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.

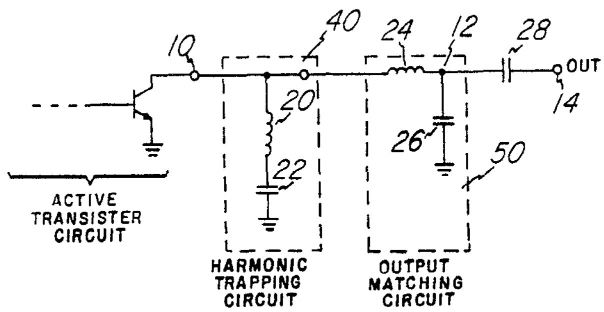
5,095,285 Mar. 10, 1992

Monolithic Realizable Harmonic Trapping Circuit

Inventor: M. Ali Kahtibzadeh.
Assignee: Texas Instruments Incorporated.
Filed: Aug. 31, 1990.

Abstract—A monolithically realizable harmonic trapping circuit that is a shunt connected series-resonant inductor-capacitor combination which has a resonant frequency designed to coincide with an undesired harmonic frequency of a desired fundamental frequency signal.

15 Claims, 6 Drawing Sheets



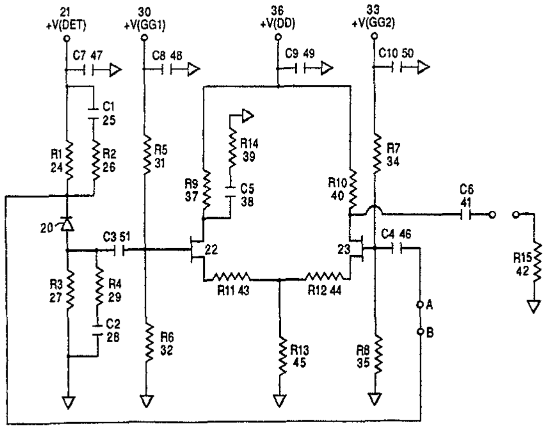
5,095,286 Mar. 10, 1992

Fiber-Optic Receiver and Amplifier

Inventors: James H. Cole, Ira J. Bush, and Leonard Baker.
Assignee: Dylor Corporation.
Filed: Nov. 15, 1989.

Abstract—An electronic receiver circuit for receiving and amplifying optical signals is disclosed. The optical signal is applied to a photodiode that generates a current signal that passes through a source load with a high resistance or impedance relative to the impedances associated with the desired bandwidth of the optical signal. The current signal is amplified and buffered by an amplifier circuit that can drive low output impedances while maintaining the proper voltage level on the high-impedance source load. The receiver circuit also maintains a wide-signal bandwidth from RF to microwave frequencies, holds pre-amplifier distortion to very low levels and still yields a high signal-to-noise ratio.

2 Claims, 2 Drawing Sheets



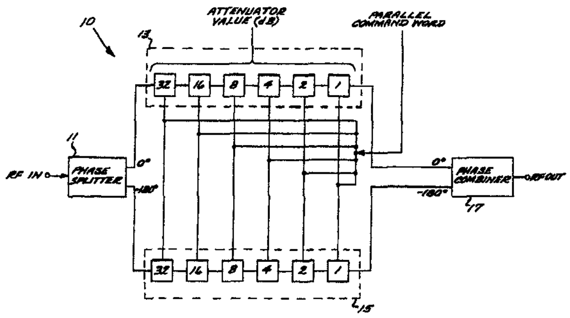
5,095,313 Mar. 10, 1992

Transient Glitch Cancellation Network

Inventors: Salim Patel and Edward Jhu.
Assignee: Hughes Aircraft Company.
Filed: May 30, 1990.

