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.

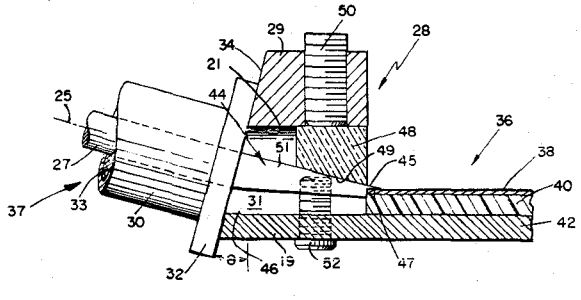
4,346,355 Aug. 24, 1982

Radio Frequency Energy Launcher

Inventor: Toshikazu Tsukii.
Assignee: Raytheon Company.
Filed: Nov. 17, 1980.

Abstract—A radio frequency energy launcher providing efficient energy transfer between a coaxial transmission line having spaced inner and outer conductors and a microstrip transmission line comprising a first relatively thin strip conductor and second wider ground plane conductor separated by a dielectric substrate. The launcher includes a conductive housing providing a passageway forming an outer conductor and a spaced inner conductor angled with respect to the passageway outer conductor forming wall and a surface of the substrate. Such angled inner conductor having an end region connected to the coaxial transmission line and having the other end interconnected to the thin strip conductor of the microstrip transmission line. The inner conductor is angled acutely and/or obliquely to such housing wall and a surface of dielectric substrate. The launcher structure is mounted on an extension of the wider ground plane conductor of the microstrip transmission line thus permitting the utilization of a substantially thinner ground plane conductor member while assuring firm mechanical contact with the thin strip conductor microstrip transmission line. The angularly orientated launcher provides for maintaining constant impedance in the transformation of electromagnetic energy fields from a concentric coaxial line distribution to a concentrated eccentric configuration for microstrip line transmission.

8 Claims, 9 Drawing Figures



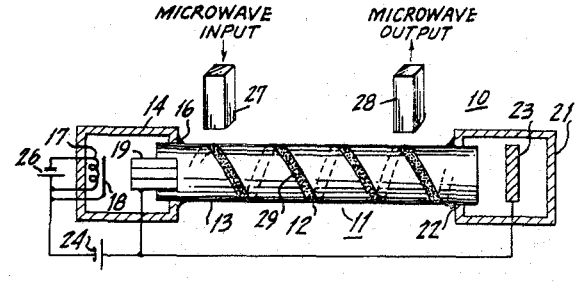
4,347,419 Aug. 31, 1982

Traveling-Wave Tube Utilizing Vacuum Housing as an RF Circuit

Inventor: Louis J. Jasper, Jr.
Assignee: The United States of America as represented by the Secretary of the Army.
Filed: Apr. 14, 1980.

Abstract—A traveling-wave-tube has a vacuum housing that includes the helix RF circuitry. The helix conductor is intertwined with and hermetically sealed to the insulating material comprising the vacuum housing. Thus, portions of the helix serve for interaction with the electron beam in the center of the vacuum housing while other portions are in contact with the atmosphere, thus cooling the helix and permitting the tube to operate at higher average powers.

8 Claims, 10 Drawing Figures



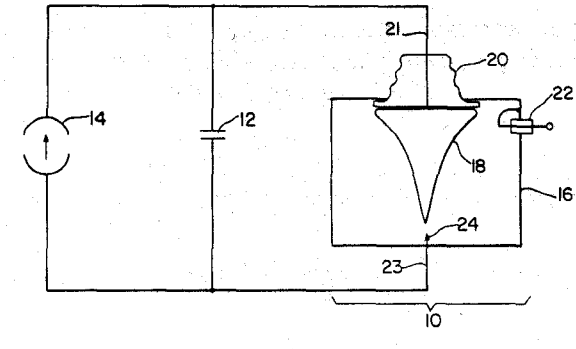
4,348,649 Sept. 7, 1982

Microwave Power Pulse Generator

Inventor: Dieter R. Lohrmann.
Assignee: The United States of America as represented by the Secretary of the Army.
Filed: Aug. 8, 1980.

