Patent Abstracts

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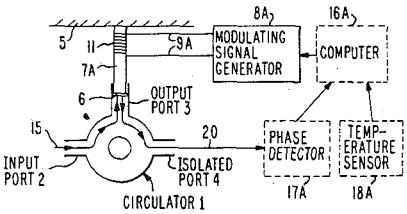
4,710,733 Dec. 1, 1987

RF Phase Modulator

Inventors: Philip D. Crill and Michael D. Rubin.
Assignee: Ford Aerospace & Communications Corporation.
Filed: Oct. 28, 1986.

Abstract—An RF phase modulator operable at up to extremely high frequencies. A circular (1) having input, output, and isolated ports (2, 3, 4, respectively), channels an RF carrier (15) in a prescribed direction. Fitting into an open end of the output port (3) is a moving reflective surface (6) coupled via a moving plunger (7) fixedly mounted at one end thereof to a housing (5) fixedly mounted at one end thereof to a housing (5) fixedly mounted with respect to the circulator (1). A modulating signal (9) is applied to the plunger (7), causing the reflective surface (6) to move linearly within the output port (3). This change in path length of the carrier (15) produces linear phase modulation thereon. The plunger (7) can comprise a magnetostrictive material (7A), a piezoelectric material (7B), a thermally expansive material (7C), or a combination thereof. The invention can be used for temperature compensation and phase stabilization as well as phase modulation.

10 Claims, 3 Drawing Figures



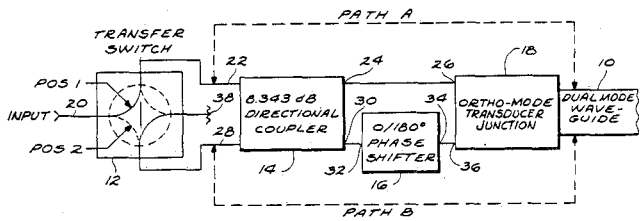
4,710,734 Dec. 1, 1987

Microwave Polarization Control Network

Inventor: William G. Sterns.
Assignee: ITT Gilfillan, a Division of ITT Corporation.
Filed: June 5, 1986.

Abstract—This invention relates to two embodiments of microwave polarization control networks. The first produces two sets of orthogonal linear polarizations and constitutes a two position transfer switch and a directional coupler having two ports alternating as input and isolated ports and two ports alternating as through and coupled output ports. The transfer switch is connected to switch an input to one or the other of the two ports alternating as input and isolated ports and couple the other to a termination. An ortho-mode transducer junction, having two input ports, has one input port coupled directly to one of the output ports of the directional coupler and the other input port connected in series through a 0°/180° phase shifter to the other output port of the directional coupler. A dual mode waveguide is employed for transmitting a varible polarization output from the ortho-mode junction. In another embodiment, the transfer switch is not employed, and a 90° differential phase shifter is incorporated in the dual mode waveguide whereby either linear or circular polarization may be obtained.

4 Claims, 8 Drawing Figures



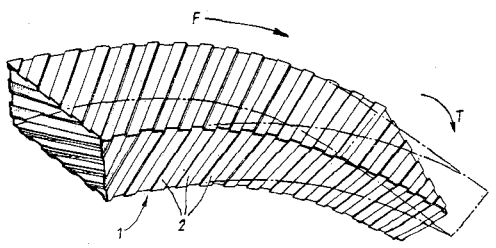
4,710,736 Dec. 1, 1987

Flexible Waveguides with 45° Corrugations to Allow Bending and Twisting of Waveguides

Inventor: Alan G. Stidwell.
PCT Filed: July 5, 1984.

Abstract—A flexible waveguide (1) has corrugated seamless walls (2) the corrugations of which are inclined to the transverse planes of the waveguide, that is, planes perpendicular to the longitudinal axis of the waveguide, at an angle of substantially 45°. The inclined corrugations, which may be annular or helical, permit both flexing and twisting of the waveguide.

