Patent Abstracts

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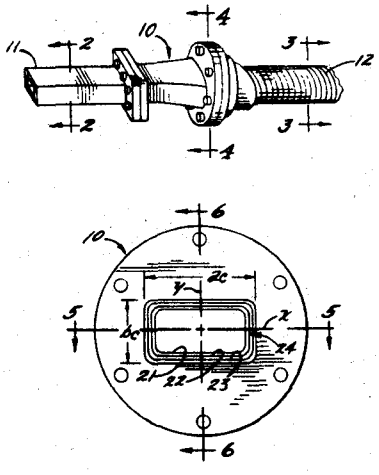
4,540,959 Sept. 10, 1985

Rectangular to Elliptical Waveguide Connection

Inventor: Saad S. Saad.
Assignee: Andrew Corporation.
Filed: Nov. 22, 1983.

Abstract—A waveguide connection formed between a rectangular waveguide (11) and an elliptical waveguide (12) having a cutoff frequency and impedance different from those of the rectangular waveguide (11) comprises an inhomogeneous stepped transformer (10) having multiple sections (31, 32, 33) all having inside dimensions small enough to cutoff the first excitable higher order mode in a pre-selected frequency band, each section (31, 32, 33) of the transformer having an elongated transverse cross section which is symmetrical about mutually perpendicular transverse axes (X, Y) which are common to those of the waveguides (11, 12), the dimensions of the said cross section increasing progressively from step to step in all four quadrants along the length of the transformer in the direction of both transverse axes (X, Y) so that both the cutoff frequency and the impedance of the transformer (10) vary monotonically along the length of the transformer (10).

5 Claims, 6 Drawing Figures



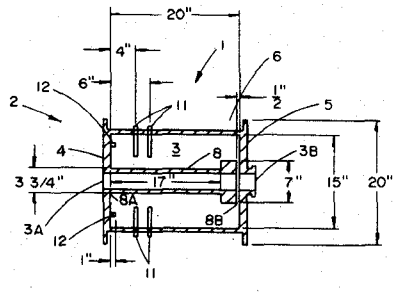
4,540,960 Sept. 10, 1985

Monochromatic Radio Frequency Accelerating Cavity

Inventor: Salvatore Giordano.
Assignee: The United States of America as represented by the United States Department of Energy.
Filed: Feb. 9, 1984.

Abstract—A radio frequency resonant cavity having a fundamental resonant frequency and characterized by being free of spurious modes. A plurality of spaced electrically conductive bars are arranged in a generally cylindrical array within the cavity to define a chamber between the bars and an outer solid cylindrically shaped wall of the cavity. A first and second plurality of mode perturbing rods are mounted in two groups at determined random locations to extend radially and axially into the cavity thereby to perturb spurious modes and cause their fields to extend through passageways between the bars and into the chamber. At least one body of lossy material is disposed within the chamber to damp all spurious modes that do extend into the chamber thereby enabling the cavity to operate free of undesired spurious modes.

12 Claims, 8 Drawing Figures



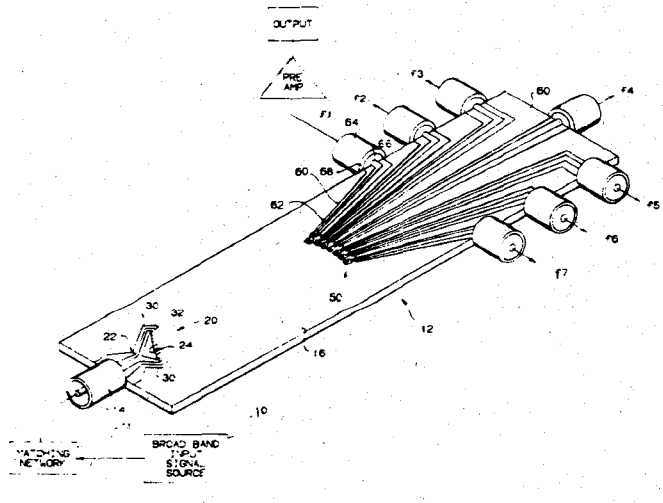
4,540,960 Sept. 10, 1985

Signal Processing System and Method

Inventor: Robert E. Brooks.
Assignee: TRW Inc.
Filed: Sept. 2, 1983

Abstract—A system for processing of multifrequency input signals to provide a Fourier transform output is provided which can, for example, partition a wide input frequency band into a number of narrow bands and concurrently detect the presence of one or more signals of different frequency in the input. An array of input wave energy transducers is energized with the broad-band signal, and by virtue of progressive shifting of the transducers relative to the propagating medium (such as a surface acoustic-wave substrate) generates one or more composite wavefronts dispersed at frequency dependent angles. An array of output transducers are disposed along a focal region, each responding to wave energy within a specific frequency range received at its location due to dispersion of the composite wavefront. Such systems preserve phase coherence while responding to multiple input frequencies, but are compact and mass producible at relatively low cost.

