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.

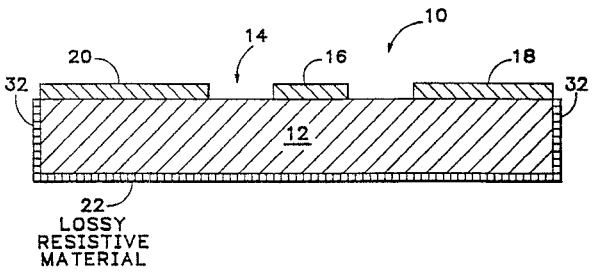
5,225,796 July 6, 1993

Coplanar Transmission Structure Having Spurious Mode Suppression

Inventors: Frank R. Williams and Thomas G. Ruttan.
Assignee: Tektronix, Inc.
Filed: Jan. 27, 1992.

Abstract—An improved coplanar transmission structure has a coplanar transmission line formed on one surface of a substrate and a lossy resistive material formed on the opposite surface of the substrate for suppressing spurious electromagnetic modes propagating through the substrate. The lossy resistive material may be nichrome or the like and is patterned on the substrate using thin or thick film processing.

16 Claims, 4 Drawing Sheets



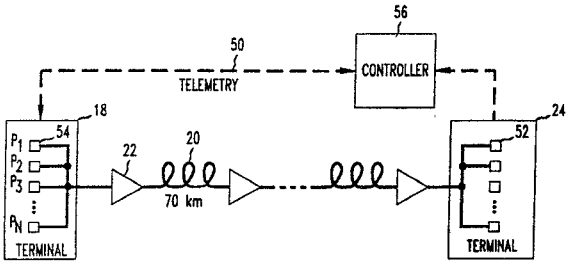
5,225,922 July 6, 1993

Optical Transmission System Equalizer

Inventors: Andrew R. Chraplyvy, Jonathan A. Nagel, Robert W. Tkach.
Assignee: AT&T Bell Laboratories.
Filed: Nov. 21, 1991.

Abstract—Increasing the capacity of an existing lightwave transmission system can be accomplished by either increasing the bit rate or adding wavelength-multiplexed channels. Recent advances in erbium-doped fiber amplifier technology make the wavelength division multiplexed option particularly attractive. Unfortunately, because of nonuniform wavelength-depenedent gain profile and saturation characteristic of erbium-doped fiber amplifiers, each channel of a wavelength-multiplexed system will expeirience a different optical gain which, in turn, can result in an excessive bit-error-rate performance in some channels. This invention is directed toward processing apparatus which selectively equalizes the optical gain or the optical signal-to-noise ratios of the channels of a wavelength-multiplexed optical transmission system. The output powers and the signal-to-noise ratios are selectively equalized by adjusting the optical input signal powers. With this invention, wavelength-multiplexed channels can be add to an existing optical fiber transmission system without requiring new optical components, upgrades or adjustments at intermediate amplifier sites.

14 Claims, 13 Drawing Sheets



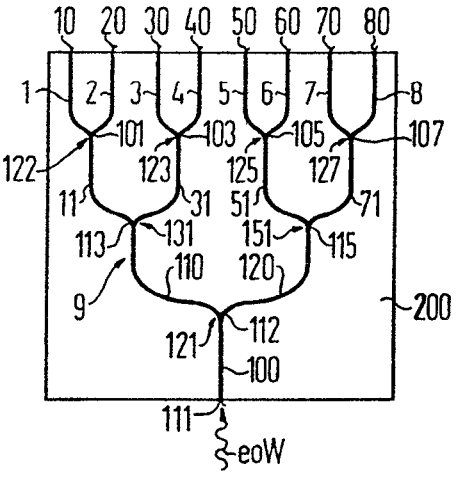
5,226,100 July 6, 1993

Optical Grating Comprising A Plurality of Side-By-Side Outfeed End Faces of Optical Waveguides

Inventor: Reinhard Maerz.
Assignee: Siemens Aktiengesellschaft.
Filed: Aug. 26, 1991.

Abstract—An optical grating being formed by a waveguide branching structure having a single infeed end face for infeeding an optical wave to be coupled into the grating, said branching structure is composed of a strip-like optical waveguide that proceeds from the infeed end face in a tree-like branching fashion and ends at the outfeed end faces, the distance between the infeed end face and each of the outfeed end faces can be the same or be different, as desired. The outfeed end faces can also be arranged to extend obliquely to the propagation direction of the optical wave being propagated in the grating.

