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, D.C. 20231.

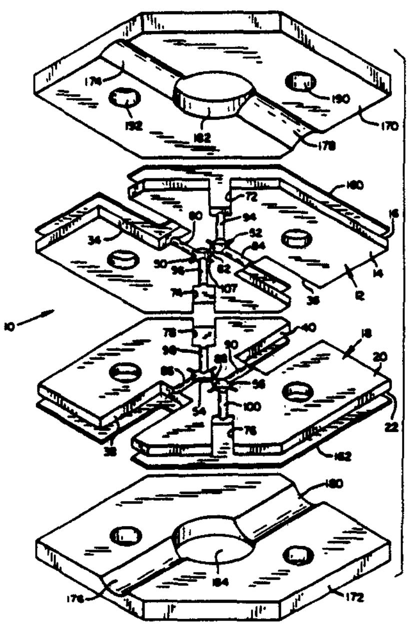
4,857,871 Aug. 15, 1989

Magnetic Field-Tunable Filter with Plural Section Housing and Method of Making the Same

Inventor: David L. Harris.
Filed: Oct. 31, 1988.

Abstract—A tunable ferrimagnetic resonator containing microwave filter with a plural piece housing is described. First and second body laminations are provided with channels and openings which form passageways and resonator receiving cavities when the laminations are assembled. These passageways and openings are preferably formed by chemical milling. Closure elements or shims overlay and close the ends of the resonator cavities. The body laminations and closure elements are of a nonmagnetic metal and are typically formed from flat thin sheets of material. Cover laminations, such as of plastic, clamp the closure and body laminations together and provide strength to the overall housing structure. Microwave filters of this invention are capable of being tuned up to 40 GHz and higher.

16 Claims, 3 Drawing Sheets



4,859,014 Aug. 22, 1989

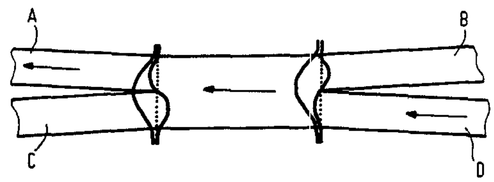
Nonreciprocal Optical Waveguide Device, Particularly for Use as an Isolator or Circulator

Inventors: Hans-Jürgen Schmitt and Hans O. B. Dammann.
Assignee: U.S. Philips Corp.
Filed: June 20, 1988.

Abstract—The invention relates to a nonreciprocal optical element, particularly for use as an isolator or circulator, which is connected to at least two monomode optical waveguides and which has a magneto-optical waveguide structure which is subjected to a transversal magnetic field directed perpendicularly to the direction of propagation of the optical wave. This arrangement is simplified by combining the functions of the coupler and the phase shifter, which is achieved by means of the following features:

- The magneto-optical waveguide structure (1, 11) is formed as a multimode waveguide which can propagate at least one fundamental mode (5) and the first-order mode (6).
- The optical waveguides (A, B, C, D, 9, 10) are off-centered with respect to the waveguide structure (1, 11).
- The dimensions and/or the cross-sectional distribution of the refractive index of the optical waveguide structure (1, 11) are chosen to be such that the two modes (5, 6) have a reciprocal phase difference of $(\pi 2)+pb2n\pi$.
- The magnetic field strength and/or the structural buildup of the magneto-optical waveguide structure (1, 11) are chosen to be such that the two modes (5, 6) have a nonreciprocal phase difference of $(\pi 2)+2m\pi$ in which n and m may be integers including 0.

