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.

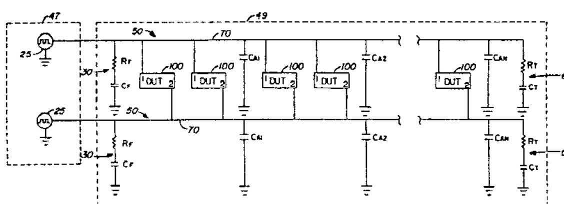
5,086,271 Feb. 4, 1992

Driver System and Distributed Transmission Line Network for Driving Devices Under Test

Inventors: Harry K. Haill, James R. Birchak, and Wai-Leung Hon.
Assignee: Reliability Incorporated.
Filed: Jan. 12, 1990.

Abstract—A distributed transmission line network for connecting a plurality of DUT's to a low-power driver includes a plurality of distributed transmission lines with distributed capacitors. The distributed capacitors are added to the distributed transmission lines to make the propagation delay on each line equal, thereby eliminating skewed input signals to the DUT's. The capacitors also minimize capacitive cross-talk between the plurality of distributed transmission lines. The distributed transmission line network includes a driver with an internal resistance that is much less than the characteristic impedance of the distributed transmission line to minimize the voltage drop at the driver. The distributed transmission line also includes an input RC network for speeding rise time and a termination RC network for minimizing reflections in the distributed transmission line.

37 Claims, 3 Drawing Sheets



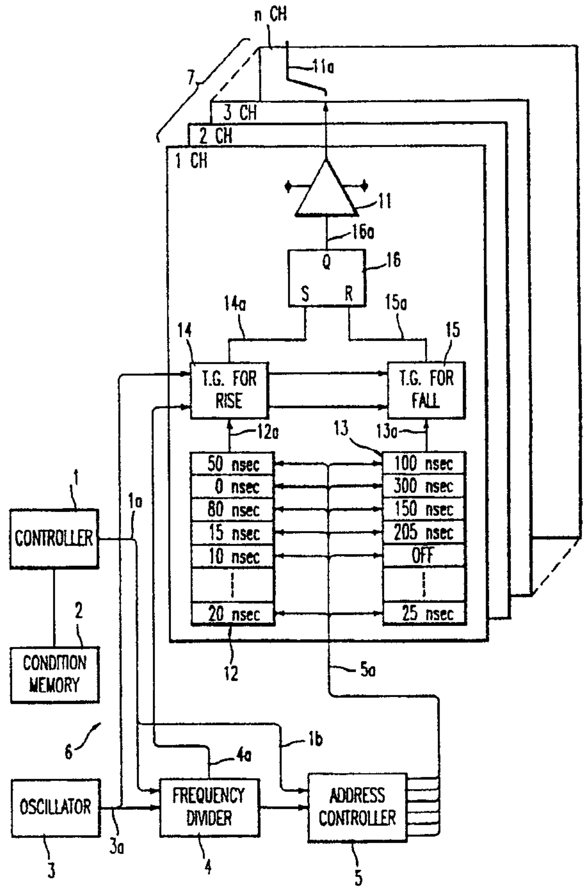
5,086,280 Feb. 4, 1992

continuously Variable Pulsewidth Waveform Formation Device Employing Two Memories

Inventors: Ryuuji Ohmura and Naomi Higashino.
Assignee: Mitsubishi Denki Kabushiki Kaisha.
Filed: July 12, 1990.

Abstract—A waveform formation device according to the present invention comprises a memory storing rise time data and fall time data related to an output waveform, a first timing generator for producing a set signal at a timing related to the rise time data, and a second timing generator for producing a reset signal at a timing related to the fall time data. A flip-flop circuit of the device produces an output signal which rises in response to the set signal and falls in response to the reset signal.

