Patent Abstracts

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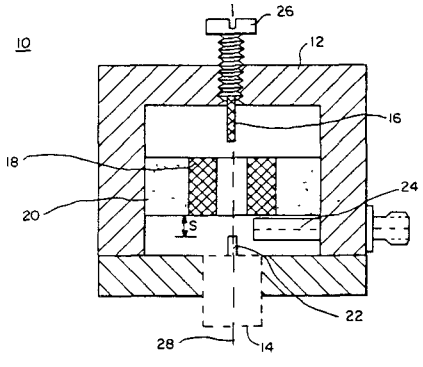
4,521,746 June 4, 1985

Microwave Oscillator with TM01δ Dielectric Resonator

Inventors: Eugene J Hwan and Darko Kajfex.
Assignee: Harris Corporation
Filed: Aug 31, 1983.

Abstract—A microwave oscillator with TM01δ dielectric resonator is disclosed. The oscillator operates with a TM01δ mode as contrasted with prior art techniques of TE01δ mode. This provides for an improved tuning range in excess of 10% of the operating frequency

9 Claims, 6 Drawing Figures



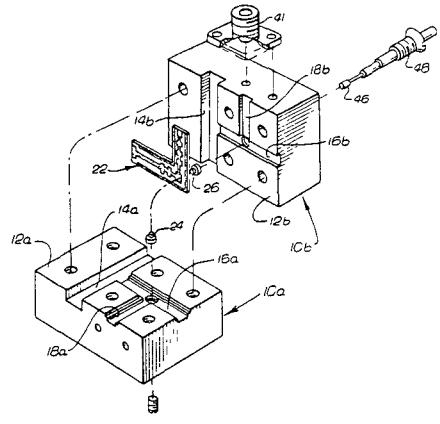
4,521,747 June 4, 1985

Suspended Stripline Varactor-Tuned Gunn Oscillator

Inventors: Raghbir S. Tahim, George M. Hayashibara, and Kai Chang.
Assignee: TRW Inc
Filed: Oct 11, 1983.

Abstract—Improved output power performance is obtained in a millimeter-wave integrated-circuit (MIC) voltage-controlled by forming an output circuit and a bias input circuit in a suspended stripline configuration, which is subject to relatively low losses compared with microstrip designs. A Gunn diode and a varactor diode are mounted in alignment and in close proximity to each other. The suspended microstrip configuration includes a suspended substrate with a Gunn diode output circuit and a bias input circuit on one side, and a varactor diode grounding pad on the other face of the substrate A sliding short-circuit device aligned with the Gunn diode output circuit provides tuning of the oscillator over a relatively wide range, and avoids having to trim the Gunn diode circuit components for final adjustment of the frequency.

8 Claims, 6 Drawing Figures



4,521,753 June 4, 1985

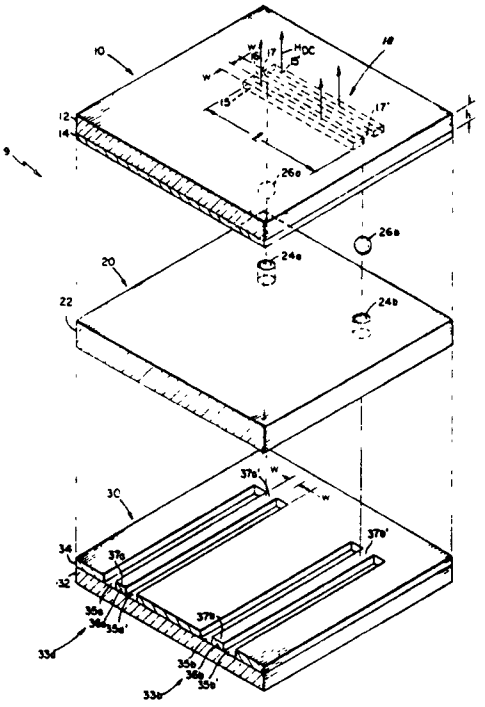
Tuned Resonant Circuit Utilizing a Ferromagnetically Coupled Interstage Line

Inventor: Ernst F. R. A. Schloemann.
Assignee: Raytheon Company.
Filed: Dec. 3, 1982

Abstract—A magnetically tuned resonant circuit for selectively coupling radio frequency (RF) energy between an input coupling circuit and an output coupling circuit, dielectrically spaced from the input coupling circuit, through a resonant body disposed therebetween. Each coupling circuit includes a center strip conductor portion dielectrically spaced from a ground plane conductor Such center strip conductor and ground plane conductor of each coupling circuit are formed on a common surface of a corresponding dielectric. The center strip conductor portions are orthogonally orientated, and have first end portions which are coaxially aligned and terminated with the ground plane

The resonant body is dielectrically supported between each one of such first end portions of such center conductors.

