Patent Abstracts

These Patent Abstracts of recently issued patents are intended to provide the minimum information necessary for readers to determine if they are interested in examining the patent in more detail. Complete copies of patents are available for a small fee by writing: U.S. Patent and Trademark Office, Box 9, Washington, DC, 20231.

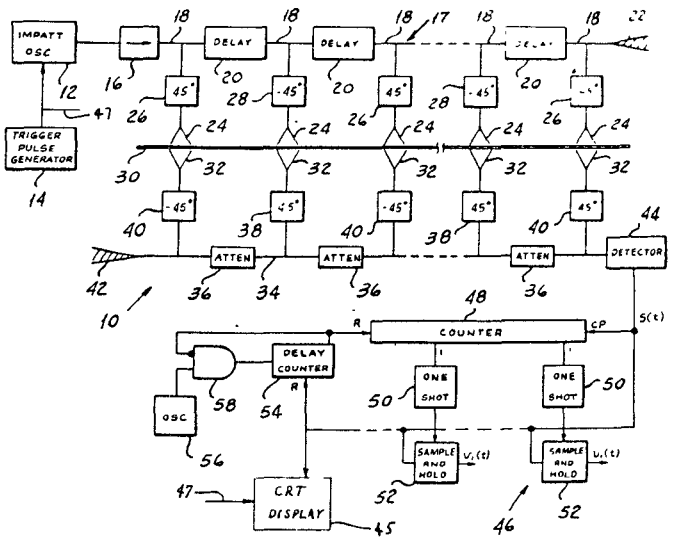
4,319,185 Mar. 9, 1982

Delay Line Microwave Moisture Measuring Apparatus

Inventor: John H. Hill.
Assignee: Sentrol Systems Ltd.
Filed: Dec. 5, 1979.

Abstract—Microwave moisture measuring apparatus in which a plurality of transmitting antennas direct microwave radiation through individual portions of a moisture-containing sheet material to respective receiving antennas coupled to a common detector. A microwave pulse is provided to one end of a transmission line containing delay elements to provide successively delayed pulses to the transmitting antennas. The delayed pulses are separately received by the detector and analyzed to permit individual measurement of the moisture content of the sheet material portions.

18 Claims, 3 Drawing Figures



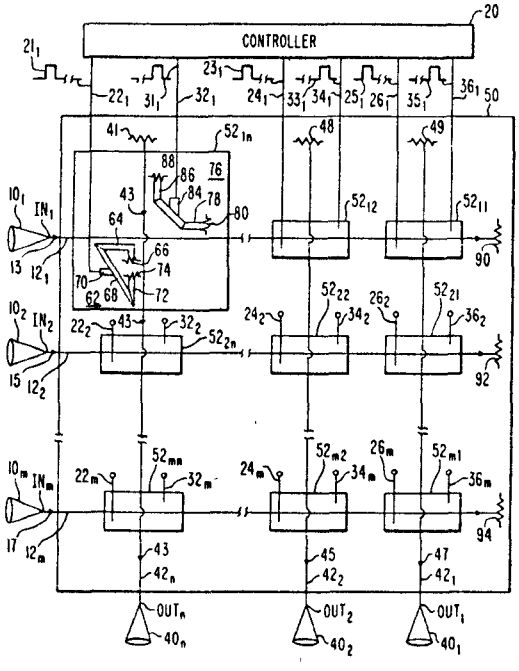
4,316,159 Feb. 16, 1982

Redundant Microwave Switching Matrix

Inventor: Pang T. Ho.
Assignee: RCA Corporation.
Filed: Jan. 22, 1979.

Abstract—A redundant microwave switching matrix providing equal power distribution of any of a plurality of microwave input signals among one or more of a plurality of microwave output signals. The redundant switching matrix used in a communication satellite selectively couples one or more of a plurality of input microwave signals received by receiving antennas among one or more of a plurality of output microwave signals radiated by transmitting antennas. The means for coupling the input and output microwave signals is provided by a pair of directional couplers diametrically positioned at each coordinate of the switching matrix. A controller selectively enables a pair of PIN diodes, internally positioned within each directional coupler, to perform the desired coupling. Diametrically positioned directional couplers, having a pair of PIN diodes, provide a highly reliable and flexibility microwave switching matrix.

