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, D.C. 20231.

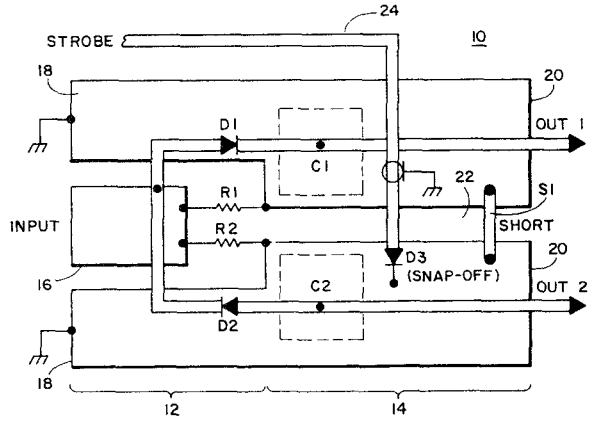
4,654,600 Mar. 31, 1987

Phase Detector

Inventor: Larry R. Lockwood.
Assignee: Tektronix, Inc.
Filed: Aug. 30, 1985

Abstract—A phase detector uses the junction of a coplanar waveguide and a slot line. The coplanar waveguide serves as an input terminal and is contiguous to the slot line which is shorted. A strobe pulse is applied to the shorted slot line via a snap-off diode, and an input signal is passed via sampling diodes and capacitors to a common mode output.

3 Claims, 1 Drawing Figure



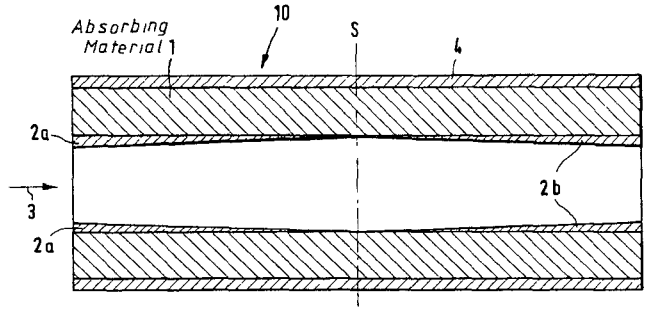
4,661,787 Apr. 28, 1987

Waveguide

Inventor: Manfred Lang
Assignee: Spinner GmbH, Elektotechnische Fabrik.
Filed: Dec 12, 1985

Abstract—A waveguide usable as absorber or as attenuator for high radio-frequency powers up to highest frequencies includes a tube with a dissipative material at whose inside a metallized layer is applied. The thickness of the metallized layer changes along the length of the tube with its initial thickness and end thickness determined in such a manner that a constant power density is obtained along the waveguide.

11 Claims, 2 Drawing Figures



4,661,789 Apr. 28, 1987

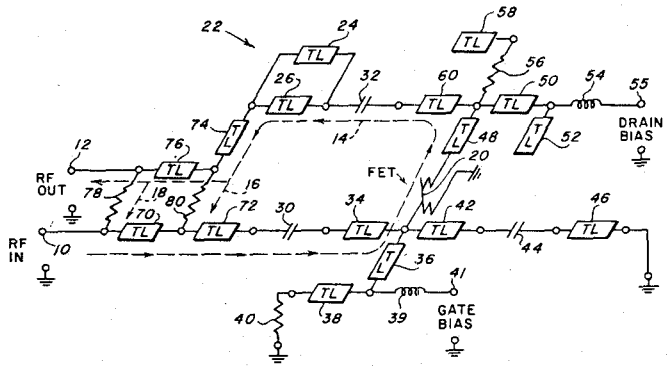
Microwave Recursive Filter

Inventor: Christen Rauscher.
Assignee: The United States of America as represented by the Secretary of the Navy.
Filed: July 17, 1985

