



## Electronics and Semiconductors

### Opportunity

Optical Fibre Sensors (OFSs) offer many inherent advantages including being lightweight, resistant to electromagnetic interference, high sensitivity and large bandwidth. Issues with the use of high Young's modulus (YM) materials, such as polymers or glass, make the use of low YM material, such as soft polymers, an attractive option. However, there is currently no practical scalable method for fabricating a low YM fibre.

### Technology

This invention relates to a method of fibre drawing for fabricating a diverse range of low Young's modulus (YM) materials into fibre.

It has the ability to cheaply fabricate complex integrated structures out of inexpensive, biologically compatible, rugged material with thousandfold greater stretchability than existing materials.

### Advantages

- More magnitudes of flexibility
- Tailored for level of sensitivity
- Simple integration of electrical wires for sensing capabilities
- Drawing allows for the fabrication of long segment of optical fibres
- Multiple sensor parameter detection including low frequency detection and directional detection
- Ideal to integrate directly into clothes
- Real time continuous monitoring

### Potential Commercial Applications

OFS technology is particularly attractive for application in wearable, implantable, and human-friendly devices as these devices allow both sensing and signal transmission.

Low YM OFSs could permit detection of multiple modes of deformation with high sensitivity and could be used for stretchable applications. Thus, fibre sensors made of low YM materials could improve existing uses of OFS technology and open up new opportunities for OFS technology in smart textiles, wearables, implantable therapeutic devices, health care, and soft robotics.

### Intellectual Property Status

WO2020041838A1 'Fibre Forming Process'

### Inventors

This technology was developed by Prof Simon Fleming, a lead researcher in photonics with over thirty year's experience, Dr Richard Lwin, Dr Alessio Stefani, and Dr Md Rejvi Kaysir



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