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.

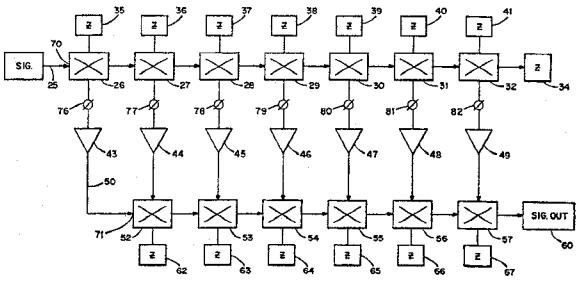
5,136,256 Aug. 4, 1992

Amplifier Combiner

Inventor: Edward Salzberg.
Filed: Apr. 29, 1991.

Abstract—A radio frequency amplifier-combiner using series fed directional couplers in an input distribution network each coupler having an amplified output to a respective coupler in an accumulator providing a high energy output with low accumulator losses. The invention can be used in waveguide with capabilities of output power levels reaching hundreds of watts and more.

11 Claims, 2 Drawing Sheets



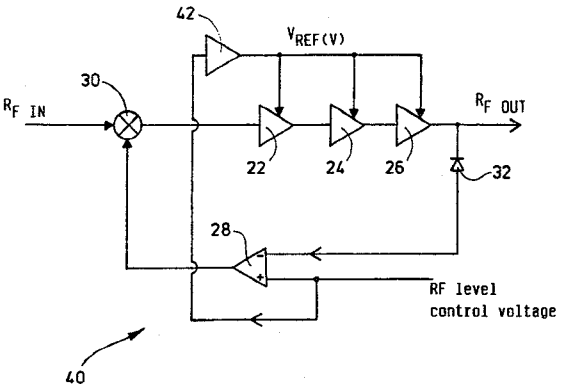
5,136,257 Aug. 4, 1992

RF Amplifier Bias Circuit

Inventor: Ian Reading.
Assignee: Hewlett-Packard Company.
Filed: Dec. 7, 1989.

Abstract—An amplifier circuit includes an amplifier and a biasing circuit. A control circuit generates an amplifier output level control voltage which is coupled to the biasing circuit for controlling the operating point of the amplifier in response to the level of control voltage.

10 Claims, 5 Drawing Sheets



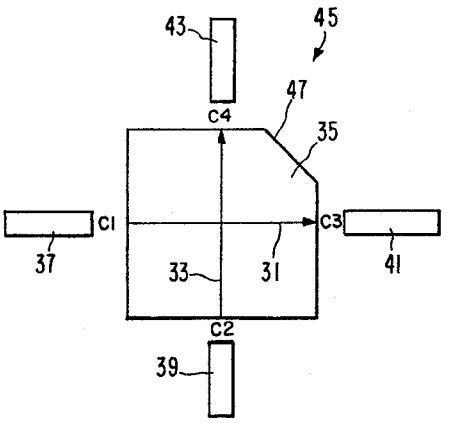
5,136,268 Aug. 4, 1992

Miniature Dual Mode Planar Filters

Inventors: Slawomir J. Fiedziuszko and John A. Curtis.
Assignee: Space Systems/Loral, Inc.
Filed: Apr. 19, 1991.

Abstract—A dual mode microstrip resonator (1) usable in the design of microwave communication filters. The substantially square resonator (1) provides paths for a pair of orthogonal signals which are coupled together using a perturbation located in at least one corner of the resonator (1). The perturbation can be introduced by notching (3) the resonator (1) or by adding a metallic or dielectric stub (5) to the resonator (1).

9 Claims, 3 Drawing Sheets



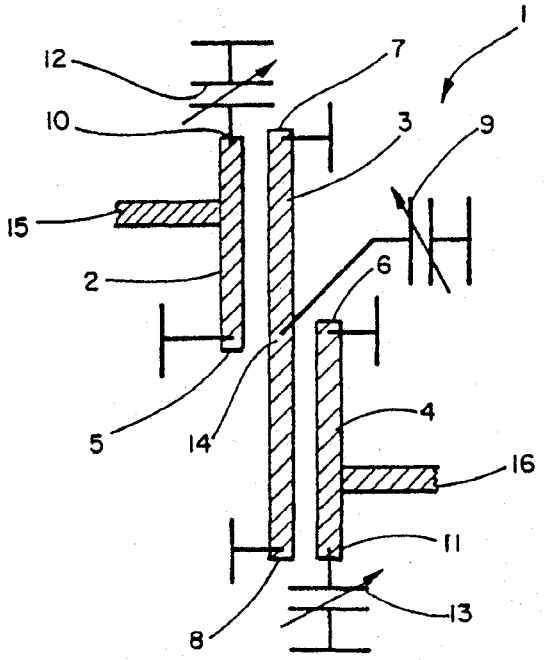
5,136,269 Aug. 4, 1992

High-Frequency Band-Pass Filter Having Multiple Resonators for Providing High Pass-Band Attenuation