Abstract—A broad-band microwave recursive filter that provides sharp transitions in the frequency domain between adjacent stop and passbands comprising a signal input node; a signal output node; a filter circuit connected between the signal input node and the signal output node for providing a signal flow therebetween which has a predetermined frequency bandwidth characteristic; a microwave transistor circuit, with the microwave transistor circuit being band-limited to provide gain in only a restricted window of frequencies within the predetermined frequency bandwidth and connected for providing amplification to signals flowing in the filter circuit between the signal input node and the signal output node while suppressing out-of-window signals resulting from design approximations. The filter circuit includes a plurality of distributed feedback loop circuits, with each of the feedback loop circuits including the microwave transistor circuit therein, and wherein each of the feedback loop circuits has a different electrical length in relation to the other of the plurality of feedback loop circuits. Finally, the present filter design includes a passive filter connected in common to all of the plurality of distributed feedback loop circuits in the filter circuit for circuit for providing filter zeros on both sides of the restricted window of frequencies. In a preferred embodiment, the microwave transistor circuit includes an FET

which is impedance-matched to obtain an approximately flat gain response across the window. It is preferred that the plurality of feedback loops all have amplitude weighting factors of the same sign.

5 Claims, 3 Drawing Figures



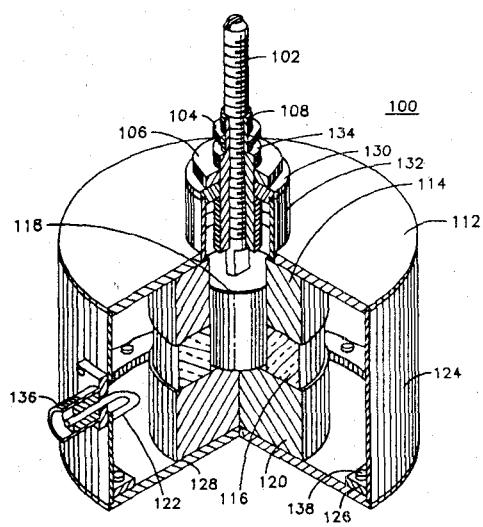
4,661,790 Apr. 28, 1987

Radio Frequency Filter Having a Temperature Compensated Ceramic Resonator

Inventors: Mark A. Gannon, Richard S. Kommrusch, and Francis R. Yester, Jr.
Assignee: Motorola, Inc.
Filed: Jan. 2, 1986.

Abstract—An RF filter (100) includes a ceramic resonator (116) sandwiched between first and second compensating discs (114 and 120) for temperature compensation, low loss mounting and heat sinking of the ceramic resonator (116). Good thermal contact between the ceramic resonator (116) and discs (114 and 120) is produced by a compressive force applied by copper plates (112 and 128) and copper can (124). The resonant frequency of the RF filter is tuned by means of a copper-plated tuning shaft (104) and ceramic tuning slug (118) which are positioned by brass bushing (134) in copper pipe (130 and 132). Input and output signals are coupled to the RF filter via respective probes (122).

13 Claims, 3 Drawing Figures



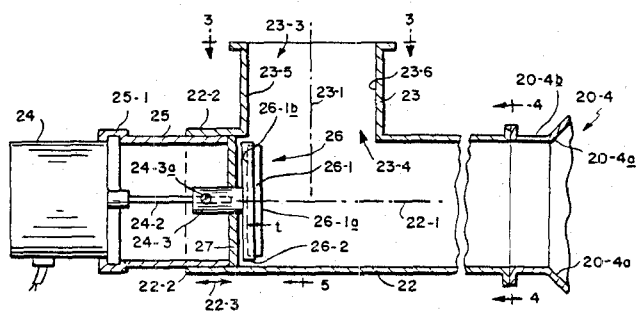
4,663,634 May 5, 1987

Polarization Converter Within Waveguide Feed for Dish Reflector

Inventor: David A. Fulton.
Assignee Epsco, Incorporated.
Filed: Nov. 21, 1983.

Abstract—A microwave polarization converter for converting circular polarization to linear polarization or vice versa. The converter includes a fin and a shorting plate to effect such conversion.

