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.

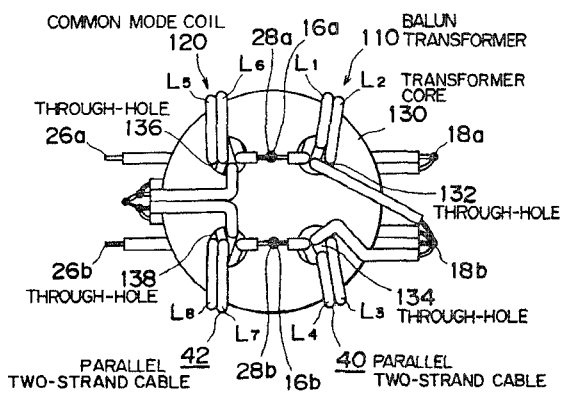
5,200,718 Apr. 6, 1993

Balun Transformer With Common Mode Coil

Inventors: Tatsuo Kato.
Assignee: SMK Company, Ltd.
Filed: Oct. 22, 1991.

Abstract—A balun transformer with a common mode coil is formed by parallel two-strand cable wound around a common core having through-holes through which the cable passes. The common mode coil can be connected either on the input side or the output side of the balun transformer. Because only one core is used to form both the balun transformer and the common mode coil, the outer dimensions of the transformer can be reached, along with manufacturing costs, to reduce the number of man-hours required to manufacture the transformer by this invention. This configuration also permits shorter connections between the balun transformer and the common mode coil.

2 Claims, 4 Drawing Sheets



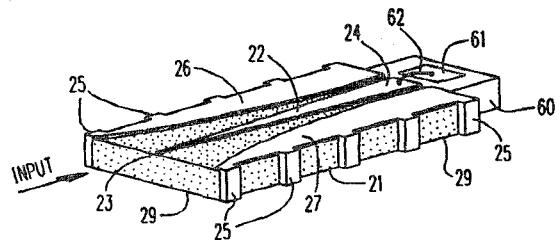
5,200,719 Apr. 6, 1993

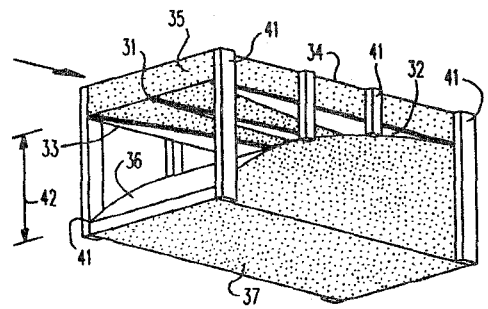
Impedance-Matching Coupler

Inventors: Walter Margulis and Maria C. R. Carvalho.
Assignee: Telecommunicacoes Brasileiras S/A.
Filed: Oct. 7, 1993.

Abstract—A coupling device has a dielectric substate with at least two joined transmission lines formed thereon. The two transmission lines have a common signal carrying conductor and separate ground plane conducting means. The conductor cross-section and the conductor spacing cross-section are varied along the length of the transmission lines to provide a large changed of the characteristic impedance of the coupling device along the line length.

9 Claims, 4 Drawing Sheets





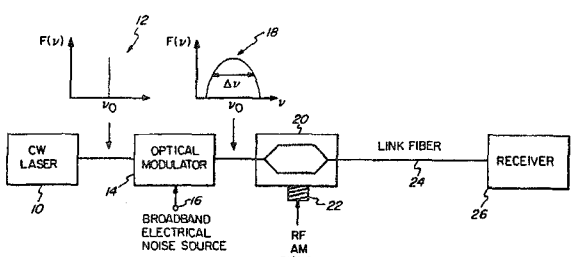
5,200,964 Apr. 6, 1993

Broad Linewidth Lasers for Optical Fiber Communication Systems

Inventors: David R. Huber.
Assignee: General Instrument Corporation.
Filed: Jan. 5, 1992.

