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.

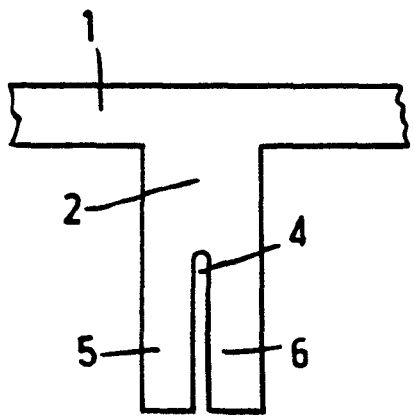
4,313,097 Jan. 26, 1982

Image Frequency Reflection Mode Filter for use in a High-Frequency Receiver

Inventor: François C. de Ronde.
Assignee: U.S. Philips Corporation.
Filed: Feb. 27, 1980.

Abstract—A planar image reflection mode filter is provided for reflecting parasitic signal frequencies produced in the mixer of a receiver. The filter includes a reflecting quarter-wavelength filter and an adaptive circuit functioning to enable the transmission of desirable frequencies. A slot can be formed in the quarter-wavelength filter to enable odd-mode resonance and reduce the width of a transition frequency band lying between a reflection band and a transmission band.

9 Claims, 13 Drawing Figures



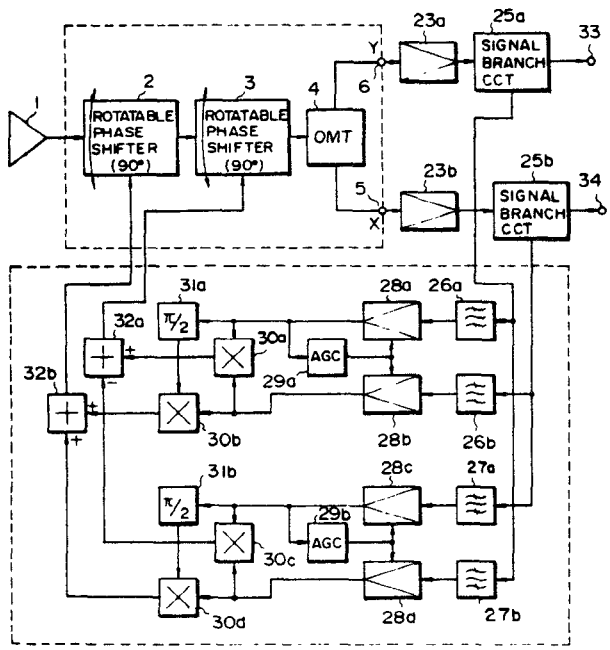
4,310,813 Jan. 12, 1982

Cross Polarization Compensating System

Inventors: Hironori Yuuki; Kazunori Inagaki; Makoto Arai; Noboru Baba; Matsuichi Yamada; Hiroshi Kurihara.
Assignee: Kokusai Denshin Denwa Kabushiki Kaisha
Filed: May 28, 1980

Abstract—A cross polarization compensating system, in which two elliptically polarized waves of opposite polarities are applied to a cascade connection of two successively connected rotatable 90° phase shifters and an Orthomode (Trademark) transducer. Two cross polarized wave components of the two elliptically polarized waves are detected from the two perpendicularly intersecting output terminals of the Orthomode (Trademark) transducer. Two in-phase components of the same phase as their co-polarized components of the two cross-polarized wave components and two orthogonal components each having a phase difference of 90° from corresponding one of the co-polarized waves of the two cross-polarized wave components are detected from the two output terminals of the Orthomode (Trademark) transducer. One of the two phase shifters is controlled by an addition output of the two in-phase components while the other of the two phase shifters is controlled by a difference output between the two orthogonal components, so that two elliptically polarized waves at the output terminals of the Orthomode (Trademark) transducer are made equal in the cross polarization, and so that a phase difference between the co-polarized wave components and a phase difference between the cross-polarized wave components are made equal in magnitude and opposite in sign.