Abstract—A self-pulsing microwave generator with a quarterwave resonator separated by an electron transit space from a field emission cathode is provided. The quarterwave resonator acts as an anode and a DC voltage is supplied by a discharge capacitor and a DC current source. The application of DC voltage to the resonator causes the resonator to resonate at a selected frequency dependent upon the size and characteristic of the resonator. The discharge capacitor is discharged by the resonator-cathode combination until the voltage drops below the field emission threshold voltage of the cathode at which time the pulse terminates. The resonator is in the shape of a cone to decrease the interelectrode capacitance.

8 Claims, 7 Drawing Figures



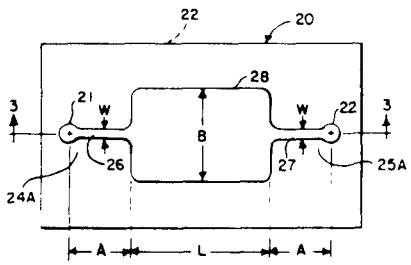
4,348,651 Sept. 7, 1982

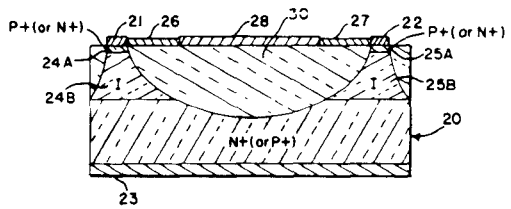
Cascading Diode Switches

Inventor: Martin J. Reid.
Assignee: Alpha Industries, Inc.
Filed: Jan. 30, 1981.

Abstract—An N or N^+ type semiconductor substrate has a P-type layer diffused therein to form a PIN junction that is etched out between adjacent mesas and filled in with glass to form adjacent diodes between top and bottom surfaces of the substrate. The bottom surface is metalized. The top surface carries a conducting layer interconnecting the adjacent P-type portions of the mesas. This conducting layer has end portions connected to a respective diode of end width and length joined by an intermediate portion of intermediate width and length. The end width and length is less than that of the intermediate width and length, respectively, so that the end portions present an inductive reactance at microwave frequencies between a respective diode and the intermediate portion, and the intermediate portion forms a transmission line with the conducting layer on the bottom surface having a characteristic impedance of 50 ohms while that of the transmission lines formed by each end portion and the conducting layer on the bottom surface is substantially 100 ohms.

10 Claims, 3 Drawing Figures





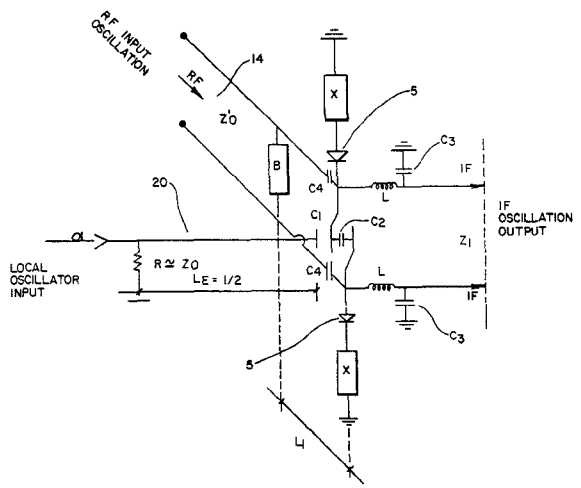
4,348,773 Sept. 7, 1982

Microwave Receiver Converters Having a Hybrid Waveguide Structure

Inventor: Ignazio Caroli.
Filed: Jan. 15, 1980.

Abstract—A microwave receiver converter apparatus of a balanced mixer type utilizes a hybrid waveguide having a parallelopiped construction having one side, which is open, adapted to receive a radio frequency (RF) input and provided with a susceptance device, a second side, orthogonal to the first side, adapted to provide an intermediate frequency (IF) output, and a third side, opposite to the second side, having an opening in which is disposed a cylindrical element and adapted to be coupled to a local oscillator (LO). A pair of diodes is coaxially mounted in the waveguide in a spaced apart relationship by means of connecting elements supported on an insulation block through which passes the IF output which is coupled to first ends of the diodes through a pair of helical inductance elements L. The other ends of the diodes are connected to ground via a reactance X. The susceptance device is placed in the RF line at a distance l_1 from the diodes and comprises a pair of cylindrical elements, threadedly engaged with the waveguide to permit spatial adjustment between the oppositely located free ends of the elements. The free ends are provided with off-center projections so that, upon the rotation of the elements, the distance between the projections and the diodes can be adjusted. This adjustability permits different types of diodes to be used in the apparatus.