11 Claims, 9 Drawing Figures



4,667,172 May 19, 1987

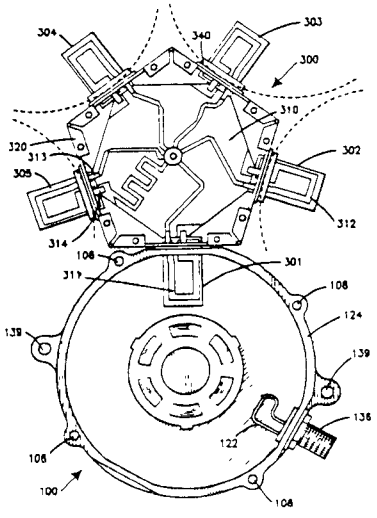
Ceramic Transmitter Combiner with Variable Electrical Length Tuning Stub and Coupling Loop Interface

Inventors: Theodore F. Longshore and Ronald J. Wanat.
Assignee: Motorola, Inc.
Filed: Apr. 7, 1986.

Abstract—Transmitter combining apparatus includes up to five RF filters (100) coupled to a microstrip combiner (300) for combining up to five input signals for application to a common antenna. The RF filter (100) includes a ceramic resonator (116) sandwiched between first and second compensating discs (114 and 120) and first and second shield plates (142 and 148) for temperature compensation, low loss mounting and heat sinking of the ceramic resonator (116). Good thermal contact between the ceramic resonator (116), discs (114 and 120) and shield plates (142 and 148) is produced by a compressive force exerted by springs (144–147) of shield plate (142) when the top cover (112) is attached to the aluminum housing (124). The resonant frequency of the RF filter is tuned by means of an aluminum tuning shaft (102) and ceramic tuning core (118) which are positioned by brass bushing (133) in top cover (112). Input signals are coupled to each RF filter via respective input coupling loops (122) and output signals are coupled via corresponding output coupling loops (311) to the microstrip combiner (300). The microstrip combiner (300) includes a circuit board (310) having five transmission lines (601–605) and a short-circuited tuning transmission line (610), all coupled to a

junction (62). The microstrip combiner (300) is tuned by means a variable impedance produced by varying the position of a dielectric tuning plate (630) with respect to the tuning transmission line (610).

20 Claims, 9 Drawing Figures



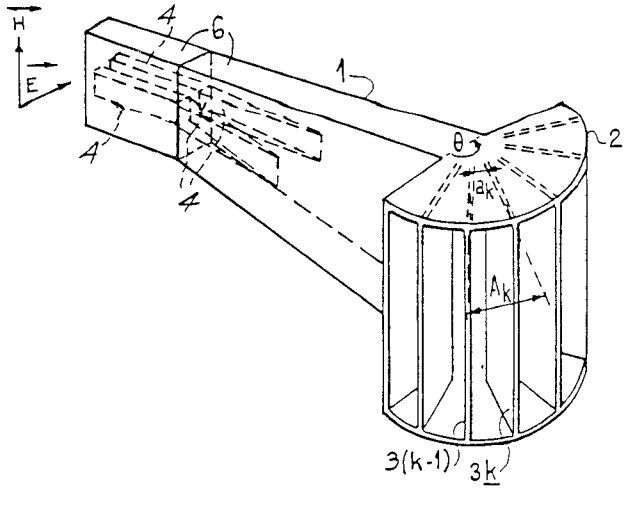
4,667,205 May 19, 1987

Wide-Band Microwave Antenna with Two Coupled Sectoral Horns and Power Dividers

Inventor: Claude Gehin.
Assignee: Thomson-CSF
Filed. Feb 17, 1984

Abstract—A wide-band microwave antenna capable of radiating over a wide angular field is fed by a rectangular wave guide and includes a first sectoral horn coupled to the rectangular wave guide. The first sectoral horn is sectoral in the *H* plane. Coupled to the first sectoral horn is a second sectoral horn which is sectoral in the *E* plane. The second sectoral horn has a partial-cylindrical-shape with circular-shaped outer edges. The second sectoral horn has a top plate and a bottom plate A plurality of equally spaced power distributors are radially disposed in the second sectoral horn and extend from the top plate to the bottom plate through the entire length of the second sectoral horn. These power distributors thus form a plurality of elementary radiation sources.