2 Claims, 15 Drawing Figures



4,305,049 Dec. 8, 1981

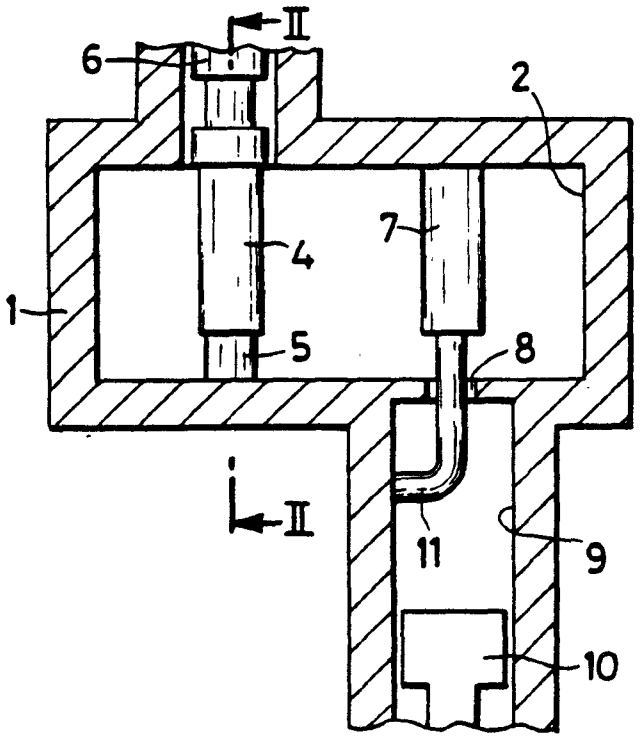
Waveguide Gunn Diode Oscillator With Harmonic Tuning

Inventor: Ezio M. Bastida.
Assignee: C.I.S E. Centro Informazioni Studi Esperienze S p.A.
Filed Oct. 29, 1979.

Abstract—The oscillator comprises a main cavity housing a Gunn diode and auxiliary cavity branching laterally and allowing only inlet of the harmonic components. The auxiliary cavity is provided with harmonic tuning means for varying the reactance of the auxiliary cavity to the harmonic components. The load impedance seen by the Gunn diode is thus varied.

6 Claims, 5 Drawing Figures

4,305,051 Dec. 8, 1981

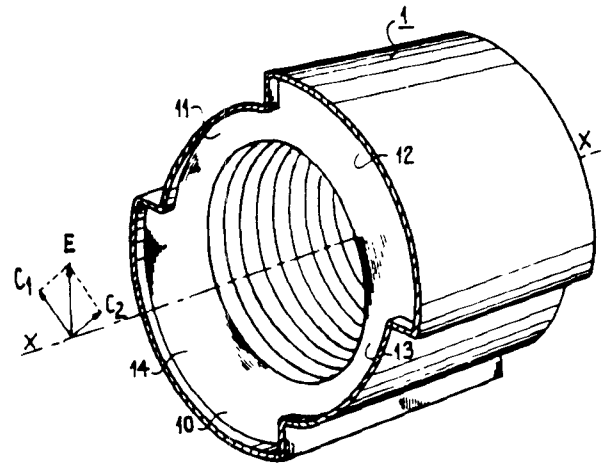


Broad Band Polarizer With a Low Degree of Ellipticity

Inventor: Nhu B. Hai.
Assignee: Thomson-CSF
Filed: July 7, 1980.