8 Claims, 1 Drawing Sheet



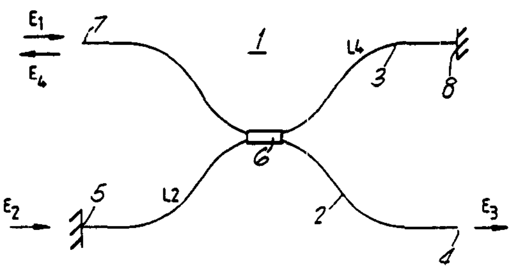
4,859,017 Aug. 22, 1989

Dielectric Optical Fabry–Perot Waveguide Device and Method for Making and Using Same

Inventors: Michael C. Brierley, Stephen R. Mallinson, Colin A. Millar, and William P. Urquhart.
Assignee: British Telecommunications plc.
Filed: July 21, 1986.

Abstract—A selective filtering device for use in optical communications systems takes the form of a transversely coupled Fabry–Perot interferometer. One described embodiment comprises a first length of monomode optical fiber transversely coupled to a second fiber in a coupling region. One end of each fiber at opposite respective ends of the coupling region is provided with a suitable highly reflective surface, for example, an evaporated gold/aluminum deposit. In operation, a light input may be modified by the resonant cavity behavior of the Fabry–Perot cavity formed between the mirrored ends to provide filtered or enhanced outputs. The outputs may be further modifed by alternative or additional light input via the ends of the fibers.

13 Claims, 6 Drawing Sheets



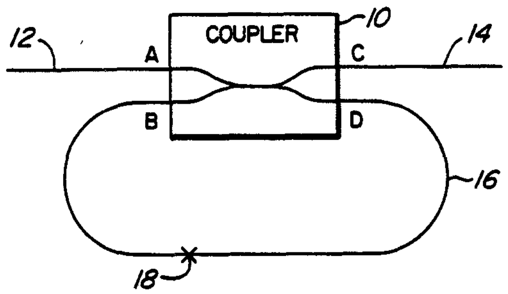
4,859,018 Aug. 22, 1989

Optical Fiber Bandwidth Limiter

Inventors: Maurice S. O'Sullivan, Hyung B. Kim, Vincent C. So, and Paul J. Vella.
Assignee: Northern Telecom Limited.
Filed: June 15, 1987.

Abstract—A bandwidth limiter for an optical fiber transmission path comprises a four-port optical coupler via which an optical signal is passed. A spliced optical fiber provides a loop, from an output to an input of the coupler, with a predetermined propagation delay and attenuation. An alternative arrangement uses two couplers which are coupled together via fibers of different length and hence propagation delay.

4 Claims, 2 Drawing Sheets



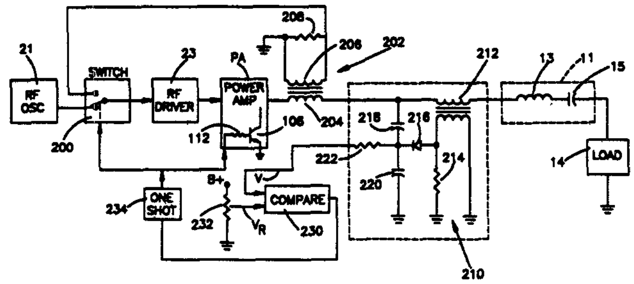
4,859,967 Aug. 22, 1989

RF Power Amplifier Protection

Inventor: Hilmer I. Swanson.
Assignee: Harris Corporation.
Filed: Nov. 9, 1988.

Abstract—An RF power amplifier is operated by supplying an RF signal to the amplifier for amplification and thereby providing an output RF signal to the amplifier's output circuit which has an impedance matching output network connected in series with a load. A detector serves to detect any reflected power in the output circuit. The RF power amplifier is turned off when the detected RF power exceeds a reference level. The amplifier is protected by discontinuing the supply of the RF signal to the amplifier while it is turned off and, instead, a frequency signal is supplied to the RF amplifier having a frequency that corresponds with that of any current flowing in the output circuit.