Abstract—A gain control network having a phase splitter circuit responsive to an RF input signal for providing first and second RF signals that are out of phase relative to each other, a first series of switched gain control elements, and a second series of switched gain control elements substantially identical to the first series and commonly controlled therewith. The first series of gain control elements is responsive to the first RF signal for providing a first gain controlled signal, and the second series of switched gain control elements is responsive to the second RF signal for providing a second gain controlled signal. A phase combining circuit combines the first and second gain controlled signals to provide a gain controlled RF output. By performing gain control with two gain control channels having substantially identical circuits and common switching control, transient glitches in each of the channels are substantially identical and are substantially cancelled via the phase combiner.

5 Claims, 2 Drawing Sheets



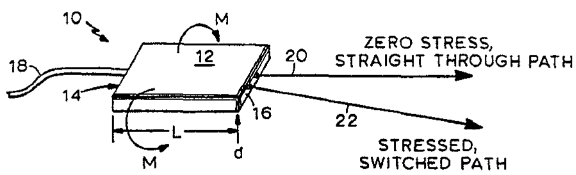
5,095,515 Mar. 10, 1992

Photoelastic Optical Switch and Optical Systems Employing the Optical Switch

Inventor: George Seaver.
Filed: May 17, 1991.

Abstract—An optical switch which comprises a photoelastic, optically transparent material whose index of refraction is changed by stress and which propagates an optical beam or beams from an inlet window to an outlet window in the material, with the inlet window adapted to receive an optical beam from an optical source and the outlet window adapted to pass an optical beam from the photoelastic material to an optical output receptor, and a receptor means of applying a stress gradient to said photoelastic material to change the index of refraction and hence, the optical path of the optical beam between a normal, unstressed optical beam path and a bent, stressed optical beam path. Optical systems are described in which the optical switch is employed to form optical lenses wherein an optical beam is focused by stress within an optical material, such as a photoelastic cylindrical rod. Optical integrated systems are also described employing the optical switch with optical devices as an optical integrated module.

22 Claims, 8 Drawing Sheets



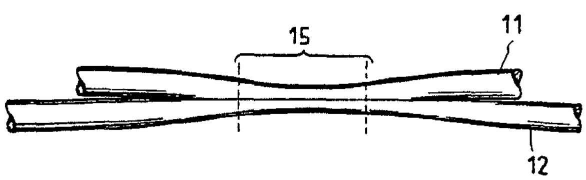
5,095,516 Mar. 10, 1992

Wide-Band Optical Fiber Coupler and Its Manufacturing Method

Inventors: Hiroyuki Sasaki, Masato Shimamura, Yoshiaki Takeuchi, Hiroaki Hanafusa, and Juichi Noda.
Assignees: Japan Aviation Electronics Industry Limited and Nippon Telegraph & Telephone Corporation.
Filed: Sept. 19, 1990.

Abstract—Two single-mode optical fibers are stretched to form prestretched portions of different diameters, and then the optical fibers are fused together at their prestretched portions to form a coupling region which is stretched to obtain a wide-band optical fiber coupler of a desired splitting ratio.

1 Claim, 3 Drawing Sheets



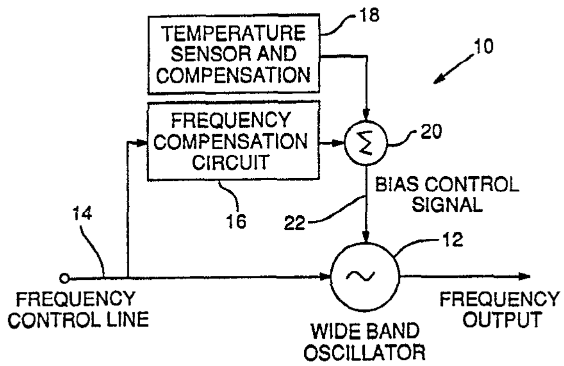
5,097,228 Mar. 17, 1992

Wide-Band Oscillator with Bias Compensation

Inventor: Barton L. McJunkin.
Assignee: Hewlett-Packard Company.
Filed: Feb. 28, 1991.

Abstract—An RF oscillator is disclosed that can be tuned to operate over a wide range of frequencies while maintaining advantageous bias conditions. The oscillator includes circuitry that adjusts an oscillator bias signal in response to changes in oscillator frequency and/or ambient temperature, and does so without resort to using the same signal for both bias and frequency control. By so doing to control parameters such as phase noise, output power and compression angle, both the frequency range and temperature range of an oscillator can be extended, while simultaneously improving the oscillator's performance.