Abstract—The polarizer with a circular waveguide in the inner wall of which are formed identical circular corrugations positioned in a plane perpendicular to the longitudinal axis XX of the guide. The corrugations have four quadrants: a first pair of quadrants opposed by the apex in which the depth of the corrugations is less than in the second pair. By positioning the waveguide in such a way that the incident field E is parallel to the limit between two adjacent quadrants, the phase velocity of the orthogonal components C_1, C_2 of field E is dependent respectively on the admittance of the quadrants of the first pair and the quadrants of the second pair. This leads to a phase difference at the polarizer outlet and the corrugations are defined so that the difference is substantially 90°

3 Claims, 9 Drawing Figures



4,305,052 Dec. 8, 1981

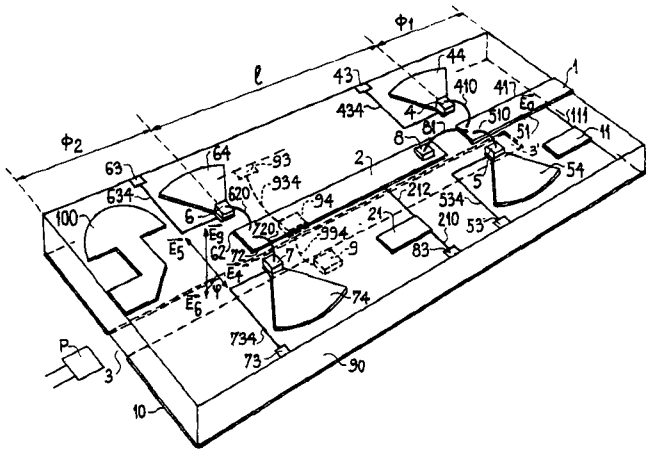
Ultra-High-Frequency Diode Phase Shifter Usable With Electronically Scanning Antenna

Inventors: Michel Baril; Vu San Hoang.
Assignee: Thomson-CSF.
Filed: Dec. 18, 1979.

Abstract—A four-state phase shifter for UHF waves comprises two O-π phase-shifting elements of planar structure on a common substrate, these phase-shifting elements including a symmetrical and an asymmetrical transmission line which can be selectively coupled in one of two ways by the alternate blocking and unblocking of respective diodes for a relative phase reversal. The two phase-shifting elements are linked by two further transmission lines of different propagation constants which can be selectively activated, again with

the aid of diodes, and which may be disposed on opposite faces of the substrate or many form part of a coplanar conductor array on the same substrate face.

16 Claims, 7 Drawing Figures



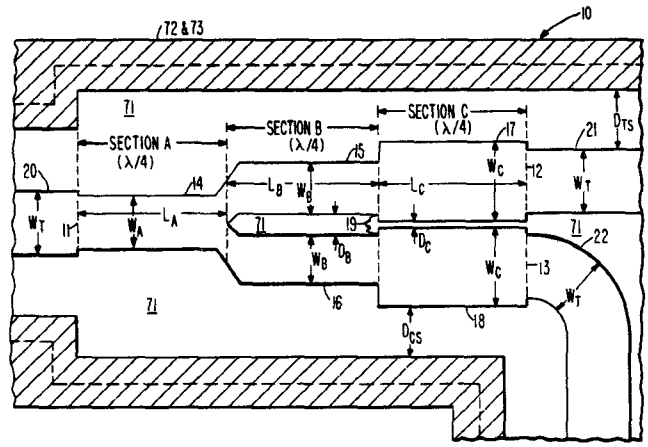
4,310,814 Jan. 12, 1982

Transmission Line Hybrid Junction

Inventor: David F. Bowman.
Assignee: RCA Corporation.
Filed: July 11, 1980.

Abstract—A transmission line hybrid junction which provides a power dividing and combining function between a first port and a pair of ports. In one embodiment it provides a well-matched, high-isolation, three-port, equal-power, equal-phase, power dividing junction with a bandwidth adequate for typical radio frequency applications. The hybrid junction comprises a single transmission line coupled to a pair of branch transmission lines, and a single resistive element coupled between the branch lines. The single transmission line comprises a quarter wavelength transforming section and each of the branch transmission lines comprises two cascaded quarter wavelength transforming sections. Coupling between two transforming sections of the branch transmission lines permits independent selection of the characteristic impedance of those sections in the odd and even modes of excitation.