Inventors: Dieter Seitzer and Thomas Brockdorff.
Assignee: Fraunhofer Gesellschaft zur Forderund der angewandten Forschung EV.
Filed: Feb. 22, 1991.

***Abstract*—A high-frequency band-pass filter has an input resonator, a middle resonator and an output resonator which are coupled in parallel. The input resonator and the output resonator are capacitively shortened quarterwave line resonators. To improve the attenuation characteristics, the middle resonator is designed as a capacitively shortened half-wave resonator. The input resonator extends along a first part of the length of the middle resonator. The output resonator extends along a second part of the length of the middle resonator.**

20 Claims, 2 Drawing Sheets



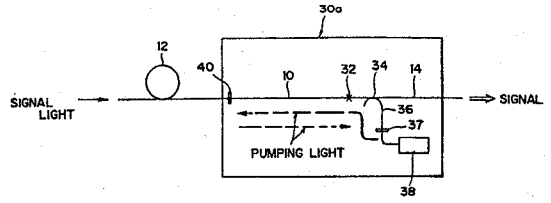
5,136,420 Aug. 4, 1992

Optical Fiber Amplifier

Inventors: Shinya Inagaki, Masayoshi Shigihara, Sakae Yoshizawa, Kazuya Sasaki, and Keiko Takeda.
Assignee: Fujitsu Limited.
Filed: June 21, 1989.

***Abstract*—An optical fiber amplifier is disclosed wherein pumping light and signal light are introduced into a an optical fiber doped with a rare-earth element to directly amplify the signal light. The optical fiber amplifier of the invention comprises means constituted from a reflecting film, a fiber loop or the like for causing pumping light to pass by a plurality of times in the doped fiber. Due to the provision of the reflective film or the fiber loop, pumping light can be utilized efficiently, and the amplification factor of the optical fiber amplifier is improved.**

7 Claims, 11 Drawing Sheets



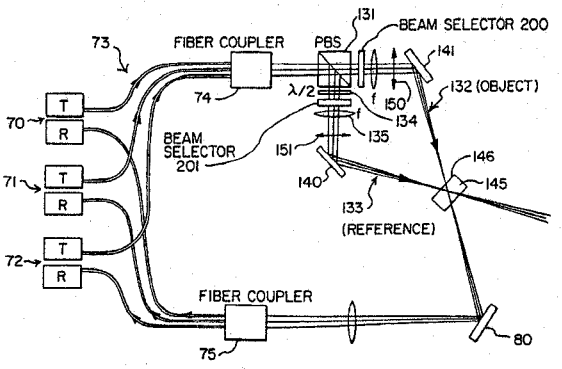
5,136,666 Aug. 4, 1992

Fiber-Optic Communication Method and Aparatus Providing Mode Multiplexing and Holographic Demultiplexing

Inventors: Dana Z. Anderson and Mark E. Saffman.
Assignee: The University of Colorado Foundation, Inc.
Filed: Aug. 6, 1991.

***Abstract*—In fiber-optic communication system, an acoustooptic modulator operates to provide a coherent light beam that is data encoded in the beam's time domain, for example by intensity modulation of the beam. A spatial light modulator then operates to address encode the beam by modulating the beam in the space domain. The resulting data and address modulated beam possesses the property of orthogonality. This beam is now transmitted to the input of a multimode optical fiber. The speckle pattern that exits the output of the optical fiber also exhibits orthogonality. This output beam is presented to a beam splitter in order to produce two spatially modulated speckle light patterns therefrom. These two beams are then focused onto photorefractive means whereat a hologram is produced. This hologram operates to address decode the beam output of the optical fiber. Detector means now operates to detect the data by receiving the beam as it is diffracted by the hologram. Ring and star interconnect networks are described.**