5 Claims, 5 Drawing Sheets



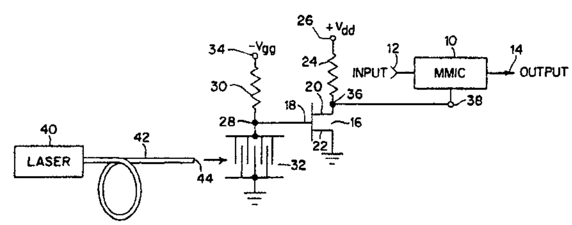
5,086,281 Feb. 4, 1992

Optical Control Circuit for a Microwave Monolithic Integrated Circuit

Inventor: Arthur Paolella.
Assignee: The United States of America as represented by the Secretary of the Army.
Filed: Mar. 4, 1991.

Abstract—A GaAs MESFET coupled to an interdigited photo-conductive detector uses the internal gain of the interdigited photo-conductive conductor and the transconductance of the MESFET to convert an optical control signal to an electrical current control signal which in turn is used to control a GaAs MMIC.

8 Claims, 1 Drawing Sheet



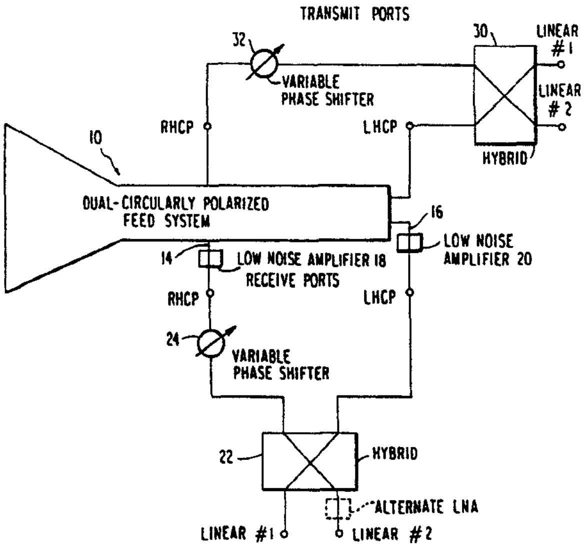
5,086,301 Feb. 4, 1992

Polarization Converter Application for Accessing Linearly Polarized Satellites with Single- or Dual-Circularly Polarized Earth Station Antennas

Inventors: William J. English and Hans H. Viskum.
Assignee: Intelsat.
Filed: Jan. 10, 1990.

Abstract—A single- or dual-circularly polarized earth station antenna is converted into a single- or dual-linearly polarized earth station antenna for accessing linearly polarized satellites. In a first embodiment, a free-space meander line polarizer providing a 90° differential phase shift between two orthogonal polarization is disposed in front of the earth station antenna feed system. In a second embodiment, a power dividing (transmit) or power combining (receive) network operates in conjunction with differential phase shift circuits to achieve the polarization conversion.

11 Claims, 1 Drawing Sheet



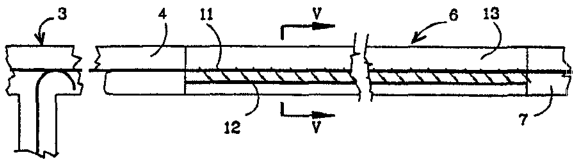
5,087,108 Feb. 11, 1992

Double-Core Active-Fiber Optical Amplifier having a Wide-Band Signal Wavelength

Inventors: Giogio Grasso, Paul L. Scrivener, and Andrew P. Appleyard.
Assignee: Societa' Cavi Pirelli S.p.A.
Filed: July 13, 1990.

Abstract—The invention relates to an optical amplifier, in particular for optical fiber telecommunication lines (1), operating with a transmission signal in a predetermined wavelength range, which amplifier comprises a fluorescent active optical fiber (6) doped with erbium, having two cores (11 and 12, 101 and 102), one (11, 101) of which is connected to a fiber (4) in which a transmission signal to be amplified and a luminous pumping energy are multiplexed, and to an outgoing fiber adapted to transmit the amplified signal, whereas the second core (12, 102) is optically coupled to the first core and is capable of absorbing the spontaneous erbium emission which would constitute a noise source, allowing a signal to be amplified in a wavelength range substantially corresponding to the tolerance range of the commercially available signal laser emitters.