14 Claims, 5 Drawing Sheets



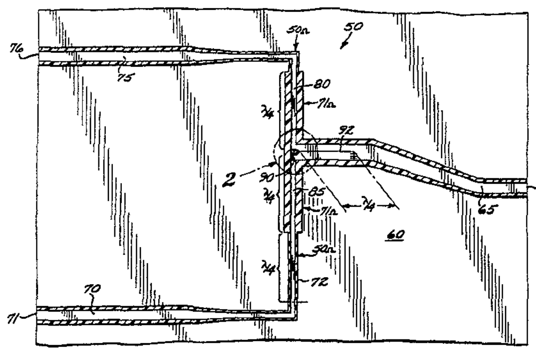
5,097,223 Mar. 17, 1992

Coplanar 3-dB Quadrature Coupler

Inventor: Joseph E. Pakarek.
Assignee: Hughes Aircraft Company.
Filed: Dec. 20, 1990.

Abstract—A low-loss coplanar waveguide 3-dB power divider is described having high isolation between the output ports and low VSWR at the input port when used in a balanced circuit configuration. The power divider includes a 50-ohm coplanar waveguide input line and two 50-ohm coplanar waveguide output lines. The output lines are matched to the input line by 71-ohm quarter wavelength sections of coplanar waveguide lines. One output line is a quarter wavelength longer than the other. A quarter wavelength slot is cut in the input line center conductor, and a resistor is defined at the juncture of the input and output lines. Reflected power that would normally travel out the input port is terminated in the resistor.

11 Claims, 4 Drawing Sheets



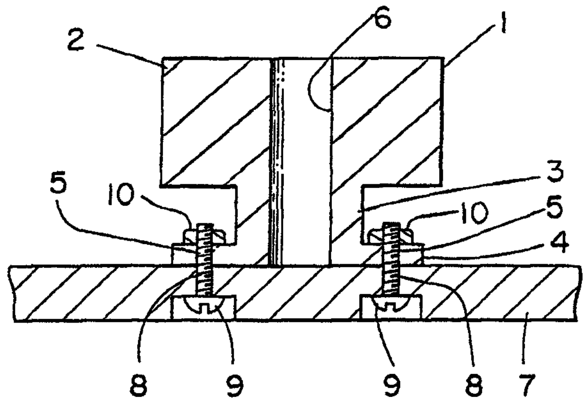
5,097,238 Mar. 17, 1992

Dielectric Resonator Device

Inventors: Manabu Sato and Takeo Kinoshita.
Assignee: NGK Spark Plug, Co., Ltd.
Filed: Aug. 29, 1990.

Abstract—A dielectric resonator device comprising a resonator body having a dielectric resonator element, a supporting member and a mounting flange which are integrally formed and are made of the same dielectric ceramic material, the mounting flange having an effective heat dissipating function and being removably fixed on a base member.

3 Claims, 2 Drawing Sheets



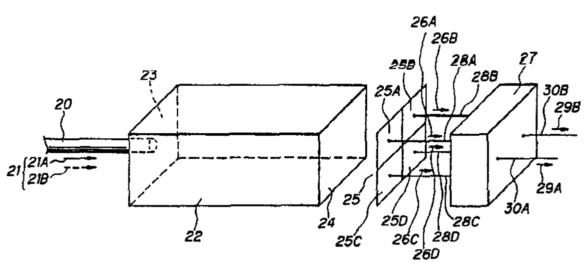
5,099,114 Mar. 24, 1992

Optical Wavelength Demultiplexer

Inventors: Takao Matsumoto and Masafumi Koga.
Assignee: Nippon Telegraph & Telephone Corporation.
Filed: Apr. 24, 1990.