9 Claims, 47 Drawing Figures



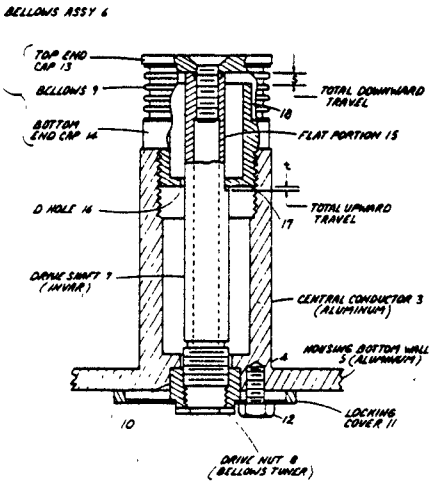
4,521,754 June 4, 1985

Tuning and Temperature Compensation Arrangement For Microwave Resonators

Inventors: Joseph C. Ranghelli and Joseph A. La Bella.
Assignee: International Telephone and Telegraph Corporation.
Filed: Aug. 29, 1983.

Abstract—The microwave resonator includes an enclosed resonator housing and a hollow central conductor having one end fastened to a bottom of the resonator housing and extending toward a top wall of the resonator housing. The other end of the central conductors is spaced from the top wall and includes an adjustable bellows assembly disposed coaxial of a longitudinal axis of the central conductor. A nonrotating, axially movable drive shaft is disposed coaxial of the axis of the central conductor within the central conductor. One end of the drive shaft is fastened to the bellows assembly and the other end of the drive shaft is coupled to a drive means disposed in the bottom wall to cause axial movement of the drive shaft to adjust the axial length of the bellows assembly and, hence, the axial length of the central conductor to adjust the resonant frequency of the microwave resonator. By selecting the material from which the housing and the central conductor is made to have a first selected coefficient of thermal expansion and by selecting the material the drive shaft is made from to have a second selected coefficient of thermal expansion. The first and second coefficients of thermal expansion are selected to minimize resonant frequency drift due to temperature variations and, hence, provides temperature compensation for the microwave resonator.

31 Claims, 4 Drawing Figures



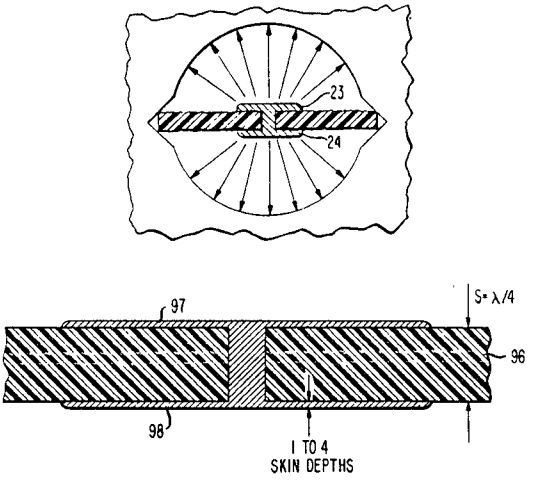
4,521,755 June 4, 1985

Symmetrical Low-Loss Suspended Substrate Stripline

Inventors: Eric R. Carlson and Martin V. Schneider.
Assignee: AT&T Bell Laboratories.
Filed: June 14, 1982.

Abstract—A stripline features high symmetry and promotes uniform current densities to lower losses. The channel (11) of the outer conductor of the stripline has a generally circular cross section. Opposing lateral grooves (13,14) securely positions a substrate (16) which includes a center conductor. The center conductor features dual metalized strips (17,18) connected together by spaced through-plated holes (19) The stripline is readily formed in a single block of metal and, hence, eliminated the losses associated with the joint of conventional split-block striplines.

5 Claims, 14 Drawing Figures



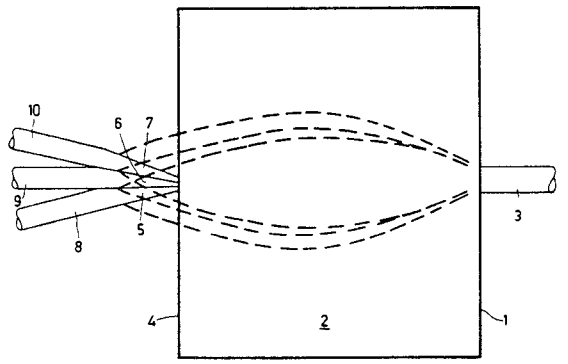
4,522,461 June 11, 1985

Optical Multiplexer

Inventor: Lothar Mannschke.
Assignee U.S Philips Corporation.
Filed: May 6, 1983.

Abstract—Radiations of different input lightwave conductors which are provided with tapering parts and are coupled at the center of an end face of a GRIM-rod lens are introduced by this lens into an output lightwave conductor. During the radiation conduction, the radiation emanating at the area of the tapering parts is also taken into account.

