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.

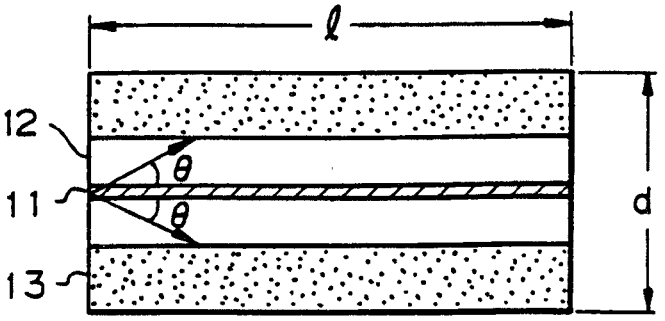
4,981,337 Jan. 1, 1991

Fiber-Type Light Wavelength Conversion Device

Inventors: Sota Okamoto and Kiyofumi Chikuma.
Assignee: Pioneer Electronic Corporation.
Filed: May 22, 1989.

Abstract—A fiber-type light wavelength conversion device for converting the wavelength of an incident light beam and issuing the incident light beam as a light beam having a predetermined wavelength, having a core and a cladding layer around the core. The device is characterized by the provision of a transparent cylindrical layer provided around the cladding layer, having a refractive index substantially equal to the refractive index of the cladding layer and having a predetermined wall thickness. According to a feature of the invention the wall thickness is determined so that the condition $d > l \tan\theta$ is satisfied, where d represents a diameter of said cylinder layer, l represents an operating length of the device, and θ represent Cerenkov angle.

4 Claims, 1 Drawing Sheet



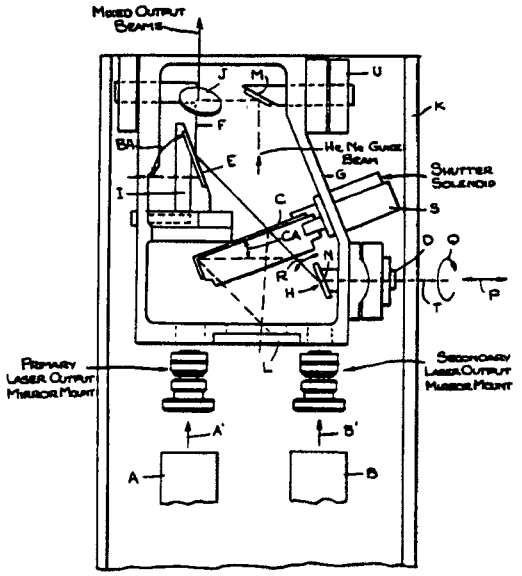
4,982,166 Jan. 1, 1991

Method and Apparatus for Combining Two Lower Power Laser Beams to Produce a Combined Higher Power Beam

Inventor: Clifford E. Morrow.
Filed: Mar. 1, 1989.

Abstract—Apparatus for combining two laser beams each having a power level into a common colinear laser beam having a power level that is the sum of the power levels of the two laser beams comprising a support, a polarization selective device disposed on the support having a first surfaces upon which a first of the laser beams impinges for transmitting the first laser beam with substantially full power transmission along an axis and having a second surface upon which the second laser beam impinges for reflecting the second laser beam with substantially full power along the axis, resulting in a common colinear beam along the axis, and suitable optical and/or mechanical devices disposed on the support for providing the first and second laser beams to the polarization selective device, the first and second laser beams being substantially orthogonally polarized with respect to each other.

26 Claims, 1 Drawing Sheet



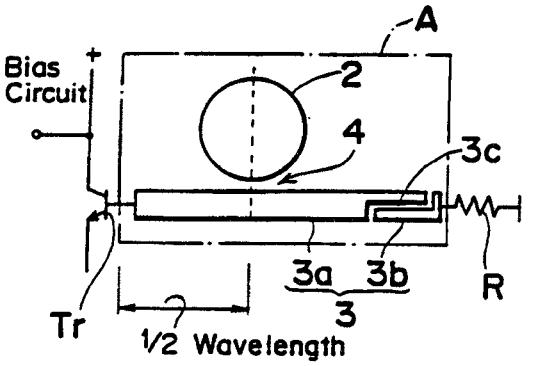
4,982,167 Jan. 1, 1991

Zone Reflection Type Microwave Oscillator

Inventor: Yukio Mori.
Filed: Sept. 1, 1989.

Abstract—A zone reflection type microwave oscillator using a dielectric resonator wherein a comparatively simple dc cutting circuit is formed that is capable of preventing the dc bias current from leaking into the terminal resistor without the use of any chip capacitor so as to improve the stability of the oscillation output and reduce the price.

7 Claims, 1 Drawing Sheet



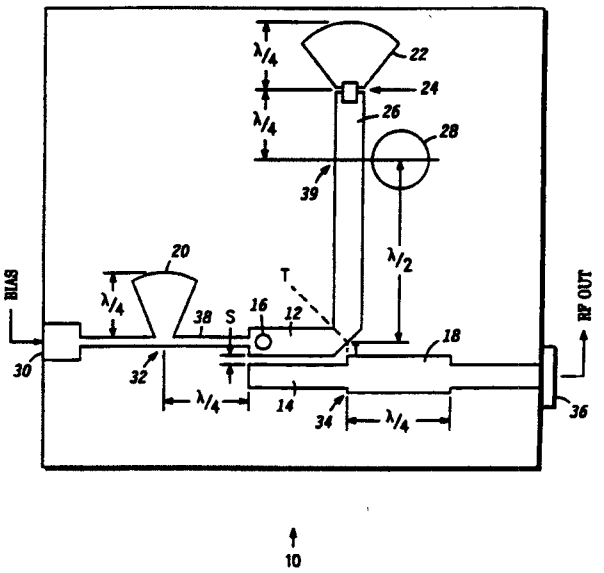
4,982,168 Jan. 1, 1991.

High Peak Power Microwave Oscillator

Inventors: Bernard E. Sigmon and Lawrence J. Schaumacher.
Assignee: Motorola, Inc.
Filed: Nov. 1, 1989.

Abstract—Oscillator that maintains a high Q constant frequency over changes in temperature utilizes two parallel transmission lines having an active element embedded within one of the lines. A dielectric resonator oriented one-half wavelength from the embedded transmission line generates a high impedance near the embedded transmission line at resonant frequency. The resonating energy is transferred to the second parallel transmission having a low impedance, an impedance inverter matches the low impedance to the output bias, and transfers the high peak powers from the low impedance in the second transmission line. The active element is bias controlled.

17 Claims, 1 Drawing Sheet



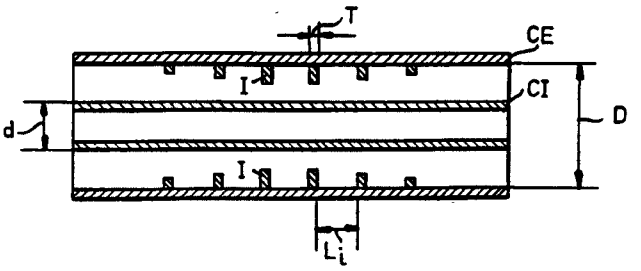
4,982,171 Jan. 1, 1991

Coaxial-Waveguide Phase Shifter

Inventors: Giuseppe Figlia, Davide Forigo, Flavio Mercurio, and Dario Savini.
Assignee: Cselt—Centro Studi E Laboratori Telecomunicazioni S.p.A.
Filed: July 24, 1989.

Abstract—The coaxial-waveguide phase shifter consists of a coaxial waveguide section, comprising an external cylindrical conductor and an internal cylindrical conductor, both hollow. Between them, a number of irises are provided and are parallel to one another. The irises can be differently shaped and can be fixed to the external or to the internal conductor. By replacing the internal cylindrical conductor with a rectangular conductor, the irises can be unnecessary.

6 Claims, 1 Drawing Sheet



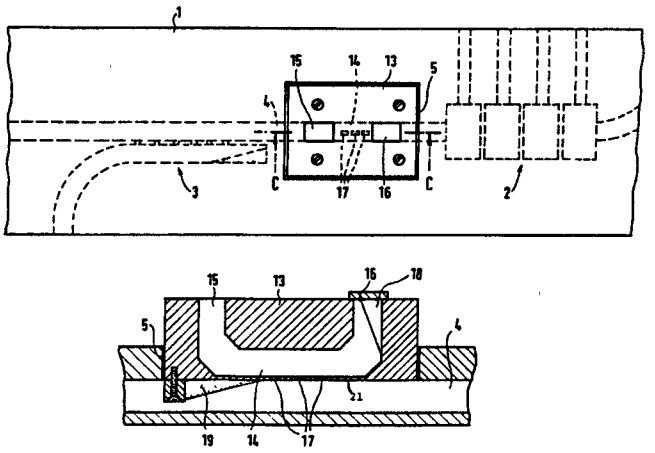
4,982,172 Jan. 1, 1991

Method of Creating a Measuring Signal Access to a Waveguide Arrangement

Inventors: Günter Mörz, Konstantin Beis, and Klaus Junger.
Assignee: ANT Nachrichtentechnik GmbH.
Filed: Sept. 22, 1989.