13 Claims, 19 Drawing Figures



4,310,816 Jan. 12, 1982

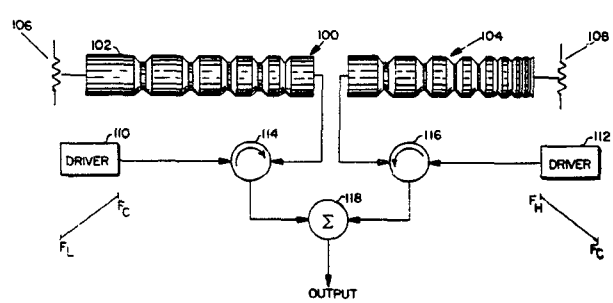
Dispersive Delay Lines

Inventor: Harrison W. Fuller.
Assignee: Sanders Associates, Inc.
Filed: May 14, 1979.

Abstract—Improvements to dispersive delay lines are provided which involve bifurcation to provide for low insertion loss and a non-dispersive/dispersive delay line which allows for non-simultaneous input/output operation, and removes input/output leakage as a limitation to dynamic range.

7 Claims, 18 Drawing Figures

4,311,974 Jan. 19, 1982

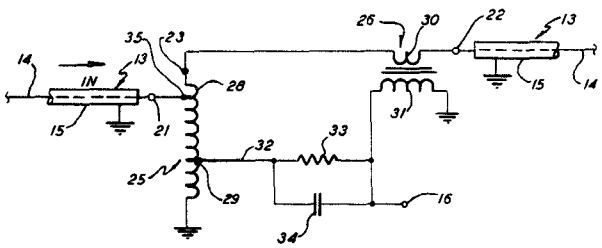


Wide Band Directional Coupler

Inventor: Prabhakara Reddy.
Assignee: Eagle Comtronics, Inc.
Filed: June 9, 1980.

Abstract—A directional coupler for sampling energy traversing a CATV system of the type wherein wide band television signals are extracted from a coaxial transmission line situated at points located at varying distances from the line amplifier. The coupler includes a voltage sensing transformer in shunt with the center and outer conductors of the cable and a current sensing transformer in series with the center conductor. The transformers are wound to provide the coupler with a relatively low tap value Windings in the shunt transformer are used to internally boost the impedance at the input to the series transformer to maximize return losses and directivity.

10 Claims, 3 Drawing Figures



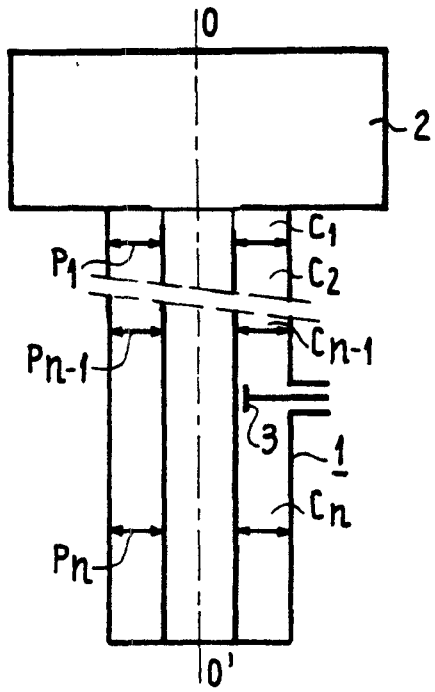
4,311,975 Jan. 19, 1982

Frequency Band Filter

Inventors: Michel Benoit; Pierre Gerlach; Claude Grolleau; Alain Lartillot.
Assignee: Thomson CSF.
Filed: Dec. 18, 1979.

Abstract—A frequency band filter includes a plurality of coupled elementary resonator cavities defined by pistons disposed within a coaxial line. The position of the pistons along the line is adjustable thereby providing selectable tuning.