Abstract—An optical wavelength demultiplexer including an optical conversion device which converts a difference in wavelengths of a plurality of input signals into a difference in spatial power distribution of the input light signals, and a pattern recognition element for recognizing patterns of the spatial power distribution and taking out output signals. At the output portion of the optical conversion device, spatial power distributions are formed which are different for different wavelengths. After converting the spatial power distributions by the pattern recognition element into electrical signals, pattern recognition of the signals is performed to regenerate the original input signals with their respective wavelengths. The optical conversion device uses a diffractive grating or a combination of an optical multimode circuit, an optical multimode fiber, and a plurality of optical wavelengths. The pattern recognition element is constructed by a combination of a photo-detector array and a neural network, or a combination of a hologram element, a photo-detector array and a neural network.

11 Claims, 2 Drawing Sheets



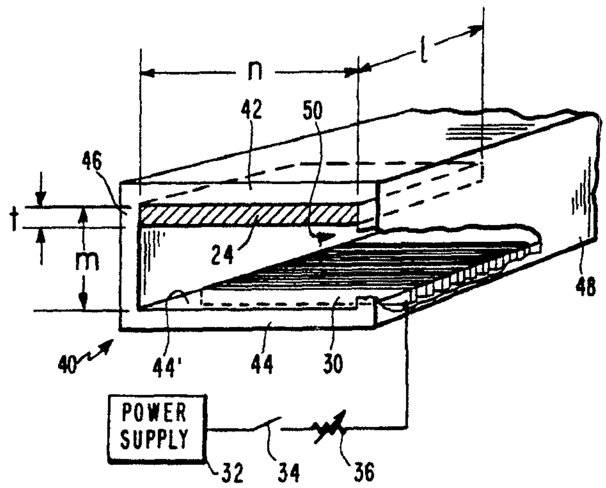
5,099,214 Mar. 24, 1992

Optically Activated Waveguide Type Phase Shifter and Attenuator

Inventors: Arye Rosen, Paul J. Stabile, and Walter M. Janton.
Assignee: General Electric Company.
Filed: Sept. 27, 1989.

Abstract—A waveguide having walls defining an opening. An optically transmissive aperture in one wall allows light from an optical illumination source such as a laser diode array to illuminate the opening in which is located a semiconductor slab positioned to be illuminated. When the array illuminates the slab, the propagation characteristics (phase velocity and attenuation constant) of the waveguide changes. A continuous wave signal passing through the waveguide is thus attenuated and phase shifted. The laser array may be pulsed on and off while still maintaining the altered propagation constant.

14 Claims, 3 Drawing Sheets



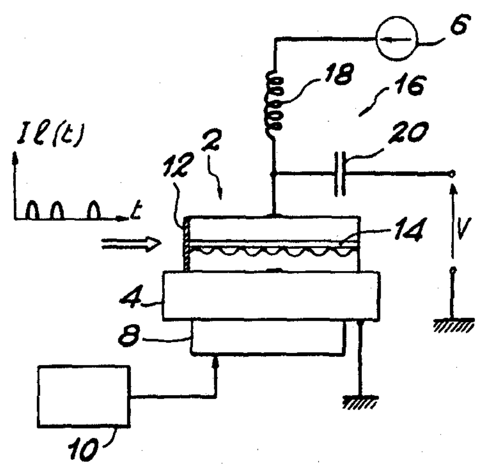
5,099,350 Mar. 24, 1992

Method and Device for the Optical Filtering and Photodetection of Intensity-Modulated Optical Signals

Inventor: Nakajima Hisao.
Assignee: Etat Francais represente par le Ministere des Postes, des Telecommunications et de l'Espace (Centre National d'Etudes des Telecommunications).
Filed: Aug. 1, 1989.

Abstract—Method and device for the optical filtering and photo-detection of intensity-modulated optical signals. Signals are injected into at least one resonating type semiconductor laser amplifier (2) close to the active layer (14) of this amplifier, the latter being polarized below its threshold current and having at least one resonance wavelength adjusted so as to coincide with the wavelength of at least one of the optical signals in order for this optical signal to be amplified by the amplifier, and the voltage existing between the terminals of the amplifier is detected so as to obtain, in the form of an electric signal, the information carried by the amplified optical signal when the angle between the polarization direction of the latter and the direction of the active layer is small. Application for the embodiment of optical receivers.