Abstract—Non-linear effects in an optical fiber used for communicating AM signals at high power levels are reduced by increasing the linewidth of the pump laser output signal. The linewidth can be increased by optically broadening the laser output signal by driving an optical angle modulator with broadband electrical noise. The optical signal is then externally modulated with an AM information signal for transmission over an optical link fiber. The optical modulation can be provided using either an FM or PM optical modulator. A desired linewidth can be provided by controlling the optical modulation index during the optical modulation step and/or by controlling the bandwidth of the noise source. Other techniques for broadening a laser output signal, including modulating the signal by a periodic function such as a sine wave, or injecting spontaneous emissions into the laser cavity, are also disclosed.

24 Claims, 6 Drawing Sheets



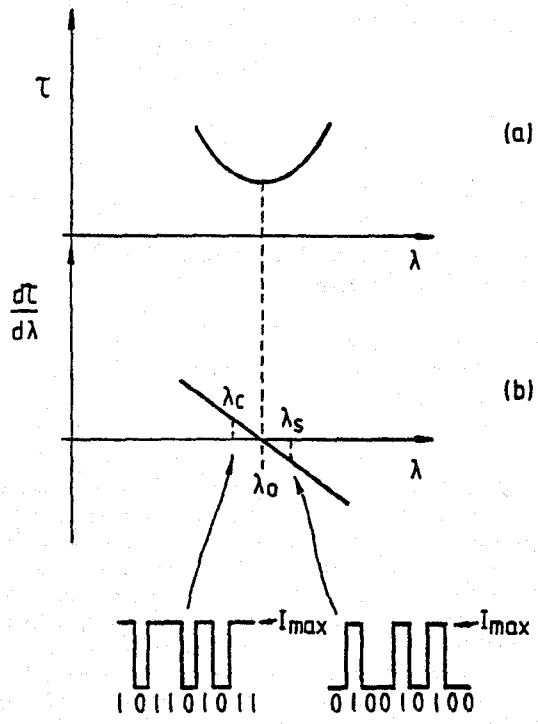
5,201,017 Apr. 6, 1993

Optical Communications Systems

Inventors: Kevin C. Byron.
Assignee: STC PLC.
Filed: Oct. 30, 1990.

Abstract—Soliton-type interaction is eliminated in optical fibre communications system by making the fibre appear to be a passive optical pipe to a signal to be transmitted along it. In particular, the signal to be transmitted is intensity modulated and at a first wavelength which is greater than the minimum dispersion wavelength of the fibre by a predetermined amount. This signal is launched simultaneously into the fibre with a signal of dark pulses of the same format but at a wavelength less than the minimum dispersion wavelength by the predetermined amount. As a result the light transmitted in the fibre is of constant intensity and soliton-type effects, which rely on intensity variation for their formation, do not occur.

3 Claims, 1 Drawing Sheet



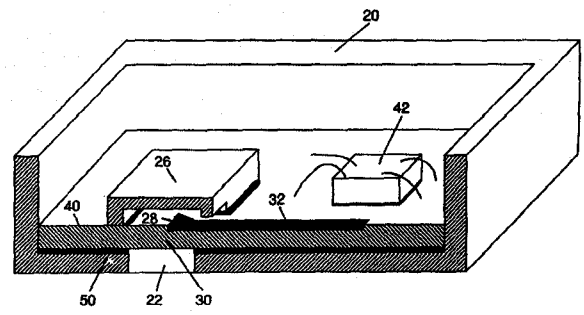
5,202,648 Apr. 13, 1993

Hermetic Waveguide-To-Microstrip Transition Module

Inventors: Jay H. McCandless.
Assignee: The Boeing Company.
Filed: Dec. 9, 1991.

Abstract—A wavelength-to-microstrip transition module transmits captured electromagnetic energy between a waveguide and signal processing circuitry. The module is an assembly of a base which includes at least one waveguide, a circuit board having one side mounted to the base and the opposite side including at least one microstrip. The microstrip is simultaneously connected to signal processing circuitry and oriented with each waveguide. A backshort is associated with each microstrip. The module further includes a housing bonded to and containing, the base and circuit board. A cover is hermetically sealed to the housing to enclose the circuit board in the housing.