7 Claims, 4 Drawing Figures



4,288,766 Sep. 8, 1981

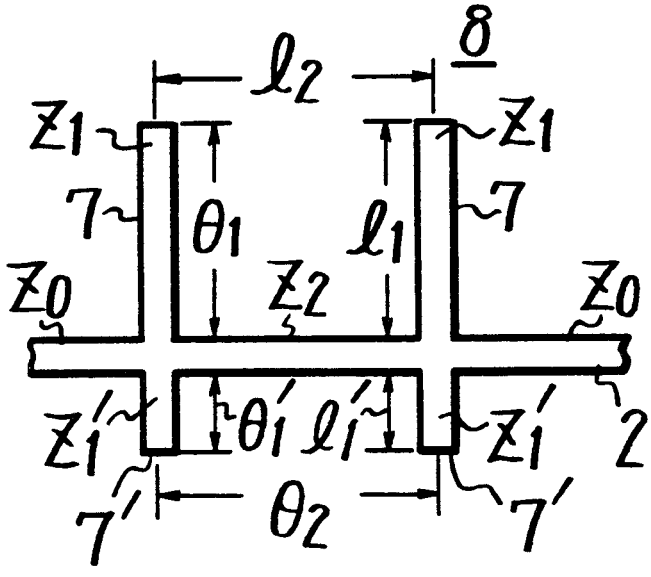
Microwave Circuit

Inventor: Toshimichi Okita.
Assignee: Sony Corporation.
Filed: Nov. 8, 1979

Abstract—A microwave circuit having a transmission line, a conductor and a dielectric gripped therebetween is disclosed. In this case, stubs are provided on the transmission line in at least two positions, at least one of the stubs extends across the transmission line to the both sides thereof with different lengths, and the distance between adjacent stubs and the lengths thereof are so

selected that the transmission line has a predetermined frequency band and attenuation characteristics.

1 Claim, 8 Drawing Figures



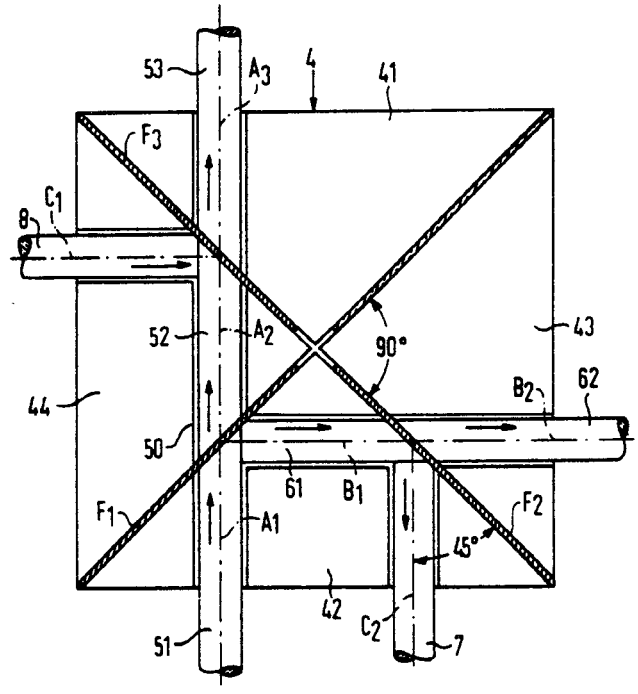
4,306,765 Dec. 22, 1981

Branch Component Comprising Optical Light Waveguides

Inventors: Gerhard Winzer; Hans F. Mahlein; Achim Reichelt
Assignee: Siemens Aktiengesellschaft
Filed: Mar 3, 1980.

Abstract—A branch component and method of making the component which can be used either to distribute light from a single waveguide into four outgoing waveguides or to collect light from four incoming waveguides into a single outgoing waveguide. The component includes seven waveguides and at least three partially transmissive reflective layers disposed on the surface of a carrier with the first, second and third waveguides being arranged in a longitudinally extending first series, the fourth and fifth waveguides being arranged in a longitudinally extending second series extending perpendicular to the first series and a first reflective layer separating the first and fourth waveguides from the second waveguide, a second reflective layer separating the second and a sixth waveguide from a third waveguide and third reflective layer separating the fourth and seventh waveguides from the fifth waveguide and the second and third reflective layer lying on a plane which extends perpendicular to a plane formed by the first reflective layer.