13 Claims, 6 Drawing Sheets



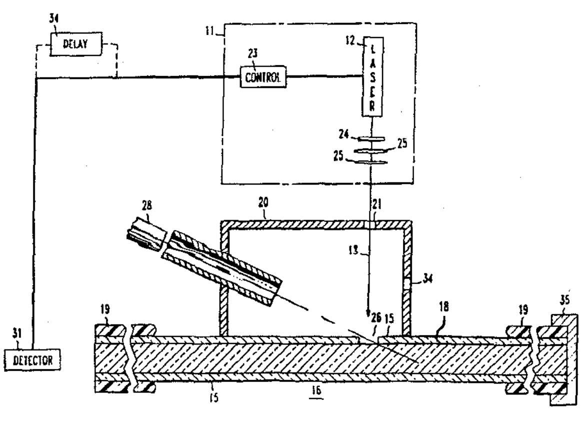
5,101,090 Mar. 31, 1992

Methods and Apparatus for Making Optical Fiber Couplers

Inventors: Richard J. Coyle, Jr., Gary J. Grimes, and Anthony J. Serafino.
Assignee: AT&T Bell Laboratories.
Filed: Nov. 19, 1990.

Abstract—A cladding portion (15) of an optical fiber (16) is laser machined by focusing a laser beam (13) that is of an appropriate wavelength to ablate the cladding. When the laser beam completely penetrates through the cladding (15) to impinge on the optical fiber core (18) light is transmitted to the two ends of the fiber. A photodetector (31) is placed in close proximity to one of the ends of the optical fiber (16) with the photodetector output being connected to a laser control device (23). When the light detected by the detector exceeds a threshold, it generates a signal that stops the laser. Even if the cladding is of an unpredicted thickness, the laser beam is not terminated until there has been complete penetration through the cladding, and after complete ablation the laser beam is promptly terminated so as to avoid subsequent damage to the optical fiber.

22 Claims, 2 Drawing Sheets



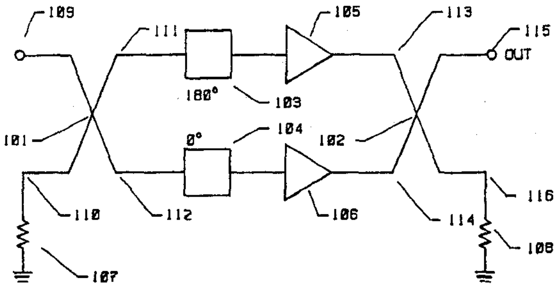
5,101,171 Mar. 31, 1992

Extended Bandwidth RF Amplifier

Inventor: Kevin Redmond.
Assignee: Advanced Systems Research, Inc.
Filed: Nov. 23, 1990.

Abstract—A system for extending the frequency range of an RF amplifier by improving the VSWR, and power handling capability of the amplifier, comprising a broadband reversing transformer, a first and a second amplifier coupled by means of a first and a second through-line quadrature coupler with the first quadrature coupler being connected to the inputs of the two amplifiers and the second quadrature coupler being connected to the outputs of the two amplifiers. The broadband reversing transformer is inserted in series with one of the two amplifiers enabling a signal at frequencies out of the passband of the quadrature couplers to pass through the through-lines port of the quadrature couplers, and thereby greatly extending the frequency range over which quadrature couplers may be used while, at the same time, retaining the usual combining and VSWR advantages of the couplers within their passbands.

