Patent Abstracts

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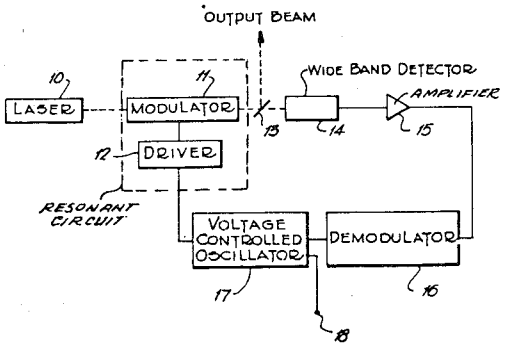
4,460,249 July 17, 1984

Control System for an Optical Modulator

Inventor: Denis M. Vincent.
Assignee: Minister of National Defense of Her Majesty's Canadian Government.
Filed: Oct. 6, 1981.

Abstract—A control system for a laser-intensity-modulator system to maintain the modulated component of the output beam at a constant amplitude. The electro-optical modulator has a resonant driving circuit supplied by a voltage controlled oscillator. A portion of the output beam is detected and a control signal representative of the amplitude of the modulated component is derived and supplied to the oscillator in addition to the normal bias voltage which sets the nominal frequency. This stabilizes the amplitude of the modulated component in the output beam.

4 Claims, 1 Drawing Figure



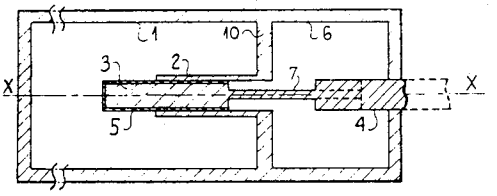
4,460,878 July 17, 1984

Tunable Resonator and an Ultrahigh-Frequency Circuit Comprising at Least One Such Resonator

Inventors: Jean Fouillet and Jean C. Cruchon.
Assignee: Thomson-CSF.
Filed: July 27, 1981.

Abstract—There is provided a resonator comprising principally a hollow metal finger integral with the wall of a guide or a cavity. A metal plunger, coated with a fine dielectric layer, of fairly low permittivity, is able to slide inside the hollow metal finger to cause the tuning frequency of the cavity or the susceptance coupled to the guide to be varied. This layer may be formed from Teflon.

5 Claims, 2 Drawing Figures



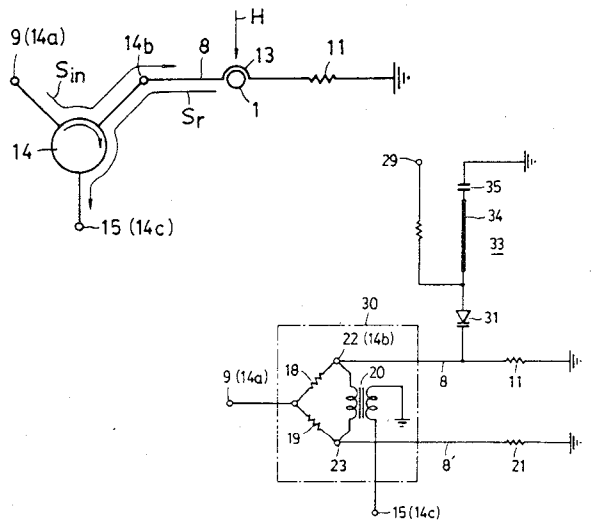
4,460,879 July 17, 1984

Variable Tuning Device

Inventor: Masaaki Hirose.
Assignee: Takeda Riken Kogyo Kabushiki Kaisha.
Filed: Dec. 4, 1981.

Abstract—An input signal is supplied to a first port of a non-reversible circuit and those frequency components of the input signal applied to a second port of the non-reversible circuit which differ from the resonance frequency of a resonance element connected to the second port are absorbed by a resistive terminating element connected to the second port. On the other hand, a frequency component of the input signal which coincides with the resonance frequency is derived at the third port of the non-reversible circuit. By changing the resonance frequency of the resonance element, the frequency component of the input signal which are provided to the third port can be altered.

12 Claims, 11 Drawing Figures



4,460,880 July 17, 1984

Circuit Matching Elements

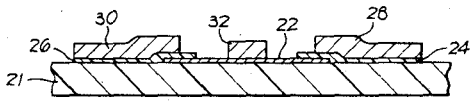
Inventor: Brian Turner.
Assignee: The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland.
Filed: July 6, 1982.

Abstract—The invention provides circuit matching elements primarily for integrated circuits and particularly for monolithic microwave integrated circuits.

A transmission line in accordance with the invention is provided with a thin metallic film deposition disposed in the signal propagation path. The effect of the film is to increase the specific capacitance of the line without decreasing the specific inductance. The result is a slowing down and therefore a decrease of the wavelength of signals in the line.