10 Claims, 2 Drawing Figures



4,310,217 Jan. 12, 1982

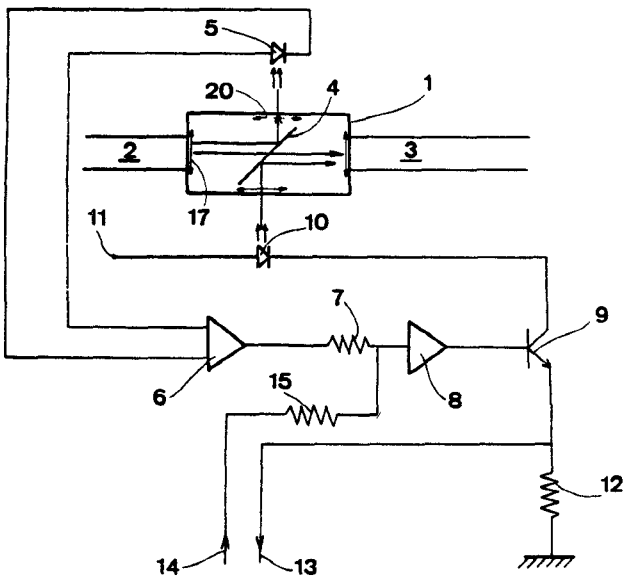
Active Coupler Between an Optical Bus Line and One of the Subscribers and Bus Line Comprising Such Active Couplers

Inventors: Ossona de Mendez; Jean J. Crosnier.
Assignee: Souriau & Cie.
Filed Jan. 31, 1980.

Abstract—An active optical coupler between an optical bus line and subscribers The optical coupler couples an emitting optical conductor and a receiving optical conductor and includes a diversion device that allows passage of a fraction of the incident light transmitted to the receiving conductor while diverting another fraction of this incident light energy to a photoreceiver which controls the injection of light energy into the optical coupler with a control in the form of a photoemitter for controlling the light energy transmitted to the receiving conductor with restoration of the level. A switch controls the operation of the photoemitter which in turn can be controlled either by the photore-

ceiver or by an input signal emitted by the subscriber. Digital data can be transmitted to subscribers by means of an optical bus line.

10 Claims, 6 Drawing Figures



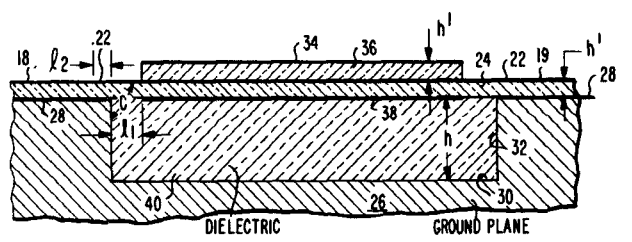
4,288, 761 Sep. 8, 1981

Microstrip Coupler for Microwave Signals

Inventor: Samuel Hopfer.
Assignee: General Microwave Corporation.
Filed: Sept. 18, 1979.

Abstract—A microstrip hybrid coupler uses a ground plane having different surfaces, one that is close and coupled to the terminal portions of the microstrip and the others further from and coupled to the coupled microstrip portions. Two shields extend over the coupled microstrip portions; an intermediate shield between the remote ground plane surface and the coupled microstrip portions and an outer shield. The coupled microstrip portions extend over the terminal surface of the ground plane.