11 Claims, 3 Drawing Sheets



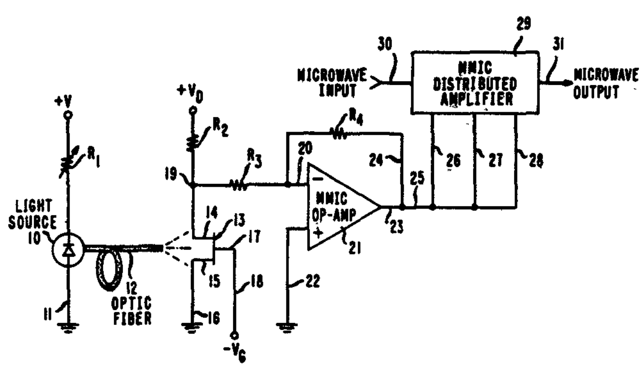
4,859,965 Aug. 22, 1989

Optical Gain Control of GaAs Microwave Monolithic Integrated Circuit Distributed Amplifier

Inventors: Arthur Paolella and Peter R. Herczfeld.
Assignee: The United States of America as represented by the Secretary of the Army.
Filed: Feb. 27, 1989.

Abstract—An optical gain control circuit for controlling the gain of a GaAs MMIC distributed amplifier having a dc gain control is provided. Variable intensity light from a controlled LED is directed to the surface of a GaAs multifinger FET by means of an optical fiber. The FET is gate biased to a point near pinch-off to maximize its light sensitivity and the drain and source of the FET are serially connected with a fixed resistance in a dc voltage divider circuit so that the output of the voltage divider circuit changes as a function of the change in light intensity of the LED. A MMIC operational amplifier connected in an inverter mode is coupled between the output of the voltage divider circuit and the dc gain control of the distributed amplifier to control the gain of that amplifier.

6 Claims, 2 Drawing Sheets



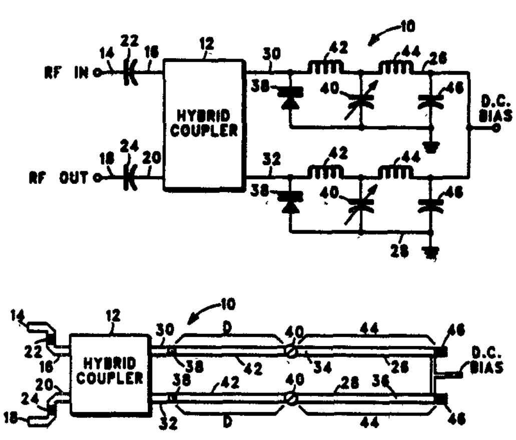
4,859,972 Aug. 22, 1989

Continuous Phase Shifter for a Phased Array Hyperthermia System

Inventors: Steven J. Franke, Ronald D. Boesch, and Richard L. Magin.
Assignee: The Board of Trustees of the University of Illinois.
Filed: Nov. 1, 1988.

Abstract—A continuous microstrip phase shifter suitable for use in a phased array microwave hyperthermia system operating at 915 MHz is provided. The phase shifter utilizes a three dB quadrature hybrid coupler in conjunction with microstrip lines to change the phase of a transmitted wave. The phase change is introduced through the reflection ports of the coupler which are loaded with identical parallel resonant circuits. An abrupt junction varactor capacitance in parallel with a distributed inductance forms a voltage-tunable resonant circuit. The resonant element values are chosen to give a specified continuous phase variation with minimum transmission loss. This is accomplished without additional microwave circuit elements.

6 Claims, 1 Drawing Sheet



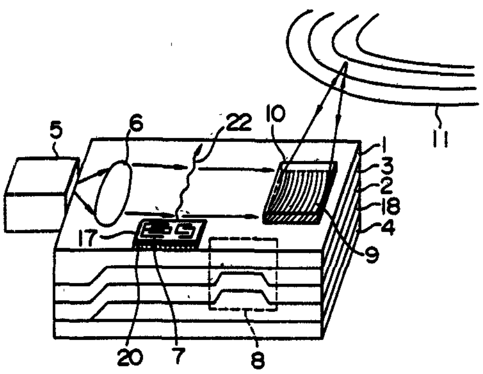
4,861,128 Aug. 29, 1989

Optical Pickup Using a Waveguide

Inventors: Sachiko Ishikawa and Akira Arimoto.
Assignee: Hitachi, Ltd.
Filed: Feb. 3, 1988.

