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.

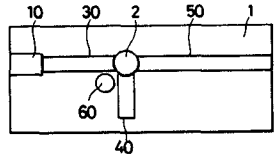
4,357,582 Nov. 2, 1982

Microstrip FET Oscillator with Dielectric Resonator

Inventors: Osamu Ishihara, Tetsuron Mori, Hiroshi Sawano.
Assignee: Mitsubishi Denki Kabushiki Kaisha.
Filed: Dec. 20, 1979.

Abstract—A microwave oscillator including a GaAs field effect transistor having a gate electrode, a drain electrode and a source electrode and disposed on a planar substrate. An elongated gate transmission line is connected to the gate electrode of the field effect transistor and disposed on the substrate and terminated by a matching impedance. An elongated drain transmission line is connected to the drain electrode of the field effect transistor and disposed on the substrate at a predetermined angle to the gate transmission line while an elongated source transmission line is connected to the source electrode and disposed on the substrate for providing the oscillating output. A dielectric resonator is disposed within an angle formed between the gate transmission line and the drain transmission line.

10 Claims, 11 Drawing Figures



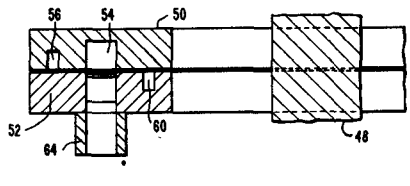
4,358,746 Nov. 9, 1982

Rotary Coupling Joint

Inventors: Coleman J. Miller, James K. Conn.
Assignee: Westinghouse Electric Corp.
Filed: Dec. 22, 1980.

Abstract—A rotary coupler for coupling a microwave signal to a rotating antenna is disclosed. The preferred embodiment comprises a section of waveguides formed into a circle and split into two pieces along the long wall of the waveguide. The two sections of waveguide are positioned to rotate with respect to each other with energy coupled into one portion of the waveguide along its narrow wall and coupled out of the second portion along its narrow wall. An isolation element is utilized at both the input and output ports to assure directional coupling into the split wall waveguide. More than one of the coupling devices can be monitored around a ship's mast, for example, to couple a plurality of microwave systems to a single multiple bandwidth rotating antenna.

3 Claims, 10 Drawing Figures



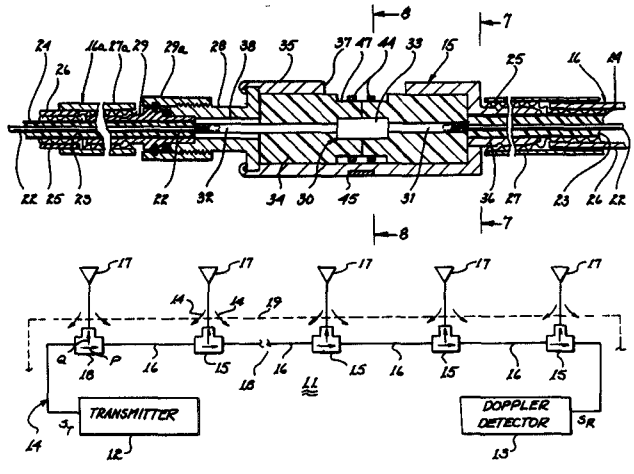
4,358,764 Nov. 9, 1982

Coupling Unit for Coaxial Cable Including Means for Radiating Wave Energy

Inventors: James Cheal, Vincent J. McHenry.
Assignee: Southwest Microwave, Inc.
Filed: July 28, 1980.

Abstract—An optimum coupling unit for joining adjacent sections of coaxial cable and a coupled radiating antenna includes different diameters of the dielectric material, different diameters of central conductor and different values of the dielectric constant material in order to provide impedance matching at any section of the coupler including the coupled antenna to the impedance of the coaxial cable. The coupling unit is combined with the antenna as an integral unit. The antenna may be a dipole whose elements are coupled to the coupling unit through a parallel plate transmission line. Impedance matches are maintained at each coupling point.

10 Claims, 10 Drawing Figures



4,359,641 Nov. 16, 1982

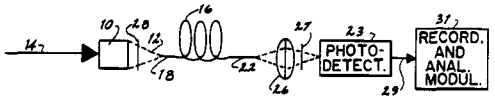
Liquid Scintillators for Optical Fiber Applications

Inventors: Larry A. Franks, Stephen S. Lutz.
Assignee: The United States of America as represented by the United States Department of Energy.
Filed: June 1, 1981.

Abstract—A multicomponent liquid scintillator solution for use as a radiation-to-light converter in conjunction with a fiber optic transmission system.