5 Claims, 11 Drawing Figures



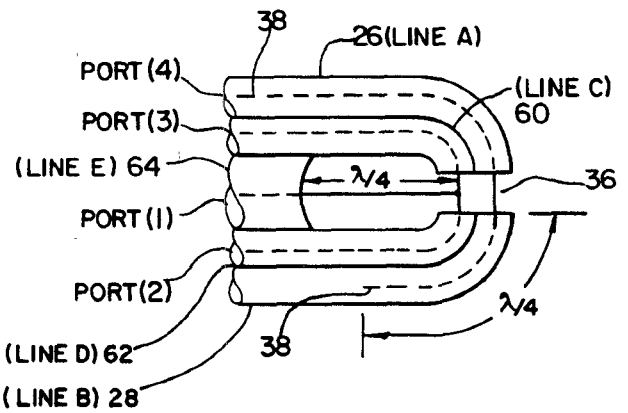
4,288,762 Sep. 8, 1981

Wideband 180° Hybrid Junctions

Inventor: Gordon J. Laughlin.
Assignee: The United States of America as represented by the Secretary of the Navy.
Filed: Apr. 11, 1980.

Abstract—Coaxial, impedance-matched, four-port 180° hybrid junctions for multioctave bandwidth operation include a gap in the outer shields of a port and a stub line at their interface for forming a uniform electric field within the gap. This gap and the interconnections between inner conductors and shields of certain ports and the stub, and the lengths of the port and stub lines are such that power input to a first port divides equally and in phase between two other ports with matched impedances and no power is at present at the fourth port. Similarly power fed into the fourth port divides equally, but 180° out of phase, between the two other ports with matched impedances and no power is present at the first port.

4 Claims, 4 Drawing Figures



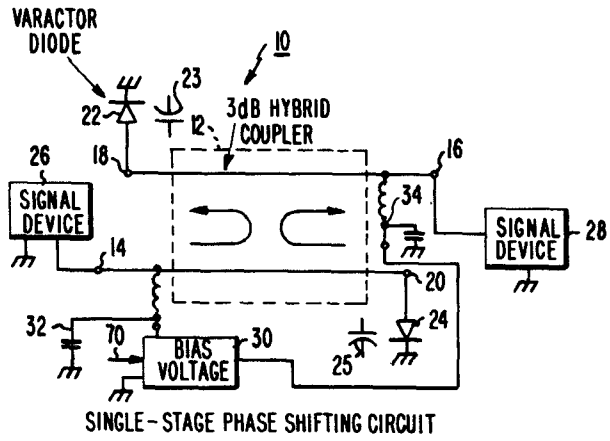
4,288,763 Sep. 8, 1981

Analog Phase Shifter

Inventor: Samuel Hopfer.
Assignee: General Microwave Corporation.
Filed: Sept. 18, 1979.

Abstract—This invention relates to an analog phase shifter for radio frequency signals that employs a hybrid coupler and biased varactor diodes at its reflection terminals. The diodes are operated so that the normalized reactance is unity (equals the coupler's input impedance) at an intermediate frequency which may be the geometric mean of the end frequencies of a broad

bandwidth. The couplers are cascaded in tandem for a 360° phase shift. A balanced configuration of hybrid couplers is used for the phase shifter.



SINGLE-STAGE PHASE SHIFTING CIRCUIT

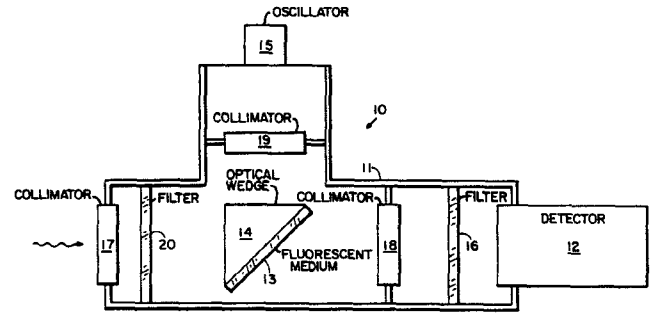
18 Claims, 7 Drawing Figures

4,314,743 Feb. 9, 1982

Optical Gain Control Device

Inventor: Howard E. Rast.
Assignee: The United States of America as represented by the Secretary of the Navy.
Filed: Nov. 19, 1979.