An example of an implementation of the invention is a coplanar waveguide having a central thick conducting line element (32) and outer thick conducting line elements (28, 30) mounted on a substrate (21). The central element overlies a thin metallic film (22) which also underlies the outer conducting the line elements and is insulated from the latter by polyamide insulation (24, 26).

9 Claims, 8 Drawing Figures



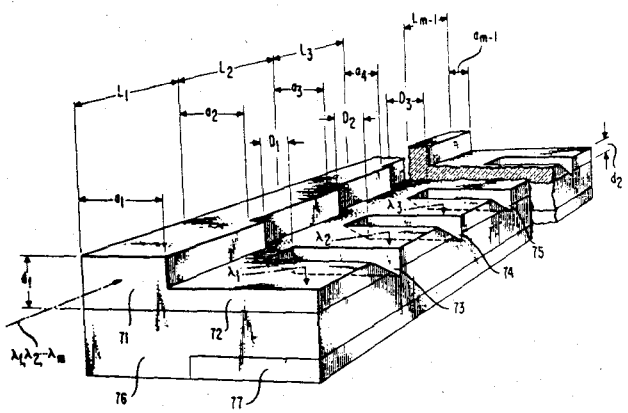
4,461,535 July 24, 1984

Wavelength Filters

Inventor: Enrique A. J. Marcatili.
Assignee: Bell Telephone Laboratories, Incorporated.
Filed: October 21, 1981.

Abstract—By introducing an asymmetry in the effective refractive index profile of a waveguide, wave energy can be extracted from the waveguide by radiation at wavelengths greater than a critical wavelength, where the latter is a function of the effective index distribution. This technique is employed to develop a variety of optical wavelength filters.

18 Claims, 16 Drawing Figures



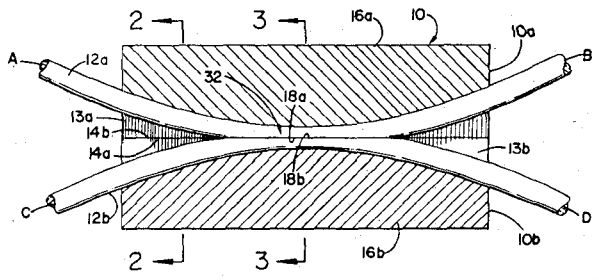
4,461,536 July 24, 1984

Fiber Coupler Displacement Transducer

Inventors: Herbert J. Shaw, Michel J. F. Digonnet.
Assignee: Board of Trustees of Leland Stanford Jr. University.
Filed: Sept. 10, 1981.

Abstract—A transducer for the measurement of minute displacements incorporates a fiber optic coupler having a coupling efficiency which varies in relation to the relative position of coupler elements. The transducer may also be used indirectly as an accurate sensor of physical parameters, such as temperature and pressure, through the use of a secondary transducer which provides a displacement proportional to such physical parameter. The outputs from the fiber optic coupler may be compared to provide a measure of the coupling efficiency, and may be monitored by a display which provides a direct measurement of displacement or a secondary physical parameter.

21 Claims, 9 Drawing Figures



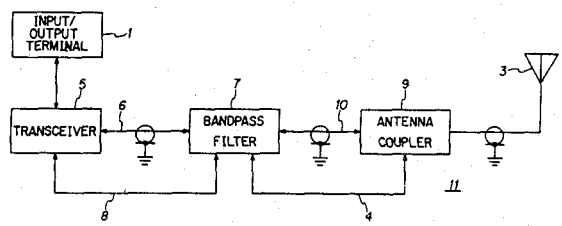
4,462,009 July 24, 1984

Broad-Band Filter and Tuning System

Inventors: Harvey L. Landt and Glenn R. Snider.
Assignee: Rockwell International Corporation.
Filed: May 25, 1982.

Abstract—A method and apparatus is disclosed for automatically and exactly tuning a broadband filter. Upon the detection of a tuning change, the filter is automatically switched end to end so that the output terminal of the filter is connected to the radio frequency power source. Radio frequency in this application refers to any signals whose frequency facilitates propagation of data via electromagnetic waves. The input terminal is terminated into a known load such as 50 ohms and C1, an input variable reactance is adjusted until a 90° phase relationship exists between the input resonator and the output resonator's node voltages. These actions set the exact tune condition for the broadband filter. The filter is then automatically reconnected in its normal operating position with its input terminal being connected to the RF power source and its output terminal being connected to its load, such as an antenna, and additional adjustments performed by varying the capacitance of the output capacitance C2 and the coupling capacitance C3.