9 Claims, 6 Drawing Figures



4,712,075 Dec. 8, 1987

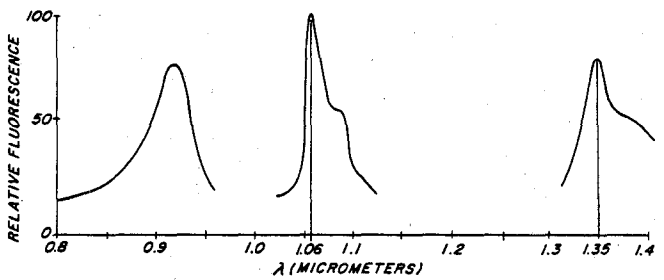
Optical Amplifier

Inventor: Elias Snitzer.
Assignee: Polaroid Corporation.
Filed: Nov. 27, 1985.

Abstract—An optical amplifier particularly suitable for use in amplifying signals carried on optical fiber in a select communication band. The amplifier comprises a resonant optical waveguide cavity which has a core containing an active gain material with given absorption and fluorescence spectrums. The

gain material is of the type that preferably has at least two different emission bands originating from the same energy level with one of the emission bands encompassing the select communication band. The cavity is structured to resonate wavelengths in both emission bands, but with a higher combination of cavity Q and gain coefficient per excited ion for wavelengths in the emission band not corresponding to the select communication band so that, when pumped, the cavity first lases at this band. The lasing action causes the atomic population of the gain material corresponding to the communication band to remain at a stable constant level where it is available to uniformly amplify by stimulated emission optical signals introduced into the cavity.

18 Claims, 9 Drawing Figures



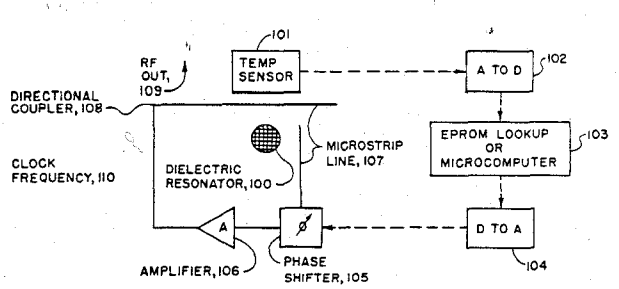
4,712,078 Dec. 8, 1987

Dielectric Resonator Oscillators with Digital Temperature Compensation

Inventors: Andrew J. Slobodnik, Jr., Martin R. Stiglitz, George A. Roberts, and Richard T. Webster.
Assignee: The United States of America as represented by the Secretary of the Air Force.
Filed: Mar. 27, 1985.

Abstract—A digital compensation circuit for improving the temperature stability of dielectric resonator oscillators is disclosed. A temperature sensor indicates a measure of ambient temperature which is correlated with an amount of phase shift necessary to compensate for frequency drift in a dielectric resonator oscillator. The correlation is made using a correction table or correction function which is determined empirically in a calibration process. The necessary phase shift is then supplied via a voltage controlled phase shifter. This phase shifter is part of the RF oscillation loop which also includes an amplifier, directional coupler and dielectric resonator filter (including microstrip).

13 Claims, 6 Drawing Figures



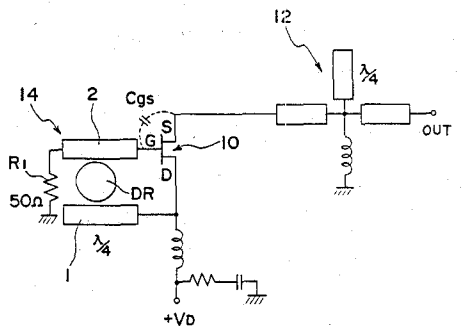
4,713,632 Dec. 15, 1987

Band Reflection Type FET Dielectric Resonator Oscillator

Inventors: Toshio Nishikawa and Sadahiro Tamura.
Assignee: Murata Manufacturing Co., Ltd.
Filed: May 16, 1986.

Abstract—A band reflection type oscillator includes a GaAs FET having a source, a gate and a drain in which the drain is connected to ground. A stripline is connected to the gate, and a dielectric resonator is provided adjacent the stripline in a magnetically coupled relationship therewith. A stripline stub is electrically connected to the drain and positioned adjacent the resonator in a magnetically coupled relationship therewith, thereby defining a positive feedback circuit through the drain, said stripline stub, the resonator and the stripline to the gate. By the positive feedback circuit, the oscillation stability is improved.