Abstract—A method of creating an access to a waveguide arrangement in order to couple measuring signals into and/or out of the waveguide arrangement includes providing a cover for covering an opening in a waveguide wall of the waveguide arrangement at a location suitable as a measuring signal access, removing the cover, and replacing the cover with another cover equipped with a coupling device.

9 Claims, 3 Drawing Sheets



4,983,005 Jan. 8, 1991

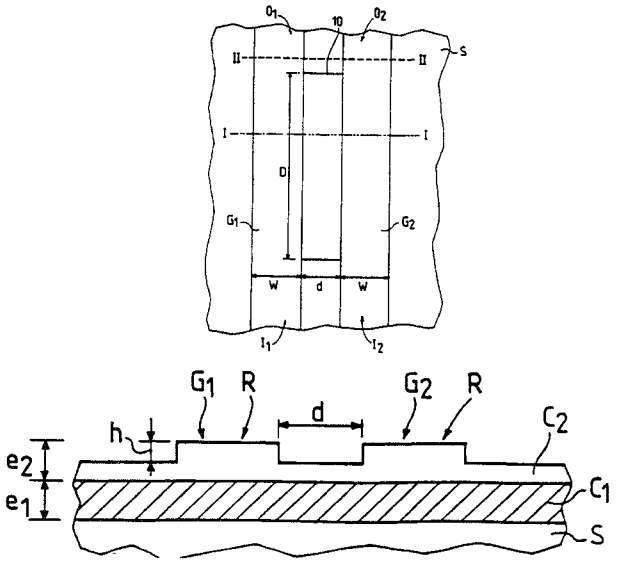
Optoelectronic Integrated Semiconductor Device Including a Separator of the TE and TM Polarizations

Inventor: Remi Gamonal.
Assignee: U.S. Philips Corp.
Filed: June 28, 1989.

Abstract—An optoelectronic integrated semiconductor device, including a separator of the polarizations TE and TM (this separator comprising two parallel and monomode optical guides $G1$ and $G2$, one of which receives at the input a luminous signal, and comprising means for carrying out the separation of this signal and its two components TE and TM, one of which (TE) is transported to the output through one of the guides while the other component (TM) is transported to the output through the other guide) is characterized in that:

- the guides are formed by at least a heterostructure S/C1 and by two parallel erected guiding ribbons R at the surface, and
- the means for carrying out the separation of the components TE and TM consist of a metallic layer extending between the guiding ribbons at the surface of the structure over a length whose value is connected with the coupling length of the component TE by the relation $D = L_c(\mathrm{TE})$, the parameters of the physical qualities of the device being chosen so that the relation $D = L(\mathrm{TE}) = 2L(\mathrm{TM})$, is satisfied.

14 Claims, 6 Drawing Sheets



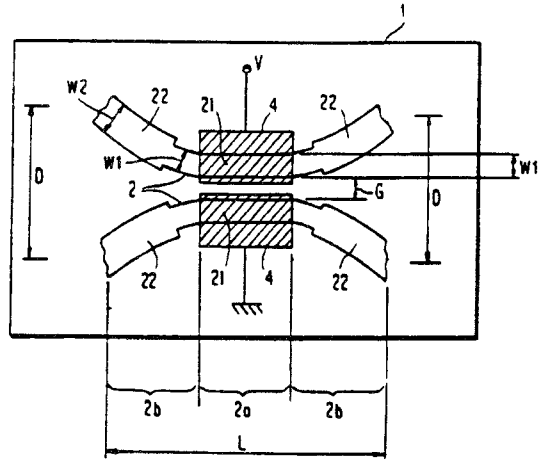
4,983,006 Jan. 8, 1991

Polarization-Independent Optical Waveguide Switch

Inventor: Hiroshi Nishimoto.
Assignee: NEC Corporation.
Filed: Mar. 29, 1989.

***Abstract*—A polarization-independent optical waveguide switch is provided featuring low loss and a small device element length by making the width of the optical waveguides in the light intake/outlet parts consisting of curved optical waveguides greater than the width of the optical waveguides of the optical coupling part.**

3 Claims, 3 Drawing Sheets



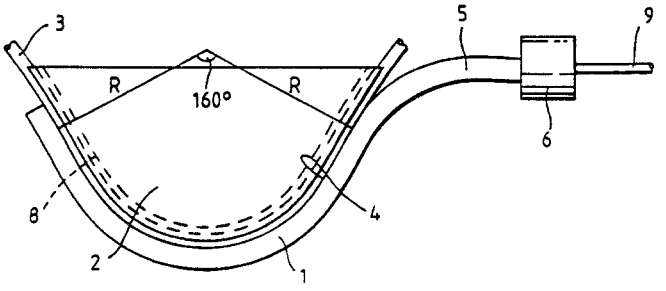
4,983,007 Jan. 8, 1991

Optical Coupling Device

Inventors: Simon M. James, Mark Davison, Stephen Hornung, and Michael H. Reeve.
Assignee: British Telecommunications.
PCT Filed: Mar. 24, 1988.

***Abstract*—A coupling device couples low power levels of optical radiation out of an optical fiber (3) for maintenance and fault-finding purposes. The assembled coupling device acts to clamp a fiber (3), with its primary plastics coating still in place, against the inner side of a gently curved silica rod (1). The rod (1) is strongly waveguiding and, picking up radiation leaked from the fiber (3), directs it to a photodetector (6). The device finds particular application in communications systems**

15 Claims, 2 Drawing Sheets



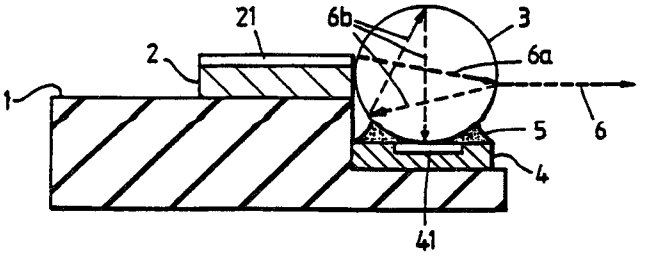
4,983,009 Jan. 8, 1991

Light Transmitting Device Utilizing Indirect Reflection

Inventor: Robert W. Musk.
Assignee: BT&D Technologies Limited.
PCT Filed: Nov. 28, 1988.

***Abstract*—An optical transmitter assembly comprises a laser (2) and an optical detector (4) arranged to receive light output from the laser (2) indirectly via a spherical lens (3). The source (2) and the detector (4) are mounted on a common support structure (1), and the lens (3) is mounted directly on the detector(4).**

19 Claims, 1 Drawing Sheet



4,983,014 Jan. 8, 1991

Bundle of Optical Fibers for Transmission of Electromagnetic Radiation of High Luminous Intensity

Inventor: Kurt Nattermann.
Assignee: Schott Glaswerke.
Filed: Oct. 17, 1989.

Abstract—A fiber bundle is provided for the transmission of high-power electromagnetic radiation, especially power lasers, wherein with a minimum expenditure of material, the radiation can be transmitted without substantial impairment in beam quality (in the beam product). Formulae are set forth for calculating the thickness of the fiber bundle, the numerical aperture, as well as the core and cladding thicknesses of the individual fibers.

26 Claims, No Drawings

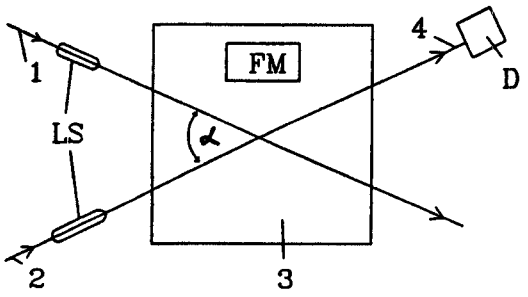
4,983,024 Jan. 8, 1991

Optical Phase to Amplitude Demodulation

Inventors: Simon A. Boothroyd, Jacek Chrostowski, and Maurice S. O'Sullivan.
Assignee: National Research Council Canada.
Filed: Oct. 5, 1989.

Abstract—A method of optical phase to amplitude demodulation comprises intersecting two mutually coherent beams of light inside a Kerr medium. One of the beams is unmodulated and the other is phase modulated. The Kerr medium is nonlinear and is characterized by an equation $n = n_0 + n_2 I$, where n is the local refractive index of the medium at a point of interest, n_0 is the linear refractive index of the medium, n_2 is a nonlinear refractive index of the medium and I is the light intensity at the point of interests. An amplitude modulated output beam is generated.

6 Claims, 1 Drawing Sheet



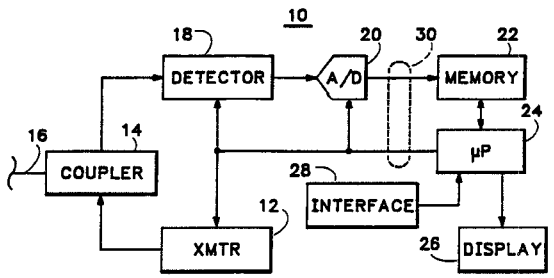
4,983,037 Jan. 8, 1991

Estimation of Fiber Loss and Return Signal Power

Inventors: Dean S. Messing and Ajay K. Luthra.
Assignee: Tektronix, Inc.
Filed: May 5, 1989.