16 Claims, 8 Drawing Sheets



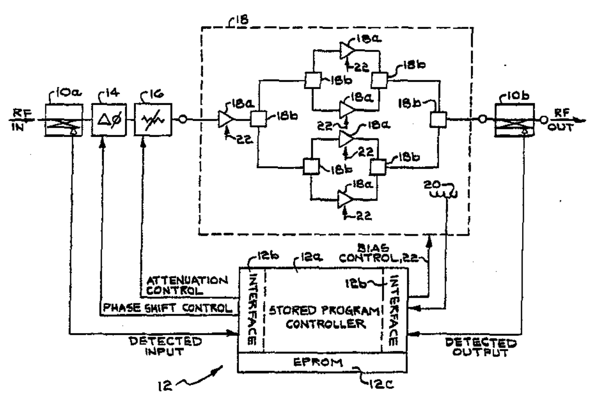
5,101,173 Mar. 31, 1992

Stored Program Controlled Module Amplifier Bias and Amplitude/Phase Compensation Apparatus

Inventors: Gerald C. DiPiazza and Mark J. Peterson.
Assignee: The United States of America as represented by the Secretary of the Air Force.
Filed: Nov. 28, 1990.

Abstract—A stored program amplifier compensation apparatus utilizing sensing elements to provide the operational states of an RF power amplifier to a controller processor unit which utilizes the operational data to provide a bias control signal to the RF power amplifier. Look-up tables which are stored in the controlled processor unit, contain a bias control signal for all the possible operational combinations.

7 Claims, 1 Drawing Sheet



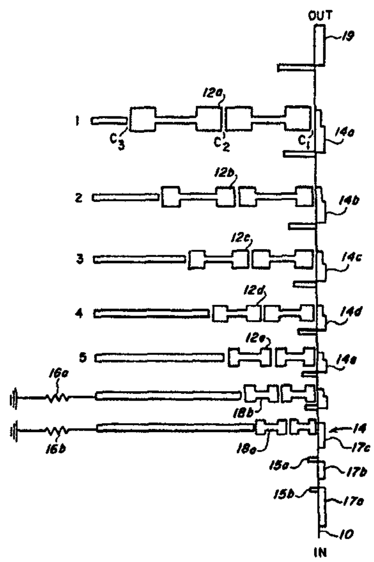
5,101,181 Mar. 31, 1992

Logarithmic–Periodic Microwave Multiplexer

Inventor: Christen Rauscher.
Assignee: The United States of America as represented by the Secretary of the Navy.
Filed: June 12, 1990.

Abstract—A multiport microwave multiplexer having components which are log-periodically scaled structures is shown and described. Circuit parameter values and characteristic frequencies are determined and a first output port is linked by a constant ratio to corresponding quantities that define the response of other networks. A capacitively end-coupled channelizer filter is used for each channel of the multiplexer.

29 Claims, 7 Drawing Sheets



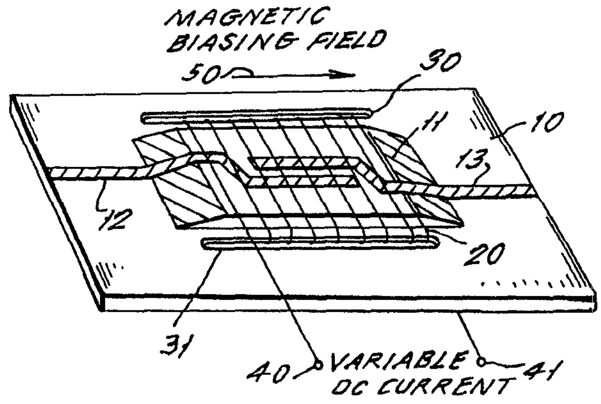
5,101,182 Mar. 31, 1992

Drop-In Magnetically Tunable Microstrip Bandpass Filter

Inventors: Richard W. Babbitt, Adam Rachlin, and Lothar Wandinger.
Assignee: The United States of America as represented by the Secretary of the Army.
Filed: Jan. 4, 1991.

Abstract—A tunable bandpass filter comprises a flat ferrite body having first and second spaced, coextensive microstrip conductive lines on its upper surface. A winding encircles the ferrite and conductive lines so that a variable dc current in the winding varies the magnetic permeability of the ferrite and thus the center frequency of the filter.