The scintillator includes a quantity of 1, 2, 4, 5, 3H, 6H, 1 OH, tetrahydro-8-trifluoromethyl (1) benzopyrano (9, 9a, 1-gh) quinolizin-10-one (Coumarin) as a solute in a fluor solvent such as benzyl alcohol or pseudo-cumene. The use of BIBUQ as an additional or primary solute is also disclosed.

6 Claims, 3 Drawing Figures



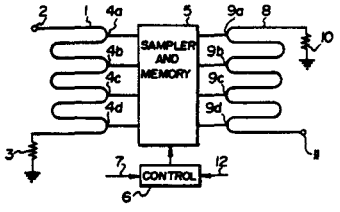
4,359,690 Nov. 16, 1982

Microwave Storage Device

Inventors: Trevor W. Tucker, Larry J. Conway, Sylvain L. Bouchard.
Assignee: Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence.
Filed: July 17, 1980.

Abstract—This invention relates to a system for storing a pulse modulated radio frequency signal and for accessing and reconstructing the stored signal repetitively whereby it can be retransmitted as desired, either at the same frequency or at a shifted or shifting frequency. An input delay line is sampled at a plurality of locations and the signal samples are stored by a plurality of capacitors. The capacitors are accessed at will and the stored samples are applied to locations on an output delay line similar to the input delay line, where the input signal is reconstructed.

23 Claims, 3 Drawing Figures



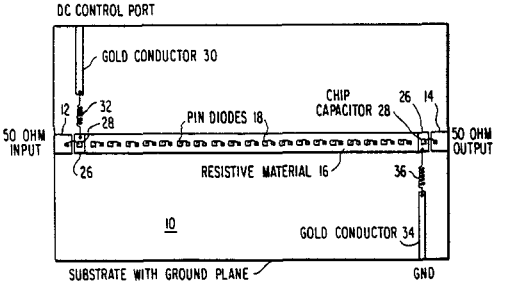
4,359,699 Nov. 16, 1982

Pin Diode Attenuator Exhibiting Reduced Phase Shift and Capable of Fast Switching Times

Inventor: Philip R. Horkin.
Assignee: Martin Marietta Corporation.
Filed: Mar 25, 1981

Abstract—A variable attenuator is formed by a section of lossy transmission line having a plurality of PIN diodes in parallel with discrete sections of the line. A D.C. current flowing through the transmission line controls the effective resistances of the diodes and thereby varies the per unit length resistance of the line.

11 Claims, 5 Drawing Figures



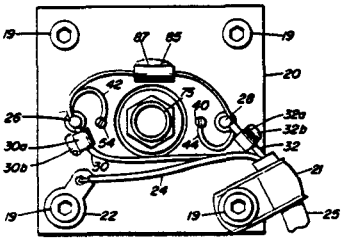
4,359,700 Nov. 16, 1982

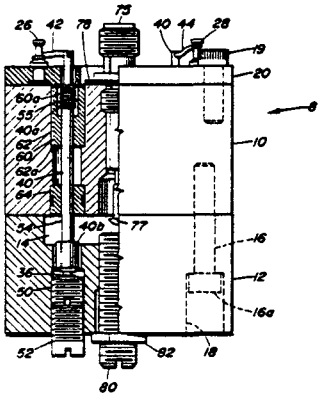
Balancing Network for Microwave Power Combiner

Inventor: Carl P. Tresselt.
Assignee: The Bendix Corporation.
Filed: Oct. 7, 1980.

Abstract—The diode bias input terminals of an IMPATT microwave power combiner are resistively coupled to a common floating node to provide stabilization of the operating points of the individual IMPATT diodes, thus minimizing the tendency of the diodes to contribute unequally to total RF output, particularly in a varying temperature environment. The optional inclusion of RF lossy bypass capacitors to ground several points of the common node suppresses bias circuit oscillations.

9 Claims, 9 Drawing Figures





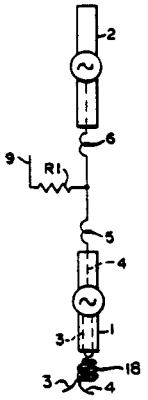
4,359,743 Nov. 16, 1982

Broad-Band RF Isolator

Inventor: Charles M. DeSantis.
Assignee: The United States of America as represented by the Secretary of the Army.
Filed: May 5, 1981.

Abstract—A broadband RF isolator system for connection between RF devices such as colinear antennas is disclosed. In accordance with this invention, two or more antennas are spaced several wavelengths apart, connected to coaxial feeds and choked at their adjacent ends to establish the electrical length. In one embodiment of the invention, the isolator is formed by placing a second line adjacent the coaxial line connected to the upper antenna. The addition of this second line forms a balanced transmission line having a given characteristic impedance. The second line is terminated at one end by a resistor having a resistance equal to the value of the characteristic impedance. In a second embodiment the second line is replaced by a coaxial sleeve which is also terminated at one end with a resistor having a resistance value equal to the characteristic impedance. In four additional embodiments, which are essentially variations of the second basic embodiment, coaxial sleeves are also utilized to form the isolation system.