5 Claims, 4 Drawing Figures



4,316,160 Feb. 16, 1982

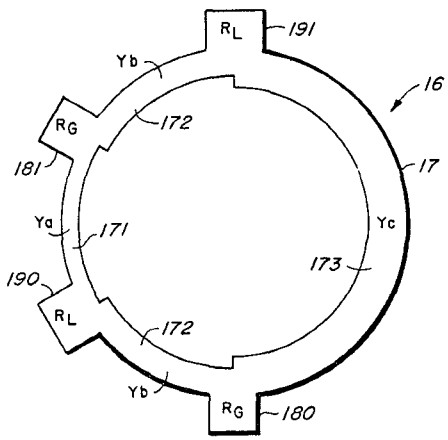
Impedance Transforming Hybrid Ring

Inventor: Michael Dydyk.
Assignee: Motorola Inc
Filed: July 28, 1980.

Abstract—An impedance transforming hybrid ring has a nonuniform impedance ring structure coupled to four ports. Two of the ports function as input ports, the remaining two as output ports. An arbitrary relationship exists between the impedance of the input ports and the impedance of the output

ports. The power division between output ports may be selected as a matter of design choice A broad band phase reversing network is utilized to provide an impedance transforming hybrid ring which efficiently operates over octave bandwidths. Design equations are provided and method for utilizing same are disclosed.

12 Claims, 7 Drawing Figures



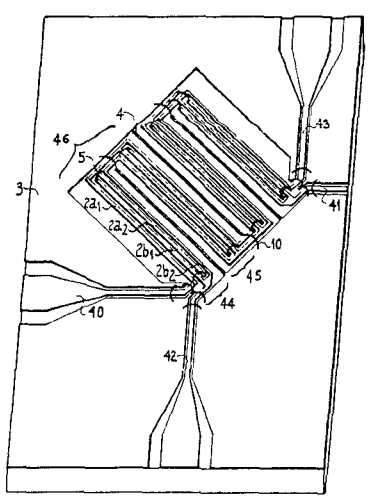
4,313,095 Jan. 26, 1982

Microwave Circuit with Coplanar Conductor Strips

Inventor: André Jean-Frederic.
Assignee: Thomson-CSF.
Filed: Feb. 7, 1980.

Abstract—A microwave circuit has a flat dielectric substrate with one face carrying a grounded metallic layer partly broken away to leave room for a multiplicity of conductor strips coplanar therewith which form part of one or more transmission lines having input and output ends each comprising an ungrounded strip portion flanked by two zones of the grounded layer. Electrical continuity between separated portions of that layer, and/or between nonadjacent conductor strips, is established by short-circuiting wires jumping across intervening strip sections. With coupled transmission lines operating with different modes of propagation, this structure substantially equalizes their respective phase velocities.

16 Claims, 8 Drawing Figures



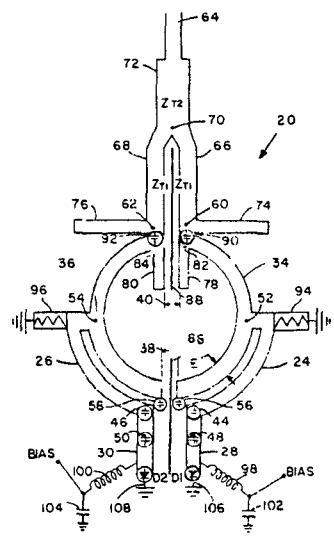
4,323,855 Apr. 6, 1982

Mic Combiner Using Unmatched Diodes

Inventor: Horst W. A. Gerlach.
Assignee: The United States of America as represented by the Secretary of the Army.
Filed: Apr. 9, 1980.

Abstract—In a microstrip circuit having dual diode driven, independently oscillating, half-wave open ring resonating sections, partially coupled quarter-wave ring sections are provided to permit matching and tuning of diodes having dissimilar negative impedances. The quarter wave ring sections are combined with appropriate line sections to accommodate the negative impedance devices. The diode circuits are connected to the low impedance points of the oscillating ring sections by the quarter-wave ring sections. Appropriate terminations to ground are provided to suppress possible oscillations in a bias circuit. Second and third harmonic traps are provided for use with TRAPATT diodes. Ground lines are provided to reduce circuit unbalance in the event of drastic power changes occuring on either side of the circuit which may other wise result in odd mode operation. Slots are provided to suppress an undesired transverse resonance mode in the line sections accommodating the negative impedance devices.