Abstract—A method of determining estimates of fiber loss and return signal power for an optical fiber from a return signal uses a polynomial fit with data samples representing the return signal. From the polynomial fit an estimated fiber loss value is determined. The estimated return signal power is computed using a function of the estimated fiber loss value.

4 Claims, 2 Drawing Sheets



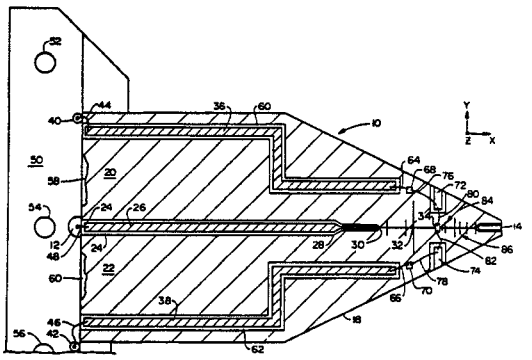
4,983,910 Jan. 8, 1991

Millimeter-Wave Active Probe

Inventors: Gholamreza Majidi-Ahy and David M. Bloom.
Assignee: Stanford University.
Filed: May 20, 1988.

Abstract—A millimeter-wave active probe for use in injecting signals with frequencies above 50 GHz to millimeter-wave and ultrafast devices and integrated circuits including a substrate upon which a frequency multiplier consisting of filter sections and impedance matching sections are fabricated in uniplanar transmission line format. A coaxial input and uniplanar 50-ohm transmission line couple an approximately 20-GHz input signal to a low-pass filter that rolls off at approximately 25 GHz. An input impedance matching section couples the energy from the low-pass filter to a pair of matched, antiparallel beam lead diodes. These diodes generate odd-numbered harmonics that are coupled out of the diodes by an output impedance matching network and bandpass filter that suppresses the fundamental and third harmonics and selects the fifth harmonic for presentation at an output.

12 Claims, 4 Drawing Sheets



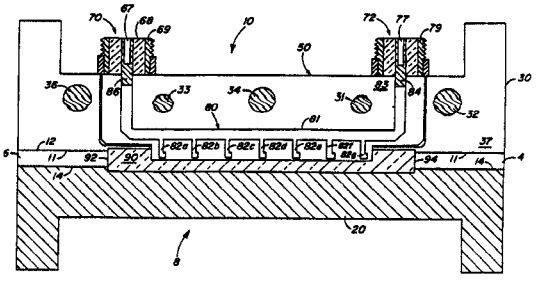
4,983,933 Jan. 8, 1991

Waveguide-to-Stripline Directional Coupler

Inventors: Paul R. Volk and Thomas R. Debski.
Assignee: Sedco Systems, Inc.
Filed: Oct. 5, 1989.

Abstract—A transducer adapted to couple radio frequency (RF) energy from a section of waveguide to a section of stripline is shown to comprise a section of stripline supporting a series of probes projecting inside the waveguide with a shaped length of a dielectric material disposed around the probes within the waveguide to match the velocity of propagation of the RF energy in the waveguide to the velocity of propagation in the stripline thereby achieving tight coupling and improved directivity.

9 Claims, 3 Drawing Sheets



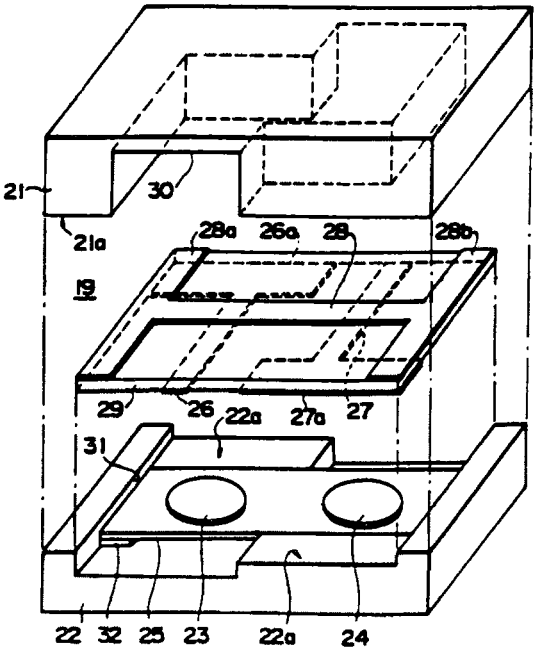
4,983,936 Jan. 8, 1991.

Ferromagnetic Resonance Device

Inventors: Yoshikazu Murakami, Takahiro Ogihara, Tsutomu Okamoto, and Kanako Niikura.
Assignee: Sony Corporation.
Filed: Feb. 21, 1989.

Abstract—A ferromagnetic resonance device is disclosed that utilize the perpendicular resonance of ferromagnetic YIG thin film operable under a dc bias magnetic field perpendicular to a major surface of the YIG thin-film element. By making the YIG thin film to have a major surface thereof (100) crystal plane of YIG or (111) crystal plane of a substituted YIG having reduced Ku value, lower limit of resonance frequency is extremely lowered. Thus wide range variable filter device can be obtained.

14 Claims, 9 Drawing Sheets



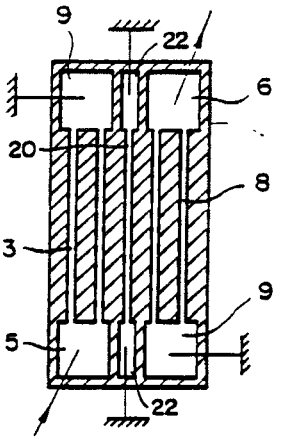
4,983,937 Jan. 8, 1991

Magnetostatic Wave Bandpass Filter

Inventors: Yasuaki Kinoshita, Sadami Kubota, and Shigeru Takeda.
Assignee: Hitachi, Ltd. and Hitachi Metals, Ltd.
Filed: July 5, 1989.

Abstract—A magnetostatic wave bandpass filter is disclosed that uses a planar structure, it has a single-crystal thin film formed on a single-crystal gadolinium gallium garnet substrate and mainly containing yttrium iron garnet. In this bandpass filter, input and output electrodes each made up of finger electrodes and pad electrodes are formed on the substrate or thin film, a high-frequency signal is applied to the input electrode, to excite a magnetostatic wave in the thin film, the magnetostatic wave is reflected from parallel straight edges of the thin film, to generate resonance, and a high-frequency current excited by the magnetostatic wave is taken out by the output electrode.

8 Claims, 5 Drawing Sheets



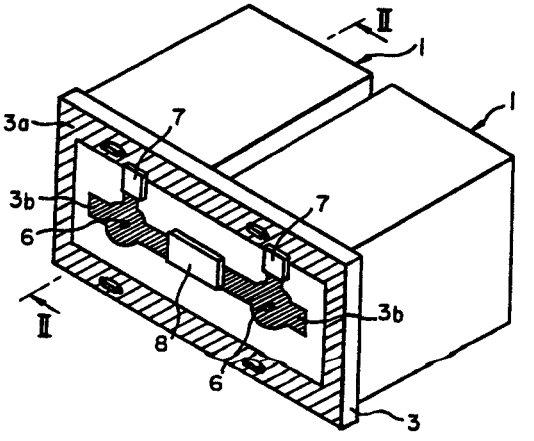
4,983,938 Jan. 8, 1991

Band-Stop Filter

Inventors: Kanemi Sasaki and Sadao Ogawa.
Assignee: Kokusai Electric Co., Ltd.
Filed: Oct. 17, 1989.

Abstract—A band-stop filter comprises a plurality of resonator units each comprised of an end-shorted coaxial resonator and a variable condensor connected in series therewith, a printed circuit board combining said resonator units in a multistage having thru-holes adjacent a bushing that isolates the inner conductor of the end-shorted coaxial resonator from the printed circuit board. A thru-hole conductor is provided in the thru-hole, and an adjusting screw having a radius is a little larger than the thru-hole. The adjusting screw can have both the proper torque and the electrical connection. The inner conductor surface of the resonator operates electrically as a stator and the adjusting screw operates as a rotor.

4 Claims, 3 Drawing Sheets



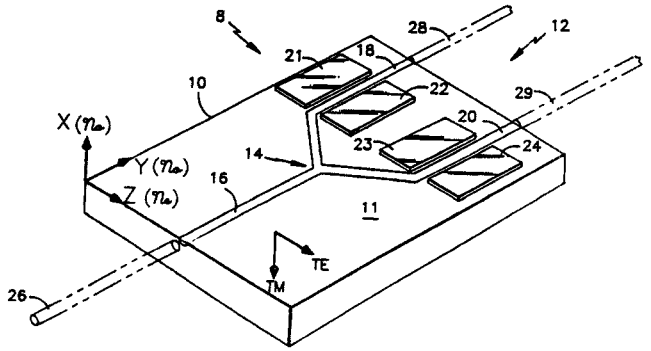
4,984,861 Jan. 15, 1991

Low-Loss Proton Exchanged Waveguides for Active Integrated Optic Devices and Method of Making Same

Inventors: Paul G. Suchoski, Jr. Talal K. Findakly, and Frederick J. Leonberger.
Assignee: United Technologies Corporation.
Filed: Mar. 27, 1989.

Abstract—A single polarization active IO device includes a crystalline material substrate having an IO circuit array comprising an optical waveguide array disposed on a major surface of the substrate by a two step proton exchange (TSPE) process, and including an electrode array disposed on the major surface in juxtaposed relation with the waveguide array to provide one or more active IO regions thereon.