6 Claims, 3 Drawing Sheets



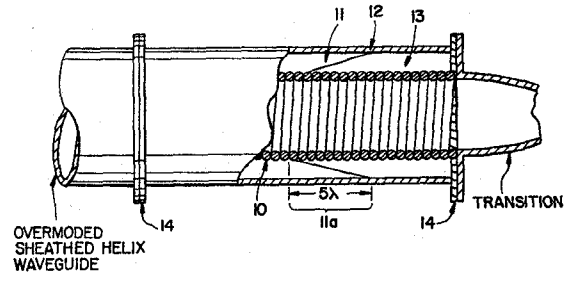
5,202,650 Apr. 13, 1993

Matched Spurious Mode Attenuator and Transition for Circular Overmoded Waveguide

Inventors: Jerry A. Krill, William A. Huting, and Edward P. Irzinski.
Assignee: The Johns Hopkins University.
Filed: June 26, 1991.

Abstract—A mode suppressor structure designed to maintain TE_01 mode matching in an overmoded waveguide, while at the same time allowing efficient coupling of unwanted modes for dissipation in the mode filtering structure of the overmoded waveguide, and in a manner which is non-intrusive on the TE_{01} mode and thus promotes high power operation.

24 Claims, 3 Drawings



5,202,745 Apr. 13, 1993

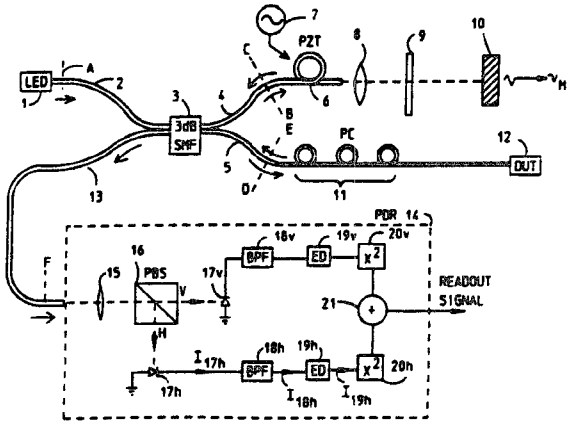
Polarization Independent Optical Coherence-Domain Reflectometry

Inventors: Wayne V. Sorin and Brian L. Heffner.
Assignee: Hewlett-Packard Company.
Filed: Mar. 2, 1992.

Abstract—An optical coherence-domain reflectometry system provides an interferometer driven by broadband incoherent light source with the device under test connected to one arm of the interferometer and a movable scanning mirror in the other arm providing a reference signal. The mirror moves at a controlled velocity to produce a Doppler shift in the reference signal frequency. The reference signal arm also includes a piezoelectric transducer which modulates the phase of the reference signal at a given frequency,

causing a further shift in the reference signal frequency. The interference signal is detected and measured by a polarization diversity receiver. A linear polarizer in the reference signal arm is adjusted to produce equal reference signal powers in each arm of the polarization diversity receiver in the absence of a reflection signal from the test arm. The measured reflectometry signal is substantially independent of the state of polarization of the reflected signal from the device under test.

8 Claims, 7 Drawing Sheets



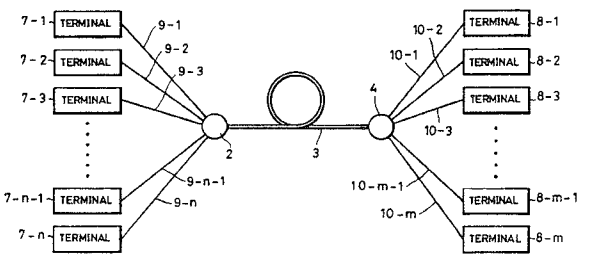
5,202,782 Apr. 13, 1993

Optical Communication Method and Optical Communication System

Inventors: Kenji Nakamura and Jun Nitta.
Assignee: Canon Kabushiki Kaisha.
Filed: Jan. 14, 1991.