4 Claims, 3 Drawing Figures



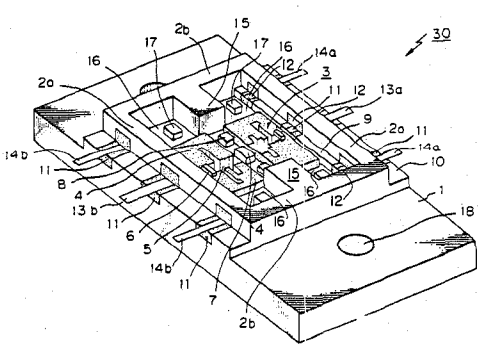
4,713,634 Dec. 15, 1987

Semiconductor Device Mounted in a Housing Having an Increased Cutoff Frequency

Inventor: Shigeyuki Yamamura.
Assignee: Fujitsu Limited.
Filed: Mar. 5, 1985.

Abstract—A semiconductor device including a metallic container for containing a radio frequency semiconductor circuit on a bottom surface thereof; a cap for covering the container; and input and output terminals connected to the circuit and penetrating through a side wall of the container at locations opposite to each other. The bottom surface of the container includes space for mounting the radio frequency semiconductor circuit and supplementary space for mounting elements of a supplementary circuit. A cutoff member for increasing the cutoff frequency of the waveguide mode wave propagation between the input and output terminals within the container is provided on a part of the supplementary space, so that the cutoff frequency is higher than the wave frequency used in the radio frequency semiconductor circuit.

3 Claims, 11 Drawing Figures



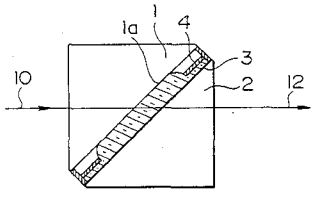
4,714,326 Dec. 22, 1987

Method and Element for Optical Modulation

Inventors: Masauyki Usui, Hiroyuki Imataki, Takashi Serizawa, Takeshi Baba, and Hiroyasu Nose.
Assignee: Canon Kabushiki Kaisha.
Filed: Feb. 27, 1985.

Abstract—Optical modulation is carried out by providing a transparent member having a surface, providing an elastomeric body disposed spaced apart from the surface, irradiating the surface with a light beam, and causing the elastomeric body to contact the surface so that the proportion of the light beam transmitted through the surface is changed.

17 Claims, 7 Drawing Figures



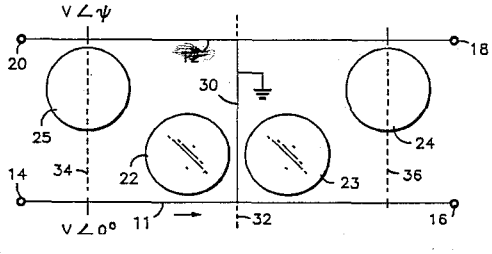
4,714,903 Dec. 22, 1987

Dielectric Resonator Directional Filter

Inventor: Jerry C. Brand.
Assignee: Motorola, Inc.
Filed: June 20, 1986.

Abstract—A directional filter wherein dielectric resonators tuned to the operating frequency couple electric energy from port one to port four while electrical energy at other frequencies passes through the filter to port two.

2 Claims, 6 Drawing Figures



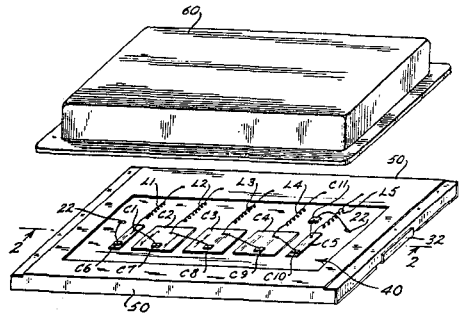
4,714,905 Dec. 22, 1987

SMC Filter and Method of Manufacture Thereof

Inventors: Richard Bernstein, William H. Anthony, and David A. Lupfer.
Assignee: K&L Microwave.
Filed: Oct. 8, 1986.