22 Claims, 2 Drawing Sheets



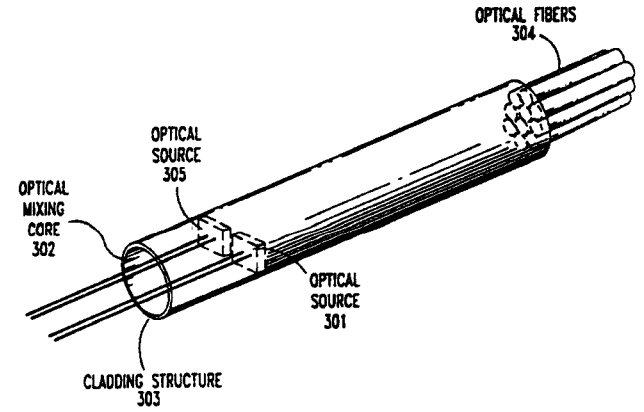
4,984,864 Jan. 15, 1991

Optical Splitter Having a Self-Contained Optical Source

Inventors: Lee L. Blyer, Jr. and Gary J. Grimes.
Assignee: AT&T Bell Laboratories.
Filed: Dec. 21, 1989.

Abstract—An optical splitter having a self-contained optical source with the optical core of the splitter being substantially numerical aperture matched to the optical source and to optical fibers connected to the splitter. By matching numerical apertures, efficient transfer of optical energy is achieved between the optical source and the connected optical fibers in spite of refractive index mismatch between the optical core and the connected optical fibers. The splitter is fabricated by inserting the optical source and optical fibers into a rigid cladding structure and filling the rigid cladding structure with a polymer, which after curing becomes an optical core for communicating light from the optical source to the optical fibers.

12 Claims, 2 Drawing Sheets



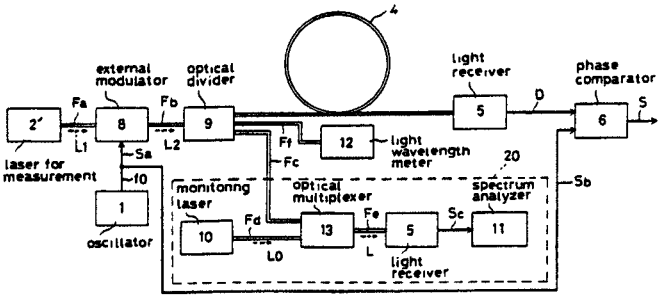
4,984,884 Jan. 15, 1991

Method for Measuring Dispersion Characteristics of an Optical Fiber

Inventors: Shiro Ryu, Kiyohumi Mochizuki, and Yukio Horiuchi.
Assignee: Kokusai Denshin Denwa Co., Ltd.
Filed: May 4, 1989.

Abstract—In measurement method of dispersion characteristics of an optical fiber, a laser for measurement connected to one end of the fiber and variable in output light wavelength and an oscillation for modulating a measurement light signal sent out from the laser are provided. The modulation frequency of the output from the oscillator is used as a reference electric signal. A measuring light signal obtained through the modulator 8 and transmitted through the fiber is converted into a measuring electric signal. And the characteristics are measured from the phase difference between the reference electric signal and the measuring electric signal, wherein an external modulator, an optical divider and a monitoring section are provided. The modulator modulates the measuring light signal sent out from the laser and having a narrow spectral linewidth. The divider divides the output light signal from the modulator, at a prescribed ratio. The measuring light signal obtained through the modulator is multiplexed with output light signal from a laser for monitoring by the section to generate a beat to measure the oscillation wavelength of the laser for measurement through optical heterodyne detection. The characteristics are measured while the result of the measurement of the oscillation wavelength is compared with that of the measurement of the phase difference.

3 Claims, 4 Drawing Sheets



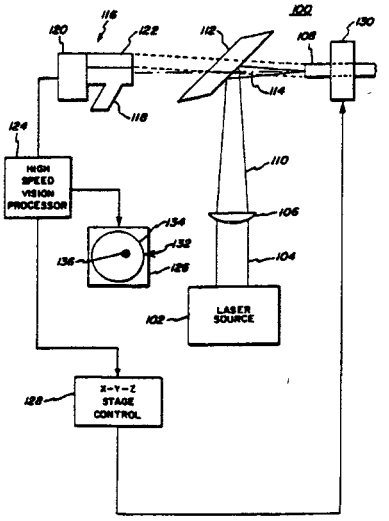
4,984,885 Jan. 15, 1991

Method and Apparatus for High-Power Optical Fiber Injection and Alignment

Inventor: Angel L. Ortiz, Jr.
Assignee: General Electric Company.
Filed: Dec. 15, 1989.

Abstract—A method and apparatus for controlling injection of a high-power beam into an optical fiber including generating a signal representative of a focus spot on an injection end of the optical fiber and adjusting the optical fiber injection end location dependent upon the representative focus spot signal. In one embodiment, the present system includes a vision system for generating the representative focus spot signal and a high-speed vision processor coupled to the vision system. An *x-y-z* stage controller is coupled to the vision processor and receives image signals from the vision system. The controller is coupled to a fiber holder, and the controller generates control signals that control operation of the fiber holder. The fiber holder includes *x-y-z* axis stages and means for engaging the optical fiber.

19 Claims, 5 Drawing Sheets



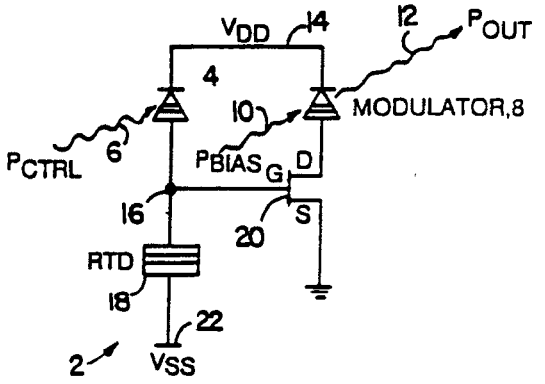
4,985,621 Jan. 15, 1991

Electrooptical Switch with Separate Detector and Modulator Modules

Inventors: Brian F. Aull, Kirby B. Nichols, and T. C. L. Gerhard Sollner.
Assignee: Massachusetts Institute of Technology.
Filed: Apr. 11, 1989.

***Abstract*—An electrooptical switch for modulating a bias light beam in response to a control beam. The switch includes a modulator for modulating the bias beam to produce an output light beam therefrom, the modulator having a variable transmissivity; a detector module for receiving the control beam and generating a control signal therefrom, the detector module exhibiting switching operation in response to the control beam; and an amplifier for amplifying the control signal to modulate the transmissivity of the modulator.**

27 Claims, 4 Drawing Sheets



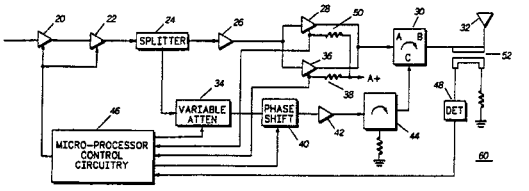
4,985,686 Jan. 15, 1991

Active Load Impedance Control System for Radio Frequency Power Amplifiers.

Inventors: Robert P. Davidson and Richard A. Rose.
Assignee: Motorola, Inc.
Filed: Dec. 4, 1989.

***Abstract*—An active load impedance control system for a radio frequency power amplifier comprising of an amplification means for amplifying radio frequency signals and providing a forward signal, a control means responsive to the operating conditions of said amplification means, a correction signal means responsive to the control means for providing an amplitude, a sampling means and phase controlled corrective reflective signal and a combining means for combining said forward signal and said corrective reflective signal.**

7 Claims, 1 Drawing Sheet



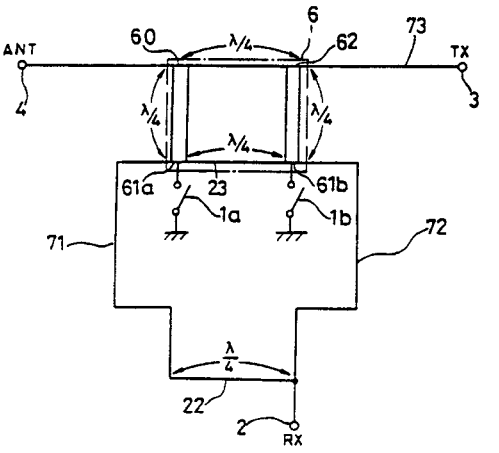
4,985,689 Jan. 15, 1991

Microwave Semiconductor Switch

Inventors: Yoshinobu Kadowaki and Yutaka Yoshii.
Assignee: Mitsubishi Denki Kabushiki Kaisha.
Filed: Sept. 27, 1989.

