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.

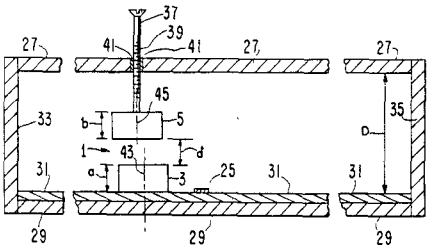
4,565,979 Jan. 21, 1986

Double Dielectric Resonator Stabilized Oscillator

Inventor: Slawomir J. Fiedziuszko.
Assignee: Ford Aerospace & Communications Corporation.
Filed: Dec. 10, 1984.

Abstract—A double dielectric resonator (1) having lower and upper preferably cylindrical dielectric elements (3,5, respectively) is used to stabilize an oscillator operating at microwave frequencies. The dielectric elements (3,5) are separated by a distance (d) which is greater than zero but less than an amount that will eliminate magnetic coupling between the dielectric elements (3,5), and preferably less than an amount that will push the oscillator into a nonlinear region of the frequency versus separation (d) curve The major axes (43,45, respectively) of the dielectric elements (3,5) are aligned, or else parallel but offset slightly. The invention may be used with reflection type, parallel feedback, and series feedback oscillators. Fine tuning may be achieved by means of a preferably dielectric tuning screw (37), which preferably has a thermal expansion coefficient between those of the dielectric elements (3,5) and electrically conductive supporting walls (33,35) to enhance the temperature compensation of the oscillator

14 Claims, 8 Drawing Figures



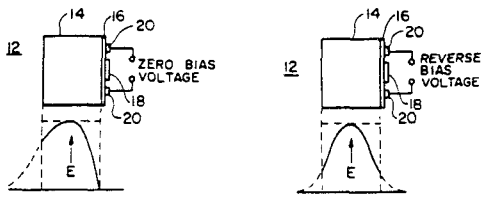
4,565,982 Jan. 21, 1986

Millimeter-Wave Electronic Phase Shifter Using Schottky Barrier Control

Inventors: Richard A. Stern and Elio A. Mariani.
Assignee: The United States of America as represented by the Secretary of the Army
Filed: Jun. 20, 1983.

Abstract—A millimeter-wave electronic phase shifter in a dielectric waveguide having a semi-insulating dielectric core and at least one semiconducting epitaxial layer. A controller affixed to the epitaxial layer is used to apply a bias voltage, thereby varying the conductivity of the epitaxial layer and influencing wave propagation in the waveguide.

10 Claims, 6 Drawing Figures



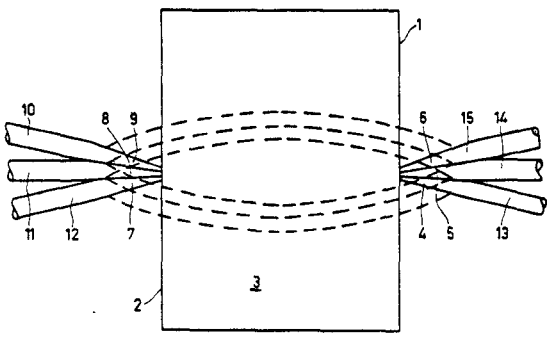
4,566,753 Jan. 28, 1986

Optical Star Coupler

Inventor: Lothar Mannschke.
Assignee: U.S. Phillips Corporation.
Filed: May 22, 1985.

Abstract—The ends of tapered optical waveguides are focused onto one another by means of a graded index rod lens. The tapered tips are connected to the end faces of the lens. The coupling conditions are improved by taking into account the cladding modes emerging from the tapered portions.

10 Claims, 1 Drawing Figure



4,566,761 Jan. 28, 1986

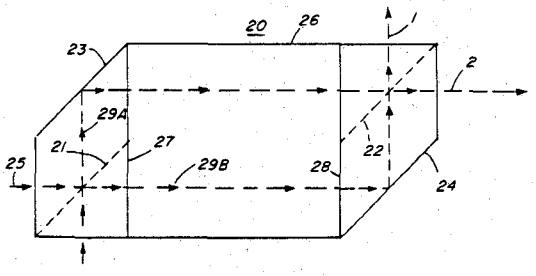
Birefringent Optical Wavelength Multiplexer/Demultiplexer

Inventors: W. John Carlsen and Paul Melman.
Assignee: GTE Laboratories Incorporated
Filed. Sept. 13, 1984.