24 Claims, 3 Drawing Sheets



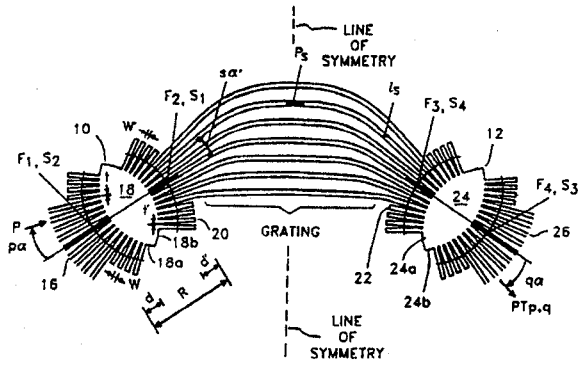
5,136,671 Aug. 4, 1992

Optical Switch, Multiplexer, and Demultiplexer

Inventor: Corrado Dragone.
Assignee: AT&T Bell Laboratories.
Filed: Aug. 21, 1991.

***Abstract*—An $N \times N$ integrated optical interconnection apparatus capable of switching, multiplexing, or demultiplexing a large number of input and output wavelength channels achieves low levels of crosstalk and insertion loss. Two substantially identical $N \times M$ star couplers are connected by an optical diffraction grating comprising M unequal length waveguides spaced from one another by predetermined amounts. Each coupler comprises a dielectric slab defining a free space region between two periodic arrays of waveguides, each radially directed toward a virtual focal point. The arrays are configured so that their respective foci are located at a predetermined distance away from and outside the free space region to minimize phase errors caused by mutual coupling between adjacent waveguides. Specifically, the focal point of each array connected to each star coupler may be located so that it coincides with the phase center of the other array connected to each coupler. Residual phase errors may be reduced by appropriately setting the lengths of the waveguides in the optical grating between the two star couplers. The length difference between any two adjacent waveguides in the grating is not constant throughout the grating.**

8 Claims, 9 Drawing Sheets



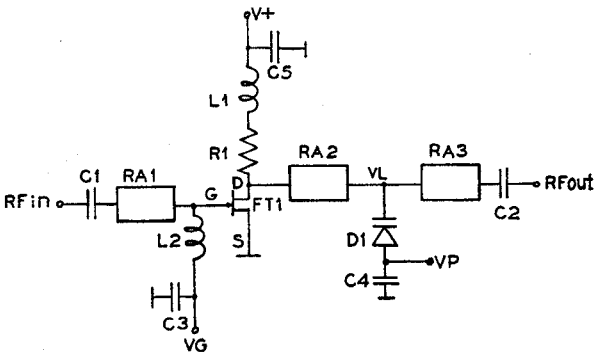
5,138,275 Aug. 11, 1992

Predistortion Linearizer for Microwave Power Amplifiers

Inventors: Antonio Abbiati, Carlo Buoli, Luigi Cervi.
Assignee: Siemens Telecommunicazioni S.p.A.
Filed: Apr. 8, 1991.

Abstract—A predistortion linearizer for microwave power amplifiers wherein a single transistor, e.g., of the GaAsFET type, is subpolarized near the pinch-off condition, and carries out the functions both of a gain expander amplifier for recovery of amplitude distortion of the power amplifier and as a command signal generator for a dephaser element for recovery of the phase distortion of the power amplifier.

15 Claims, 2 Drawing Sheets



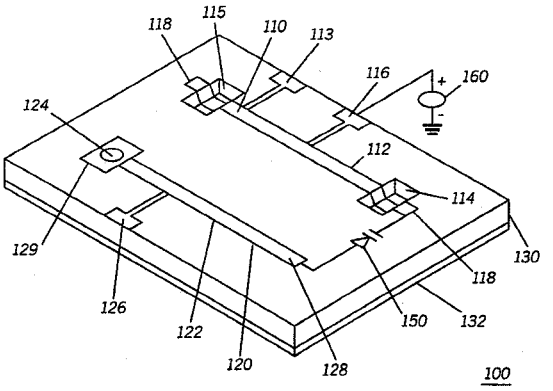
5,138,288 Aug. 11, 1992

Microstrip Filter Having a Varactor Coupled Between Two Microstrip Resonators

Inventor: Dane E. Blackburn.
Assignee: Motorola, Inc.
Filed: Mar. 27, 1991.