***Abstract*—A microwave transmit-receive switch for switching between transmission and reception of a microwave signal, including a directional coupler, an antenna terminal connected with an input terminal of the directional coupler, a transmission terminal connected to the isolation terminal of the directional coupler, two switches connected between the respective output terminals of the directional coupler and ground, respectively, a quarter wavelength phase delay element connecting one output terminal to a reception terminal and a transmission line having no phase delay connecting the other output terminal to the reception terminal of the switching.**

4 Claims, 2 Drawing Sheets



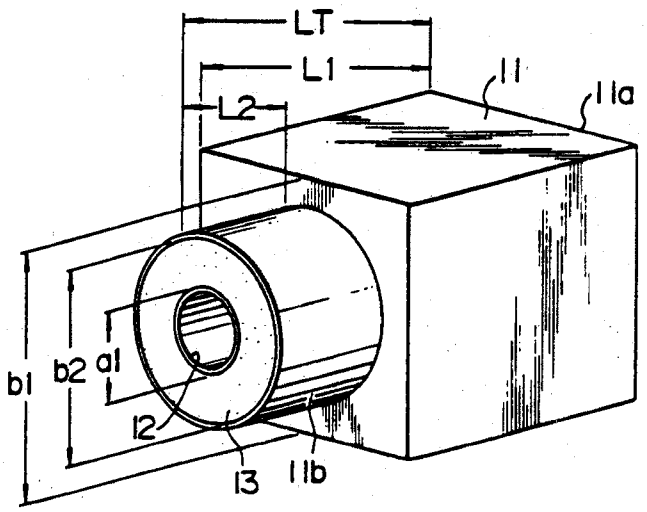
4,985,690 Jan. 15, 1991

Dielectric Stepped Impedance Resonator

Inventors: Kazuhiro Eguchi, Eiichi Ochiai, Shinichiro Ito, Takehiko Yoneda, Hiromitsu Taki, Toshiharu Noguchi, Kuniaki Kiyosue, Akiro Yoshida, Morikazu Sagawa, and Mitsuo Makimoto.
Assignee: Matsushita Electric Industrial Co., Ltd.
Filed: July 5, 1989.

Abstract—A coaxial dielectric resonator is for use at high frequency. The outer or inner peripheral surface of a tubular dielectric member is stepped so as to provide a greater suppression of spurious resonance. The dielectric member has a prism-shaped outer configuration so as to provide a high Q value, as well as improved space factor.

3 Claims, 6 Drawing Sheets



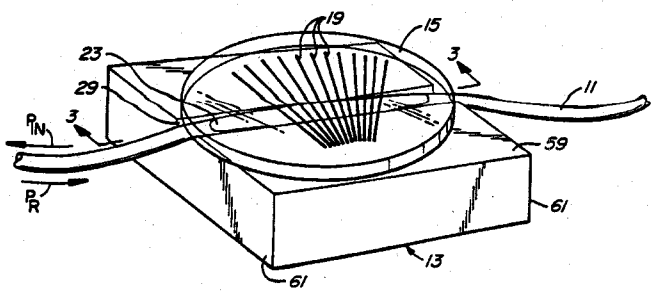
4,986,623 Jan. 22, 1991

Broad-band Tunable In-Line Filter for Fiber Optics

Inventor: Wayne V. Sorin.
Assignee: Hewlett-Packard Company.
Filed: May 15, 1989.

Abstract—A broad-band tunable in-fiber filter includes a grating with divergent ridges that can be translated transversely of a side-polished optical fiber to vary the periodicity at an exposed evanescent field. The divergence is gradual, so that at any given transverse position of the grating, the ridge interacting with the evanescent field are effectively parallel. The divergence is great enough so that a tuning-to-reflected bandwidth ratio of about 33:1 is demonstrated. The grating is fabricated in an amorphous silicon film on a fused quartz substrate. The film is coated with photoresist, which is exposed to a holographic interference front. The substrate is tilted with respect to an interference front created by two spherically diverging beams to achieve the desired divergence. Subsequent processing, including etching, are standard.

16 Claims, 9 Drawing Sheets



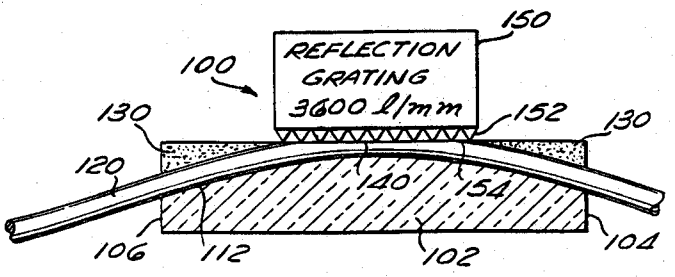
4,986,624 Jan. 22, 1991

Optical Fiber Evanescent Grating Reflector

Inventors: Wayne V. Sorin and Herbert J. Shaw.
Assignee: The Board of Trustees of Leland Stanford Junior University.
Filed: Jan. 20, 1988.

Abstract—A periodic grating structure is placed on a facing surface formed on an optical fiber so that the grating structure is within a portion of the evanescent field of an optical signal propagating through the optical fiber. The spatial periodicity of the grating structure is selected to be equal to one-half the propagation wavelength of the optical signal. The grating structure causes the optical signal to be reflected at an angle of 180 degrees and thus to propagate in a reverse direction from its original direction of propagation.

19 Claims, 3 Drawing Sheets



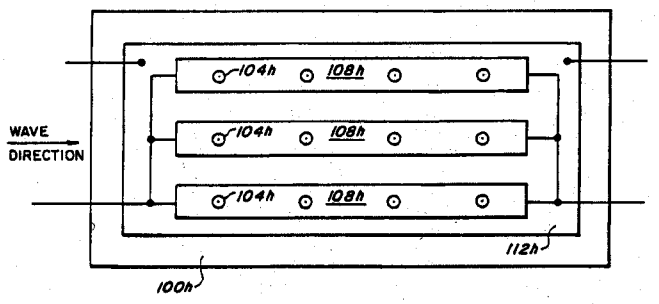
4,987,377 Jan. 22, 1991

Field Emitter Array Integrated Distributed Amplifiers

Inventors: Henry F. Gray and Richard F. Greene.
Assignee: The United States of America as represented by the Secretary of the Navy.
Filed: Oct. 31, 1989.

Abstract—Distributed amplifiers in integrated circuit form wherein dielectric material and electrically conductive material combine to form field emitter cathodes, grids, and anodes in a module forming one or more amplifier cells embedded in a matrix of reactive impedances that form companion stripline-like transmission lines in a vacuum or sufficiently low-pressure gas such that electrons remain unscattered during travel over trajectories from cathode to anode in a cell.

8 Claims, 15 Drawing Sheets



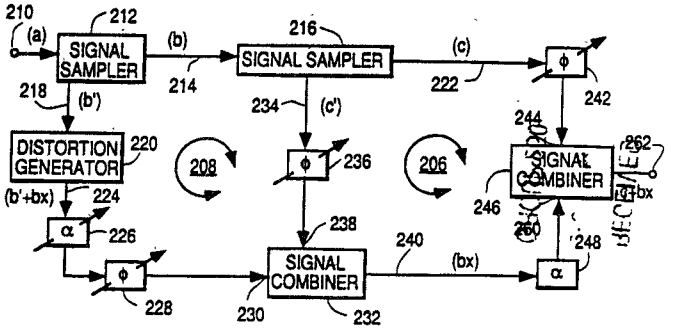
4,987,378 Jan. 22, 1991

Feedforward Predistortion Linearizer

Inventors: Brian E. Eggleston and Allen Katz.
Assignee: General Electric Company.
Filed: Nov. 28, 1989.

Abstract—A feedforward predistortion equalizer includes a first loop with a signal divider for dividing signals into first and second portions, and a distortion generator for distorting the second signal. The first loop is completed by a signal combiner that combines the undistorted first signal and the distorted second signal. The phase and amplitude of the signals in the loop are controlled so that the linear or carrier signal component is cancelled, leaving at the output of the first combiner only the distortion component of the distorted signal. A second loop includes phase and amplitude controls for combining the pure distortion and undistorted signals to produce the desired predistorted signals. In a particular embodiment, the phase and amplitude controls of the first loop are automatically adjusted for a null.

14 Claims, 8 Drawing Sheets



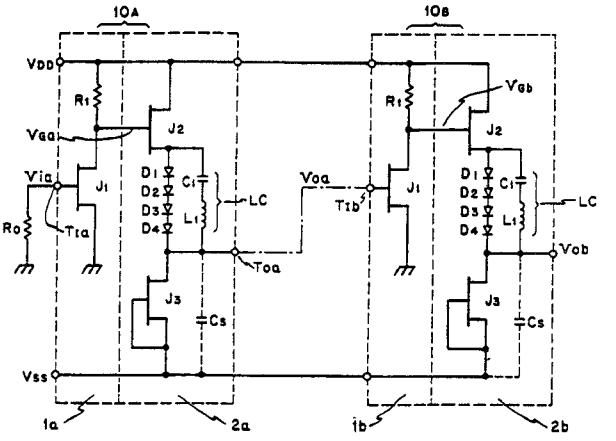
4,987,382 Jan. 22, 1991

Microwave Integrated Circuit Having a Level Shift Circuit

Inventors: Yasuo Saitoh.
Assignee: NEC Corporation.
Filed: Oct. 13, 1989.