20 Claims, 3 Drawing Sheets



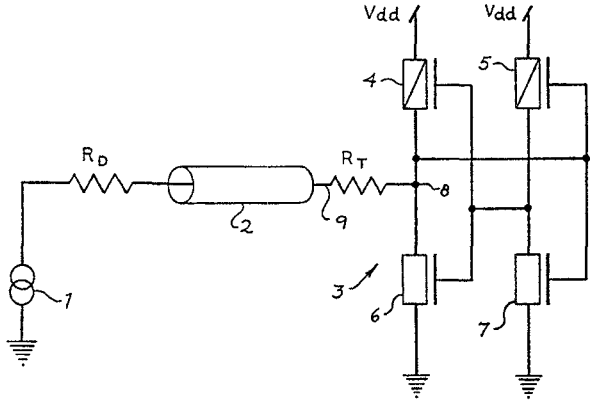
5,227,677 July 13, 1993

Zero Power Transmission Line Terminator

Inventor: Anatol Furman.
Assignee: International Business Machines Corporation.
Filed: June 10, 1992.

Abstract—A terminator for a transmission line that consumes substantially zero power. According to a preferred embodiment, a four device latch is provided, coupled at one side of the latch to the transmission line by way of a resistance. The size of the devices on the side of the latch connected to the transmission line and the value of the resistance are selected such that the combined impedance of the resistance and the device impedance to ground is substantially the same as the characteristic impedance of the transmission line. A proper impedance termination is provided for steady state high and steady state low conditions, as well as during substantially all of a transition there between.

7 Claims, 2 Drawing Sheets



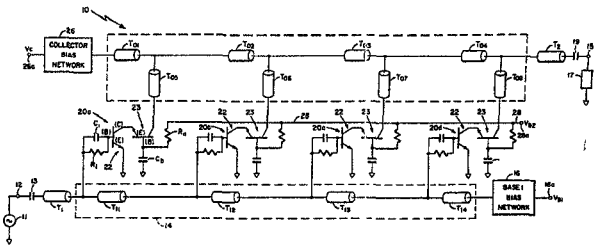
5,227,734 July 13, 1993

Broadband Bipolar Transistor Distributed Amplifier

Inventors: Manfred J. Schindler, Marc E. Goldfarb, J. Bradford Cole, Aryeh Platzker.
Assignee: Raytheon Company.
Filed: Oct. 20, 1992.

Abstract—A distributed circuit includes a plurality of pairs of cascode coupled first and second transistors with each transistor having base, emitter, and collector electrodes. The first transistor of each pair is disposed to have a first one of emitter and collector electrodes coupled to a reference potential and the second one of said transistors of each pair is disposed to have the base electrode coupled to a reference potential with the second one the collector and emitter electrodes of the first transistor of each pair being coupled to the emitter electrode of the corresponding second transistor of each pair. The network further includes an input propagation network disposed to successively couple the base electrode of each one of the first transistors of each pair of transistors to an input terminal and an output propagation network disposed to couple the collector electrodes of each one of the second transistors of each one of the pair of transistors to an output terminal of the circuit.

27 Claims, 6 Drawing Sheets



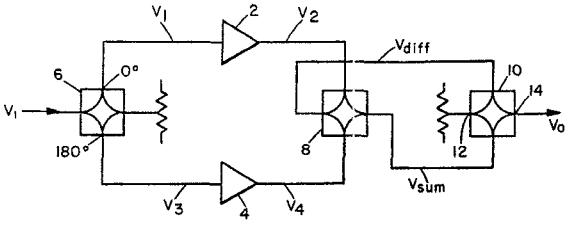
5,227,736 July 13, 1993

Second-Order Predistorter

Inventors: Mark E. Tucker and Steward L. Cummings.
Assignee: Tacan Corporation.
Filed: May 18, 1992.