25 Claims, 3 Drawing Sheets



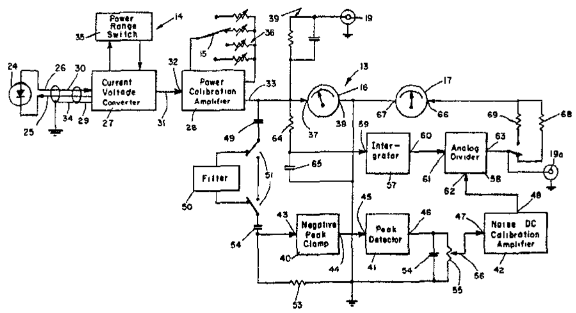
5,087,808 Feb. 11, 1992

Combned Optical Power and Noise Meter

Inventor: Edwin A. Reed.
Filed: Feb. 26, 1991.

Abstract—A combined optical power and noise meter for measuring both optical power and optical noise includes a detector housing and a photodiode which is disposed in the detector housing. The resistence of the photodiode changes continually in response to the application of optical power thereon. A current to voltage converter applies a bias voltage to the photodiode and transforms an output current therefrom in order to obtain a power voltage which is proportional to the optical power. A first voltage meter is electrically coupled to the current to voltage converter in order to display the power voltage. A noise measuring circuit measures noise in the output voltage of the current to voltage converter and processes the output voltage in order to obtain a noise voltage that is proportional to the optical noise. A divider divides the noise voltage by the power voltage in order to obtain an optical noise to optical power voltage which is proportional to the ratio of optical noise to optical power. A second voltage meter is electrically coupled to the divider in order to display the optical noise to optical power voltage.

1 Claim, 2 Drawing Sheets



5,087,896 Feb. 11, 1992

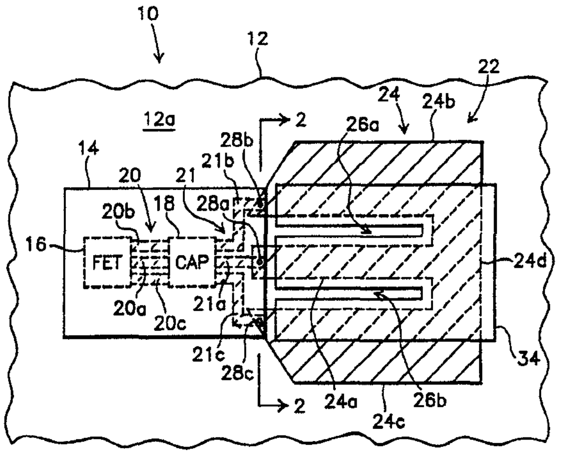
Flip-Chip MMIC Oscillator Assembly with Off-Chip Coplanar Waveguide Resonant Inductor

Inventors: Cheng P. Wen, Gregory S, Mendolia, Mario Siracusa, Joseph J. Maieron, and William D. Higdon.
Assignee: Hughes Aircraft Company.
Filed: Jan. 16, 1991.

Abstract—A coplanar waveguide based microwave monolithic integrated circuit (MMIC) oscillator chip (14) having an active oscillator element (16)

and a resonant capacitor (18) formed thereon is flip-chip mounted on a dielectric substrate (12). A resonant inductor (22) is formed on the substrate (12) and interconnected with the resonant capacitor (18) to form a high Q-factor resonant circuit for the oscillator (10). The resonant inductor (22) includes a shorted coplanar waveguide section (24) consisting of first and second ground strips (24*b*, 24*c*), and a conductor strip (24*a*) extending between the first and second ground strips (24*b*, 24*c*) in parallel relation thereto and being separated therefrom by first and second spaces ((26*a*, 26*b*) respectively. A shorting strip (24*d*) electrically interconnects adjacent ends of the conductor strip (24*a*) and first and second ground strips (24*b*, 24*c*) respectively. A dielectric film (34) may be formed over at least adjacent portions of the conductor strip (24*a*) and first and second ground strips (24*b*, 24*c*). The resonant inductor (22) is adjusted to provide a predetermined resonant frequency for the oscillator (10) by using a laser (40) to remove part of the dielectric film (34) in the first and second spaces (26*a*, 26*b*) for fine adjustment, and/or to remove part of the shorting strip (24*d*) at the ends of the first and second spaces (26*a*, 26*b*) for coarse adjustment.