Abstract—An optical multiplexer/demultiplexer provides for arbitrarily closely spaced wavelength channels, the spacing and locations thereof being

determined by the thickness of birefringent crystals such as, for example, quartz. Such a device can also be used for duplexing bidirectional signals. Methods for mechanically tuning the devices to given laser wavelengths are described, as well as simplified constructions which can be used with polarized light sources such as lasers.

8 Claims, 7 Drawing Figures



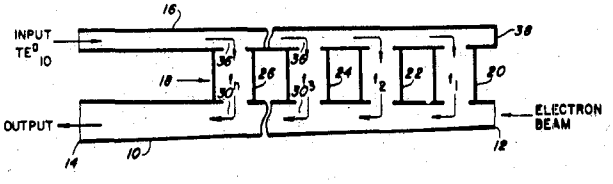
4,567,401 Jan. 28, 1986

Wide-Band Distributed RF Coupler

Inventors: Larry R. Barnett, Yue-Ying Lau, Kwo R. Chu, and Victor L. Granatstein.
Assignee: The Unites States of America as represented by the Secretary of the Navy.
Filed: June 12, 1982.

Abstract—A wide-band distributed coupler for coupling RF energy from an input waveguide into a tapered interaction waveguide in a traveling-wave amplifier comprising a plurality of channel filters connecting between the input and interaction waveguides, with each filter coupled to the interaction waveguide at the appropriate cross-sectional position along its tapered length where the interaction waveguide cutoff frequency approximately matches the wave frequency propagated by the filter. Each filter comprises, in one embodiment, a main coaxial cavity tuned to a distinct center frequency, a first simple isolation cavity for coupling RF energy between the input waveguide and the main cavity, and at least one second simple isolation cavity for coupling energy between the main cavity and the tapered interaction waveguide. This coupler is compatible both in bandwidth and geometry with the tapered interaction waveguide.

13 Claims, 7 Drawing Figures



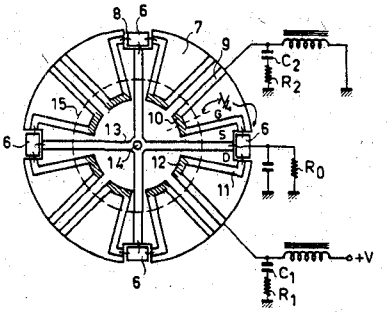
4,567,449 Jan. 28, 1986

Low-Noise Oscillator Operating in the Ultra-High-Frequency Range

Inventors: Alain Bert and Marc Camiade.
Assignee: Thomson-CSF.
Filed: June 29, 1983.

Abstract—The invention relates to an ultra-high-frequency oscillator (11–14 GHz) having a plurality of transistors, stabilized on at least one of their electrodes by a microstrip line coupled to a dielectric resonator. The oscillator according to the invention groups the transistors on the periphery of an insulating substrate, which centrally supports a single dielectric resonator common to all the transistors. The microstrip lines have two end portions, which are not coupled and are parallel to the field lines of the resonator, and a coupled central portion, perpendicular to the field lines. The transistors and microstrip lines are coplanar. The output is by a coaxial cable at the center of the substrate or by a microstrip line coplanar to the substrate.

11 Claims, 7 Drawing Figures



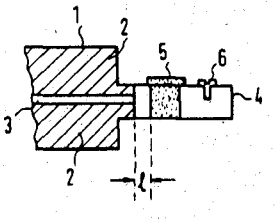
4,567,450 Jan. 28, 1986

Finline Oscillator

Inventors: Laszio Szabo and Klaus Schünemann.
Assignee: International Standard Electric Corporation.
Filed: Aug. 16, 1983.

Abstract—The finline oscillator includes a packaged diode as an active element and an impedance-matching network for matching the diode to a load and determining the frequency. In a first embodiment, the diode package (5) is mounted in a cutoff waveguide (4) connected with the waveguide (1) containing the finline. The fins (2) of the finline extend a given distance into the cutoff waveguide. In further embodiments, the diode package is mounted in or on the substrate on which the fins of the finline are deposited.

4 Claims, 4 Drawing Figures



4,567,454 Jan. 28, 1986

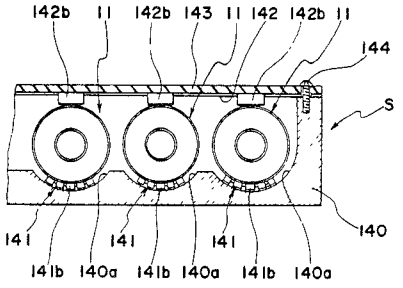
Resonator Device

Inventor: Koji Saito.
Assignee: Murata Manufacturing Co., Ltd.
Filed: Apr. 27, 1984.

