Domestic Fiber Bragg Grating Patents



Overview

Fabrication of fiber optic grating apparatus and methodA number of Bragg gratings have been fabricated in hydrogen loaded standard telecommunication fibers.

Key Takeaways

Recent domestic patents on Fiber Bragg Gratings cover multicore optical fibers, multi-axis sensing systems, and advanced laser inscription methods. Key Patents and Technologies1.

Multicore Optical Fiber and Gain-

Flattening Gratings US20190041575A1 describes a multicore optical fiber (MCF) with fiber Bragg gratings (FBGs) used for gain flattening in long-haul optical communication systems. The patent details methods for inscribing gratings using ultraviolet lasers, including phase mask and interference exposure techniques, to achieve uniform refractive index modulation across multiple cores. This technology addresses issues like ripple width in transmission spectra and improves reproducibility and manufacturing efficiency for multicore slanted fiber gratings (MC-SFGs) in erbium-doped fiber amplifiers (EDFAs) for C-band and L-band transmission.

2.

Multi-

Axis Fiber Bragg Grating Sensors US20250258048 focuses on multi-axis FBG sensor systems for measuring forces in three dimensions. The system uses spatially distributed, mechanically isolated sensing towers with nonparallel pillars supporting FBGs. An interrogator captures wavelength shifts to measure multi-axis forces, enabling tactile sensing in robotics and harsh environments.

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This patent highlights the application of FBGs beyond communication, emphasizing strain and force sensing with high durability and immunity to electromagnetic interference. 3. Femtosecond Laser Inscription in Optical Waveguides US20230194775A1 introduces a method for inscribing FBGs using ultrashort femtosecond laser pulses and diffractive optical elements or phase masks.

This approach allows precise modification of the refractive index in the fiber core, enabling high-resolution quasi-distributed temperature and strain sensing. The method enhances sensitivity, multiplexing capability, and EMI immunity, making it suitable for advanced sensing applications in industrial and scientific environments. 4.

Fiber Bragg Grating Position and Shape Sensing Additional patents, such as those summarized in Patsnap Eureka, describe FBG arrays in single-core or multicore fibers for position and shape sensing. These devices use broadband reference reflectors and frequency domain reflectometry to measure strain and local bending, enabling accurate determination of object shape or motion.

Summary of Trends

Multicore FB

Gs improve optical communication performance and allow simultaneous grating formation in multiple cores.

Multi-axis FB

G sensors expand applications into robotics, structural health monitoring, and tactile sensing. Advanced laser inscription techniques (femtosecond pulses, phase masks) enhance precision, sensitivity, and multiplexing. Integration with optical amplifiers and sensing systems demonstrates the dual role of FBGs in both communication and measurement technologies.

These patents collectively illustrate the domestic innovation landscape for FBGs, highlighting both manufacturing methods and diverse applications in sensing and optical networks.

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Article Content

Fabrication of fiber optic grating apparatus and method

A number of Bragg gratings have been fabricated in hydrogen loaded standard telecommunication fibers (SMF-28, Coming) with Bragg wavelength around 1300 nm and ordinary commercial...

MULTICORE OPTICAL FIBER, FIBER BRAGG GRATING, AND

The present invention relates to a multicore op-tical fiber, a fiber Bragg grating, and a method for man-ufacturing a fiber Bragg grating.

MULTI-AXIS FIBER BRAGG GRATING SENSORS AND SYSTEMS

The optical fiber has a plurality of fiber Bragg gratings and is affixed to each of the dimensional multi-axis sensing towers wherein a fiber Bragg grating is positioned along a straight portion of a sensing pillar

U.S. Patent Application for FIBER BRAGG GRATING

Fiber Bragg grating interrogation and sensing used for strain and temperature measurements. A simple, broadband light source is used to interrogate one or more fiber Bragg

Security component with fiber Bragg grating (Patent) | OSTI.GOV

A fiber Bragg grating (FBG) security component for single-party and multi-party monitoring is provided. The security component includes an optical fiber having a plurality of Bragg

Fiber Bragg grating patented technology retrieval search results ...

Patsnap Eureka AI that helps you search prior art, draft patents, and assess FTO risks, powered by patent and scientific literature data. A fiber Bragg grating (FBG) is a type of distributed Bragg

Fiber bragg grating sensor patented technology retrieval search

This page includes the patent name, patent number, legal status, invention/applicant, technical efficacy and accompanying drawings of Fiber bragg grating sensor-related invention patents and utility model

WO/2024/022871 OPTICAL FIBRE COMPRISING A BRAGG GRATING

The invention relates to an optical fibre comprising a Bragg grating (20), wherein: - each pattern (M i) of the Bragg grating extends mainly in a plane, referred to as the "pattern plane",

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(12) United States Patent (10) Patent No.: US 7,031,571 B2

Such core and cladding of the optical fiber need not be chemically doped to support the grating. The method incorporates an ultra short duration pulse laser Source.

US20190041575A1

Definitions the present inventionrelates to a multicore optical fiber, a fiber Bragg grating, and a method for manufacturing a fiber Bragg grating. an optical fiber amplifier to which a rare earth-element such

A novel temperature-compensated, intensitymodulated fiber Bragg grating ...

Abstract—An intensity-modulated, fiber Bragg grating (FBG) sensor system based on radio-frequency (RF) signal measurement is presented. The RF signal is generated at a photodetector by two

U.S. Patent for Bragg grating and method of producing a Bragg grating ...

A novel Bragg grating filter in optical waveguiding fiber with suppressed cladding mode coupling and method of producing same is disclosed. The novel grating structure is induced in both the core and

Fiber Bragg grating patented technology retrieval search results ...

A fiber Bragg grating (FBG) is a type of distributed Bragg reflector constructed in a short segment of optical fiber that reflects particular wavelengths of light and transmits all others. This is achieved by

Fiber Bragg grating

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US9335468B2

A method of fabricating Fiber Bragg gratings in a micro/nanofiber using ultrashort pulse irradiation, the method includes elongating and flame-brushing a single mode optical fiber to create a

Biomedical Fiber Optic Pressure Sensors Market

Fiber Bragg Grating – 45%: Known for their high resolution and multiplexing capabilities, FBG technology sees substantial application, particularly in critical monitoring.

Apparatus and process for making fiber optic bragg gratings

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This invention relates to Bragg gratings, and more particularly to improvements in the process of making Bragg gratings in optical fibers by photo-induction, and to an improved apparatus for carrying out the

Fabrication of fiber optic grating apparatus and method

An apparatus and method for forming a Bragg grating on an optical fiber using a phase mask to diffract a beam of coherent energy and a lens combined with a pair of mirrors to produce two symmetrical

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