6 Claims, 9 Drawing Figures



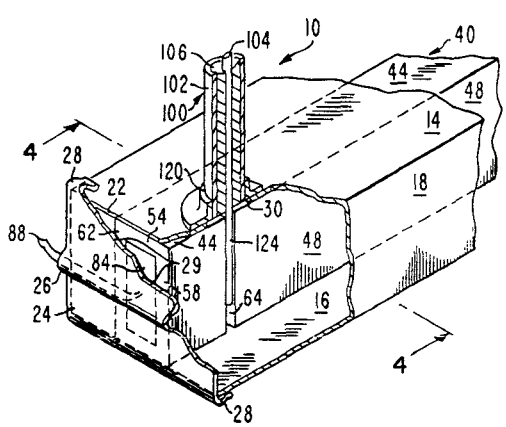
4,349,790 Sept. 14, 1982

Coax to Rectangular Waveguide Coupler

Inventor: Norman R. Landry.
Assignee: RCA Corporation.
Filed: Apr. 17, 1981.

Abstract—A coaxial transmission line is coupled to a dielectrically loaded rectangular waveguide by an E-plane probe which extends through a broad wall of the waveguide and into a slot in the body of loading dielectric. The slot and probe are positioned substantially laterally off-center in the body of dielectric material.

7 Claims, 5 Drawing Figures



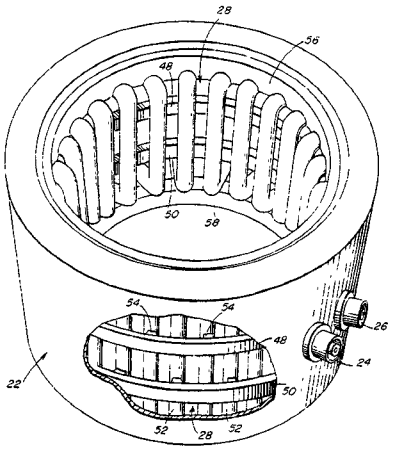
4,349,791 Sept. 14, 1982

Slow Wave Coupling Circuit

Inventors: Lawrence J. Nichols;
George H. MacMaster.
Assignee: Raytheon Company.
Filed: Aug. 21, 1980.

Abstract—A system of slow wave structures for coupling a first electromagnetic circuit to a second electromagnetic circuit includes an inner slow wave structure and an outer slow wave structure concentric with the inner structure. The outer structure is configured to provide for a greater phase velocity of electromagnetic waves than the inner structure, the phase velocities for each structure being proportional to the circumference of each structure so that the rate of circulation of a wavefront about the common axis of the two structures is the same for a wave propagating about the inner structure and a wave propagating about the outer structure. The structures are terminated in their characteristic impedances to provide for wave propagation in one direction without reflections.

22 Claims, 14 Drawing Figures



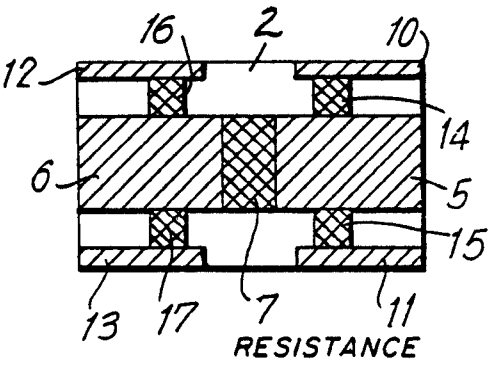
4,349,792 Sept. 14, 1982

PI Pad Attenuator

Inventor: Harry Scheiner.
Assignee: Kings Electronics Co., Inc.
Filed: July 14, 1978.

Abstract—A pi pad attenuator for microwave systems is formed on an insulating substrate in the form of a small card or chip. Resist material covers the substrate, and input and output conductors are plated over the resist in the desired configuration. Resist material is removed to leave conductors interconnected in a predetermined pattern by individual sections of resist to form the pi pad. Characteristics of the attenuator are determined by the area of the remaining resist sections and/or the thickness of the applied resist.