4 Claims, 1 Drawing Sheet



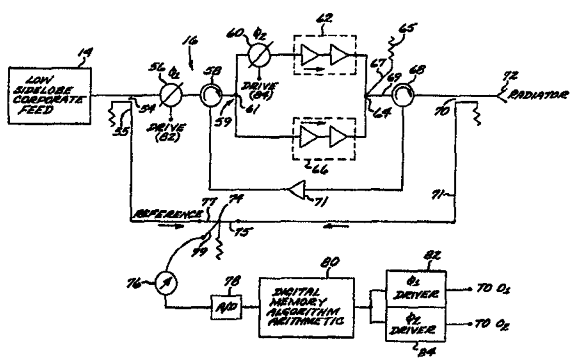
5,101,211 Mar. 31, 1992

Closed-Loop RF-Power Amplifier Output Correction Circuit

Inventor: Edward C. DuFort.
Assignee: Hughes Aircraft Company.
Filed: Jan. 10, 1991.

Abstract—A closed-loop RF-power amplifier output correction circuit is disclosed, for providing closed-loop continuous amplitude and phase correction of solid state amplifiers. The circuit includes a two-channel RF solid-state high-power amplifier whose inputs are fed through two control phase shifters and whose outputs are combined in a hybrid junction. A reference signal is provided, which the power amplifier must duplicate in amplitude and phase. A coupling and comparison circuit compares the reference signal and the amplifier output signal and provides an error signal representative of error power. Digital circuitry is provided that takes only relative error power measurements and nulls the error by adjusting the control phase shifters in a closed loop.

17 Claims, 5 Drawing Sheets



5,101,291 Mar. 31, 1992

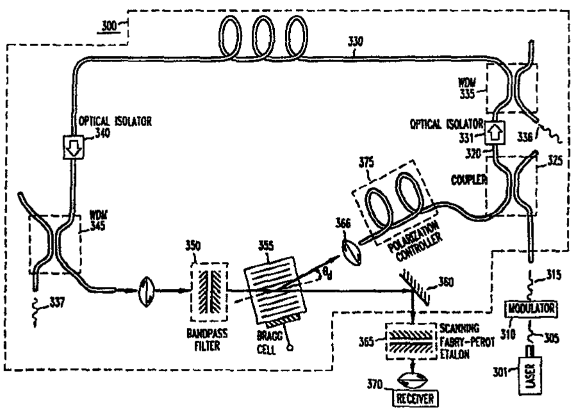
Optical Frequency Conversion Device

Inventor: Robert M. Jopson.
Assignee: AT&T Bell Laboratories.
Filed: Dec. 28, 1990.

Abstract—An optical apparatus for generating an optical frequency comb from an optical input signal is realized by transmitting the optical signal

through an optical circuit comprising an optical amplifier and a Bragg cell configured in an optical cavity. By aligning the cavity such that the incident light is deflected by the Bragg cell and recirculated therein, on each pass within the cavity the incident light is frequency shifted by a predetermined frequency, producing a comb of optical frequencies, each a time-delayed replica of the incident light. Importantly, the optical amplifier positioned within the cavity substantially compensates for any cavity loss, enhancing the output uniformity of each generated carrier.

25 Claims, 5 Drawing Sheets



5,101,294 Mar. 31, 1992

Surface Acoustic Wave Optical Modulator

Inventors: Faguir C. Jain and Kushal K. Bhattacharjee.
Assignee: The University of Connecticut.
Filed: Mar. 30, 1990.

Abstract—An acoustooptic modulator is described that comprises a first support layer and a second layer of piezoelectric semiconductor material disposed over the support layer. The second layer includes a plurality of active sublayers, each active sublayer having a planar surface and thickness dimension which is such as to enable the active layer to exhibit quantum-well effects. A surface acoustic wave structure is disposed on the second layer for creating an acoustic wave in the second layer. The acoustic wave induces electric field variations therein which are perpendicular to the planar surface of the active sublayers and alter an optical property thereof. An optical beam is directed through the second layer, which beam is modulated by the altered optical properties of the active sublayers.

18 Claims, 6 Drawing Sheets