Abstract—A microwave integrated circuit having a level shift circuit includes level shift diodes connected in series, a transistor resistor connected to form a two-terminal device that serves as a resistance, a field effect transistor and a series resonant circuit. The field effect transistor may be a GaAs field effect transistor and has a gate electrode receiving an input signal having frequency ranges from dc to super high frequencies, a drain electrode connected to the drain voltage line and a source electrode connected, through the series connection of the level shift diodes, to the transistor resistor and an output terminal. The series resonant circuit comprises a peaking capacitance and a peaking inductance and is provided in parallel with the level diodes. The series resonant circuit connected in parallel with the level shift diodes enables to reduce the device area for the level shift circuit and improves high-frequency characteristics thereof.

11 Claims, 2 Drawing Sheets



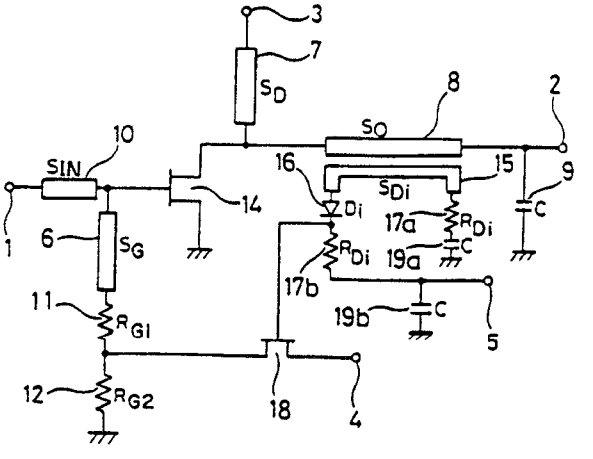
4,987,384 Jan. 22, 1991

High-Frequency Amplifier

Inventors: Masahide Yamanouchi and Tetsuro Mori.
Assignee: Mitsubishi Denki Kabushiki Kaisha.
Filed: Oct. 2, 1989.

Abstract—A high-frequency amplifier including a field-effect transistor as the amplifying element, includes an output detection section stripline for detecting the level of the output signal from the field-effect transistor conducting main amplification, a pair of resistors connected between the both ends of the output detection section stripline and ground, a second field effect-transistor to the gate of which a resistor from one end of the output detection section stripline is connected, the source or drain of the second field-effect transistor being connected to the gate bias circuit of the main amplifying FET for controlling the drain current of the main amplifying FET in response to the output signal level of the main amplifying FET.

9 Claims, 3 Drawing Sheets



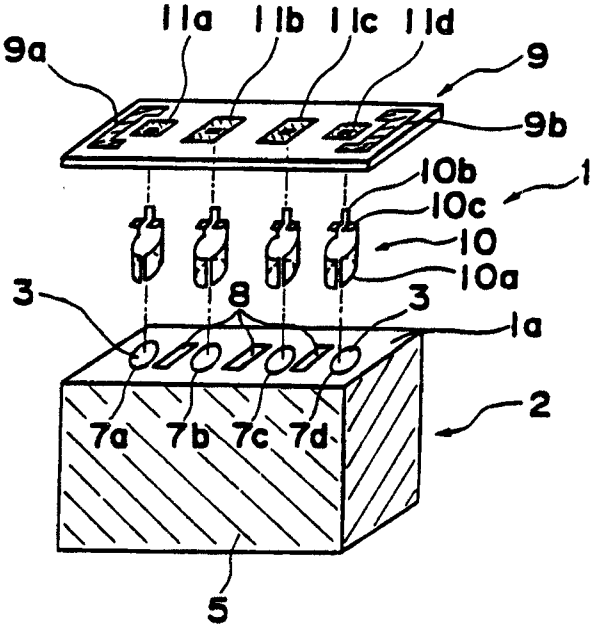
4,987,393 Jan. 22, 1991

Dielectric Filter of Solid Mold Type With Frequency Adjustment Electrodes

Inventors: Tadahiro Yorita and Haruo Matsumoto.
Assignee: Murata Manufacturing Co., Ltd.
Filed: Sept. 20, 1988.

Abstract—A filter having an improved frequency adjustment construction that is capable of conforming the frequencies of the resonators with better accuracy through improvements in the accuracy of the sizes of the electrodes used for frequency adjustment, and through better stabilizing of the filter characteristics through forming a positive connection between each electrode for adjustment use and the corresponding inner conductive film. Electrodes for adjustment use are formed on a base plate, which is a separate unit from the dielectric block, so as to connect them with the respective resonators through coupling members, whereby the size accuracy of the electrodes for adjustment use is improved so as to considerably improve the frequency adjustment accuracy. Also, the connection between the electrodes for adjustment use and the inner conductive films of the respective resonators is positively stabilized to improve the stability of the filter characteristics.

10 Claims, 4 Drawing Sheets



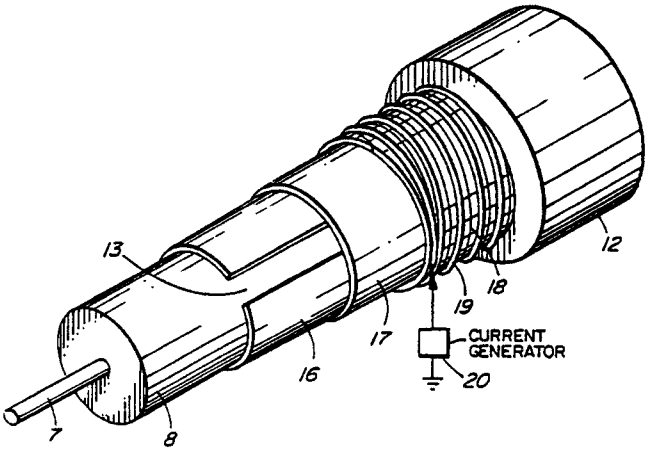
4,987,394 Jan. 22, 1991

Leaky Cables

Inventors: R. Keith Harman and Kenneth L. Smith.
Assignee: Senstar Corporation.
Filed: Dec. 1, 1987.

Abstract—A leaky cable useful antenna or as an intruder detector sensor either buried in a single trench or above ground substantially reducing sensitivity variations due to the environment. Egression of the electric field from the cable is blocked by magnetic fields escape. The velocity of the externally propagating electromagnetic field is slowed and attenuated. In one embodiment, the leaky coaxial cable is comprised of an inner conductor, a dielectric surrounding the inner conductor, a first external shield having a low-series impedance at VHF frequencies surrounding the dielectric, means for coupling a magnetic field through the first external shield, a second external shield surrounding the first external shield having high-series impedance relative to series impedance of the first external shield and means for limiting VHF conduction current between the shields, which effectively causes separation of the internal and external propagation fields of the cables. The external shields are arranged so that the first external low-series impedance shield does not short circuit the second external high-series impedance shield, thus separating the internal and external propagating fields of the cable. A thin semiconductor or insulating sheath can be placed between the two shields. Alternatively, the skin depths at VHF in the two shields are made adequate to effectively separate the two signals. The external signal, propagating on the outside of the second external shield and the internal signal propagating on the first external shield are effectively separated thereby.

51 Claims, 3 Drawing Sheets



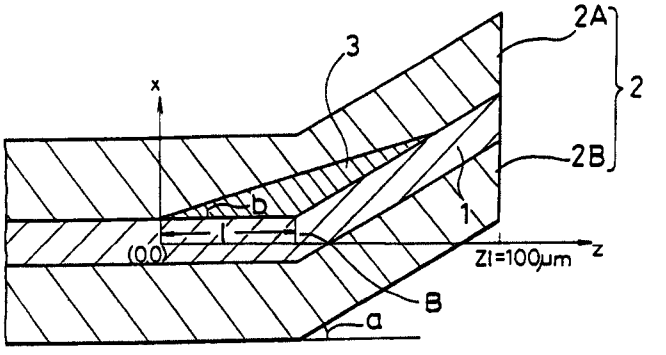
4,988,156 Jan. 29, 1991

Bent Waveguide for an Optical Integrated Circuit

Inventor: Kimio Shigihara.
Assignee: Mitsubishi Denki Kabushiki Kaisha.
Filed: Aug. 31, 1988.

Abstract—A bent waveguide for an optical integrated circuit includes a core region, cladding regions disposed at both sides of the core region forming a waveguide including a bent portion comprising the core region and the cladding region, a local waveguide region in the cladding region at the inner side of the bent portion. The local waveguide region has a larger refractive index than that of the core region or than that of the cladding region.

7 Claims, 2 Drawing Sheets



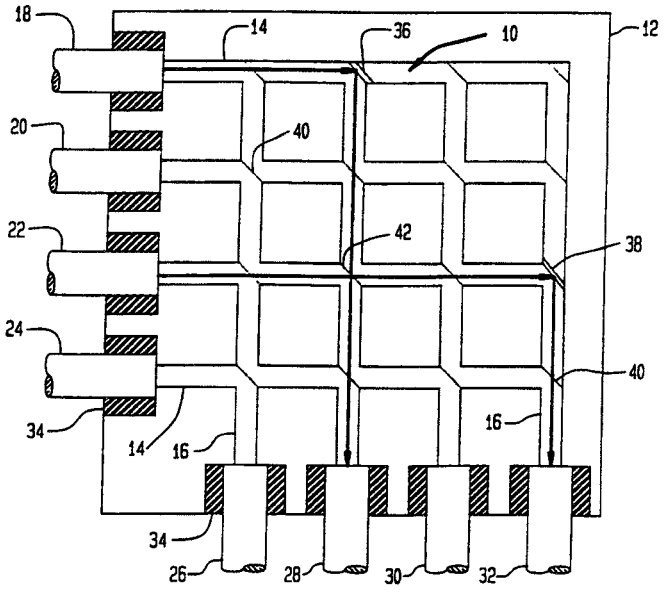
4,988,157 Jan. 29, 1991

Optical Switch Using Bubbles

Inventors: Janet L. Jackel and Walter J. Tomlinson.
Assignee: Bell Communications Research, Inc.
Filed: Mar. 8, 1990.