Abstract—An optical pickup comprising a semiconductor laser, a first waveguide for leading light emitted by the semiconductor laser to recording medium and coupling again light returning from the recording medium; splitting element for separating the light returning from the recording medium from the first waveguide path; and a second waveguide propagating light returning from the recording medium and separated by the splitting element; wherein light going towards the recording medium and light returning from the recording medium propagate separately in the first and the second waveguide so that the utilization efficiency of the light is increased.

18 Claims, 4 Drawing Sheets



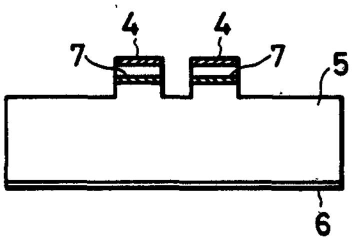
4,861,130 Aug. 29, 1989

Optical Modulating Device Utilizing Polariton Substance

Inventors: Toshio Katsuyama, Hiroyoshi Matsumura, Hiroaki Inoue, Tadashi Fukuzawa, and Naoki Chinone.
Assignee: Hitachi, Ltd.
Filed: Oct. 26, 1987.

Abstract—An optical device utilizes a polariton substance and utilizes the absorption wavelength band of excitonic polaritons. Further, an external stimulus such as electric field, magnetic field, stress, current or electromagnetic wave (light) is continuously or intermittently given to the polariton substance, thereby to modulate light which enters the optical device. Thus, a modulating operation of ultrahigh speed is possible.

22 Claims, 5 Drawing Sheets



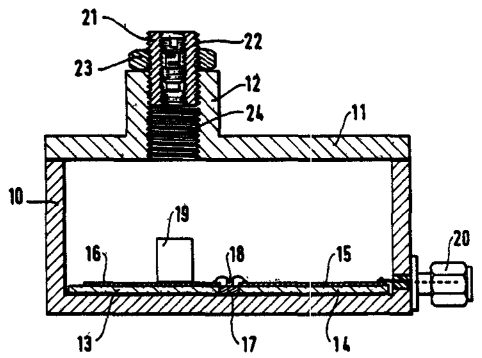
4,862,111 Aug. 29, 1989

Microwave Oscillator Having a Dielectric Resonator, in Particular for the 22 GHz Range

Inventors: Isaac Mettoudi and Francois Lafranca.
Assignee: Societe Anonyme dite Alcatel Thomson Faisceaux Hertziens.
Filed: Apr. 13, 1988.

Abstract—A microwave oscillator having a dielectric resonator, in particular for use in the 22 GHz range, the oscillator comprising a negative resistance component (18) and a dielectric resonator (19) disposed on the surface of a substrate (13, 14) situated inside a housing (10), and the housing (10) being provided with a clearance situated over the dielectric resonator (19).

10 Claims, 2 Drawing Sheets



4,862,112 Aug. 29, 1989

W-Band Microstrip Oscillator Using Gunn Diode

Inventor: Donald R. Singh.
Assignee: Honeywell, Inc.
Filed: Feb. 22, 1988.

Abstract—A microstrip oscillator utilizing a Gunn diode as its active element for operation in the *W*-band. A microstrip shunt resonator is dimensioned to resonate the Gunn diode at either its fundamental frequency or second harmonic frequency while a matching circuit, including a quarter wavelength transformer and a coupled microstrip transformer is employed to match the complex impedance of the Gunn diode device to the load. A radial hat on the Gunn diode effectively prevents radiation of electromagnetic energy from the system to thereby maximize the energy delivered to the load while, at the same time, functioning as a transformer element.

5 Claims, 2 Drawing Sheets