26 Claims, 2 Drawing Sheets



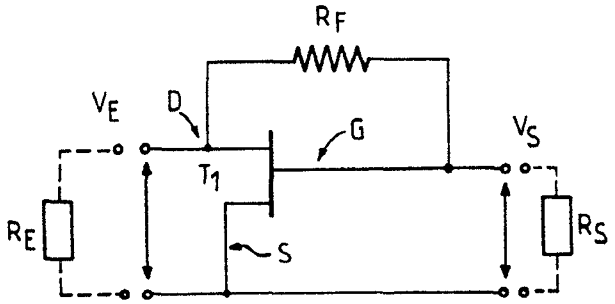
5,087,898 Feb. 11, 1992

Integrated Semiconductor Active Isolator Circuit

Inventors: Ramesh Pyndiah and Francis van den Bogaart.
Assignee: U.S. Philips Corp.
Filed: Feb. 28, 1991.

Abstract—An integrated semiconductor active isolator circuit that includes a negative feedback amplifier having an active semiconductor amplifier element. The control terminal of the semiconductor amplifying element defines the output of the isolator circuit and a principal conduction electrode of the semiconductor amplifying element defines an input of the isolator circuit.

18 Claims, 5 Drawing Sheets



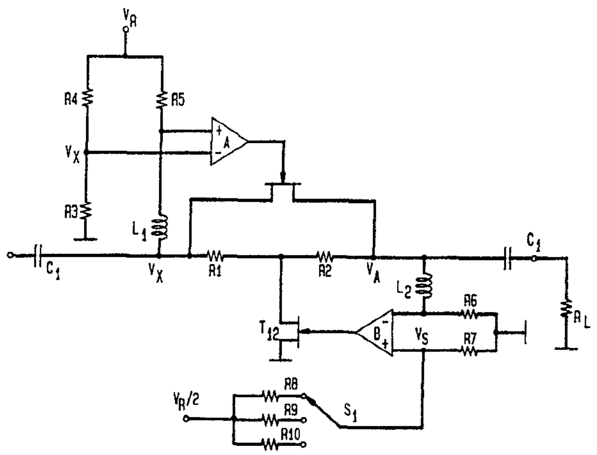
5,087,899 Feb. 11, 1992

Variable Attenuation Network with Constant Input and Output Resistances

Inventor: Alfred Lauper.
Assignee: Siemens-Albis AG.
Filed: May 19, 1989.

Abstract—An attenuation network comprises a T or a π network and first and second regulating circuits for controlling it. The T or π network has at least two variable resistances. A switch $S1$ permits selection of a desired attenuation value which is set through the operation of the second regulating circuit on the T or π network, while the first regulating circuit acts on the T or π network such that its input and output resistances are kept constant.

6 Claims, 3 Drawing Sheets



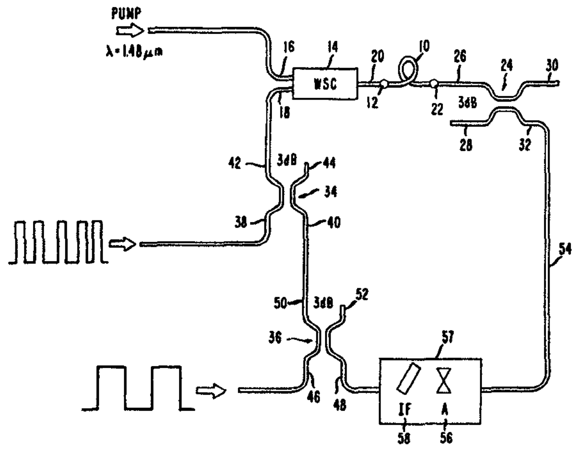
5,088,095 Feb. 11, 1992

Gain Stabilized Fiber Amplifier

Inventor: Martin Zirngibl.
Assignee: AT&T Bell Laboratories.
Filed: Jan. 31, 1991.