Abstract—A microwave bandpass filter for frequencies in the range of 30–3000 MHz comprises a substrate formed from dielectric ceramic sheets fused together and stacked according to a dielectric constant required of the filter capacitors, the plates of which are formed on the substrate. Discrete air core coils, to provide greater frequency selectivity in this particular frequency range, are attached into the circuit on a top surface of the substrate, and a drawn metal can covers the circuitry on the top surface and is soldered to a metallized coating extending over substantially all of the rest of the substrate except for surface mounting lead portions and associated conductive paths. Thus, EMI and RFI shielding is provided by the combination of the metal can and the ground plane of the circuit. The metal can portion of the shield also provides physical protection for the fragile air core coils, while presenting a solid, uniform profile for engagement by a pick and place head during subsequent handling of the finished component.

5 Claims, 8 Drawing Figures



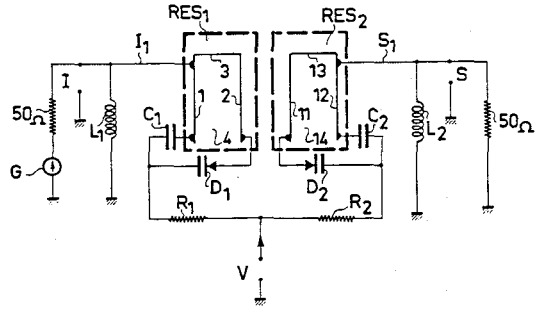
4,714,906 Dec. 22, 1987

Dielectric Filter with Variable Central Frequency

Inventors: Bertrand D'Albaret and Antoine Colombani.
Assignee: Compagnie D'electronique et de Piezo-electricite.
Filed: May 23, 1985.

Abstract—A dielectric filter with variable central frequency is provided comprising at least one dielectric resonator formed from a dielectric ceramic body covered with electrodes as well as electromagnetic input and output means for coupling the signal to and from the filter. According to the invention, the filter further comprises a variable capacity connected between the electrodes of the resonator, in a capacitive zone of said resonator, for continuously varying the central frequency of said filter.

9 Claims, 4 Drawing Figures



4,716,382 Dec. 29, 1987

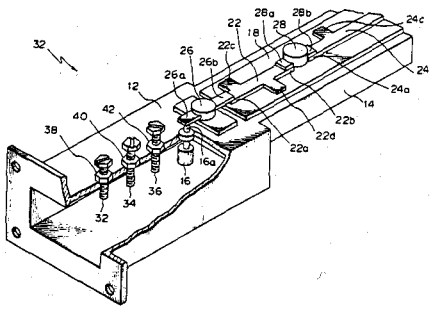
Microwave Amplifying Apparatus

Inventors: Wasauke Yanagisawa and Kenichi Muramatsu.
Assignee: Yokowo Mfg. Co., Ltd
Filed: Oct. 24, 1986.

Abstract—A microwave amplifying apparatus includes a waveguide which is shorted at one end and supplied with a TM mode or a TE mode signal, a

pickup probe mounted on the waveguide for converting the signal into a TEM mode signal, and microstrip lines and field effect transistors, or amplifier elements, for amplifying the TEM mode signal. A matching device is arranged on the shorted waveguide adjacent to an incidence side with respect to the pickup probe while an input terminal of the first-stage amplifier element is directly interconnected to an output terminal of the pickup probe. The device is, therefore, free from a signal loss otherwise developed between the pickup probe and the initial-stage amplifier element. The matching device consists of three conductive rods which are spaced a quarter-wavelength distance from each other, and three lock nuts for fixing the conductive rods.