Abstract—The second-order predistorter comprises two RF amplifiers and three 180° hybrid combiner/splitters. The RF sinusoidal input is split into two separate signals which have equal amplitudes but are 180° out of phase. Each of these signals is fed into separate moderately linear amplifiers, the output of each being composed only of the amplified input signal and second-order distortion components produced by the amplifiers' non-linearities. The output signal from each amplifier is combined with the other in a second combiner/splitter to produce two different outputs consisting of the sum and difference of the amplified signals. The difference signal consists only of the desired signal, and the sum signal consists of only the second-order distortion terms. The sum and difference signals are recombined in a third combiner/splitter to form a composite signal which is input into the device to be linearized. The output signal of the final hybrid combiner/splitter is taken from its sum or its difference port, depending on the desired relative phase between the amplified signals.

18 Claims, 1 Drawing Sheet



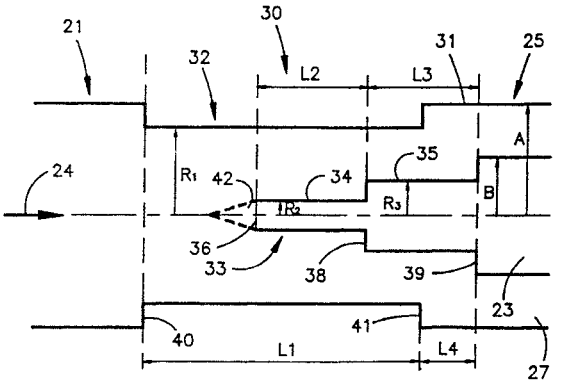
5,227,744 July 13, 1993

Transmission Element Between Electromagnetic Waveguides, Notably Between a Circular Waveguide and a Coaxial Waveguide

Inventor: Christian Sabatier.
Assignee: France Telecom.
Filed: July 16, 1991.

Abstract—A transition element for electromagnetic waveguides of the type designed to provide for the transition between a circular waveguide and a coaxial waveguide, constituted by a circular external guide cooperating with an internal conductor forming an end portion of the central conductor of the coaxial waveguide, the internal conductor having at least one intermediate transition step with a substantially constant section throughout its length. The device can be applied notably to the making of two-band duplexers.

9 Claims, 2 Drawing Sheets



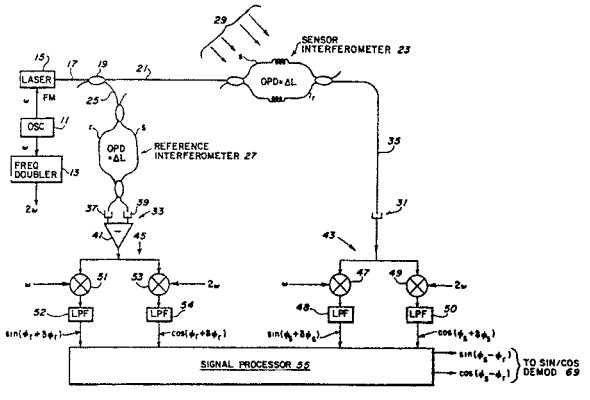
5,227,857 July 13, 1993

System for Cancelling Phase Noise in an Interferometric Fiber Optic Sensor Arrangement

Inventor: Alan D. Kersey.
Assignee: The United States of America as Represented by the Secretary of the Navy.
Filed: Apr. 24, 1991.

Abstract—A fiber optic sensor system for cancelling phase noise while it senses a measurand field is disclosed. The system includes circuitry for developing a light beam that is frequency modulated at a fundamental frequency. First and second unbalanced interferometers, having equal path imbalances, are responsive to the frequency modulated light beam for producing respective first and second optical outputs. Detection circuitry is responsive to the fundamental frequency, the second harmonic of the fundamental frequency, and the first and second optical outputs for producing a plurality of sine and cosine signals containing phase difference and phase noise components. A signal processor is responsive to the plurality of sine and cosine signals for cancelling the phase noise components and only producing output sine and cosine components of the difference in the phase shift between the first and second unbalanced interferometers. The system can further include a demodulator for demodulating the sine and cosine components to produce an output signal proportional to the phase shift difference between the first and second unbalanced interferometers.

