Stretchable and Flexible E-Fiber Wire Antennas

Current processes for manufacturing flexible, yet mechanically durable, antennas on E-fibers yield non-stretchable prototypes, and a lack of fine print details. Typically, their geometrical accuracy or resolution is no more than 1 mm. When applied to wire antennas with fine geometrical details, these processes for stretchable and flexible electronics are prone to failure due to fatigue and wear. They can also be complicated and difficult to reproduce. Aforementioned wire antennas are traditionally made of copper wires or by etching metal patterns on rigid substrates. When stretched or folded/twisted, these antennas are permanently deformed, or may even break. Thus, current products are not suitable for applications which require high flexibility and are subject to continuous mechanical deformation. The limitations of the current go-to product can be answered by this new technology. The invention fabricates stretchable and flexible wire antennas using E-fibers embedded in polymers. It has been tested to achieve reliable fabrication and excellent performance. The developed prototype exhibits comparable performance to their copper counterparts. Additionally, it also protects against corrosion and achieves higher geometrical accuracy of 0.3 mm.

INTELLECTUAL PROPERTY

Patent Pending
THE MARKET

The development of flexible and wearable electronics has been a major field of study for years. Until now, wearable technology products have been a fringe market of devices that have been impractical, bulky and unaesthetic for consumer applications. For many years, markets for wearable devices have primarily been focused on non-consumer applications, such as, healthcare, defense, and industrial. However, recent advances in many STEM fields have allowed wearable technology products to emerge.

MARKET OPPORTUNITIES

- **Electronics** Need for flexibility and wearability
  - Flexible display, battery, sensors, and memory
  - Smart clothing, watches, smart glasses
  - Printed or organic electronics

THE OHIO STATE UNIVERSITY

CDME is supporting the commercialization of technologies that emerge from Ohio State’s annual research efforts. Ohio State has one of the largest research and development budgets of all universities. The amount of annual funding is a leading indicator of the breakthrough innovation occurring within the University. Recent annual highlights from OSU:

- $934 Million: Total research and development (R&D) expenditures
- $470 Million: Federal R&D expenditures
- $101 Million: Industry-sponsored research expenditures

Whether your interest is in licensing, sponsored research, joint ventures, investment, corporate giving or placement of our best students, Ohio State is here to help accelerate your business through innovation.

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