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.

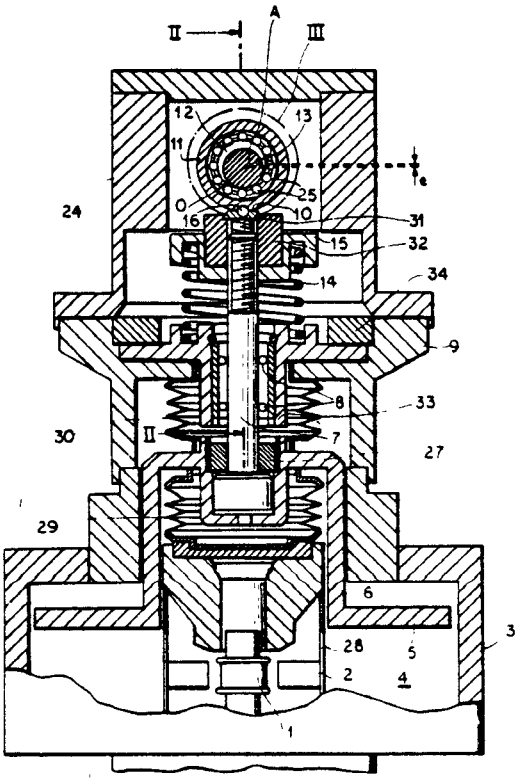
4,313,091 Jan. 26, 1982

Crankshaft Tuning Mechanisms for Microwave Oscillators

Inventors: Guido Busacca; Vincenzo Meli; Arcangelo Passaglia; Michele Sanfilippo.
Assignee: Societa Italiana Telecomunicazioni Siemens S.p.A.
Filed: Feb. 11, 1980

Abstract—A resonant cavity of a microwave generator, such as a magnetron oscillator, is provided with a tuning piston which is rectilinearly displaceable between two terminal positions, corresponding to respective limiting frequencies, by means of a rotating crankshaft whose eccentric portion constitutes the inner race of a ball or roller bearing. The outer race of that bearing rolls, directly or through the intermediary of a captive spherical or cylindrical coupling member on a transverse face of the tuning piston held in contact therewith by spring pressure.

6 Claims, 4 Drawing Figures



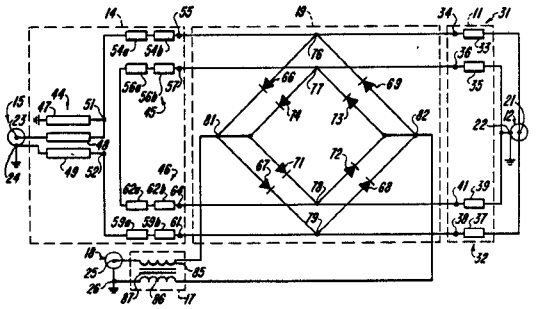
4,355,421 Oct. 19, 1982

Broadband Mixer with Coplanar Balun

Inventor: Warren L. Seely.
Assignee: Vari-L Company, Inc.
Filed: Dec. 5, 1980.

Abstract—An improved broadband mixer includes a first balun (11) with a first signal port (12), a second balun (14) with a second signal port (15), a third balun (17) with a third signal port (18), and a frequency converter (19) coupled between the first, second, and baluns. The first balun means, which preferably receives an RF signal via said first signal port, includes two juxtaposed ground plane baluns 31 and 32 each having opposed, spaced, strip conductors in different planes. The second balun, which preferably receives an LO signal via the second signal port, has a coplanar balun (44) including three strip conductors in the same plane which in turn connects to two juxtaposed ground plane baluns (45 and 46) each having opposed, parallel spaced, strip conductors. The combination of the coplanar balun (44) with the two ground plane baluns (45 and 46) establishes signal polarities which merge end to end with the opposite ground plane baluns (31 and 32) to prevent signals from passing from one signal port to the opposite signal port without requiring cross-connections between the strip conductors in different planes opposite the ground plane baluns.