Abstract—In this invention, an optical fiber doped with a rare earth element and coupled to be pumped with a laser is coupled to an optical feedback loop. The feedback loop couples the output signal of the fiber amplifier to the input of the fiber amplifier. A narrow bandwidth filter coupled to the feedback loop allows a selected wavelength of the amplified spontaneous emission to pass from the output of the fiber amplifier to the input of the fiber amplifier. The feedback signal has a wavelength which is different from that of the pump signal and the wavelengths of the signals to be amplified. In operation, when bursts of optical signals from at least two discrete word or frequency division multiplexed channels are amplified in the fiber amplifier, the undesired fluctuations of gain of the output signals normally due to transient saturation of the erbium-doped filter amplifier are substantially eliminated.

9 Claims, 4 Drawing Sheets



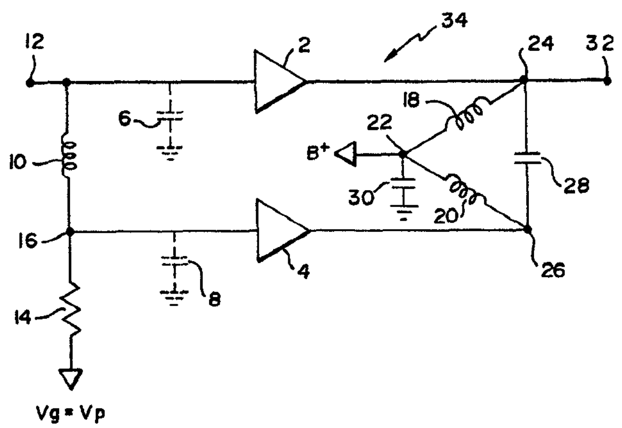
5,089,791 Feb. 18, 1992

MMIC-Compatible Power Amplifier

Inventor: Carmine F. Vasile.
Assignee: Grumman Aerospace Corporation.
Filed: Nov. 30, 1990.

Abstract—The parasitic capacitance which is inherent in an amplifier stage fabricated by MMIC or MIC technology oftentimes is cumbersome and of little use. The present invention utilizes this parasitic capacitance for effecting a quadrature circuit, fabricated onto the same substrate as the amplifiers for matching and biasing the amplifiers, thereby providing for broadband operation. When a pair of amplifiers are driven in quadrature, there results a low Q, low inductance circuit that has enhanced efficiency and operates at a decreased temperature.

19 Claims, 2 Drawing Sheets



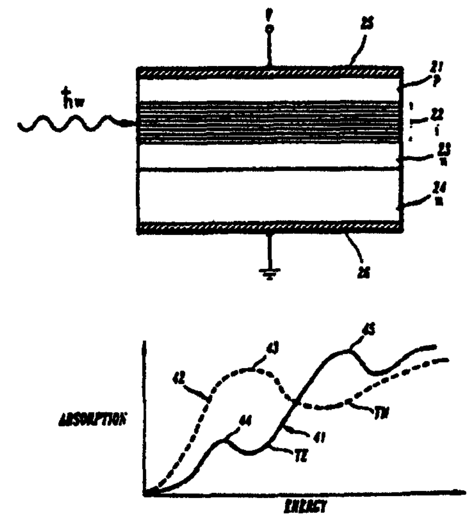
5,090,790 Feb. 25, 1992

Polarization-Independent Semiconductor Waveguide

Inventor: Jane E. Zucker.
Assignee: AT&T Bell Laboratories.
Filed: June 29, 1990.