12 Claims, 6 Drawing Figures



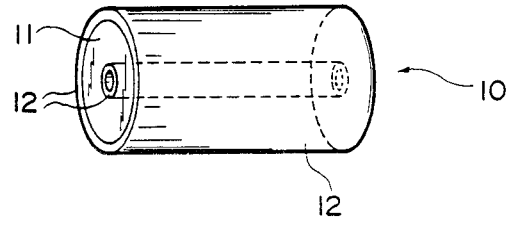
4,668,925 May 26, 1987

Dielectric Resonator and Method for Making

Inventors: Yoshishige Towatari and Tetsuo Akoh.
Assignee: TDK Corporation
Filed: Nov. 15, 1985.

Abstract—An improved dielectric resonator for high frequency operation having improved unloaded *Q* is provided which is prepared by forming a first copper coating on the ceramic body to a thickness of 0.2 to 1 μm by electroless plating or vacuum deposition, electrolytic plating a second copper coating on the first coating to a thickness of at least two-fold of the skin depth, and heat treating the thus coated body at 120°–300°C in a reducing atmosphere or at 700°–1080°C. in a weakly acidic atmosphere

10 Claims, 9 Drawing Figures



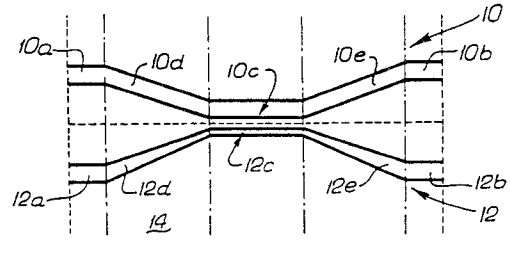
4,669,815 June 2, 1987

Integrated Optical Waveguide Multiplexer/Demultiplexer

Inventor: Suwat Thaniyavarn.
Assignee: TRW Inc
Filed: Aug. 12, 1985

Abstract—An optical waveguide device for multiplexing and demultiplexing transverse magnetic (TM) and transverse electric (TE) polarization modes. The device has two waveguides, having first and second coupler segments in close proximity to each other, but with the second coupler segment capable of supporting only one polarization mode. When both TE and TM modes are introduced into the first coupler segment, one mode is coupled completely across to the second coupler segment, but the mode not supported in that segment remains in the first segment and is transmitted to an output port In the illustrative embodiment of the invention, this selective coupling of the polarization modes is achieved by choosing a narrow width for the second coupling segment, such that the TE polarization mode is not supported but the TM polarization mode is The interaction length of the coupling segments is selected to produce complete coupling of the TM energy to the second coupling segment.

3 Claims, 1 Drawing Figure



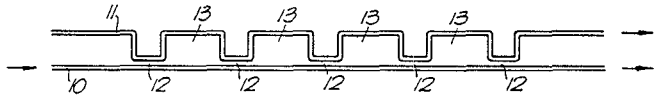
4,669,816 June 2, 1987

Optical Waveguide Coupler

Inventor: George H. B. Thompson.
Assignee: Standard Telephones and Cables Public Limited Company.
Filed: Nov. 28, 1984

Abstract—A single mode optical waveguide directional coupler is provided with enhanced wavelength selectivity by dividing the coupling region up into a number of identical sections (12) between which are interposed a set of identical decoupled sections (13) over which the two waveguides (10, 11) of the coupler are not optically coupled and have different optical path lengths.