8 Claims, 1 Drawing Figure



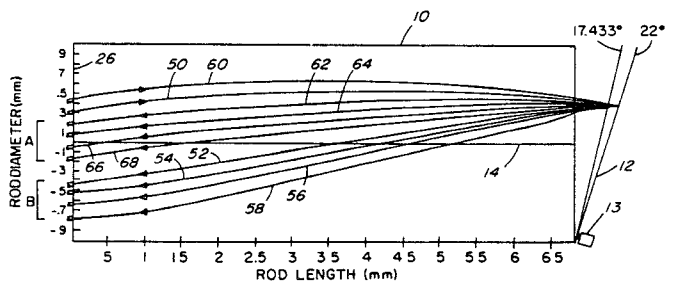
4,522,462 June 11, 1985

Fiber-Optic Bidirectional Wavelength Division Multiplexer/Demultiplexer with Total and/or Partial Redundancy

Inventors: Scott F. Large and Bruce D. Metcalf.
Assignee: The Mitre Corporation.
Filed May 27, 1983

Abstract—The wavelength division multiplexer/demultiplexer includes a gradient index of refraction (GRIN) lens and a diffraction grating located adjacent to one end of the GRIN lens. The diffraction grating is adapted for switching from a first angle to a second angle with respect to the GRIN lens. For both path and terminal equipment redundancy, first and second input optical fibers are located at first and second input locations on an end surface of the GRIN lens A first and second plurality of output optical fibers are also located on this end surface to the GRIN lens. The input and output optical fibers are located so that optical energy will travel from the first input optical fiber to the first plurality of output optical fibers when the diffraction grating is oriented at the first angle and optical energy will travel from the second input optical fiber to the second plurality of output optical fibers when the diffraction grating is oriented at the second angle.

6 Claims, 3 Drawing Figures



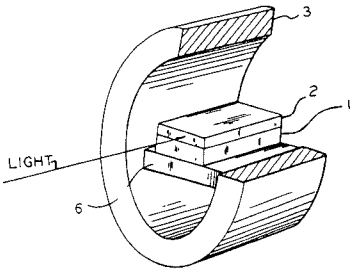
4,522,473 June 11, 1985

Faraday Rotator for an Optical Device

Inventors: Taketoshi Hibiya, Yoshinori Ohta, and Koichi Matsumi.
Assignee: Nippon Electric Co , Ltd.
Filed: Mar 22, 1982.

Abstract—A Faraday rotator has a nonmagnetic garnet substrate with a ferrimagnetic garnet film epitaxially grown on the substrate A magnet induces a magnetic field in the film for rotating the plane of polarization of a light beam which strikes an end surface of the film at predetermined angle The substrate and film are composed of a material wherein the difference ($\Delta a = a_s - a_f$) between the lattice constant a_s of the substrate and the lattice constant a_f of the film satisfies $|\Delta a| \leqq 0\,001$ A (angstrom).

11 Claims, 9 Drawing Figures



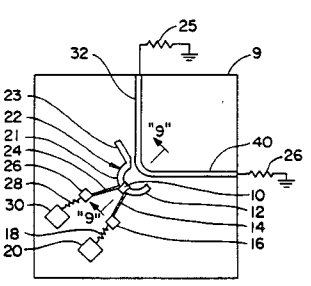
4,523,159 June 11, 1985

Microwave Oscillator and Single Balanced Mixer for Satellite Television Receiver

Inventor: Pierre Dobrovolny.
Assignee: Zenith Electronics Corporation.
Filed: Dec. 28, 1983.

Abstract—A microwave oscillator and a combination microwave oscillator/single balanced mixer for a satellite television receiver includes a cylindrical dielectric resonator located on one side of a ground plane formed by a conductive foil on a substrate with microstrip transmission lines formed by foil patterns on the opposite side of said substrate. A gallium arsenide FET is disposed in a hole through said substrate with its source electrode connected to the ground plane and its drain and gate electrodes coupled to first and second transmission-line strips, portions of which are following the contours of said dielectric resonator. Two sets of coupling slots are formed in the ground plane for permitting magnetic coupling between the dielectric resonator and the opposite transmission-line strips. In one embodiment and additional coupling slot in the ground plane couples the dielectric resonator to an output transmission-line strip. In another embodiment a dual diode package is disposed in a square hole in the substrate and ground plane with the common junction of the two diodes being coupled to a third transmission-line strip and the opposite ends of the series connected diodes coupled to the ground plane. Coupled magnetic energy from the resonator creates a potential difference across the ground plane at the opposite sides of the square hole thus generating a local oscillator signal across the series connected diodes. The third transmission-line strip serves as a coupling for both an RF signal input to and an IF signal output from, the mixer.