19 Claims, 4 Drawing Sheets



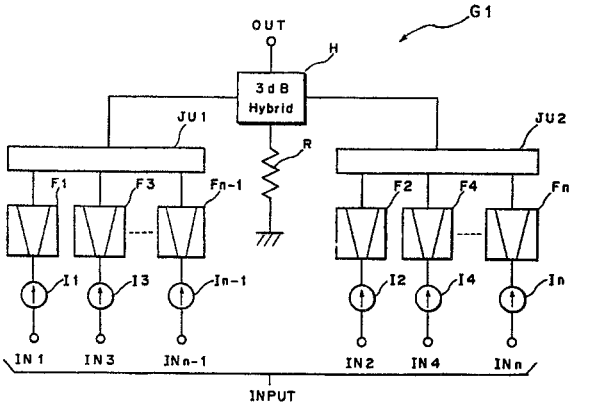
5,229,729 July 20, 1993

Radio Frequency Signal Combining/Sorting Apparatus

Inventors: Toshio Nishikawa, Youhei Ishikawa, Koichi Takehara.
Assignee: Murata Manufacturing Co., Ltd.
Filed: July 13, 1992.

Abstract— A radio frequency signal combining/sorting apparatus which includes a plurality of channel filters which allow band regions of respective transmission channels to pass through them, isolators connected to respective inputs of the channel filters, a plurality of sets of power composing circuits each including branch lines for composing outputs of the channel filters into one output, and hybrid circuits arranged to each compose the outputs per two sets of the power composing circuits. The band regions to be applied to the respective channel filters are selected in such relation that the band regions of the respective channel filters corresponding to a given power composing circuit are spaced from each other to the largest possible extent.

21 Claims, 16 Drawing Sheets



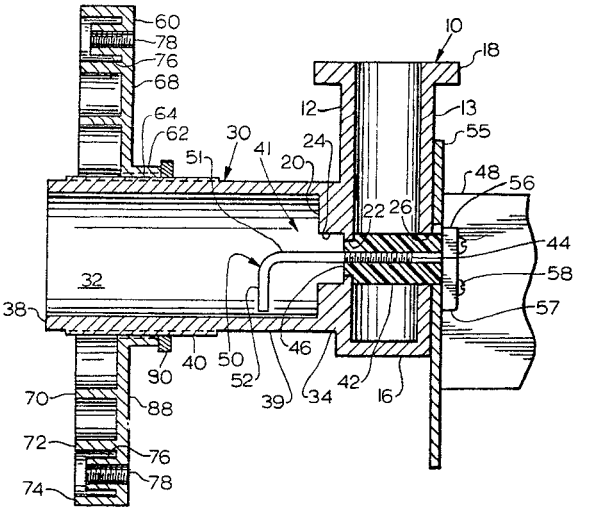
5,229,736 July 20, 1993

Waveguide Polarization Coupling

Inventors: Douglas W. Adams and Carol Kirksey.
Filed: Jan. 7, 1992.

Abstract— A waveguide and a scaler ring assembly in which the waveguide has external threads and the scaler ring has internal threads for threaded mating engagement so that the position of the waveguide can be easily selected, and is maintained in a secure, close-fitted relationship. The scaler ring has means for attaching to an antenna dish.

2 Claims, 2 Drawing Sheets



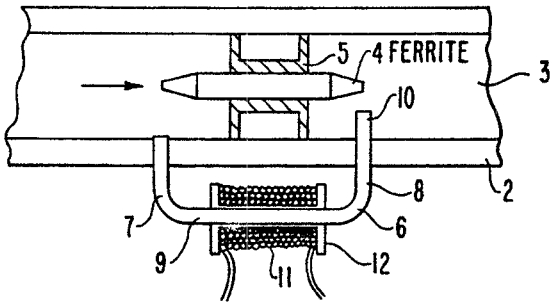
5,229,737 July 20, 1993

Ferrite Polarizer

Inventor: Brian Prime.
Assignee: Marconi Electronic Devices Limited.
Filed: Mar. 27, 1992.

Abstract—A polarizer particularly suitable for use in receiving satellite television signals includes a ferrite rod located within a waveguide, a yoke co-extensive with the ferrite member and a coil wound around the yoke. The yoke preferably is "U" shaped and includes an arm which projects into the waveguide at the end of the ferrite rod remote from the input of the waveguide.