Abstract—A polarization independent guided wave semiconductor device is realized wherein the waveguide region of the device includes one or more strained quantum well layers wherein strain is designed to be tensile in nature so that energy subbands in the quantum well or wells are displaced by a predetermined amount in a direction opposite to that for the quantum size effect. Polarization independence is achieved when, for a lightwave signal having an incident mean photon energy below the absorption bandedge of the strained quantum well layer or layers, the ratio of the oscillator strengths versus the wavelength detuning for heavy and light holes in a first polarization (TE) is substantially equal to a similar ratio computed in a second polarization (TM). Wavelength detuning is understood to be the difference between the wavelength of operation and the wavelength of an exciton resonance peak. Passive and active or actively controllable waveguides and waveguide devices are described.

11 Claims, 2 Drawing Sheets



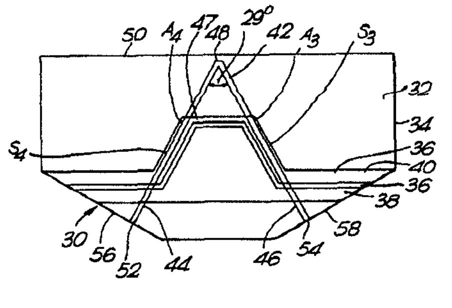
5,091,981 Feb. 25, 1992

Traveling Wave Optical Modulator

Inventor: David G. Cunningham.
Assignee: BT&D Technologies Limited.
Filed: Apr. 28, 1989.

Abstract—A travelling wave optical modulator comprises a Z-cut lithium niobate substrate on which is formed a proton exchanged optical waveguide and a travelling wave electrode. The optical waveguide is removed from the electrode intermittently to bring an optical signal in the optical waveguide back into phase with an electric field passing along the electrode. The optical signal is delayed relative to the electric field thereby allowing modulation of the optical signal by a nonperiodic electric field. The optical waveguide is defined within the boundaries of the top surface of the substrate.

8 Claims, 2 Drawing Sheets



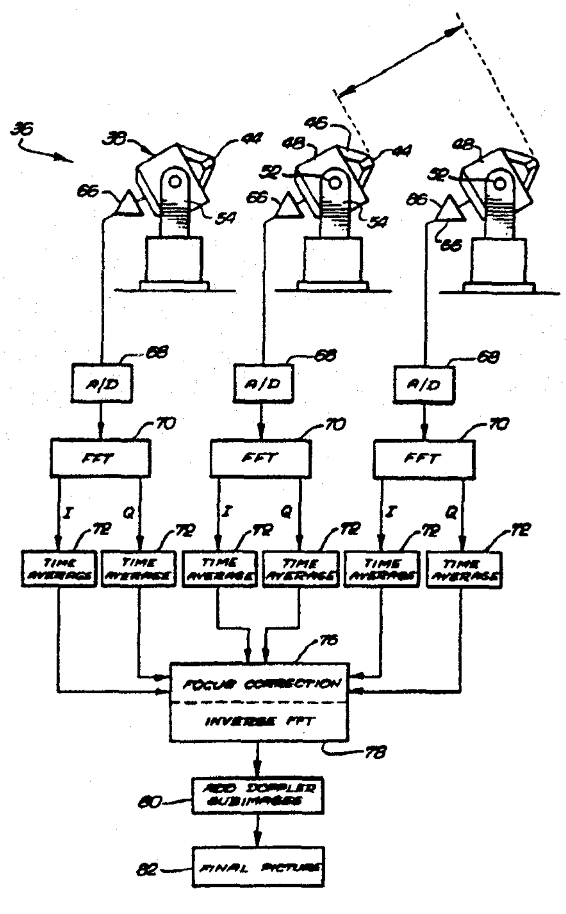
5,093,563 Mar. 3, 1992

Electronically Phased Detector Arrays for Optical Imaging

Inventors: James G. Small and Dennis R. Rossbach.
Assignee: Hughes Aircraft Company.
Filed: Mar. 3, 1989.

