ACTUATION OF INTEGRATED OPTICAL COMPONENTS WITH MEMS MICROMOTORS

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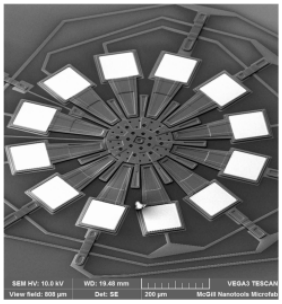
BACKGROUND

Optical coherence tomography (OCT) has found many applications in medicine and health sciences. It has been adopted in medical specialities such as ophthalmology, cardiology, gastroenterology, and dermatology because it enables non-invasive imaging of features down to a few millimeters inside living tissues. Despite its relatively recent adoption by the medical community, OCT has already improved illness diagnostic and treatment. For instance, OCT imaging of arteries has led to the identification of different types of atherosclerotic plaque, which pose different risks, and this has resulted in the development of novel treatment plans. However, widespread use of this technology is limited by its high acquisition and installation cost.

Two technologies enabled by micro-fabrication can enable lower cost miniaturized integrated OCT systems: microelectromechanical systems (MEMS) and integrated optics. Integrated optics take advantage of the micro-fabrication processes to produce chip-scale optical devices on large scales and at much lower costs than their discrete counterparts. Similarly, MEMS combine mechanical and electrical phenomena to create integrated devices with unique properties that can be produced with a batch process. Highly integrated systems can greatly improve the accessibility of advanced technologies because they can be manufactured in high volumes while providing state-of-the-art performance.

TECHNOLOGY

The inventors have established a novel technology that enables the realisation of integrated optical scanning systems which form the basis of optical systems for optical spectroscopy and optical coherence tomography. The technology is based on a rotating MEMS polygon scanner.



SEM micrograph of micro-motor based MOEMS swept optical elements

COMPETITIVE ADVANTAGES

- MEMS and integrated optics can enable ultra-compact and low cost OCT systems
- Scan rates of up to 30 kHz, which competes with commercial OCT systems

TECHNOLOGY DEVELOPMENTAL STAGE

Proof of concept

BUSINESS OPPORTUNITY

Partnering/licensing opportunities

IP STATUS

US Patent Application 62/305,610

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