17 Claims, 8 Drawing Figures



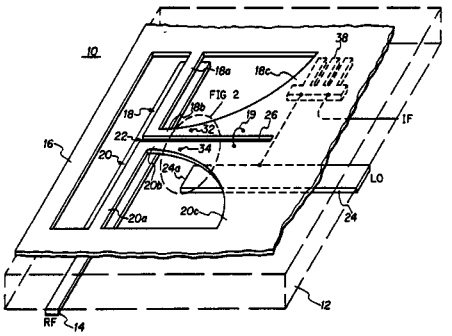
4,359,781 Nov. 16, 1982

Balun Coupled Microwave Frequency Converter with Single Pair of Diodes

Inventor: Ben R. Hallford.
Assignee: Rockwell International Corporation.
Filed: Dec. 15, 1980.

Abstract—A balun coupled microwave frequency converter is provided by a mixer using a single diode pair with one port balanced and the other port unbalanced. The balanced port is provided by first and second coplanar conductors extending toward a common area and juxtaposed in spaced parallel relation with a transmission line interacting therewith to couple a field balanced between the first and second conductors across the common area. The unbalanced port to the mixer is provided by a third conductor. The diode pair is connected in series between the first and second conductors, and a point between the diodes is connected to the third conductor. One implementation is an up converter with an LO and an IF signal applied on the third conductor and input to the mixer to generate an RF signal between the first and second conductors and hence an induced output RF signal on the transmission line.

20 Claims, 5 Drawing Figures



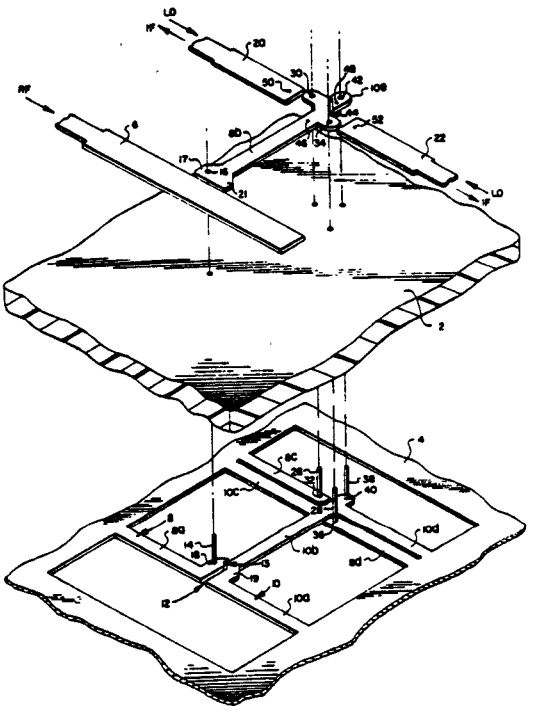
4,359,782 Nov. 16, 1982

Microwave Mixer with Linking Juxtaposed Balun Port

Inventor: Ben R. Hallford.
Assignee: Rockwell International Corporation.
Filed: May 19, 1981.

Abstract—Microwave circuit layout and structure is disclosed for a diode bridge mixer. Linking structure provides interconnection from coplanar sections of balanced first and second conductors to non-coplanar sections juxtaposed on opposite sides of the substrate which are in turn interconnected to two pairs of parallel divergent coplanar grounding stubs which are juxtaposed third and fourth conductors on the other side of the substrate.

24 Claims, 3 Drawing Figures



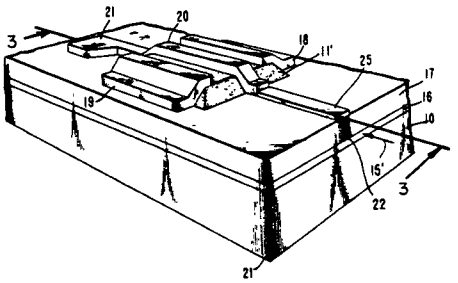
4,360,246 Nov. 23, 1982

Integrated Waveguide and FET Detector

Inventors: Luis Figueroa,
Charles W. Slayman,
Huan-Wun Yen.
Assignee: Hughes Aircraft Company.
Filed: May 23, 1980.