13 Claims, 24 Drawing Figures



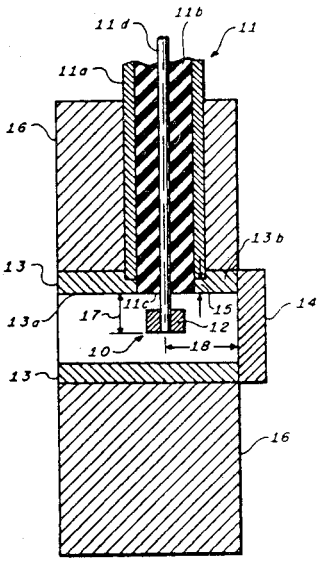
4,463,324 July 31, 1984

Miniature Coaxial Line to Waveguide Transition

Inventor: John C. Rolfs.
Assignee: Sperry Corporation.
Filed: June 3, 1982

Abstract—A miniature coaxial transmission line to waveguide transition particularly useful for frequencies beyond 40 GHz utilizes a projecting center conductor of a miniature coaxial line inserted directly into a waveguide. A metallic cylindrical sleeve is affixed to the end of the projecting center conductor to form a probe. The coaxial line is housed in the waveguide flange, and a plate is affixed across the cross section of the waveguide to provide a short circuit.

6 Claims, 1 Drawing Figure



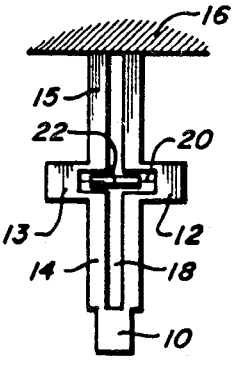
4,463,325 July 31, 1984

Stub-Supported Coaxial Power Divider Having Dissipation Resistor Buried in Center Conductor

Inventors: Gordon P. Riblet and Henry G. Riblet.
Filed: Aug. 17, 1982.

Abstract—A coaxial microwave divider network employing a quarter wavelength long grounded stub for providing support for the center conductor of the divider and also providing improved heat dissipation of the center conductor. Also, this form of stub support permits the center conductor to be supported without a dielectric thereby reducing the insertion loss. Consequently, improved CW power handling performance is possible in comparison with prior designs. Moreover, with the proper choice of the stub admittance level, the input VSWR can also be improved in comparison with a design which employs a multi-section matching transformers only at the input.

8 Claims, 9 Drawing Figures



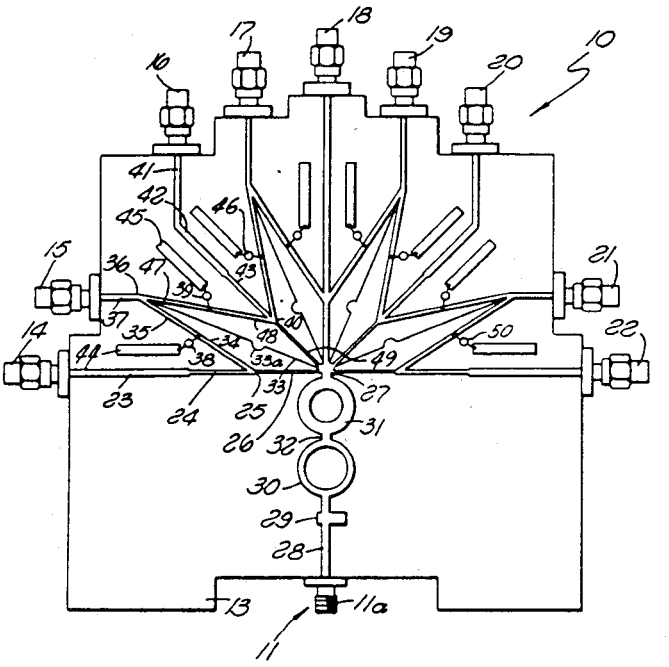
4,463,326 July 31, 1984

Planar N-Way Combiner/Divider for Microwave Circuits

Inventor: Harvey K. Hom.
Assignee: International Telephone and Telegraph Corporation.
Filed: Dec. 2, 1981.

Abstract—A microwave combiner/divider circuit instrumented in stripline medium and therefore planar in form. Circuit traces are produced by etching of a standard microwave printed circuit board having a conductive ground plane or base plate and a layer of low-loss insulation over which a copper layer is provided. A common signal port feeds a division point through a capacitive stub and a two-stage, ring-type impedance matching circuit. The multiple circuit traces emanating from the division point are arranged so that N individual branch ports are connected thereto. The stripline circuitry between the division point and the branch ports provide compensation for phase reversal. Resistors for branch port isolation connected within the stripline circuitry such that for equal loads or equal power sources connected to the branch ports (divider or combiner applications, respectively) zero currents flow in these resistors and they are therefore not required to provide a large power dissipating capability.