Abstract—An optical switch, particularly useful as a bistable cross-connect matrix. Parallel input waveguides and parallel output waveguides are formed on a substrate at perpendicular angles so as to intersect. A 45° slot is formed across each intersection and is filled with a fluid having a refractive index matching the waveguide material. Electrodes are positioned adjacent to the slots and are selectively activated to electrolytically convert the fluid to gaseous bubbles, thereby destroying the index matching across the slot and causing light to be reflected by the slot rather than propagating across the slot. In the presence of a catalyst, a pulse of opposite polarity or of sufficient size and of the same polarity will destroy the bubble.

14 Claims, 6 Drawing Sheets



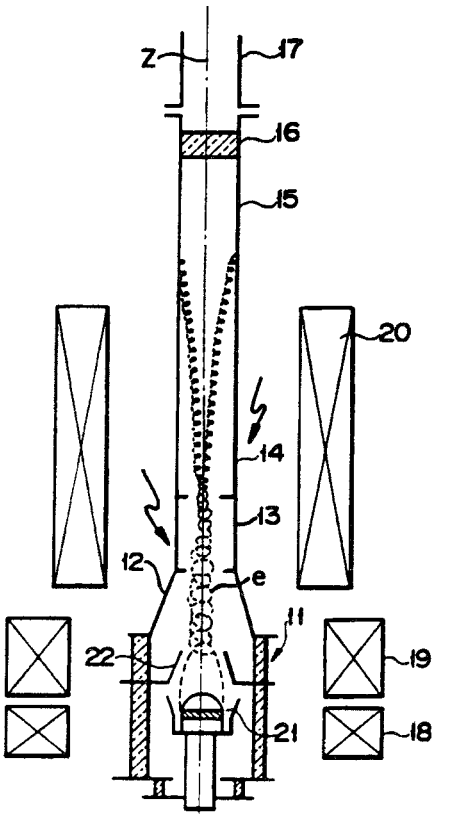
4,988,956 Jan. 29, 1991

Auto-Resonant Peniotron Having Amplifying Waveguide Section

Inventors: Shoichi Ono, Kuniyoshi Yokoo, and Tadashi Okamoto.
Assignee: Kabushiki Kaisha Toshiba.
Filed: Oct. 27, 1989.

Abstract—In a peniotron, a hollow electron beam is generated from a cathode gun assembly and a dc magnetic field is applied to the electron beam from solenoid coils. Thus, each electron of the electron beam is gyrated into a resonant cavity and into propagating waveguide sections that are maintained in auto-resonant conditions so that the electrons interact with an electromagnetic wave of TE mode not only in the resonant cavity section, but also in a waveguide section. Accordingly the electromagnetic wave is oscillated in the resonant waveguide section and amplified in the propagating waveguide section in such a manner that the level of the electromagnetic wave in the resonant cavity section is far less than the output power from said propagating waveguide.

4 Claims, 5 Drawing Sheets



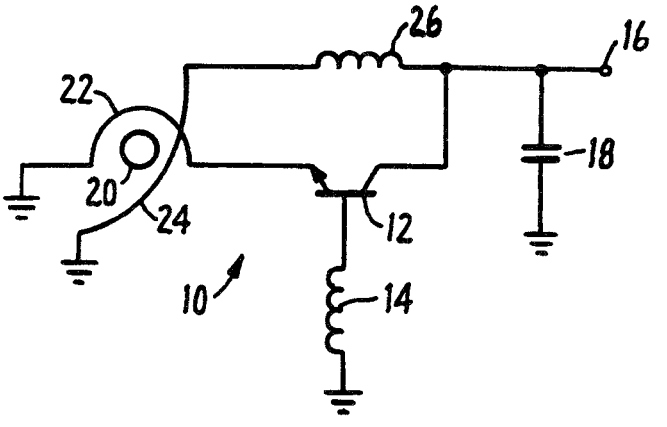
4,988,959 Jan. 29, 1991

YIG-Tuned Oscillator Using Composite Feedback

Inventors: Amarpal S. Khanna and Derek Davis.
Assignee: Avantek, Inc.
Filed: Oct. 31, 1989.

Abstract—A broad-band YIG-tuned oscillator is disclosed that has both series and parallel feedback provided by a YIG sphere. The oscillator includes a transistor capable of driving a load coupled to a first port of the transistor, a reactive feedback element coupled to a second port of the transistor, a YIG resonator, and coupling means for coupling the YIG resonator to both a third port of the transistor and to the first port of the transistor.

8 Claims, 1 Drawing Sheet



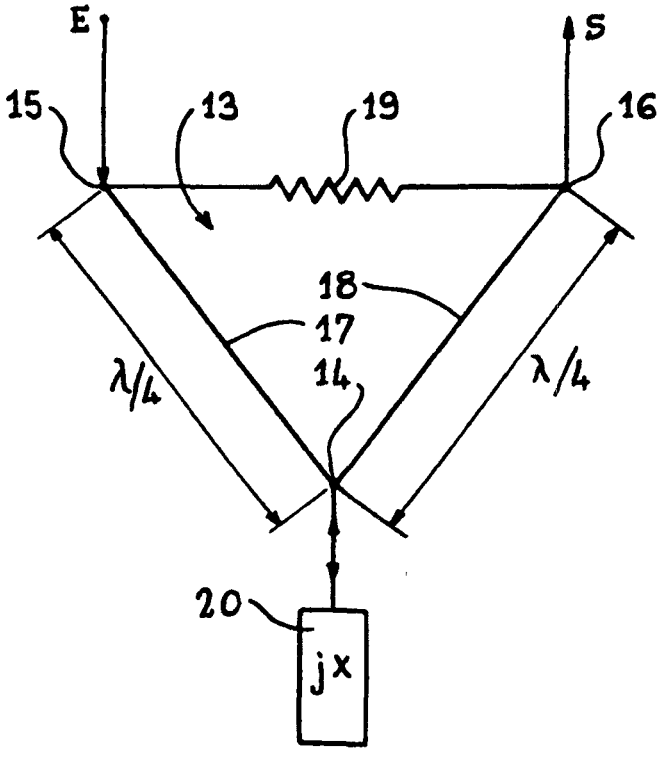
4,988,962 Jan. 29, 1991

Circuit for Correcting Group Delay at Microwave Frequencies

Inventor: Patrick Janer.
Assignee: Alcatel Transmission Par Faisceaus Hertziens A.T.F.H.
Filed: Oct. 27, 1989.

Abstract—A microwave frequency group delay corrector operates by reflecting the microwave on a correcting complex impedance (jx). It makes use of a power divider (13), of the Wilkinson type. The complex impedance (20) is connected to the port (14), which is normally the inlet port to the power divider (13). The microwave (E) is applied to one of the other two ports (15), and the remaining other port (16) is used as the port from which the phase corrected outlet microwave (S) is taken.

3 Claims, 2 Drawing Sheets



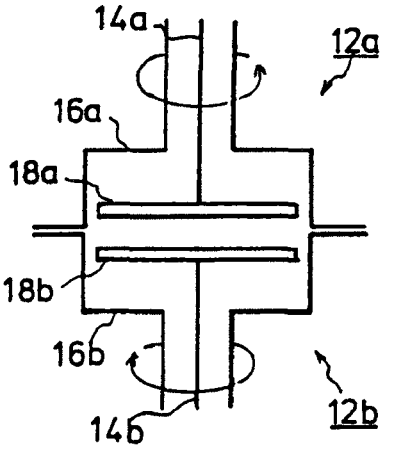
4,988,963 Jan. 29, 1991

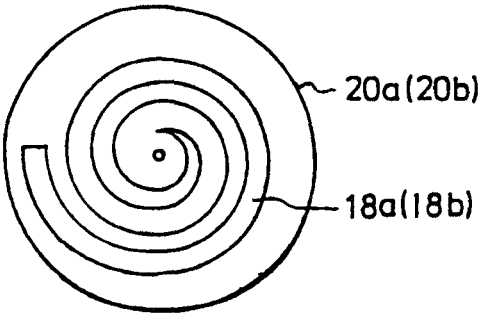
High-Frequency Coaxial Line Coupling Device

Inventors: Toshiaki Shirosaka and Nobuyuki Ten.
Assignee: DX Antenna Company, Limited.
Filed: Jan. 8, 1990.

Abstract—A high-frequency coaxial line coupling device that is insertable along the length of a coaxial line such as that which connects a rotary antenna carried on a moving body such as a vehicle or vessel to receive a signal from a communication or broadcast satellite, with a receiver component such as a tuner fixed to the moving body, for the purpose of allowing free relative rotation of the two segments of the coaxial line separated by the coupling device and preventing a twist or entanglement of the coaxial line caused by rotation of the antenna with the turning movement of the moving body. The device structure provides for a low transmission loss characteristic over a wide frequency range.