10 Claims, 10 Drawing Figures



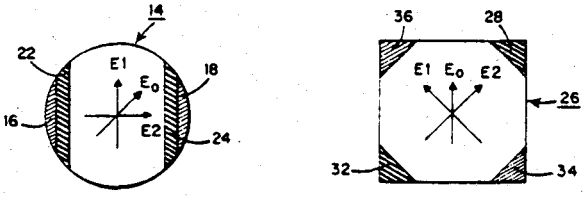
4,523,160 June 11, 1985

Waveguide Polarizer Having Conductive and Dielectric Loading Slabs to Alter Polarization of Waves

Inventor: George Ploussios.
Filed: May 2, 1983.

Abstract—The invention is embodied in a waveguide polarizer of the kind arranged to alter the propagation modes of an incident wave to produce elliptical or circular polarization. The phase shift is produced by the simultaneous use of dimensional perturbation and dielectric loading distributed along a waveguide section. Embodiments are illustrated using square, circular, and crossed waveguide sections. The use of relatively light, symmetrical and continuous loading provides improved performance over that which can be attained by discrete element phase shifters or those that make use of only a single kind of loading.

3 Claims, 11 Drawing Figures



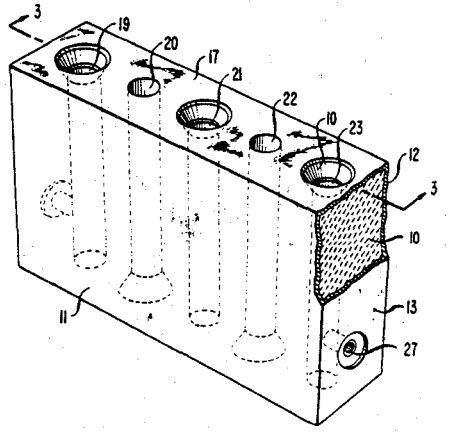
4,523,162 June 11, 1985

Microwave Circuit Device and Method for Fabrication

Inventor: Arlen K. Johnson.
Assignee: AT&T Bell Laboratories.
Filed: Aug. 15, 1983.

Abstract—Microwave devices are fabricated by a method wherein a block of dielectric material is conformed to the physical configuration of a required microwave device, and it is then coated with electrically conductive material. Portions of the coating material are removed from predetermined regions of the block to implement a predetermined microwave device. One microwave device fabricated in accordance with the foregoing method is shown, and comprises an interdigital bandpass filter in which the block is shaped and drilled with a line of parallel holes to define the physical configuration of an interdigital filter in which the interiorly-coated drilled holes comprise resonator rods within a microwave cavity formed by exteriorly-coated remaining portions of the dielectric material block. Coating material is removed from end portions of the rods formed by the coated holes in order to fine-tune the filter to a desired center frequency in the band of operation.

11 Claims, 3 Drawing Figures



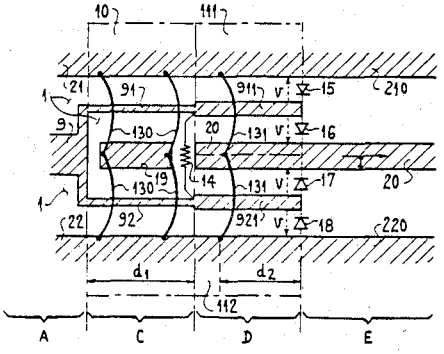
4,523,163 June 11, 1985

Wide-Band and Microwave Device Generating Even Harmonics of an Incident Signal

Inventors: Michael Houdart, Edouard Arruberrenal, and Frédéric Maurette
Assignee: Thomson-CSF.
Filed: Sept. 24, 1982.

Abstract—A wide-band microwave device for generating even harmonics of an incident microwave signal. A co-planar-type input structure conducts an incident microwave signal with an asymmetrical propagation mode. Two asymmetrical mode outputs of an equiphase divider are applied to respective inputs of two nonlinear circuit structures, whose respective output signals include even harmonics of the incident signal. The two outputs signals are combined in a circuit having an asymmetrical propagation mode output and which may be followed by a filtering circuit helping to isolate the desired even harmonic.

3 Claims, 5 Drawing Figures



4,525,027 June 25, 1985

Single-Mode Optical Fibers

Inventors: Katsunari Okamoto, Takao Edahiro, Akio Kawana, and Tetsuo Miya
Assignee: Nippon Telegraph & Telephone Public Corp.
Filed: Sept. 5, 1984.

Abstract—In a single-mode optical fiber comprising a core made of glass and a cladding surrounding the core and made of glass, when a difference Δ between refractive indices n_1 and n_2 of the core and cladding is expressed by $(n_1 - n_2)/(n_1) \times 100\%$, the refractive indices n_1 and n_2 are determined to satisfy a relation $1.0 < \Delta < 3.6$ and a diameter of the core is determined according to this value of Δ.

4 Claims, 4 Drawing Figures