8 Claims, 1 Drawing Sheet



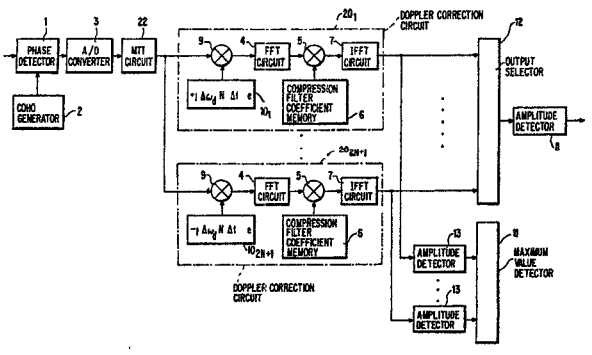
5,229,775 July 20, 1993

Digital Pulse Compression Apparatus

Inventors: Shoko Sakamoto, Haruo Akagi, Shoji Matsuda.
Assignee: Mitsubishi Denki Kabushiki Kaisha.
Filed: Apr. 13, 1992.

Abstract—A digital pulse compression apparatus comprises a plurality of doppler correction circuits for carrying out doppler correction in the time domain or the frequency domain and for carrying out pulse compression, and a maximum amplitude selecting means for selecting and outputting the maximum amplitude signal out of the compressed signals obtained from the doppler correction circuit at the rate of range bin period. The present invention can supply a pulse compression apparatus having a stable compression performance, even if a doppler frequency of the input signal is not known.

6 Claims, 8 Drawing Sheets



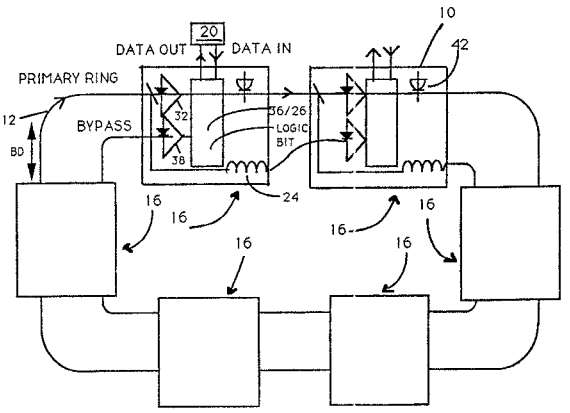
5,229,875 July 20, 1993

Fault-Tolerant Fiber Optic Coupler/Repeater for Use in High Speed Data Transmission and the Like

Inventor: Andrew S. Glista.
Filed: Aug. 27, 1990.

Abstract—A fault-tolerant fiber optic coupler/repeater for use in a terminal in a high speed digital, audio or video data transmission system has optical data input from one or a plurality of upstream terminals and sends optical data to one or a plurality of downstream terminals via fiber optic lines. The terminal includes one or more bypass lines and is connected to the bypass line of at least one upstream terminal. The terminal receives optical data signals from upstream terminals via primary line and one or more bypass lines which bypass one or more of the upstream terminals. The terminals includes a logic device which analyzes or compares these signals to preset values. The logic device selects the signal having characteristics closest to the preset values and rejects the other signals. The logic device likewise activates a built-in test circuit. If multiple signals are rejected for not having characteristics within a preset range, all of the data is rejected. The selected primary or bypass signal is sent to an input/output device such as a computer or television.

17 Claims, 15 Drawing Sheets



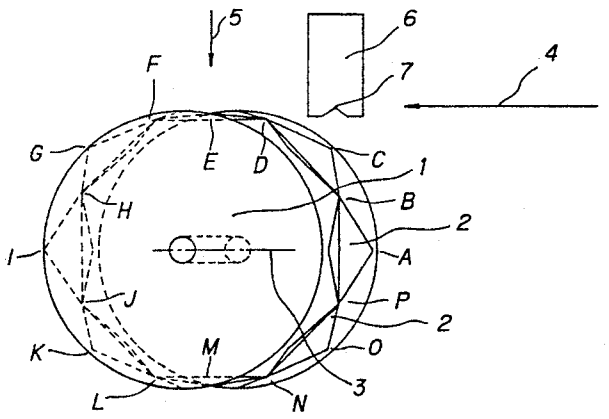
5,229,877 July 20, 1993

Method of Controlling Size of Light Beam

Inventor: Koji Hanada.
Assignee: Toyo Ink Manufacturing Co., Ltd.
Filed: Oct. 25, 1991.