Abstract—An optical gain control device limits the light intensity incident on a photodetector or photomultiplier. A fluorescent medium is interposed between a monitored source of electromagnetic energy and the detector and is irradiated by a local oscillator. The irradiation is absorbed by the fluorescent material which undergoes an electronic transition from the ground state to a first excited state Photons impinging on the fluorescent material from the monitored electromagnetic source cause another transition to a second, more excited state. When the relaxation occurs from the higher state back to the ground, the material fluoresces. Because the magnitude of the local oscillator irradiation is kept within prescribed limits, the number of ions in the fluorescing material which are brought to the first excited state stay within certain limits. Consequently, the impinging monitored electromagnetic energy cannot excite more ions to the second higher state than were irradiated to the first excited state. Thus, high energy bursts of the monitored electromagnetic energy will not be transmitted to the detection device. Including a blocking filter having one passband which directly receives the monitored electromagnetic energy and another filter having a different passband which is located between the fluorescing material and the detection device, the transmission of dangerous levels of electromagnetic energy is further prevented. Protection of the detection device is automatic and does not depend on any mechanical coaction to assure quick response and long-term high reliability.



17 Claims, 6 Drawing Figures

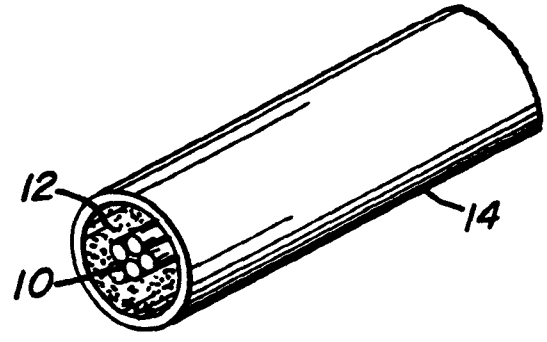
4,314,741 Feb. 9, 1982

Intrusion-Free Optical Cable

Inventors: Czeslaw Deminet; James F. Kenney.
Assignee: The Boeing Company.
Filed: Dec. 17, 1979.

Abstract—An intrusion-free optical cable of the type wherein one or more signal-carrying optical fibers are carried within an outer cladding which will self-destruct, with or without destruction of the inner signal-carrying giber, in the event an attempt is made to penetrate the outer cladding and extract a signal. Self-destruction is sensed to indicate that an attempt has been made to penetrate the outer cladding. Various embodiments of the invention are shown including a cladding formed from tempered glass which will shatter when an attempt is made to penetrate it. In another embodiment, a laser is employed which directs a light beam through the cable. This light beam is of sufficient power to melt, or at least raise the temperature of, the cladding or fiber at a point where penetration is attempted such that the severance or rise in temperature can be detected.

8 Claims, 3 Drawing Figures



4,314,740 Feb. 9, 1982

Optical Fiber Beam Splitter Coupler

Inventor: Gary W. Bickel.
Assignee: International Telephone and Telegraph Corporation.
Filed: May 7, 1980.

Abstract—The optical fiber beam splitter coupler disclosed includes in the first half thereof a first optical fiber having a first core coaxial of a longitudinal axis and a first cladding disposed concentric to and outside the first core. The second half of the coupler includes a concentric core fiber having an inner core coaxial of the longitudinal axis, an inner cladding concentric to and outside the inner core, an outer core concentric to the inner cladding and an outer cladding concentric to the outer core. The adjacent ends of the first, fiber and the concentric fiber are polished at 45° angles complementary to one another and are abutted end-to-end to provide an interface therebetween. A mirror surface is deposited on the interface so as to cover either the adjacent end of the outer core or the inner core of the concentric fiber. This arrangement enables the coupling of two different light beams into and/or out of the coupler. Several embodiments are disclosed.

22 Claims, 8 Drawing Figures