2 Claims, 6 Drawing Figures



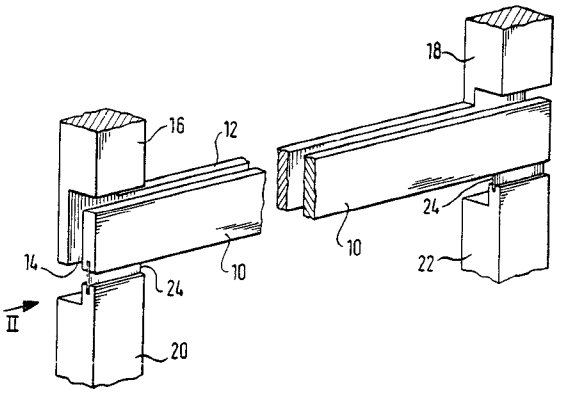
4,349,793 Sept. 14, 1982

Adjustable Directional Coupler Having Tiltable Coupling Conductor

Inventor: Georg Spinner.
Filed: Nov. 19, 1980.

Abstract—A directional coupler for coupling between four inner conductors 16,18,20,22 of four coaxial lines has two coupling conductors 10,12 which are connected across respective pairs of inner conductors 20,22,16,18, and are spaced apart to define a coupling gap 14. The width of the coupling gap can be varied by tilting movement of one, and preferably both coupling conductors which are attached to the respective inner conductors by tilting joints in the form of leaf springs 124. A modification (FIGS. 4,5) enables the coupler to be used for crossed coaxial lines.

14 Claims, 5 Drawing Figures



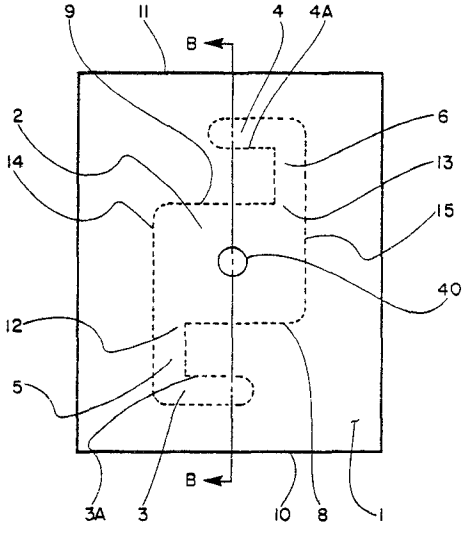
4,349,798 Sept. 14, 1982

Compact Microwave Resonant Cavity for use in Atomic Frequency Standards

Inventors: Allen F. Podell; Louis F. Mueller.
Assignee: Hewlett-Packard Company.
Filed: July 31, 1980.

Abstract—A compact resonant cavity with a substantially uniform magnetic field in the cavity is formed by lumped resonantly loading a rectangular primary cavity. The lumped capacitive load is produced by forming secondary cavities on opposite sides of the rectangular primary cavity. The component resonant cavity is designed for applications in atomic frequency standards.

10 Claims, 12 Drawing Figures



4,349,799 Sept. 14, 1982

Switching Between Radio Frequency Circuits

Inventors: Roderick K. Blocksome;
Sherman J. Hornbeck;
Donald R. Fee.
Assignee: Rockwell International Corporation.
Filed: Mar. 12, 1981.

Abstract—An apparatus is disclosed for selecting between multiple radio frequency circuits such as low pass filters. Each of the circuits is mounted on a printed circuit board, with first and second terminals printed on the board. Each of the terminals has a raised electrical contact on it. Associated with the first terminals of the circuits is a first printed strip transmission line with raised contacts spaced along it, each contact near a corresponding contact on one of the first terminals of the circuits. A second printed transmission line is similarly arranged. External connection to the apparatus is made at one end of each of the transmission lines. To select one of the circuits, the first and second terminals of the circuit are connected to the corresponding transmission lines, by a switch which moves a resilient conducting member against the pairs of raised contacts of the transmission lines and the circuit terminals.

2 Claims, 2 Drawing Figures