5 Claims, 5 Drawing Sheets





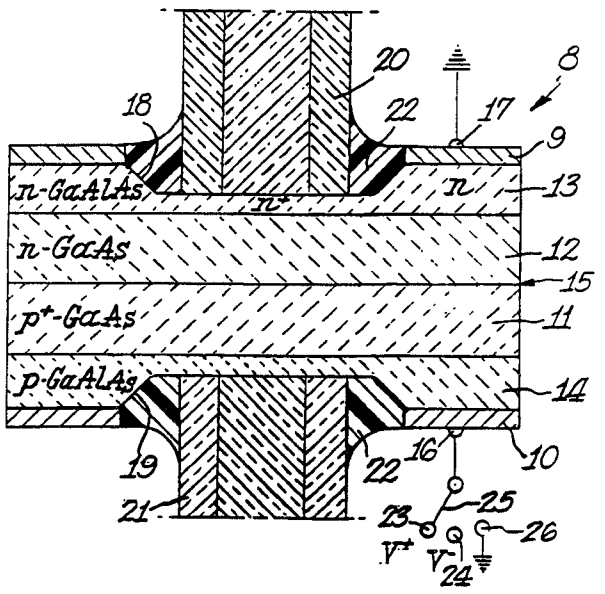
4,989,051 Jan. 29, 1991

Bidirectional, Feed-Through Emitter-Detector for Optical Fiber Transmission Lines

Inventors: Thomas W. Whitehead, Robert G. Hunsperger, and Garfield Simms.
Assignee: The University of Delaware and E.I. DuPont de Nemours & Co.
Filed: Feb. 13, 1990.

Abstract—A unitary emitter-detector diode device for direct optical coupling to optical transmission lines as two surface oriental optical fibers on lateral surfaces of the device. The device has a *p-n* junction formed between a heavily doped semiconducting layer and a lightly doped semiconducting layer and means for guiding and concentrating the recombination of carriers within the diode. The feed-through geometry permits transmitting in either direction from the device, as well as detecting.

13 Claims, 3 Drawing Sheets



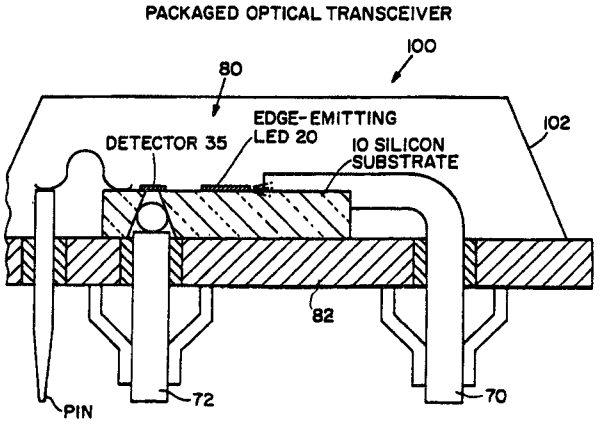
4,989,934 Feb. 5, 1991

Monolithic Integrated Transceiver of III-V Devices on Silicon

Inventors: Paul M. Zavracky, Matthew M. Zavracky, John C. C. Fan, and Jack P. Salerno.
Assignee: Kopin Corporation.
Filed: Nov. 3, 1989.

Abstract—A monolithic integrated transceiver formed on an Si substrate comprising of a III-V compound light source, a III-V compound light detector, and a pyramidal groove formed in the substrate for aligning an optical fiber with said transmitter.

10 Claims, 5 Drawing Sheets



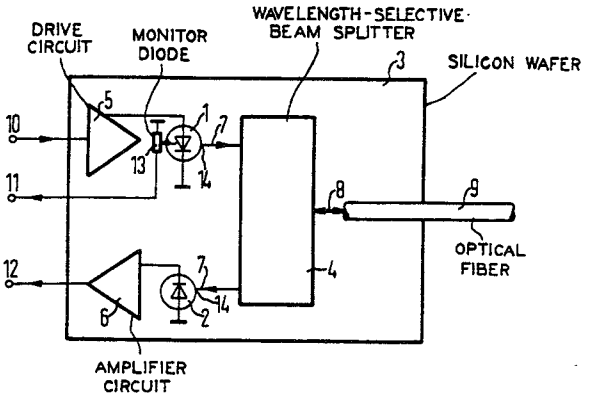
4,989,935 Feb. 5, 1991

Optoelectronic Transmitter and Receiver

Inventor: Karl-Ulrich Stein.
Assignee: Siemens Aktiengesellschaft.
Filed: Sept. 18, 1989.

Abstract—An optoelectronic transmission and reception device includes an optical transmitter inserted into a silicon wafer as a laser chip composed of III-V compound semiconductor material, an optical receiver inserted into the silicon wafer as a reception diode chip composed of III-V compound semiconductor material or which is monolithically integrated into the silicon wafer as a metal-semiconductor diode. A coupling optics for connection to an optical fiber is monolithically integrated into the silicon wafer, as is a controller that includes a drive circuit for the transmitter and a preamplifier circuit for the receiver, a wavelength selective beam splitter and light wave guides for light guidance. The device is particularly useful as a bidirectional transmission and reception module.

25 Claims, 1 Drawing Sheet



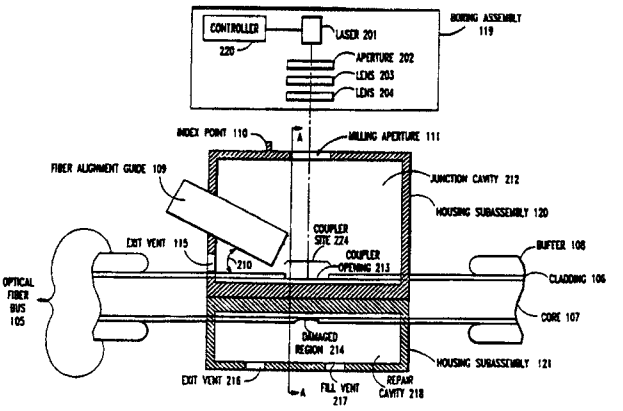
4,989,936 Feb. 5, 1991

Fabrication of Optical Components Utilizing a Laser

Inventors: Richard J. Coyle, Jr., Gary J. Grimes, Lawrence J. Haas, Anthony J. Serafino, and George J. Shevchuk.
Assignee: AT&T Bell Laboratories.
Filed: Dec. 21, 1989.

Abstract—An excimer laser fabricates either an optical coupler opening or an optical mode scrambler by ablatively removing the cladding from the optical core of an optical fiber bus without damaging the optical core. Either coupler housing or a mode scrambler housing is attached to the optical fiber bus where the coupler or mode scrambler is to be fabricated. The coupler housing is used to position the laser, secure and align a coupler fiber, and provide cavities for junction and cladding repair materials. The mode scrambler housing serves a similar purpose.

3 Claims, 6 Drawing Sheets



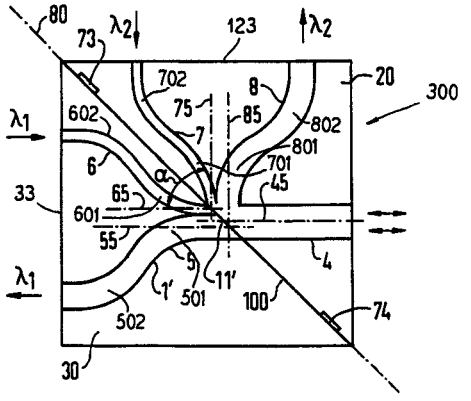
4,989,937 Feb. 5, 1991

Light Waveguide Coupler Having Three or More Gates and Utilizing the Beam Splitter Principle and the Method for Manufacture

Inventors: Hans F. Mahlein and Gerhard Winzer.
Assignee: Siemens Aktiengesellschaft.
Filed: May 16, 1986.

Abstract—A method for forming a three-gate optical coupler, operating on a beam-splitting principle, or a five-gate optical coupler characterized by providing a carrier block having a pair of marks to define a line of a parting plane, creating a continuous branching waveguide structure having a waveguide node located adjacent to the parting plane of the carrier block by a ion exchange method, parting the carrier block in the parting plane, polishing the parted surfaces and forming a light transmitting optical layer, such as a frequency selective filter layer on a polished surface, then rejoining the two parts with the waveguides aligned. The method is particularly useful in forming three-gate and five-gate frequency multiplexers/demultiplexers, which have a continuous light waveguide structure except in the location of the frequency selective filter layer.

12 Claims, 4 Drawing Sheets



4,989,938 Feb. 5, 1991

Continuously Variable Fiber-Optic Attenuator

Inventor: Thomas W. Tamulevich.
Assignee: Light Control Systems, Inc.
Filed: Feb. 7, 1990.

Abstract—A continuously variable fiber-optic attenuator that can be constructed in a size amenable to direct mounting on optical data application apparatus is presented. The attenuator utilizes a flexible filter of varying optical density that is oriented in an optical coupling region between two optical fibers. The filter can be displaced in a manner to vary the filter density in the optical coupling region and thereby vary the attenuation across the device. A resistor coupled to the attenuator provides means for calibration of the attenuator to provide a highly accurate and reproducible attenuation.

11 Claims, 2 Drawing Sheets