***Abstract*—Disclosed is a method of and an apparatus for conducting communications using an optical communication system that includes a plurality of light transmitters and a plurality of light receivers mutually connected to the plurality of light transmitters. The communication method includes detecting, from a predetermined wavelength range, first and second wavelengths in one of the light transmitters, which wavelengths are different from each other and which have not been used by other light transmitters; conducting communications between one of the light transmitters and one of the light receivers using light having the first wavelength; and conducting communications between the light transmitter and the light receiver using light having the second wavelength when the quality of the communications using the light having the first wavelength deteriorates. Also disclosed is a method of and an apparatus for conducting communications using an optical communication system that includes a plurality of mutually connected light transceivers. This communication method includes conducting communications between those light transceivers which are a selected pair of light transceivers using light having a set wavelength; detecting interference in the communications between the selected pair of light transceivers and interference in those light transceivers other than the selected pair; and shifting the set wavelength to avoid the interference when interference is detected.**

27 Claims, 10 Drawing Sheets



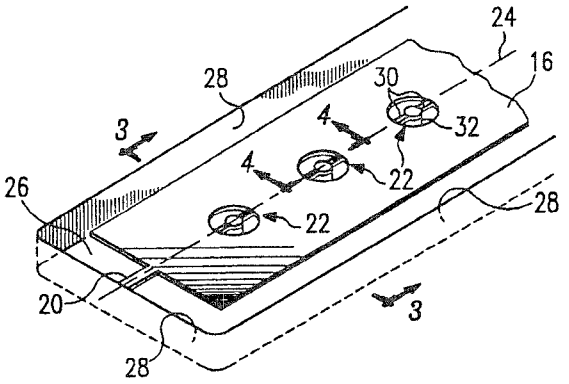
5,202,785 Apr. 13, 1993

Method and Device for Steering Light

Inventors: William E. Nelson.
Assignee: Texas Instruments, Incorporated.
Filed: Dec. 20, 1991.

***Abstract*—A method for periodically steering a beam of light is disclosed comprising the steps of reflecting a beam of light off of a mirror suspended by at least two supporting elements. At least one of the supporting elements is displaced from an edge of the mirror. A periodic voltage is applied to an electrode displaced from the mirror to cause the mirror to rotate about an axis.**

9 Claims, 3 Drawing Sheets



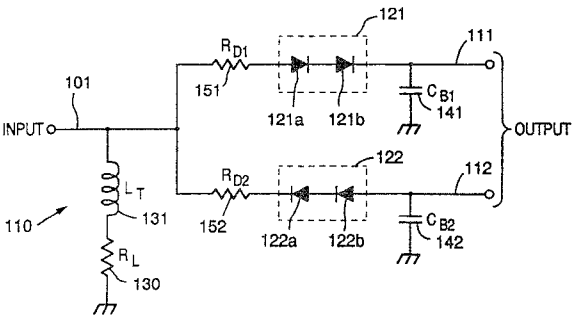
5,204,613 Apr. 20, 1993

RF Power Sensor Having Improved Linearity Over Greater Dynamic Range

Inventors: Stephen C. Cripps and Thomas R. Allen.
Assignee: Wavetek Microwave, Incorporated.
Filed: May 2, 1991.

***Abstract*—A radio frequency ("RF") power sensor providing RF signal power sensing with reduced dependency upon its input signal power level includes multiple series-connected diodes for detecting the power of an input RF signal and providing an output voltage representing that power. The multiple series-connected diodes couple the input node shunted by an input load resistor to the output mode shunted by an output filter capacitor. Using multiple series-connected diodes results in reduced reverse bias voltages across the diodes (presented by the charged output filter capacitor), thereby increasing their junction capacitances. These increase junction capacitances, in turn, result in reduced fractional changes thereof (e.g. capacitance "modulation") over changes in the input RF signal power. This reduction in fractional capacitance changes as a function of input signal power variations, further in turn, results in reduced input signal power dependency of the sensors' impedances and sensitivities. Therefore, the power detection performed by the diodes becomes more predictable, e.g. more linear, over a broader input RF signal power range.**

12 Claims, 2 Drawing Sheets



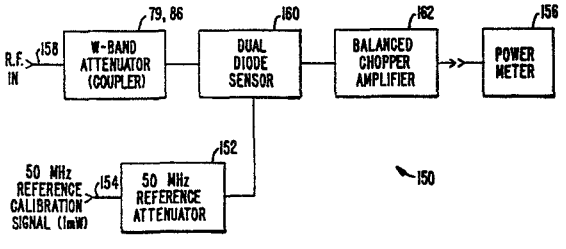
5,204,614 Apr. 20, 1993

Broad-Band Microwave Power Sensor Using Diodes Above Their Resonant Frequency

Inventors: Pedro A. Szente and Gratz L. Armstrong.
Assignee: Hewlett-Packard Company.
Filed: Aug. 14, 1991.

