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(54) **BROADBAND WAVEGUIDE BASED OPTICAL COUPLER**

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See application file for complete search history.

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(57) **ABSTRACT**

An apparatus having a first waveguide, a second waveguide, a third waveguide, a fourth waveguide, and a fifth waveguide is described. A symmetric coupler has a proximal end and a distal end. The proximal end of the symmetric coupler is coupled to and in optical communication with the first waveguide and the second waveguide. The distal end of the symmetric coupler is coupled to and in optical communication with the fourth waveguide. An asymmetric coupler has a proximal end and a distal end. The asymmetric coupler is in a cascaded configuration with the symmetric coupler. The cascaded configuration has the proximal end of the asymmetric coupler coupled to and in optical communication with the fourth waveguide and the third waveguide. The distal end of the asymmetric coupler is coupled to and in optical communication with the fifth waveguide.

20 Claims, 12 Drawing Sheets