Abstract—A resonator device including an electrically conductive mounting member, at least one dielectric coaxial resonator mounted on the mounting member and an electrically conductive elastic member for securing the dielectric coaxial resonator to the mounting member. In the resonator device, the

dielectric coaxial resonator is secured and electrically connected to the mounting member through elasticity of the elastic member

11 Claims, 10 Drawing Figures



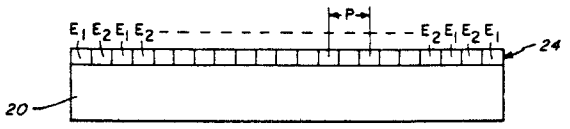
4,568,147 Feb. 4, 1984

Flat Profile Grating Coupler

Inventors: Robert J. Seymour and Donald M. Koffman.
Assignee. GTE Laboratories Incorporated
Filed: Nov. 17, 1983.

Abstract—A device for efficiently coupling electromagnetic radiation in the far-infrared and submillimeter microwave regions of the electromagnetic spectrum to surface electromagnetic waves comprising a base metal substrate formed by producing periodic alternating areas thereof in which the dielectric constants differ so as to provide periodic field modulation to, in turn, enhance coupling between the surface plasmons and free photons at the proper coupling angles. The different dielectric constant areas may be formed by selective overplating or evaporating or may alternately be formed by the selective processing of a uniformly deposited material such as by annealing of an amorphous material in strips. In an alternate embodiment of the invention the periodic modulation of the dielectric constant is of the overcoat material rather than the base metal substrate.

3 Claims, 2 Drawing Figures



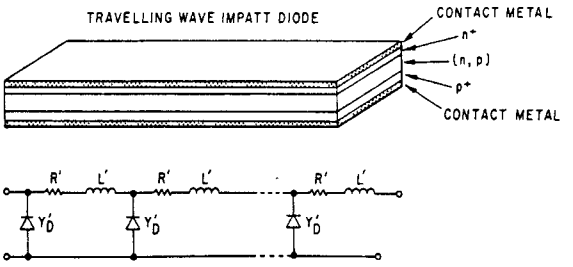
4,568,889 Feb 4, 1986

Distributed Diode VCO with Stripline Coupled Output and Distributed Variable Capacitor Control

Inventor: Burhan Bayraktaroglu.
Assignee: Texas Instruments Incorporated.
Filed: Aug. 31, 1983.

Abstract—In a distributed IMPATT structure, power is coupled out through a side contact That is, in previously proposed distributed IMPATT structures, the gain medium (the active region of the IMPATT) operates as a transmission line. The prior art has attempted to couple output power from the gain medium through an end contact, i e., through a contact which is perpendicular to the primary direction of energy propagation (and also to the direction of maximum elongation) of the active medium. In the present invention, a sidewall contact extends in a direction which is parallel to the principal direction of propagation of the energy in the active medium. Thus, the sidewall contact plus the active region together can be considered as a single transmission line. This extended transmission line is also connected to a second distributed semiconductor element which functions as a varactor. By changing the bias voltage on this varactor, the distributed capacitance of a transmission line is changed, and this change in transmission line loading causes a change in the propagation characteristic of the transmission line.

6 Claims, 26 Drawing Figures



4,568,890 Feb. 4, 1986

Microwave Oscillator Injection Locked at its Fundamental Frequency for Producing a Harmonic Frequency Output

Inventor: Robert N. Bates.
Assignee U.S Phillips Corporation
Filed: Dec. 6, 1983.

Abstract—A microwave oscillator suitable for millimeter wavelengths comprises a Gunn diode (3) coupled to a waveguide (1) by a resonant-cap structure (5,6). The diode (3) generates microwave energy both at a fundamental frequency f_0 which is below the cutoff frequency of the waveguide (1) and at a second harmonic frequency $2f_0$ above cutoff. To control the generation of microwave energy at $2f_0$, energy at f_0 is coupled into the waveguide (1) from an adjacent further waveguide (9) above its cutoff, by means of an electric probe (8) extending close to the cap (5). The probe (8) may couple in a locking signal at or close to the free-running value of f_0 from another oscillator having better noise performance and electronic tuning, thereby locking $2f_0$ to twice the frequency of the locking signal, or alternatively may couple to a varactor-tuned cavity resonant at f_0.

16 Claims, 5 Drawing Figures