16 Claims, 3 Drawing Figures



4,321,560 Mar. 23, 1982

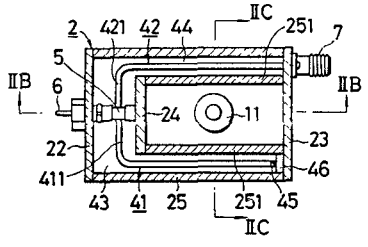
Oscillator Using Dielectric Resonator

Inventors: Toshio Nishikawa; Yoji Ito; Youhei Ishikawa; Sadahiro Tamura.
Assignee: Murata Manufacturing Co., Ltd.
Filed: Feb. 20, 1980.

Abstract—An oscillator comprises two leakage lines extending in parallel with a dielectric resonator positioned therebetween, within a housing made of metal The dielectric resonator is electromagnetically coupled to the respective leakage lines with a predetermined coupling degree through coupling gaps formed between the dielectric resonator and the respective leakage lines The dielectric resonator is disposed at an optimum position for establishing an

oscillating condition of the oscillator. Preferably, the dielectric resonator is movable in the length direction of the leakage lines.

13 Claims, 6 Drawing Figures



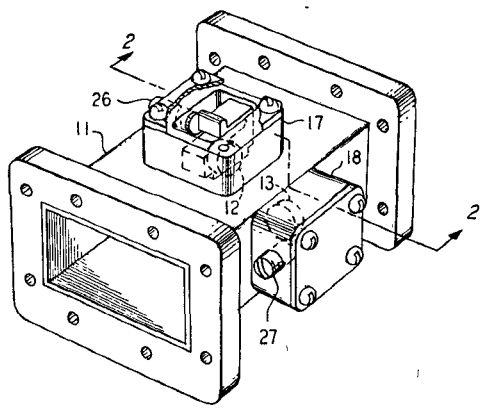
4,321,568 Mar. 23, 1982

Waveguide Filter Employing Common Phase Plane Coupling

Inventors: Francis G. Joyal; Chung-Li Ren.
Assignee: Bell Telephone Laboratories, Incorporated.
Filed: Sept. 19, 1980.

Abstract—Bandstop (FIGS. 1–3) and bandpass (FIGS. 4,5) filters are presented utilizing broad and narrow wall resonator coupling in a rectangular waveguide (11 and 37) at a common cross sectional reference plane. For the bandstop filter, the resonators (12,13) are resonant at a common frequency f_0 to provide a two-pole bandstop response in a filter of minimal longitudinal dimensions. For the compact bandpass filter, each tone rejection is provided by a pair of resonators (31,35) coupling to the electromagnetic field signal at two points one from a broad wall and the other from a narrow wall of the waveguide (37) but displaced by some multiple of a half wavelength. Another pair of resonators (33,34) are in common cross sectional plane relationship to the first pair but located on a wall of different width to provide rejection of a tone at the other end of the passband. The use of resonators with different resonant frequencies at a common cross sectional plane avoids possible inter-resonator coupling. Additional pairs of resonators (e.g., 32,36) may be interleaved with these resonator locations. Each resonator (e.g., 13) is associated with an aperture (e.g., 19) and has its major portion extending into a housing (e.g., 18) located exterior to the waveguide (e.g., 11).

17 Claims, 7 Drawing Figures



4,322,695 Mar. 30, 1982

Planar Transmission Line Attenuator and Switch

Inventors: Paul L. Fleming; Thane Smith.
Assignee: Communications Satellite Corporation.
Filed: Dec. 26, 1979.

Abstract—The planar transmission line attenuator and switch is formed on a flat piece of semiconductor material. Transmission line metallic conductors are deposited on a flat surface of the semiconductor material, and at least one of the metallic conductors forms a Schottky barrier contact to this flat semiconductor surface. The gap between the metallic conductors defined a shunt current path through the semiconductor material. The semiconductor material at the surface in contact with the transmission line conductor must be conductive. By applying a bias voltage to the metallic conductor forming the Schottky barrier contact, the conductivity of the shunt path can be controlled by changing the depletion layer width across the Schottky barrier. A plurality of planar transmission line switches can be combined into multiport networks, examples of which are cross-bar switching devices and β element switching devices.

5 Claims, 12 Drawing Figures