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(54) **TUNABLE, MECHANICALLY INDUCED LONG-PERIOD FIBER GRATING WITH ENHANCED POLARIZING CHARACTERISTICS**

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(52) **U.S. Cl.** **385/37**; 385/10; 385/11; 385/28; 359/130

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(57) **ABSTRACT**

A new type of fiber filter is useable in optical communication systems. In particular, the fiber filter may be used to flatten the gain of erbium-doped fiber amplifiers (EDFAs). Such gain flattening is important for long-haul, dense (wavelength dependent multiplexed) WDM communication systems. The filter includes a periodic mechanical structure pressed against the side of a single-mode fiber to induce a wavelength-dependent loss in a signal propagating in the fiber core by coupling the signal to fiber cladding modes. The mechanical structure is a periodic comb of small ridges. Each ridge induces a local index change in the fiber via the photoelastic effect. For coupling to the right cladding modes, the period of the grating (and the comb) is in the range of few hundreds of microns. Thus, the grating is easy to fabricate with standard machining equipment.

95 Claims, 16 Drawing Sheets