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[54] **SWITCHABLE N-WAY POWER DIVIDER/ COMBINER**

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[52] **U.S. Cl.** **333/101**; 333/105; 333/125

[58] **Field of Search** ..... 333/101, 1, 105, 333/108, 124, 125, 127, 128, 136; 330/51, 124 D

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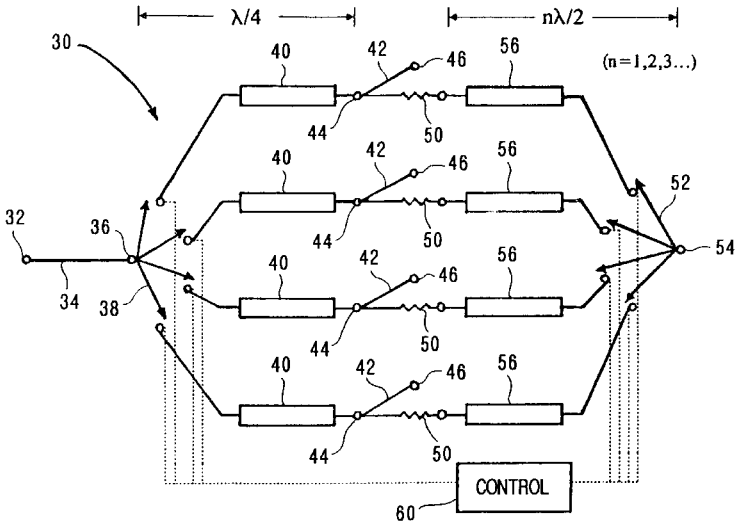
[57] **ABSTRACT**

An improved Wilkinson-type power divider/combiner possessing switching capabilities for selectively controlling operative modes of its constituent dividing/combining channels is disclosed. The switchable power divider/combiner includes N first switches connecting N input/output transmission lines to a common junction and N second switches connecting N isolation resistors coupled to the N input/output transmission lines to a common node. The operating mode of the power divider/combiner can be controlled by activating each pair of the first and second switches to a closed or open switch position. The impedance values of the dividing/combining channel transmission lines are adjusted to provide the optimal impedance matching in both N-way and (N–1)-way operating modes. The resulting switchable power divider/combiner is capable of providing efficient power combining and distribution in a low-loss, phase-balanced manner in both N-way and (N–1)-1 way modes. When one of the signal-processing channels in the dividing/combining system fails, the power divider/combiner is switched to the (N–1)-way mode to provide continuing operation of the system without any degradation in the signal characteristics.

23 Claims, 8 Drawing Sheets