Abstract—A transmission line filter is provided that includes a first resonator having open ends being coupled to a second resonator disposed on a substrate. A transmission zero frequency is tuned by means of a varactor that is coupled between the first and the second resonator. The first resonator includes a terminal for applying a control voltage to the varactor for varying its capacitance.

9 Claims, 2 Drawing Sheets



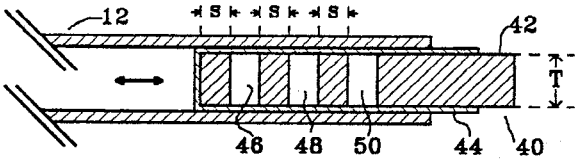
5,138,289 Aug. 11, 1992

Noncontacting Waveguide Backshort

Inventor: William R. McGrath.
Assignee: California Institute of Technology.
Filed: Dec. 21, 1990.

Abstract—A noncontacting waveguide backshort is provided for use with frequencies of interest between 1 and 1000 GHz including a relatively rugged metallic bar movable mounted within the waveguide in a MYLAR insulator. A series of regularly shaped and spaced circular or rectangular openings are made in the metallic bar to form sections of high impedance alternating with sections of the bar having low impedance. This creates a periodic impedance variation which serves to provide an adjustable short circuit in a waveguide for the frequencies of interest.

20 Claims, 1 Drawing Sheet



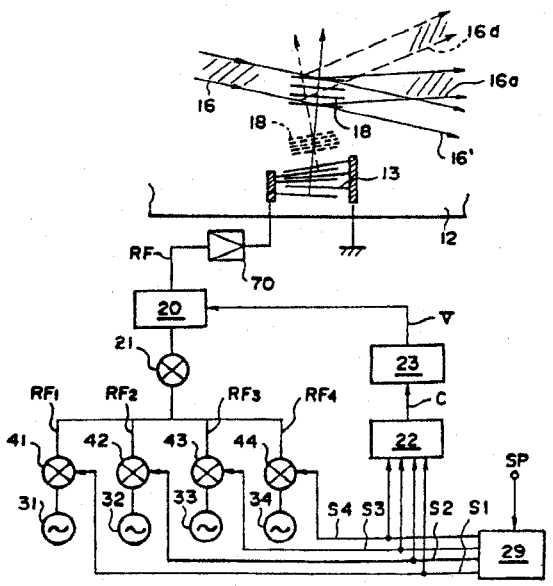
5,138,482 Aug. 11, 1992

Light Modulator and Recording Device Employing Same

Inventors: Masami Hatori and Hiroshi Sunagawa.
Assignee: Fuji Photo Film Co., Ltd.
Filed: Sept. 25, 1990.

Abstract—A light modulator includes an interdigital transducer having a plurality of interdigital electrode fingers for generating surface elastic waves having respective different frequencies in an optical waveguide. The electrode fingers are oriented in different directions to enable the generated surface elastic waves to diffract a light beam guided through the optical waveguide, while satisfying the Bragg condition for diffraction. A driver applies high-frequency voltages having respective frequencies to the electrode fingers to generate the surface elastic waves, respectively. The application of the high-frequency voltages to the electrode fingers is turned on and off by switching circuits. The light modulator is incorporated in a recording device.

4 Claims, 14 Drawing Sheets



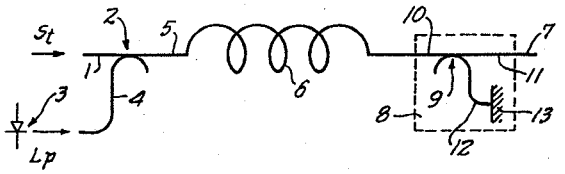
5,138,483 Aug. 11, 1992

Low-Noise Active Fiber Optical Amplifier with Pumping Power Reflector

Inventors: Giorgio Grasso, Aldo Righetti, and Flavio Fontana.
Assignee: Societa' Cavi Pirelli S.p.A.
Filed: Jan. 21, 1992.

Abstract—An optical, low-noise amplifier of the active-fiber type, which fiber contains a laser light emitting substance, adapted to be connected to an optical telecommunication fiber and receiving light therefrom at the transmission wavelength. The active fiber is also fed from a light source at a pumping wavelength and has a length corresponding to a partial absorption of the pumping light. Downstream of active fiber, there is a selective mirror device which reflects the light at the pumping wavelength and is transparent to the transmission wavelength light. Preferably, the mirror device consists of an optical demultiplexer adapted to separate the transmission wavelength and the pumping wavelength on two output fibers. A mirror which reflects the pumping wavelength is present at the end of the fiber carrying the pumping wavelength.

