



Scientific Solutions, Inc.

Spectroscopic devices and consulting

Scientific Solutions, Inc. receives US Patent No. 6,757,046

N. Chelmsford, Massachusetts (June 29, 2004) - Scientific Solutions, Inc. (SSI) is pleased to announce that it has received the first of three potential US patents for an "Optical multiplexer and cross-switch using etched liquid crystal Fabry-Perot etalons". The invention described in this Patent relates generally to the fields of optical network communications and optical switching. More particularly, the invention relates to multiplexing and cross switching of digital signals in an optical communications network. Officially filed on April 1, 2003, this second divisional has priority benefit via the parent application to a July 25, 2000 provisional filing date, giving SSI broad protection of their Liquid Crystal Fabry-Perot (LCFP) tunable filter technology.

In its most basic manifestation, SSI's LCFP represents a dramatically improved version of the classic Fabry-Perot interferometer (FPI) developed in the late 1800s. The FPI is a pair of highly polished mirrors that face one other across a given distance creating a resonant cavity. Light of all wavelengths enters the device, reflects multiple times between the mirrors, interferes constructively, and exits the device in a bulls-eye pattern of concentric rings, separated by wavelength and distributed radially outward from the center of the pattern. Traditionally these devices are tuned by physically changing the distance (gap) separating the mirrors or by changing gas pressure within the gap; these techniques require extremely complex mechanical systems. The LCFP is similar to a classic FPI, except that the resonant cavity is filled with liquid crystal (LC). Changing the index of refraction of the LC by the application of a low-voltage electric field is effectively equivalent to changing the physical distance separating the mirrors. The result is a completely solid-state, robust, compact, easy-to-use, tunable optical filter with high spectral resolution and rapid, precise, stable spectral selection.

The optical multiplexer described in the awarded Patent consists of two LCFP etalons laser-etched into many sub-etalons in a rectangular array. Each sub-etalon is independently tunable and can be coupled to a distinct fiber. Any single sub-etalon or random combination of sub-etalons is free to be tuned to a particular wavelength corresponding to one of the input channels. This allows for any combination of signals (i.e. digital video, data and voice) in a signal broadband channel to be switched to any of several receivers. This particular LCFP configuration increases the number of WDM channels that can be isolated by existing devices, simultaneously establishes the cross-connection, and does so with a mechanically robust, solid-state device. Full text relating to this patent is available online through the USPTO Patent Full-Text and Image Database via <http://patft.uspto.gov/>.

About Scientific Solutions, Inc.

Scientific Solutions, Inc. (SSI), a small business located in North Chelmsford, Massachusetts, was established in 1995 to provide new frequency-agile solutions to spectroscopic systems. SSI specializes in the fabrication of both classic Air-Gap Fabry-Pérot Interferometers and next-generation Liquid Crystal Fabry-Pérot (LCFP) tunable optical filters for which it won a Circle of Excellence award in 2001. SSI proudly distributes Avantes fiber optic spectrometers and related accessories to the northeastern USA. In addition to its award-winning products, SSI provides a range of photonics services including optical system design, spectroscopic consulting, and optical coating design and application. SSI can be reached via telephone at +1 (978) 251-4554 or on the web via <http://www.sci-sol.com/>.

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