9 Claims, 2 Drawing Figures



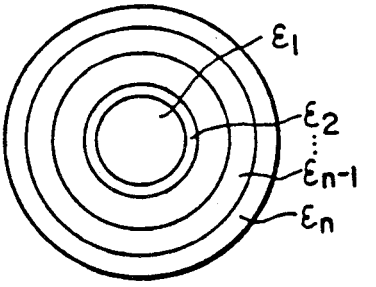
4,463,329 July 31, 1984

Dielectric Waveguide

Inventor: Hirosuke Suzuki.
Filed: Jan. 15, 1982.

Abstract—A dielectric waveguide in cable form fabricated from polytetrafluoroethylene. An embodiment of cable is a composite of partially sintered PTFE and sintered and unsintered expanded PTFE arranged in such a fashion that the specific gravity of cable decreases from the core to the outer surface.

21 Claims, 5 Drawing Figures



4,463,330 July 31, 1984

Dielectric Waveguide

Inventor: Tsukasa Yoneyama.
Assignee: Seki & Company, Ltd.
Filed: Aug. 23, 1982.

Abstract—A dielectric waveguide consists of dielectric strips sandwiched between two parallel conductive plates whose inner surfaces are covered with thin dielectric layers. The other space of the waveguide is filled with an appropriate dielectric medium which can be air or any other low loss dielectric material whose dielectric constant is smaller than that of the dielectric strips. In this waveguide, radiated waves which might be generated at the curved sections and any other discontinuities of the dielectric strips can almost completely be suppressed due to the cutoff property of the conductive plates, if the electric field of electromagnetic waves to be transmitted is polarized primarily parallel to the conductive plates and relevant parameters of the waveguide are chosen to satisfy the following inequality:

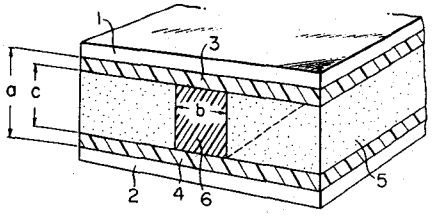
$$\tan\left(\frac{\pi_c}{\lambda_0}\right) < \sqrt{\epsilon_{rl}}\cot\left(\sqrt{\epsilon_{rl}}\pi\frac{a-c}{\lambda_0}\right)$$

where ϵ_{rl} is the relative dielectric constant of the dielectric layers with respect to the surrounding dielectric medium, a is the spacing between the conductive plates, c is the spacing between the dielectric layers, and λ_0 is the wavelength of electromagnetic waves in the surrounding dielectric medium. The above inequality reduces to

$$a < \lambda_0/2,$$

when the dielectric layers are removed ($a = c$).

4 Claims, 20 Drawing Figures



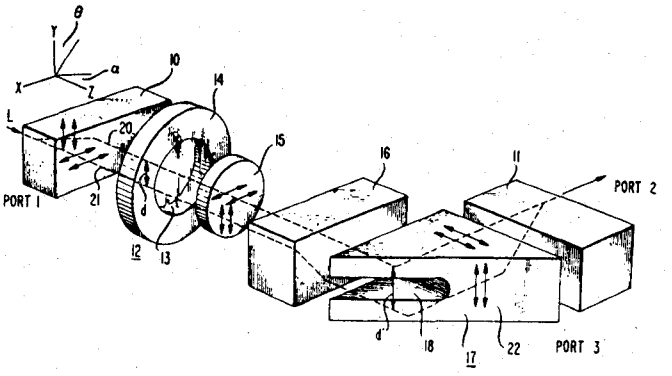
4,464,022 Aug. 7, 1984

Optical Circulator

Inventor: William L. Emkey.
Assignee: AT&T Bell Laboratories
Filed: Sept. 28, 1982.

Abstract—A polarization independent optical circulator is disclosed. A first birefringent plate (10) is used to separate an incident beam from a first port into two beams having orthogonal polarizations, and a second plate (11) recombines the beams at a second port. Means (12) providing nonreciprocal rotation of the polarizations are disposed between the plates. Placed between the rotating means and the second plate is a third plate (16) to further separate the beams and a reflecting element (17) for deflecting the beams toward the second port. The reflecting element includes a slotted portion (18) so that light from a third port can pass therethrough back toward the first port.

8 Claims, 4 Drawing Figures



4,465,987 Aug. 14, 1984

Ring-Bar Slow Wave Structure and Fabrication Method

Inventor: Arthur E. Manoly.
Assignee: Hughes Aircraft Company.
Filed: Sept. 7, 1982

Abstract—A tubular ring-bar slow wave structure is provided. The structure includes a plurality of axially spaced, coaxially aligned, generally parallel metallic rings connected by a plurality of generally axially parallel, alternately spaced metallic bars. The structure also includes a plurality of axially spaced, coaxially aligned, generally parallel dielectric support rings, each of which has a width that is narrower than the width of a metallic ring.

11 Claims, 12 Drawing Figures