Abstract—A GaAs FET structure with a high electric field region, or active region, contacted by source, gate and drain electrodes is provided which can be used for high speed optical detection or for microwave oscillator optical injection locking. The device provides for efficient coupling of incident optical radiation into the active region, employing confinement and waveguiding regions lying in the plane of the device and adapted to guide incident optical radiation to the active region. GaAs photoconductors are also provided by eliminating the gate electrode

23 Claims, 3 Drawing Figures



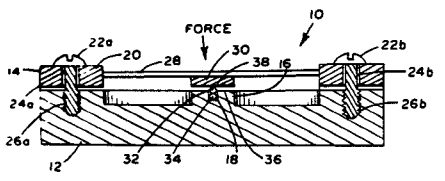
4,360,247 Nov. 23, 1982

Evanescent Fiber Optic Pressure Sensor Apparatus

Inventor: J. Donald Beasley.
Assignee: Gould Inc.
Filed: Jan. 19, 1981.

Abstract—An apparatus is disclosed for optically sensing pressure using evanescent wave coupling between two fiber optics. A support base with a channel holds the two waveguides, one on top of the other, with the portion of the waveguide having the cladding material removed in the channel. An upper member having a diaphragm is attached to the support base. The diaphragm has a pedestal attached that is in slight contact with one of the waveguides. When pressure is exerted upon the diaphragm, the waveguides are forced closer together thus affecting the amount of evanescent coupling therebetween.

7 Claims, 4 Drawing Figures



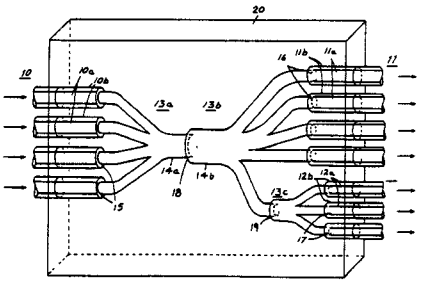
4,360,248 Nov. 23, 1982

Multiport Optical Communication System and Optical Star Structure Therefor

Inventors: Gary W. Bickel, David L. Baldwin.
Assignee: International Telephone and Telegraph Corporation.
Filed: Feb. 12, 1981.

Abstract—A multiport optical cable or bus, composed of bundles of parallel fibers interconnected by an optical star structure, has a higher packing fraction and greater efficiency in the mixing and redistribution functions because the star's radiating arms have their individual cladding layers omitted or removed and because they are fused together to form the mixer section or a part of it. Where the numbers of input and output ports and arms are unequal, the unclad arms have their fused portions optically spliced or connected to form a composite mixer section. Several sections may be cascaded, using the same structural principles, to provide additional lower-level optical outputs for control or other purposes. The cladding function for the star structure is provided by separately encasing the radiating arms and mixer section or sections in a light-reflecting material. Preferably, this is a plastic potting compound having an optical index of refraction lower than those of the star arms or mixer portions. Alternatively, a metallic reflective coating may be applied. The invention has particular utility as applied to optical buses comprised of fibers of the plastic clad silica type.

8 Claims, 2 Drawing Figures



4,360,865 Nov. 23, 1982

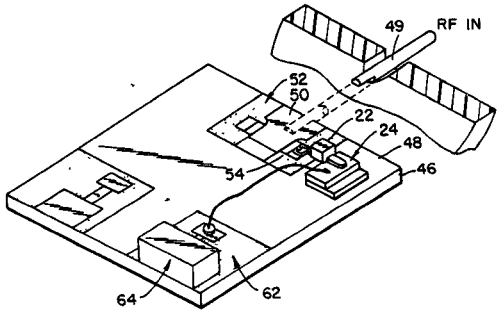
Broad-Band Microwave Detector

Inventors: Gary Yasumura,
Robert D. Genin,
Scott F. Wetenkamp.
Assignee: Pacific Measurements, Inc.
Filed: Feb. 24, 1981.

Abstract—An improved broad band microwave detector of the type including a detector diode, a by-pass capacitor, and a resistive termination wherein

fabrication using coplanar transmission line techniques results in a substantial increase in the frequency response of the detector.

9 Claims, 6 Drawing Figures



4,361,818 Nov. 30, 1982

Balanced Converter for Microwave Range

Inventor: Klaus Otremba.
Assignee: Siemens Aktiengesellschaft.
Filed: June 23, 1980.

Abstract—A balanced converter for the microwave range which allows simple construction of modulators and similar electrical assemblies which have particularly good properties as far as noise level and decoupling are concerned. A first embodiment is constructed in microstrip line technology and provides a transition from a line which is asymmetrical to ground and a microstrip and coplanar line to a line which is symmetrical to ground and in which the embodiment is formed from metal strips arranged on a dielectric plate. A second embodiment of the balanced converter is constructed in triplate technology.

9 Claims, 4 Drawing Figures