10 Claims, 2 Drawing Sheets



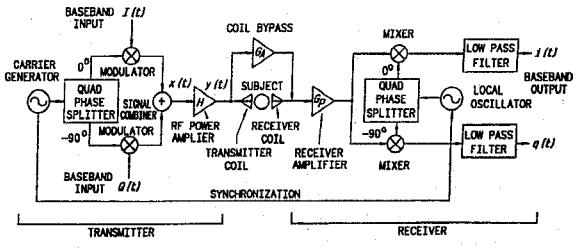
5,140,268 Aug. 18, 1992

Method and Means for Correcting RF Amplifier Distortion in Magnetic Resonance Imaging

Inventor: Frandics P. Chan.
Assignee: The Board of Trustees of the Leland Stanford Junior University.
Filed: June 15, 1990.

Abstract—In a magnetic resonance imaging system, an RF power amplifier is employed to boost an RF pulse to sufficient strength to excite the nuclear spins in a subject. The non-ideal behavior of the amplifier distorts the shape of an excitation pulse, and this distortion in turn degrades a slice profile. The distortion of the RF signal is manifested by nonlinearity in amplification and in incidental phase modulation. By determining the amount of nonlinearity and the phase modulation resulting from the power amplification, the baseband RF signal can be predistorted or prewarped to offset the distortion resulting from amplification. Improved slice selectivity results therefrom.

15 Claims, 10 Drawing Sheets



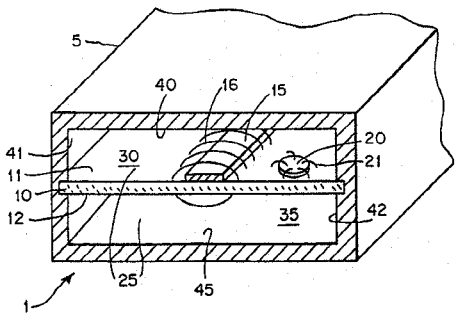
5,140,285 Aug. 18, 1992

Q Enhanced Dielectric Resonator Circuit

Inventor: Leonard D. Cohen.
Assignee: Ail Systems, Inc.
Filed: Aug. 26, 1991.

Abstract—A *Q* enhanced dielectric resonator circuit includes a metal enclosure having interior walls defining a chamber. Secured to at least two interior walls is a dielectric substrate. Flatly mounted to at least one side of the dielectric substrate is a substrate stripline. A dielectric resonator is secured to the dielectric substrate at a selected distance from the substrate stripline. The dielectric substrate is positioned a sufficient distance from a ground plane such that the magnetic field lines of the dielectric resonator do not significantly interact with the ground plane. The dielectric resonator is also positioned such that there is substantially coupling of the magnetic field lines of the dielectric resonator with the magnetic field lines of the substrate stripline.

6 Claims, 6 Drawing Sheets



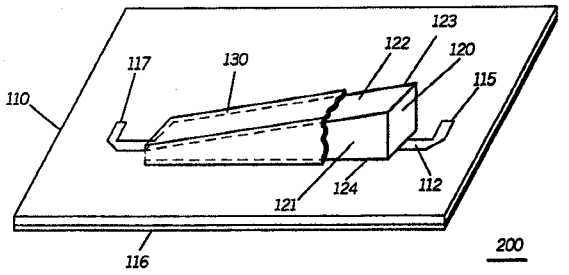
5,140,288 Aug. 18, 1992

Wideband Transmission Line Impedance Matching Transformer

Inventor: Randall L. Grunwell.
Assignee: Motorola, Inc.
Filed: Apr. 8, 1991.

Abstract—An impedance matching transformer includes a dielectric having a varying thickness between opposing surfaces. A transmission conductor and a return conductor are formed on the opposing surfaces. The impedance transformation between a first terminal and a second terminal is proportional to the thickness variation of the dielectric.

