

# INTERNET OF THINGS MEDICAL MONITORING DEVICE WITH AI DIAGNOSTICS

**Patent No:** US 10,777,999 B2

**Publication Date:** August 10, 2024

**Filed:** March 18, 2023

**Int. Cl.:** A61B 5/00 (2006.01); G16H 50/20 (2018.01); H04L 67/12 (2022.01)

**CPC:** A61B 5/00 (2006.01); G16H 50/20 (2018.01)

## ABSTRACT

A wearable Internet of Things (IoT) medical device for continuous patient monitoring with integrated Artificial Intelligence (AI) diagnostic capabilities. The device monitors Electrocardiogram (ECG), blood pressure, and oxygen saturation using advanced sensors. Data transmission occurs via Bluetooth and WiFi to cloud servers for analysis. Machine Learning (ML) algorithms detect anomalies and predict potential health issues. The system complies with Health Insurance Portability and Accountability Act (HIPAA) regulations and integrates with Electronic Health Record (EHR) systems. The device includes Near Field Communication (NFC) for easy pairing and features a Light Emitting Diode (LED) display for real-time health metrics.

## FIELD OF THE INVENTION

This invention relates to medical monitoring devices, specifically to IoT-enabled wearable devices with AI-powered diagnostic capabilities for remote patient monitoring and preventive healthcare.

## BACKGROUND

Traditional medical monitoring requires frequent hospital visits and manual data recording. Existing wearable devices (see US 9,678,901) provide basic heart rate monitoring but lack comprehensive diagnostic capabilities. Internet connectivity in medical devices remains limited, with most systems using proprietary protocols rather than standard IoT frameworks. Prior art includes basic fitness trackers (US 9,789,012) and hospital-grade monitors (US 9,890,123) that are not suitable for continuous home use. The integration of AI for predictive diagnostics in wearable form factors represents a significant advancement over existing technology.

## SUMMARY

The device includes multiple biosensors connected to a microcontroller with embedded ML algorithms. Data is encrypted using Advanced Encryption Standard (AES) before transmission via Hypertext Transfer Protocol Secure (HTTPS) to cloud servers. The backend utilizes Software as a Service (SaaS) architecture hosted on Amazon Web Services (AWS). The mobile application, available on both Android and iOS platforms, provides a Graphical User Interface (GUI) for viewing health trends. Push notifications alert users and healthcare providers of concerning patterns. The system uses Time Series analysis and Neural Networks for predictive modeling. Battery life exceeds 7 days using efficient power management. The device is Food and Drug Administration (FDA) approved for medical use and meets

International Organization for Standardization (ISO) 13485 standards for medical device quality management.

## REFERENCES CITED

### U.S. Patent Documents:

- US 9,678,901 - Basic heart rate monitor (2020)
- US 9,789,012 - Fitness tracking device (2021)
- US 9,890,123 - Hospital monitoring system (2022)
- US 9,901,234 - Wireless health sensor (2023)

### Foreign Patent Documents:

- EP 3678901 - Wearable medical device (2022)
- WO 2022/234567 - IoT health monitoring (2022)

### Other Publications:

- "AI in Healthcare Monitoring" - Journal of Medical Devices, 2023
- "IoT Security in Medical Applications" - IEEE Trans. on Biomedical Engineering, 2024