15 Claims, 4 Drawing Figures



4,355,863 Oct. 26, 1982

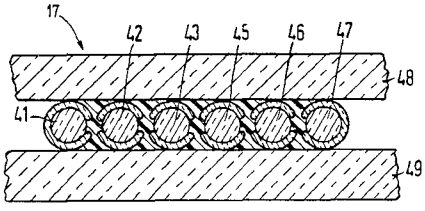
Cladded Optical Fiber Having a Longitudinal Side Coupling Zone

Inventors: Hubert Aulich; Franz Auracher.
Assignee: Siemens Aktiengesellschaft.
Filed: Sep. 21, 1978.

Abstract—An optical fiber having a core surrounded by a cladding layer which has an index of refraction less than the index of refraction of the core characterized by a longitudinal side coupling zone being formed by a longitudi-

nal opening extending through the cladding layer of the fiber to expose a portion of the core. The optical fiber of the invention is particularly useful in conjunction with a light sensitive detector and is useful in a mixer where more than one fiber are joined together either in a bundle or in a strip configuration. The fiber with the side coupling zone can be formed by drawing the fiber from a workpiece having a core or rod member surrounded by a sleeve member or layer which is provided with the opening or can be drawn from a molten material utilizing a double crucible in which the opening of the inner crucible is provided with at least one bulge extending to the edge of the opening of the outer crucible.

2 Claims, 6 Drawing Figures



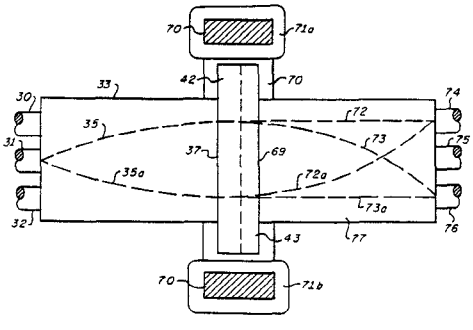
4,355,864 Oct. 26, 1982

Magnetooptic Switching Devices

Inventor: Richard A. Soref.
Assignee: Sperry Corporation.
Filed: Mar. 26, 1980.

Abstract—Magnetooptical switches for application in optical communication and data processing systems for switching, multiplexing, and demultiplexing take improved compact forms for switching unpolarized optical signals from one multimode fiber guide to selected ones of a plurality of such fiber guides. Reflection and transmission switches are provided, as well as devices for simultaneous switching of both upstream and downstream light waves.

22 Claims, 11 Drawing Figures



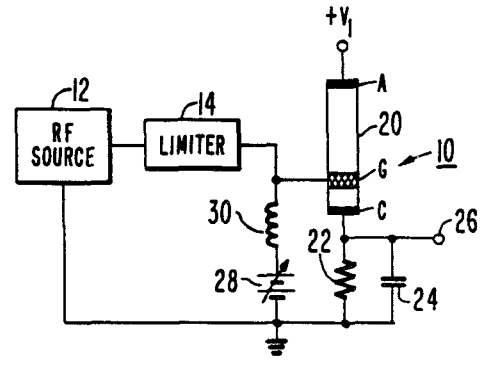
4,356,415 Oct. 26, 1982

Frequency Discriminator Utilizing a Transferred Electron Device

Inventor: Fred Sterzer.
Assignee: RCA Corporation.
Filed: July 14, 1980.

Abstract—A three terminal transferred electron device (TED) with a Schottky barrier gate and a series connected output circuit are connected to a bias supply which biases the TED just below threshold. A radio frequency (RF) signal of a given peak amplitude is applied to the TED gate which is biased such that the negative peak of each cycle of RF signal nucleates the domain in the TED. The resulting change in signal over a given time period at the output circuit is a measure of RF signal frequency.