Abstract—A microwave power sensor is disclosed which is capable of using diodes above their resonant frequency to sense the power of input microwaves. The power sensor includes a sensing diode, a conditioning means, and a tapered waveguide. For input waves having frequencies near and above the resonant frequency of the sensing diode, the output of the diode begins to be frequency dependent. That is, the diode output different DC signals for waves having different frequencies even though the power of the waves is the same. The conditioning apparatus is adapted to offset the frequency dependence of the diode by varying the fraction of the input wave that is transmitted to the diode so as to cause the output of the diode to be relatively constant for waves having equal power but different frequencies. the conditioning apparatus also provides a load impedance which matches the characteristic impedance of the input wave to minimize the reflection of the input wave. In addition, the conditioning apparatus attenuates the input signal to ensure that the sensing diode operates in the square law region. The tapered waveguide receives the wave transmitted by the conditioning apparatus and conveys it to the sensing diode. The waveguide is adapted to cause the input wave to have a voltage maximum at its output port. By attaching the sensing diode across the output port of the waveguide, the power sensor is capable of sensing the power of input waves having frequencies over a broad frequency band.

9 Claims, 8 Drawing Sheets



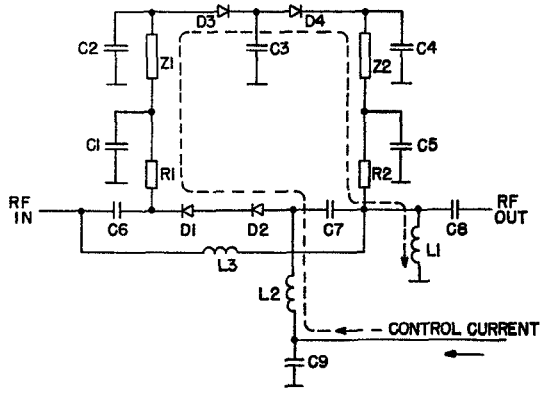
5,204,643 Apr. 20, 1993

Controllable High-Frequency Attenuator

Inventors: Jouni I. Verronen.
Assignee: Nokia Mobile Phones Ltd.
Filed: Jan. 8, 1992.

Abstract—The present invention describes a high-frequency attenuator using PIN diodes, which is especially intended as power control means in a radio-telephone transmitter, and in which the input and output impedances remain constant as the attenuation is varied. The attenuator comprises a longitudinal branch between the input and the output port, having PIN diodes (D1, D2) attenuating the RF signal, transverse branches connected with the input and the output port, each comprising a quarter-wavelength transformer (C1, Z1, C2; C4, Z2, C5) viewed from the signal path and PIN diode (D3, D4). The same control direct current passes via all the diodes. In spite of the variations of the resistance of the PIN diodes, the input and output impedances of the attenuator do not change owing to the quarter-wavelength transformer.

8 Claims, 1 Drawing Sheet



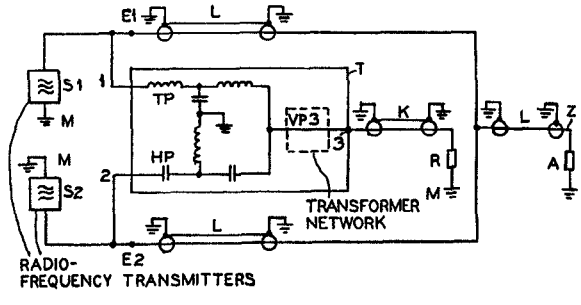
5,204,644 Apr. 20, 1993

Circuit Arrangement for Distrubuting or for Combining Radio-Frequency Power

Inventors: Uwe Dalisda.
Assignee: Rohde & Schwarz GmbH & Co. KG.
Filed: Jan. 27, 1992.