6 Claims, 2 Drawing Figures



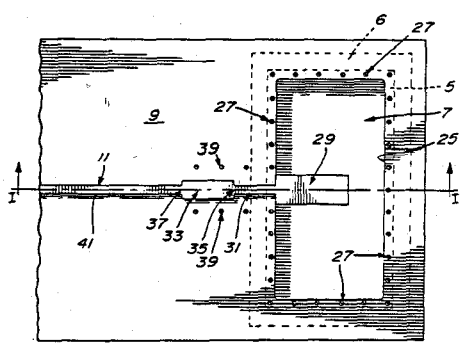
4,716,386 Dec. 29, 1987

Waveguide to Stripline Transition

Inventor: Andrew J. Lait.
Assignee: Canadian Marconi Company.
Filed: June 10, 1986.

Abstract—The waveguide includes an input section and a short circuit section which each have a hollow interior of like size and shape enclosed by a surrounding wall. In arrangement, the input and short circuit section are in spaced alignment, and the stripline is interposed in the gap between the two sections. The stripline includes ground planes on either side thereof, and apertures are cut into the ground planes of the same size and shape as the hollow interiors, and, in arrangement, the apertures are in alignment with these hollow interiors. A wall of pins is disposed between the two sections whereby to simulate the continuation of the waveguide walls. The position of the transition may be arbitrarily chosen to suit the design of the stripline circuit.

8 Claims, 3 Drawing Figures



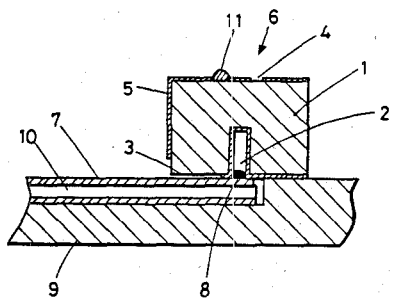
4,716,387 Dec. 29, 1987

Waveguide–Microstrip Line Converter

Inventor: Sadao Igarashi.
Assignee: Alps Electric Co., Ltd.
Filed: Sept. 25, 1986.

Abstract—A waveguide–microstrip line converter to be used in combination with a waveguide, for mode conversion in transmitting a signal from the waveguide to a microstrip line. A probe for receiving a signal transmitted through the waveguide is formed by forming a conductive layer over the inner surface of a hole formed in a cuboidal dielectric body and is connected directly to the microstrip line to avoid needless induction of inductance. Since the hole can be formed accurately in size and position in the cuboidal dielectric body and the probe is formed in the hole, the probe is formed accurately in size and position and is highly resistant to vibration.

10 Claims, 5 Drawing Figures



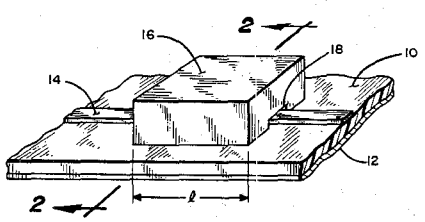
4,716,389 Dec. 29, 1987

Millimeter-Wave Microstrip Surface-Mounted Attenuator

Inventors: Michael J. Gawronski and John R. Lamberg.
Assignee: Honeywell Inc.
Filed: Oct. 20, 1986.

Abstract—A microstrip attenuator comprising a block of lossy material which is preferably impregnated with ferrite particles and having a groove of a predetermined height and width dimension formed in the bottom surface thereof defining a tunnel and positionable upon a microstrip transmission line assembly, such that the microstrip element of the assembly passes through the tunnel, but is in non-contact relation with respect to the surface-mounted microstrip element. The degree of attenuation afforded by the attenuator is primarily a function of the aforementioned length and height dimension of the tunnel formed in the block of lossy material.

4 Claims, 2 Drawing Figures



4,716,391 Dec. 29, 1987

Multiple Resonator Component-Mountable Filter

Inventors: Michael F. Moutrie, Raymond L. Sokola, and Philip J. Gordon.
Assignee: Motorola, Inc.
Filed: July 25, 1986.

Abstract—A dielectric block filter which may be mounted on a printed circuit board or other substrate as a single component is disclosed. The dielectric filter utilizes metalized hole resonators having coupling characteristics determined by the metalization pattern on one surface of the dielectric block. Input and output coupling is accomplished via terminals asymmetrically arranged in a mounting bracket. Mounting tabs on the bracket opposite a recessed area holding the dielectric block secure the filter to the circuit board and provide ground connection for the filter.

12 Claims, 16 Drawing Figures