7 Claims, 2 Drawing Sheets



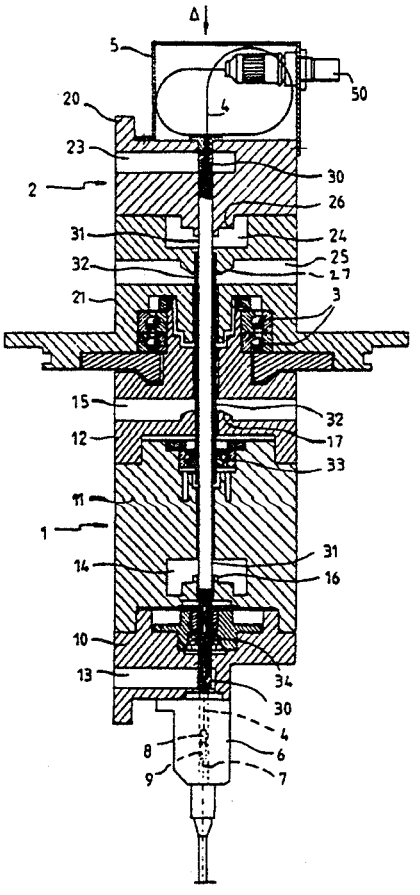
5,140,289 Aug. 18, 1992

Combined Microwave and Optic Rotary Joint

Inventors: Francois Andrieu, André Jacquemet, Philippe Gerard.
Assignee: Thomson-CSF.
Filed: May 13, 1991.

Abstract—This combined microwave and optic rotary joint has a fixed part and a rotating part in rotation about an axis Δ in relation to the fixed part. It has at least one pair of microwave guide inputs, one of which is positioned in the fixed part while the other is positioned in the rotating part, these microwave guide inputs being coupled to each other by a coaxial link that is fixedly joined to the rotating part and placed in a conduit going through the fixed and rotating parts along the rotation axis Δ. The core of the coaxial link is drilled with a longitudinal channel enabling the passage of an optic fiber fixedly joined to the rotating part. The end of this optic fiber goes through the fixed part and emerges in a case where it is coupled through an optic rotation plane to the end of another optic fiber fixedly joined to the fixed part.

7 Claims, 2, Drawing Sheets



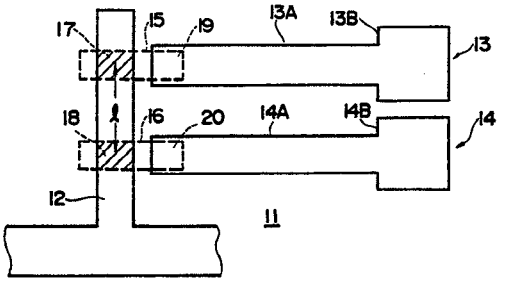
5,140,382 Aug. 18, 1992

Microwave Integrated Circuit Using a Distributed Line with a Variable Effective Length

Inventor: Nobuo Shiga.
Assignee: Sumitomo Electric Industries, Ltd.
Filed: Apr. 12, 1991.

Abstract—In this invention, a distributed constant line on a microwave IC is formed of a Schottky metal, and a semiconductor conductive layer contacting the distributed constant line at least at one position and an ohmic contact electrode contacting the semiconductor conductive layer are arranged. According to this invention, characteristics of IC's can be optimized against a variation in elements combined with a circuit comprising the distributed constant line after the manufacture of IC's.

5 Claims, 1 Drawing Sheet



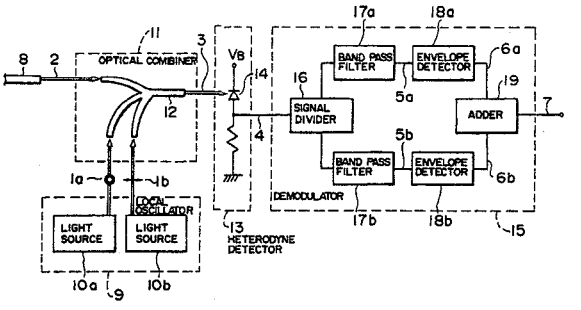
5,140,453 Aug. 18, 1992

Optical Receiving Method Utilizing Polarization Diversity and Apparatus for Carrying Out the Same

Inventors: Hideaki Tsushima, Katsuyuki Imoto, Hiroshisa Sano, Akihiko Takase, Yoshitaka Takasaki, and Minoru Maeda.
Assignee: Hitachi, Ltd.
Filed: Mar. 11, 1988.

