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(54) **ELECTRO-OPTIC MODULATOR WITH RESONATOR**

2003/0215170 A1 * 11/2003 Hum et al. 385/2

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(51) **Int. Cl.⁷** **G02F 1/035**

(52) **U.S. Cl.** **385/2; 385/1; 385/40; 385/41**

(58) **Field of Search** **385/1, 2, 3, 15, 385/16, 40, 41, 129, 130, 131**

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(57) **ABSTRACT**

An electro-optic modulator structure for particular use in narrowband optical subcarrier systems. A traveling wave is established across the active region of the device, instead of a standing wave. This is accomplished through the use of a directional resonator structure that prevents reverse-traveling waves from being established within the resonator. Hence, the electric field is applied to the traveling optical wave in a similar fashion to a traveling-wave modulator, except that the traveling wave has a much greater amplitude due to the build-up of energy inside the resonator. Since the modulator is operated in a traveling-wave fashion, it can be tuned to operate at any frequency using tuning elements, regardless of the length of the active region. Furthermore, the microwave and optical signals can be velocity-matched to mitigate optical transit time effects that are normally associated with a resonant modulator utilizing a standing-wave electrode structure.

14 Claims, 7 Drawing Sheets