12 Claims, 6 Drawing Figures



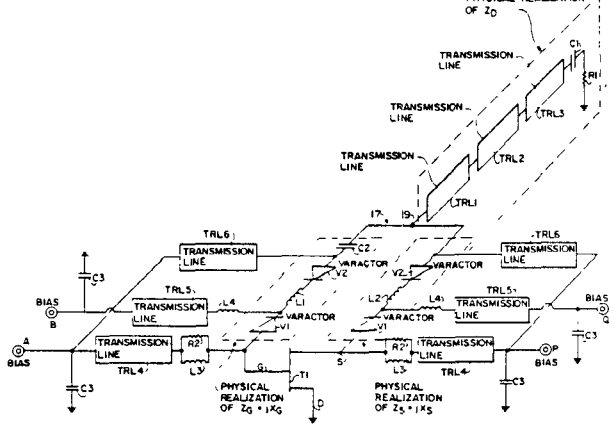
4,670,722 June 2, 1987

FET Oscillator Having Controllable Reactance Element-Controlled Two-Port Feedback Network

Inventor: Christen Rauscher.
Assignee: The United States of America as represented by the Secretary of the Navy.
Filed: Mar. 9, 1981.

Abstract—A broad-band high frequency power oscillator employing a GaAs FET transistor and a two-port coupling network whose input port is connected across the drain and source terminals of the GaAs FET. The coupling network consists of 3 branches in T- or π-configuration One branch includes a matching network and the load. The other two branches are purely reactive and each includes at least one independently tunable reactance element, such as a varactor.

5 Claims, 4 Drawing Figures



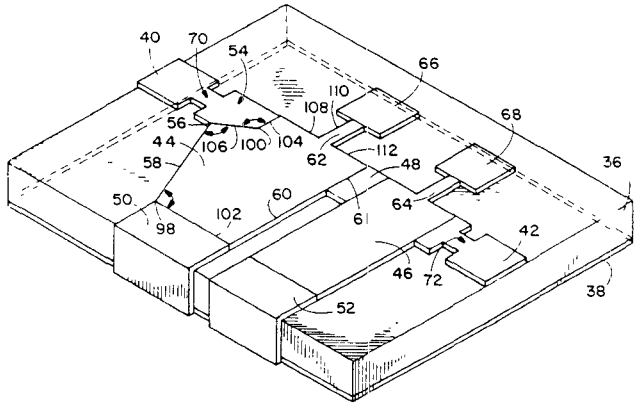
4,670,723 June 2, 1987

Broad-Band, Thin Film Attenuator and Method for Construction Thereof

Inventors: Leonard A. Roland, Larry R Lockwood, and Erwin Grellmann
Assignee. Tektronix, Inc.
Filed: Mar. 18, 1985.

Abstract—A broad-band, thin film attenuator for microwave circuits is constructed by placing a ground plane conductor on one side of a ceramic, insulating substrate, and conductive, resistive, and reactive elements on the other side of the substrate. Capacitive stubs are provided to compensate for inductance in grounding conductors between resistance elements and the ground plane conductor. Constrictions are provided in input and output conductors to provide increased series inductance to compensate for distributed capacitance of the resistance elements One resistance element is constructed so that the interface between the input conductor and that resistance element forms an obtuse interior angle with an adjoining transitional edge extending from the input conductor to the grounding conductor, and the transitional edge forms an obtuse interior angle with the adjoining edge of the grounding conductor, so as to minimize current density concentrations and distributed capacitance A second resistance element is employed to achieve additional attenuation.

13 Claims, 5 Drawing Figures



4,670,724 June 2, 1987

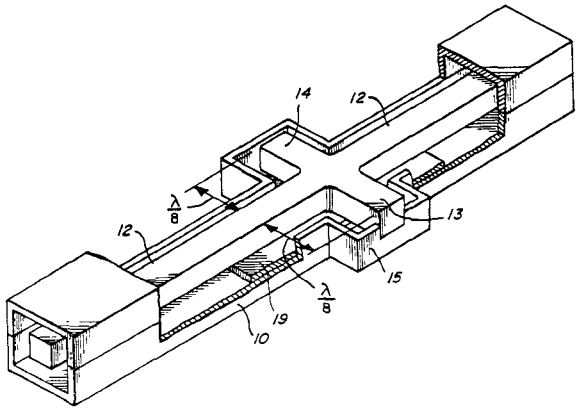
Stub-Supported Transmission Line Device

Inventors: Gordon P. Riblet and Ronald A. Wilson.
Assignee: Microwave Development Laboratories, Inc.
Filed: July 22, 1985.