Abstract—In a circuit arrangement for distributing radio-frequency power supplied from a summation port to a plurality of single-ports, or for combining in a summation port radio-frequency power supplied from single-ports, the absorption resistance which is active between the single-ports is constituted by an absorption resistor coupled to ground and connected to the single-ports via a three-port network, the three-port network being designed so that within the operating frequency range the signals to the two input ports thereof are in phase opposition at the common output port.

10 Claims, 1 Drawing Sheet



5,204,771 Apr. 20, 1993

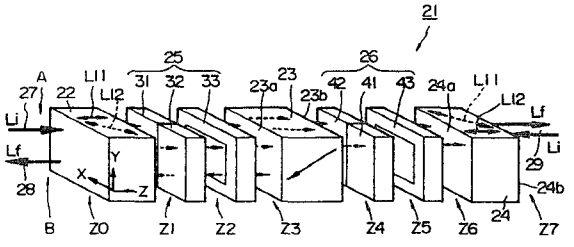
Optical Circulator

Inventors: Masafumi Koga.
Assignee: Nippon Telegraph and Telephone Corporation.
Filed: Dec. 16, 1991.

Abstract—The optical circulator according to the present invention comprises three birefringent crystal plates 22, 23, and 24; reciprocal and non-reciprocal rotators 25 of the first group inserted between birefringent crystal plates 22 and 23; reciprocal and non-reciprocal rotators 26 of the second group inserted between birefringent crystal plates 23 and 24; and more than

two beam incoming and outgoing ports 27, 28 and 29. The rotating directions of the reciprocal and non-reciprocal rotators 25 of the first group are so set that the directions in which ordinary beam and extraordinary beam are separated on the birefringent crystal plates differ among birefringent crystal plate 23 and birefringent crystal plates 22 and 24, and the electric field vibration directions of the beams agree at birefringent crystal plate 23. The rotating directions of the reciprocal and non-reciprocal rotators 26 of the second group are set so that the polarization face of the beams are perpendicular to each other at birefringent crystal plate 24. According to the above optical circulator, there is no need to use angular prisms or polarization beam splitters as have been required till now.

14 Claims, 31 Drawing Sheets



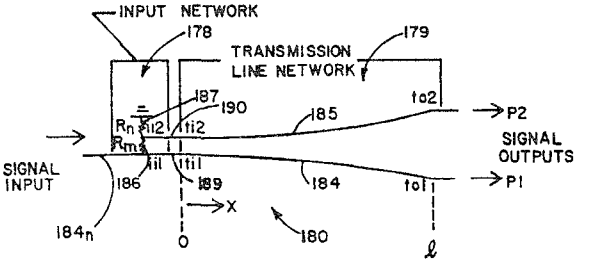
5,206,611 Apr. 27, 1993

N-Way Microwave Power Divider

Inventors: Thomas J. Russell.
Assignee: Krytar, Incorporated.
Filed: Mar. 12, 1992.

Abstract—A power divider formed by the interconnection of an input resistive network and a transmission line network for dividing a signal received on an input port into N output ports Four embodiments are described. Three are two-way power dividers and one is a three-way power divider. A 2–way equal division power divider comprises an outer conductor 51 which has a generally rectangular cross section and is filled with a lower dielectric sheet, a center dielectric sheet and an upper dielectric sheet. The dielectric sheets are made of low loss material. Inner conductors are photo-etched from a conducting material that has been deposited or laminated to both surfaces of the center dielectric sheet. Two conductors are spaced a maximum distance from each other at their outputs and are in close proximity to each other at their inputs. Two resistors are connected respectively from the conductor inputs to a power divider input. Another form of two-way equal division power divider, a two-way unequal division power divider, and a three-way equal division power divider are also described.

15 Claims, 21 Drawing Sheets



5,206,712 Apr. 27, 1993

Building Block Approach to Microwave Modules

Inventors: William P. Kornrumpf and David A. Bates.
Assignee: General Electric Company.
Filed: Apr. 5, 1990.

Abstract—Microwave components are prepackaged and pretested to provide standard microwave components or subsystems. A dielectric overlay interconnection structure enables accurate testing and rework of out of specification packages. Microwave systems are formed of a plurality of such prepackaged components with a high yield.

49 Claims, 6 Drawing Sheets