4 Claims, 3 Drawing Figures



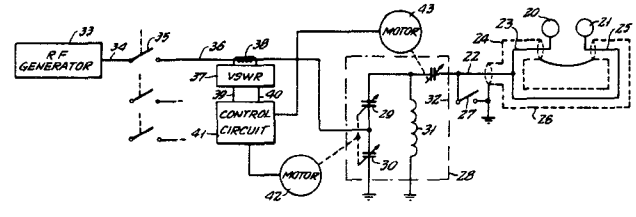
4,356,458 Oct. 26, 1982

Automatic Impedance Matching Apparatus

Inventor: David Armitage.
Assignee: Harry H. LeVeen.
Filed: Aug. 31, 1981.

Abstract—Automatic impedance matching apparatus in which a matching unit is connected between a radio frequency source and a load and which comprises variable capacitors and inductor, the capacitors being varied by stepping motors to match the impedance presented to the source to the impedance of the source. The stepping motors are controlled by a circuit which generates trains of pulses corresponding to the forward wave voltage and the reflected wave voltage on a line between the source and the matching unit and provides a train of pulses corresponding to the ratio of the voltages. The pulse rates of trains of pulses corresponding to the ratio, before and after a capacitor is varied, are compared, and the sign of the difference between the pulse rates is used to select a motor and step it in the direction which will cause the variable capacitor connected thereto to change its reactance in a direction which will increase the ratio between the forward and reflected wave voltages.

10 Claims, 5 Drawing Figures



4,357,580 Nov. 2, 1982

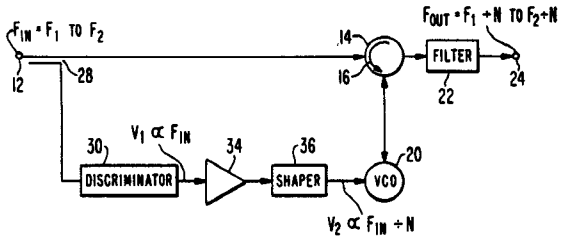
Wideband Microwave Frequency Divider

Inventor: Daniel D. Mawhinney.
Assignee: RCA Corporation.
Filed: Aug. 21, 1980.

Abstract—A signal of frequency value F_{IN} is coupled to a discriminator and to one terminal of a voltage controlled oscillator (VCO) tuned to operate at a range of frequencies about $F_{IN} \div N$ where N is a nonunity positive integer. The

discriminator produces a voltage proportional to frequency F_{IN} which is scaled and applied to a control terminal of the VCO to cause it to be tuned to approximately $F_{IN} \div N$. The signal of frequency F_{IN} applied to the VCO causes it to be injection locked to frequency $F_{IN} \div N$.

6 Claims, 1 Drawing Figure



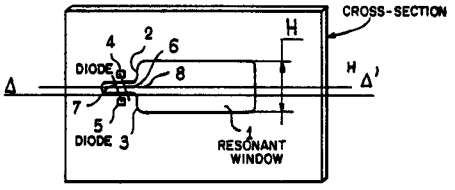
4,357,583 Nov. 2, 1982

Passive Electromagnetic Wave Limiter and Duplexer Formed by Means of Such a Limiter

Inventors: Jacques Martel; Gilles Sillard.
Assignee: Thomson-CSF.
Filed: May 27, 1980.

Abstract—A passive limiter formed as a wave-guide, in at least one cross-section of the guide, by means of one or more resonating windows in which is shunt-mounted at least head-to-tail one pair of diodes having the same polarity and being disposed in the same plane. One or more such limiters may be contemplated for forming duplexers.