Abstract—An optical imaging system includes an array of small aperture subtelescopes each with heterodyne detectors. The array detects the amplitude and phase of light waves emanating from a scene under observation before they are combined into an image. The beam combining and interfering functions are performed after detection by the use of novel electronic signal processing. Large-aperture resolution is synthesized by electronically detecting and correcting phase errors without optical phase compensating components. Parallel processing and atmospheric turbulence compensation are achieved. The system images laser illuminated or naturally illuminated targets as well as stationary or moving targets. The heterodyne detectors can also achieve similar results when arranged in a pupil plane array located behind a single large aperture telescope.

72 Claims, 18 Drawing Sheets



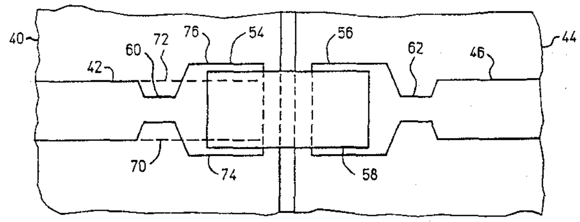
5,093,640 Mar. 3, 1992

Microstrip Structure having Contact Pad Compensation

Inventor: Richard S. Bischof.
Assignee: Hewlett-Packard Company.
Filed: Sept. 29, 1989.

Abstract—A microstrip structure includes a microstrip transmission line having a characteristic impedance, a contact pad for interconnection of the transmission line to an external device, and a compensation line connected between the contact pad and one end of the microstrip transmission line. The contact pad has larger dimensions than the transmission line and thus introduces parasitic capacitance. The compensation line is a narrow line having high impedance and is selected such that its equivalent inductance resonates with the parasitic capacitance at the upper frequency of the range of frequencies over which the transmission line is intended to be operated, thereby matching the contact pad to the transmission line.

20 Claims, 3 Drawing Sheets



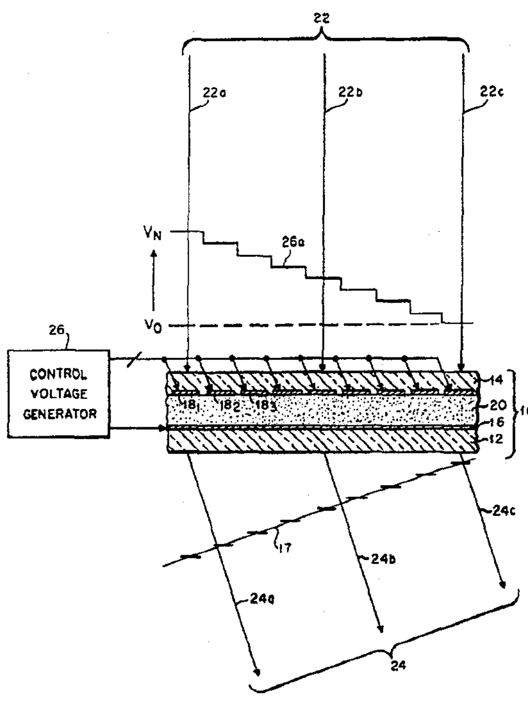
5,093,747 Mar. 3, 1992

Method for Providing Beam Steering in a Subaperture-Addressed Optical Beam Steerer

Inventor: Terry A. Dorschner.
Assignee: Raytheon Company.
Filed: Feb. 28, 1991.

Abstract—A practical means for electrically addressing the extremely large number and high density of phase shifters needed for operation of an optical phased array beam steerer. The array of phase shifters is subdivided into identical subarrays which completely fill an optical aperture. All subarrays are connected electrically in parallel by electrically interconnecting corresponding electrodes of each subarray. Methods are disclosed herein for providing an enhanced number of beam steering positions for the subaperture-addressed beam steerer.

