On-Demand Functionalized Textiles For Drag-And-Drop Near Field Body Area Networks

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OTHER INFORMATION

CATEGORIZED AS

- **Biotechnology**
  - Health
- **Communications**
  - Wireless
- **Materials & Chemicals**
  - Textiles
- **Medical**
  - Devices
  - Other
  - Rehabilitation
- **Sensors & Instrumentation**
  - Biosensors
  - Medical

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BRIEF DESCRIPTION

This technology introduces a flexible, secure, and scalable approach to creating body area networks (BANs) using textile-integrated metamaterials for advanced healthcare monitoring.

FULL DESCRIPTION

The technology features on-demand functionalized textiles that incorporate arrays of magnetically coupled resonators to propagate magneto-inductive waves, enabling seamless near-field communication (NFC) across the human body. By integrating these metamaterials into clothing, it facilitates the creation of multi-node wireless networks without the need for batteries, supporting continuous health monitoring through wearable and implantable sensors

SUGGESTED USES

- Advanced healthcare monitoring systems for continuous health and wellness tracking.
- Secure and scalable networks for wearable technology in sports and fitness.
- Emergency response systems for real-time monitoring of patients and at-risk individuals.
- Consumer electronics for seamless integration of smart devices with clothing and accessories.

ADVANTAGES

- Facilitates long-distance NFC-based communication across the body without direct connection terminals.
- Flexible and durable integration into textiles allows for easy expansion and customization.
- Eliminates the need for batteries, reducing user burden and enabling true continuous monitoring.
- Supports secure, on-demand network creation with quick pairing and high security through NFC protocol.
- Allows for the drag-and-drop of sensors, enhancing versatility and user-friendliness.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20250281044	09/11/2025	2021-787

RELATED MATERIALS

- Hajiaghajani, A., et al. Tseng, P. (2021). Textile-integrated metamaterials for near-field multibody area networks. Nature Electronics, 4.