Abstract—An optical receiving method utilizing polarization diversity is disclosed in which first and second reference lightwaves having different frequencies and having polarization planes substantially perpendicular to each other, are combined with a signal lightwave to form a combined lightwave. The combined lightwave is subjected to heterodyne detection to obtain a detection signal and the detection signal is separated into first and second intermediate-frequency signals having different carrier frequencies. The first and second intermediate-frequency signals are converted into first and second baseband signals, respectively, and the first and second baseband signals are added to obtain an output signal.

13 Claims, 10 Drawing Sheets



5,142,185 Aug. 25, 1992

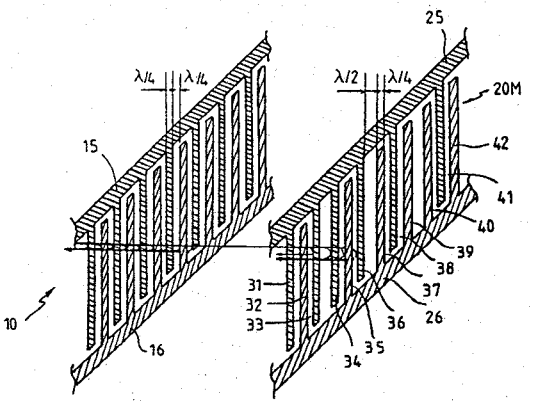
Acoustic Electric Surface Wave Device

Inventors: Benoit Noel and Jean-Louis Foure.
Assignee: Electronique Serge Dassault.
Filed: Mar. 22, 1990.

Abstract—A surface acoustic electric wave device of the type comprising, over a large face of a planar piezo-electric substrate, a first row of parallel conductive fingers having an individual geometry chosen and distributed according to a chosen distribution arrangement along this row, a second row of parallel conductive fingers having an individual geometry chosen and distributed according to a chosen distribution arrangement along this row, the second row being interspaced from the firs so as to allow a propagation of surface acoustic waves between the fingers of the first row and those of the second, which imparts to the device spectral and/or temporal characteristics defined by the acoustic propagation and the frequency selectivity due to the geometry of the fingers.

The geometries of the fingers are chosen, in correspondence as from one row to the other, in order to obtain an acoustic coupling with a wide frequency bandwidth, and one of the two distribution arrangements or sequences for the attachment of the fingers is modified substantially periodically.

11 Claims, 4 Drawing Sheets



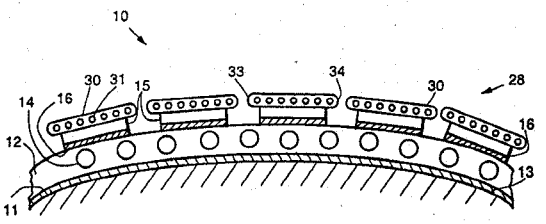
5,142,595 Aug. 25, 1992

Microwave System Employing Optically Phased Conformal Antennas Having Photonic Interconnects and Method of Forming Photonic Interconnects

Inventor: Arthur N. Chester.
Assignee: Hughes Aircraft Company.
Filed: Oct. 21, 1991.

Abstract—An optically phased conformal antenna and photonic interconnect therefor that may be used in such microwave systems. Rows of microwave circuits are disposed on top of a cooling arrangement disposed on a curved surface. An optical ribbon cable disposed on top of the microwave circuits is employed to couple signals to the microwave circuits. Microwave antennas are disposed on top of the optical ribbon cable which has windows therein that permit welding of the antennas to the appropriate microwave circuits. Optical coupling of signals from the optical cable to the microwave circuits is achieved through the use of diffraction gratings, and the like, formed in the optical cable, in conjunction with laser diodes and detectors disposed on the chips.

18 Claims, 3 Drawing Sheets



5,142,596 Aug. 25, 1992

Tapered Light Wave Guide and Wavelength Converting Element Using the Same

Inventors: Kiminori Mizuuchi, Kazuhisa Yamamoto, and Tetsuo Taniuchi.
Assignee: Matsushita Electric Industrial Co., Ltd.
Filed: July 16, 1991.

Abstract—A tapered light wave guide reduced in propagation loss, improved in coupling efficiency and free from the problem of optical damage. An input section, a widthwise tapered coupling section having a depth d2, and a wave guide having a depth d1 are formed on an $LiNbO_3$ substrate. A depthwise tapered section in which the depth is changed from d2 to d1 is provided to connect the widthwise tapered coupling section having constant depth d2 and the wave guide, whereby a reduction in light propagation efficiency due to optical damage is prevented.

7 Claims, 9 Drawing Sheets