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Innovation at Work

Colorado State University

Production of Sparks via High-Quality Laser Pulses Through Optical Fibers

Optical sparks may have significant advantages for improved engine operation. Optical sparks also reduce the need or maintenance as less residue builds up in the cylinder. Fiber optic technology allows the laser to be located away from the extreme conditions inside the cylinder, and allows a single laser to supply sparks to multiple cylinders at once.

Researchers in the Department of Mechanical Engineering at Colorado State University are developing a functional optical ignition system. The system uses new fiber technology with specific characteristics to overcome the difficulties associated with traditional heavy-duty engines.

To make a spark in the cylinder, the output bean must be both powerful and high-quality so that it can be focused on a point. Large core step-index fibers with thick cladding are ideal. The fibers feature optics on both ends to maximize the quality and effectiveness of the beam. The system allows light produced by the combustion to return from the cylinder for analysis.

With three issued patents and two others pending, these researchers are at the forefront of this exciting field and further breakthroughs are anticipated. Contact us for more information regarding partnership and licensing opportunities.

Patent Information
U.S. Patents 7,340,129; 7,412,129; 7,420,662

Inventor Information
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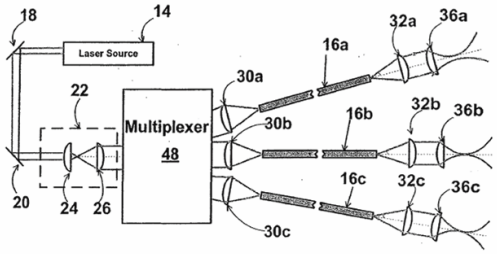

FIG.3

Features and Benefits

- Laser can be located away from engine unit.
- One laser can serve multiple cylinders, lowering cost and maintenance.
- Fiber optic system allows diagnostic light to return for analysis.

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