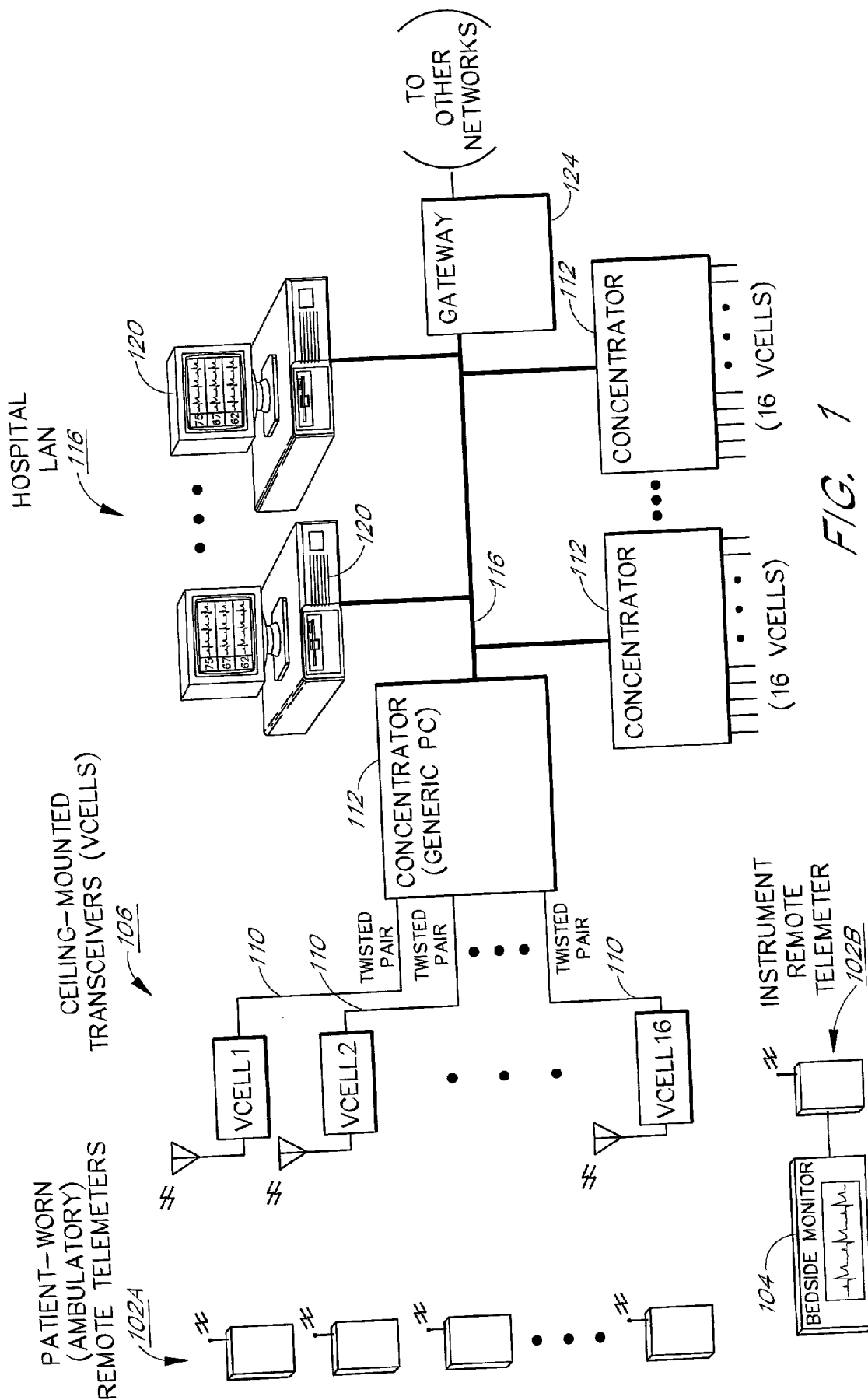


FIG. 1

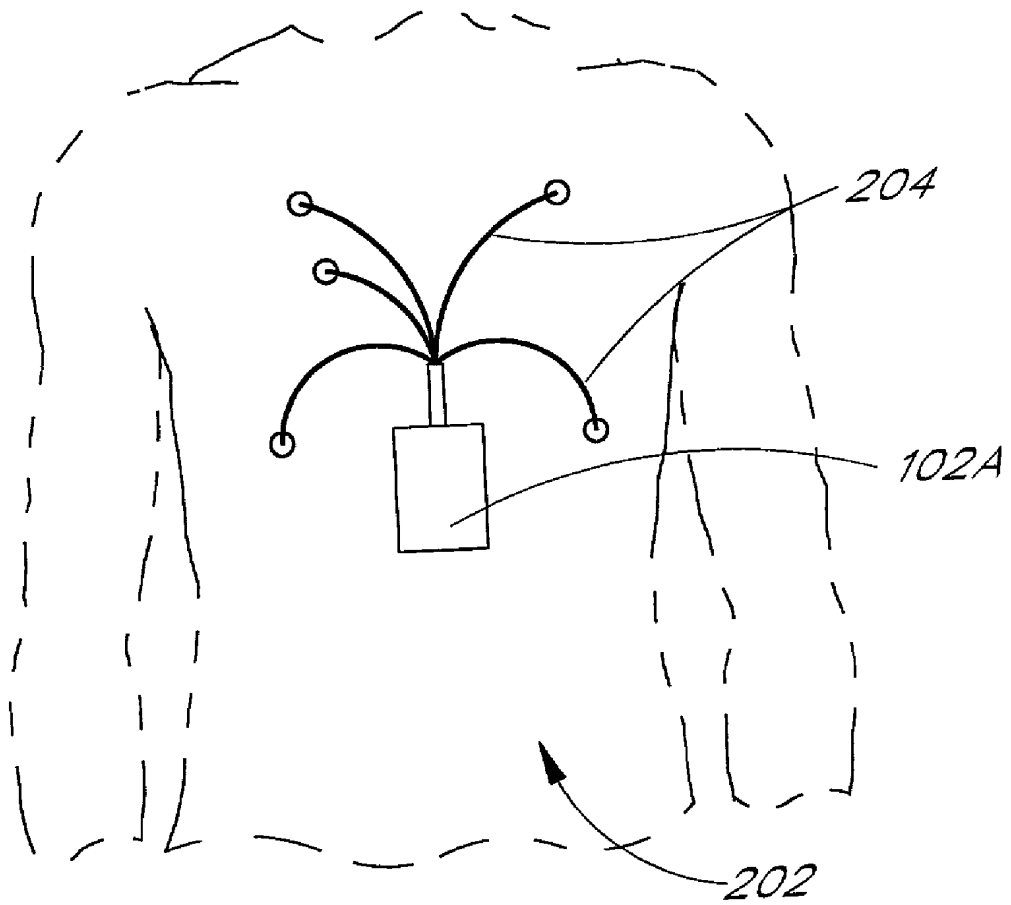


FIG. 2

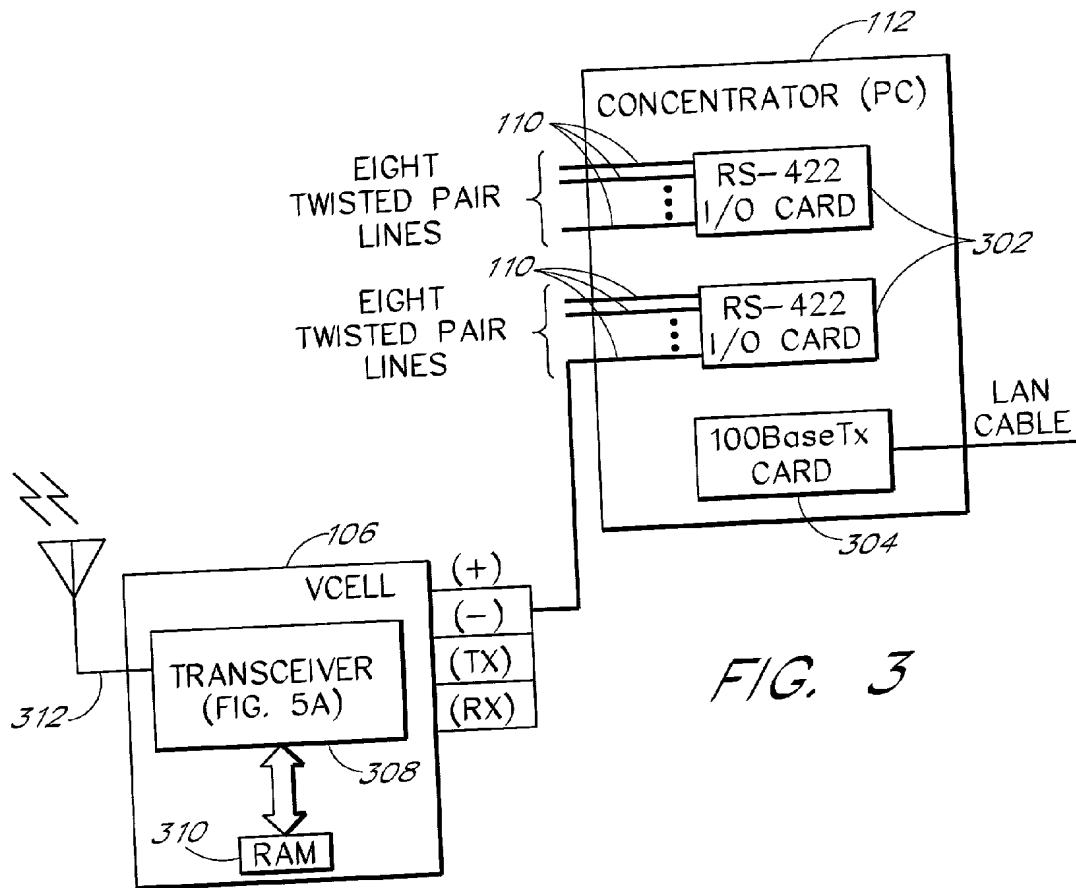


FIG. 3

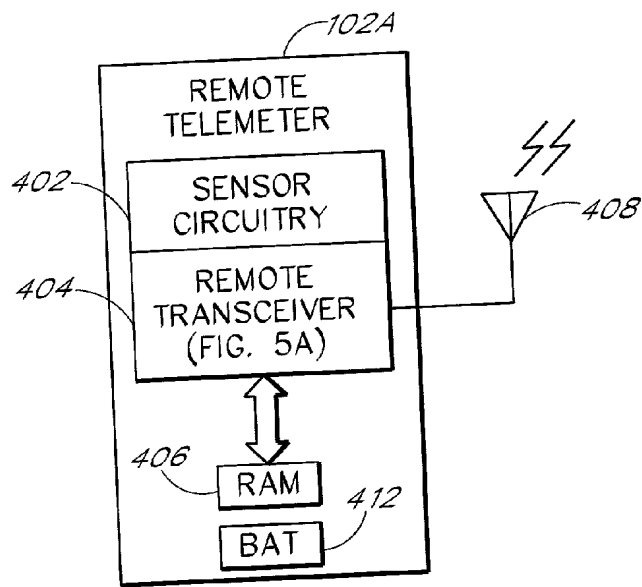


FIG. 4

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