14 Claims, 4 Drawing Sheets



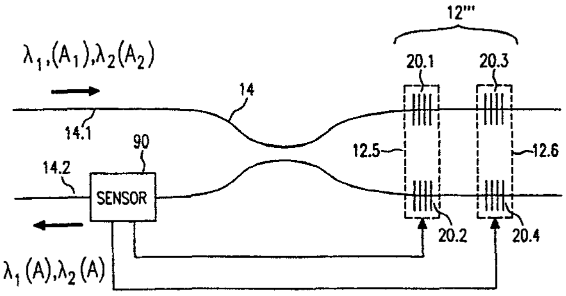
5,093,876 Mar. 3, 1992

WDM Systems Incorporating Adiabatic Reflection Filters

Inventors: Charles H. Henry, Rudolf F. Kazarinov, and Yosi Shani.
Assignee: AT&T Bell Laboratories.
Filed: May 31, 1991.

Abstract—A wavelength selective structure is coupled to an adiabatic Y-coupler via a multimode section which supports both symmetric and antisymmetric modes. One single mode branch of the coupler converts guided light to a symmetric mode, whereas the other single mode branch converts guided light to an anti-symmetric mode. The structure, which includes a pair of single mode waveguide arms coupled to the common section and a reflection device (such as a grating or ROR) located in each arm, converts reflected light from a symmetric mode to an anti-symmetric mode and conversely. Applications described include a channel dropping filter and channel balancing apparatus for WDM systems, and a dispersion compensator for fiber-optic systems.

4 Claims, 3 Drawing Sheets



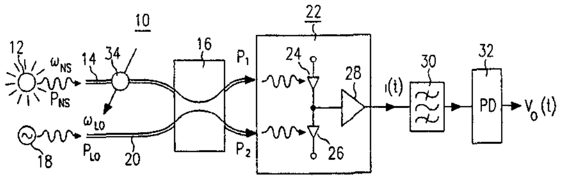
5,095,281 Mar. 10, 1992

Method and Apparatus for Determining the Absolute Noise Figure of Optical Amplifiers

Inventor: Liang D. Tzeng.
Assignee: AT&T Bell Laboratories.
Filed: Nov. 13, 1990.

Abstract—A test apparatus and method is disclosed for determining the absolute noise figure of an optical amplifier. The apparatus comprises an optical receiver and functions to measure the output power of a test noise source, such as a lamp or LED. A plot of input power versus output power yields a linear relationship, with a y-intercept at the test apparatus (first) noise floor (N_0). An optical amplifier to be tested is then inserted in the signal path between the noise source and the receiver. A new plot is generated and a second system noise floor value is determined (N_1). The difference between the two noise floor values ($N_1 - N_0$) is then defined as the amplifier absolute noise figure (N_A). The inventive technique is equally applicable to semiconductor and fiber optical amplifiers.

30 Claims, 2 Drawing Sheets



5,095,283 Mar. 10, 1992

Amplifier Circuit Having Feedback Circuit

Inventors: Kazuhiko Kobayashi, Hiroshi Kurihara, Naofumi Okubo, Yoshihiko Asano, Yoshimasa Daido, Shuji Kobayakawa, and Toru Maniwa.
Assignee: Fujitsu Limited.
Filed: Feb. 7, 1991.

Abstract—An amplifier circuit includes a high-gain amplifier, and a feedback circuit for extracting an unstable output having a level equal to or less than a threshold level from an amplified signal from the amplifier and for feeding back the unstable signal to the amplifier, so that the amplifier oscillates at a predetermined oscillation frequency. The amplifier circuit also includes a band rejection filter for passing signal components of the amplified signal other than an oscillation output which is obtained at the output terminal of the amplifier when the amplifier oscillates at the predetermined oscillation frequency. The signal components obtained from the band rejection filter are an output signal of the amplifier circuit.

10 Claims, 3 Drawing Sheets