Abstract—A method of controlling a size of a light beam, which comprises rotating a disk having a groove whose size changes continuously or a polygonal-shaped rotor having grooves of different sizes, on the circumferential surface, and irradiating the groove or grooves with a light beam, whereby the groove or grooves provide a transmitted light beam having a size that change continuously or stepwise, respectively, while retaining an analogous form of the light beam.

10 Claims, 5 Drawing Sheets



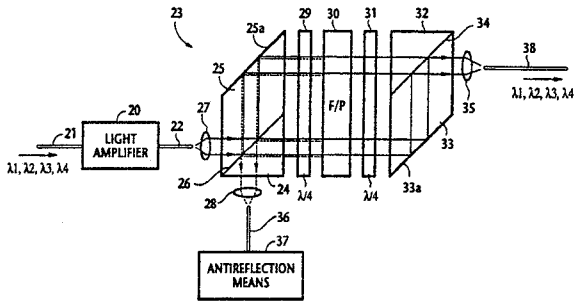
5,231,529 July 27, 1993

Light Amplifier for Multi-Wavelength Signals

Inventor: Kazuhisa Kaede.
Assignee: NEC Corporation.
Filed: Dec. 19, 1991.

***Abstract*—A multi-wavelength light amplifier comprises a light amplifier for amplifying a wavelength division multiplex signal with accompanying generation of spontaneous emission. An optical coupler is provided for coupling light from the light amplifier to a wavelength filter, such as Fabry-Perot filter. The filter has a plurality of spectral peaks of transmittance and corresponding valleys of reflectance, with the spectral peaks and valleys corresponding respectively to the wavelengths of the multiplex signal. The optical coupler further provides coupling of light reflected from the wavelength filter to an optical sink by which the undesired spontaneous emission is absorbed.**

4 Claims, 6 Drawing Sheets



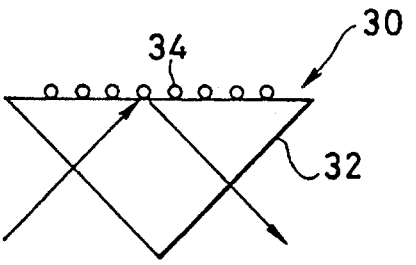
5,231,533 July 27, 1993

Nonlinear Optical Element and Uses Thereof

Inventors: Makoto Gonokami, Kenji Takeda, Eiichi Hanamura, Yoshinori Tokura.
Assignee: Japan Synthetic Ruber Co., Ltd.
Filed: Feb. 13, 1992.

***Abstract*—The nonlinear optical element includes a sunstrate and one or more transparent microspheres made of a nonlinear optical active substance system fixed to the substrate, or the nonlinear optical element includes one or more transparent microspheres contacting a solid medium and fixed to the substrate. The element can be used for controlling nonlinear optical characteristics such as light amplification, optical switching, injection mode locking, and coupling of whispering gallery modes.**

28 Claims, 15 Drawing Sheets



5,231,683 July 27, 1993

Attaching Optical Fibers to Integrated Optic Chips

Inventors: Bruce D. Hockaday and Geary R. Carrier.
Assignee: United Technologies Corporation.
Filed: Oct. 11, 1991.

***Abstract*—A method of attaching an optical fiber to an IOC includes the step of preparing the IOC for attachment by utilizing a dicing saw to cut into the IOC at a depth less than the thickness of the IOC, the cut forming a surface which is normal or at an angle with respect to an optical axis of the waveguide, such step of cutting having the additional result of optically polishing the surface. A portion of the IOC between the initial cut and an end of the IOC is then progressively removed by a series of cuts using the dicing saw, the cuts are to a predetermined depth which is less than the thickness of the IOC, and greater than the radius of the fiber so as to insure proper coupling of the IOC waveguide and fiber core, such series of cuts producing a stepped surface in the IOC. Next, the fiber core is optically aligned with the waveguide by translational and rotational positioning of the fiber end face adjacent to the surface and above the stepped surface. The fiber end face is then secured to the cut surface with adhesive or other suitable means, and the fiber is attached to the stepped surface with adhesive or other suitable means.**

7 Claims, 2 Drawing Sheets