

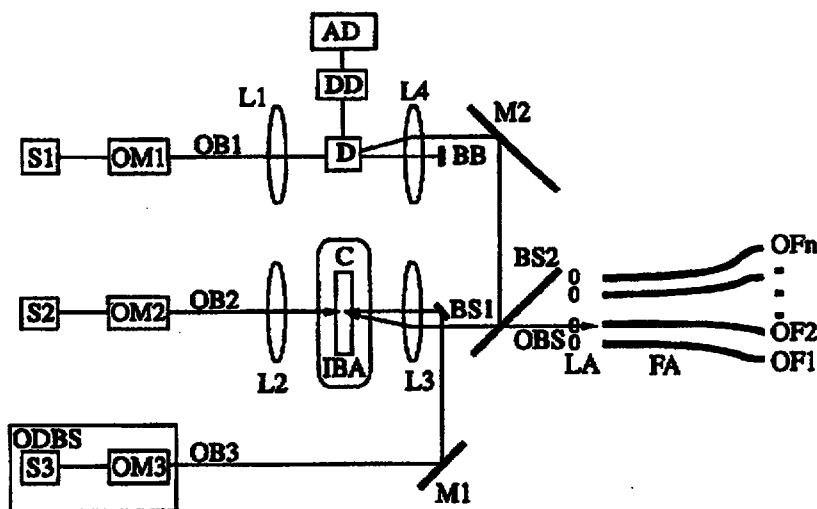
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(71) Applicant: THE STATE OF OREGON acting by and through THE STATE BOARD OF HIGHER EDUCATION on behalf of THE UNIVERSITY OF OREGON [US/US]; 311 Hendricks Hall, Eugene, OR 97403-1238 (US).			
(72) Inventors: BABBITT, William, Randall; 618 168th Avenue N.E., Bellevue, WA 98008 (US). MOSSBERG, Thomas, W.; 584 Lynnbrook Drive, Eugene, OR 97404 (US).			
(74) Agent: STEPHENS, Donald, L., Jr.; Klarquist Sparkman Campbell Leigh & Winston, L.L.P., One World Trade Center, Suite 1600, 121 S.W. Salmon Street, Portland, OR 97204-2988 (US).			

(54) Title: APPARATUS AND METHODS FOR ROUTING OF OPTICAL BEAMS VIA TIME-DOMAIN SPATIAL-SPECTRAL FILTERING



(57) Abstract

Apparatus and methods are disclosed for spatially routing an optical pulse (data pulse) of an electromagnetic radiation and containing a specific address temporal profile and possibly additional data. Routing generally involves a unit of active material (AM) that is programmed using one or more input beams or pulses (e.g. K2) of the electromagnetic radiation providing address (i.e., waveform-discriminating) and directional (i.e., pulse routing) information to the active material. During programming, a spatial-spectral grating is created by optical interference on or in the active material of the input pulses encoding the address and directional information pertinent to data pulse. Whenever a data pulse, encoding a temporal profile that is substantially similar to temporal profile of the address, interacts with the grating in or on the active material, the active material produces an output pulse (KS) that propagates in a direction, relative to the material, corresponding to the directional information provided during programming.