Abstract—A stub-support arrangement for a coaxial transmission line wherein the line has inner and outer conductors and the stub is in the form of oppositely disposed stubs each having a length of 1/8 wavelength at the center operating frequency or less One of the stubs is an open-circuit stub and the other is a short-circuit stub. In the case of the stubs being of 1/8 wavelength, the characteristic admittances of the stubs are equal and in the case of the

stubs being less than 1/8 wavelength the characteristic admittance of the open-circuit stub becomes larger and that of the short-circuit stub becomes smaller as the physical length of the stub is reduced.

6 Claims, 9 Drawing Figures



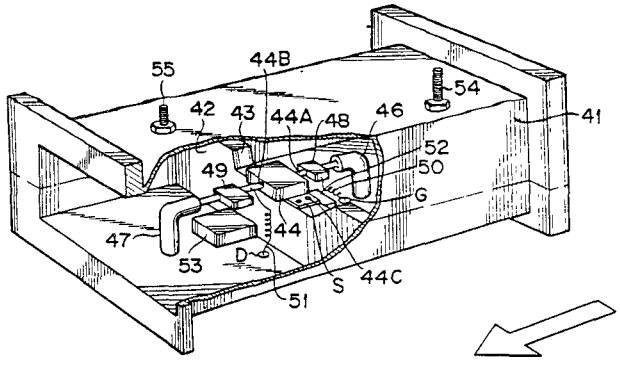
4,672,328 June 9, 1987

Waveguide-Mounted Amplifier

Inventors: Masahiko Adachi, Isao Ono, and Hiroaki Ikeda
Assignees: Nippon Hoso Kyokai, Nippon Wave Guide Co., Ltd.
Filed Dec 10, 1985

Abstract — A metal partition wall is placed inside a waveguide without ridge or the like and has an aperture in which a GaAs-FET is located, so that the input and output are coupled only through this GaAs-FET. The input and output terminals of the GaAs-FET are coupled through L-shaped coupling to the waveguide An amplifier thus constructed has a high gain and is best adapted for power, while because the metal partition wall also serves as a heat sink

20 Claims, 27 Drawing Figures



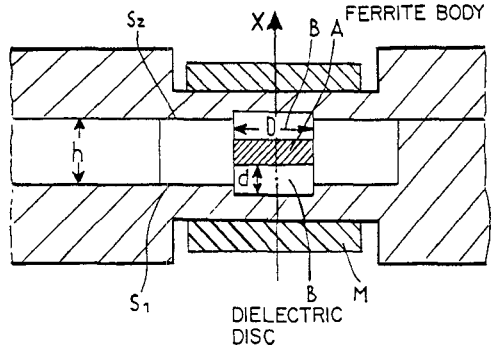
4,672,333 June 9, 1987

Waveguide Junction Circulator

Inventor: Stefan Bartels.
Assignee: Licentia Patent-Verwaltungs-GmbH.
Filed: Oct. 11, 1985.

Abstract — A waveguide circulator includes a resonator body which is separated from a waveguide side by dielectric spacer disc. The spacer disc has an interface turned toward the waveguide side in which defined electromagnetic boundary conditions are to prevail. The thickness of the spacer disc and the dielectric constant of the disc material are matched so that the disc thickness equals a quarter wavelength, referred to a wave propagating in the disc perpendicular to the waveguide side.

5 Claims, 2 Drawing Figures



4,672,334 June 9, 1987

Dual-Band Circular Polarizer

Inventor: Saad M. Saad.
Assignee: Andrew Corporation
Filed: Sept 27, 1984.

Abstract — A dual-band circular polarizer for simultaneously transforming two to four linearly polarized waves of two different frequency bands into two to four circularly polarized waves, and vice versa, the polarizer comprising a waveguide of circular or square cross-sectional shape dimensioned to simultaneously propagate signals in two different frequency bands and two arrays of conductive elements, each array comprising a pair of diametrically opposed rows of conductive elements extending inwardly from the walls of the waveguide

32 Claims, 10 Drawing Figures