19 Claims, 8 Drawing Figures



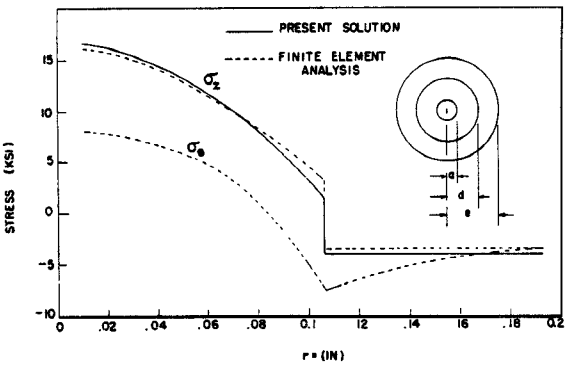
4,358,181 Nov. 9, 1982

Gradient Index Optical Waveguide and Method of Making

Inventors: Suresh T. Gulati; George W. Scherer.
Assignee: Corning Glass Works.
Filed: July 24, 1980.

Abstract—In the method of making a preform for a high numerical aperture gradient index optical waveguide, the concentration of two dopant constituents is changed during fabrication. Concentration of the first dopant, GeO_2, is changed radially as the preform is built up in order to produce the desired radial refractive index gradient. The concentration of the second dopant, B_2O_3, is changed radially to compensate for the radial change in thermal expansion coefficient caused by the varying GeO_2 concentration. B_2O_3 is added to the cladding layer to make the thermal expansion coefficient of the cladding equal to or greater than the composite thermal expansion coefficient of the core. The magnitude of residual tension at the inner surface caused by thermal expansion gradients is reduced and premature cracking of the preform is eliminated.

9 Claims, 5 Drawing Figures



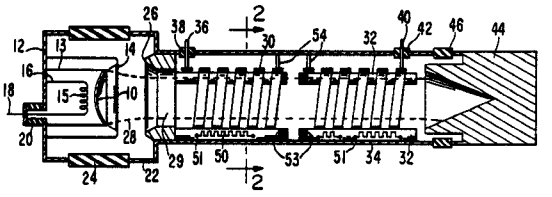
4,358,704 Nov. 9, 1982

Helix Traveling Wave Tubes with Reduced Gain Variation

Inventor: Ernest A. Conquest.
Assignee: Varian Associates, Inc.
Filed: Sept 2, 1980.

Abstract—In a traveling wave tube (TWT) using an interaction circuit of the helix-derived type, the gain of the tube normally varies significantly over the passband. The invention provides a simple method of reducing the gain variation together with a reduction in the noise power density produced at the output of the tube. This is accomplished by affixing a nonresonant terminated transmission line such as a meander line on at least one of the dielectric rods used to support the helix.

24 Claims 6 Drawing Figures



4,358,705 Nov. 9, 1982

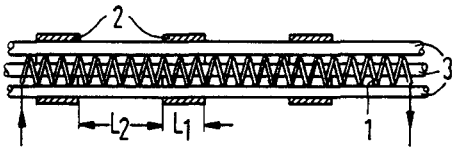
Supporting System for the Delay Line of a Traveling Wave Tube

Inventor: Hinrich Heynisch.
Assignee: Siemens Aktiengesellschaft.
Filed: Oct. 31, 1980.

Abstract—A supporting system for a delay line of a travelling wave tube wherein a number of clamping rings press dielectric support rods against the delay line. The clamping rings have a natural length along the delay line and a

spacing distance such that $(N \cdot w\lambda)/4 = L_{1,2}$, where $L_{1,2}$ designates the length of the line resonators, λ_w the wave length on the delay line, and N a whole uneven number

3 Claims, 1 Drawing Figure



4,358,744 Nov. 9, 1982

Impedance Matched Dielectric Window

Inventor: Jacques Tikes.
Assignee: Thomson-CSF
Filed: Dec 12, 1980.

Abstract—The microwave window is inserted in a rectangular waveguide and is constituted by a half-wave impedance transformer, the wavelength considered being such as to correspond to the central frequency F_0 for which the window has been realized; a dielectric plate of small thickness is mounted above the transformer and two inductive shutters are located on each side of the plate. The dimensions of the window components are so determined that in the case of a matched waveguide, the standing-wave ratio of the window is substantially 1 in a frequency band of at least 35 percent of the central frequency around the central frequency.

11 Claims, 10 Drawing Figures