36 Claims, 6 Drawing Figures



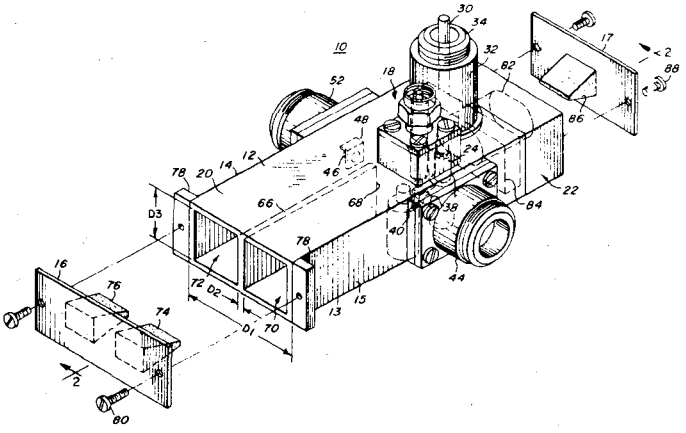
4,542,352 Sept. 17, 1985

Cavity Oscillator with Undesired Mode Absorbing Waveguides for Linear FM

Inventors: Francis R. Yester, Jr., Paul H. Gailus, and Edward V. Louis.
Assignee: Motorola, Inc.
Filed: June 17, 1983.

Abstract—A modulated elongate cavity oscillator with minimized modulation nonlinearities includes a first cavity having dimensions which determine the fundamental resonant frequency of the oscillator, a gain element disposed in said first cavity that provides amplification to sustain oscillation, and a varactor diode disposed in said first cavity for modulating the fundamental frequency. A first waveguide is coupled to the first cavity for absorbing modes higher than the mode of the fundamental frequency which have an electric field maxima concurrent with the longitudinal center line of the first cavity. A second waveguide is coupled to the first cavity for absorbing modes higher than the mode of fundamental frequency which have an electric field minima concurrent with the longitudinal center line of the first cavity, whereby the first and second waveguides provide effective attenuation of higher order modes such that modulation nonlinearities due to the existence of higher order modes are substantially eliminated.

35 Claims, 3 Drawing Figures



4,543,543 Sept. 24, 1985

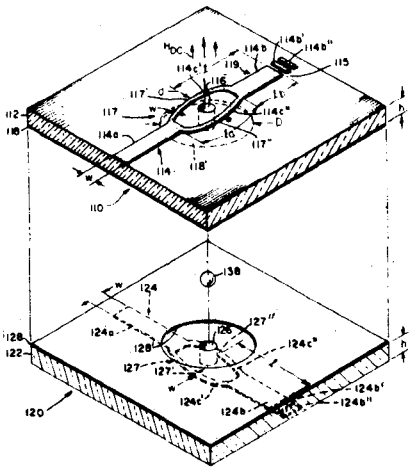
Magnetically Tuned Resonant Circuit

Inventors: Ronald E. Blight and Ernst F. R. A. Schloemann.
Assignee: Raytheon Company.
Filed: Dec. 3, 1982.

Abstract—A magnetically tuned resonant circuit for selectively coupling radio frequency (RF) energy between an input coupling circuit and an output coupling circuit through a resonant body disposed between such coupling circuits. Each coupling circuit includes a plurality of spaced conductors which are arranged to selectively spatially distribute RF energy fed thereto in order to provide, in the region where the resonant body is disposed, a magnetic field having a predetermined spatial distribution. Such magnetic field distribution is selected in accordance with characteristics of the resonant body to reduce coupling of unwanted spurious RF energy through the magnetically tuned resonant circuit.

Further, a ground plane conductor associated with such coupling circuits has a selected portion thereof removed to provide a void therein, and a portion of the resonant body is disposed within the void provided in the ground plane. The size of the void is selected to increase coupling of RF energy through the resonant body, between the input and the output coupling circuits and to reduce coupling of RF energy between the body and the ground plane conductor and hence the RF energy loss concomitant therewith, without substantially affecting the desired coupling between the coupling circuits.

31 Claims, 47 Drawing Figures



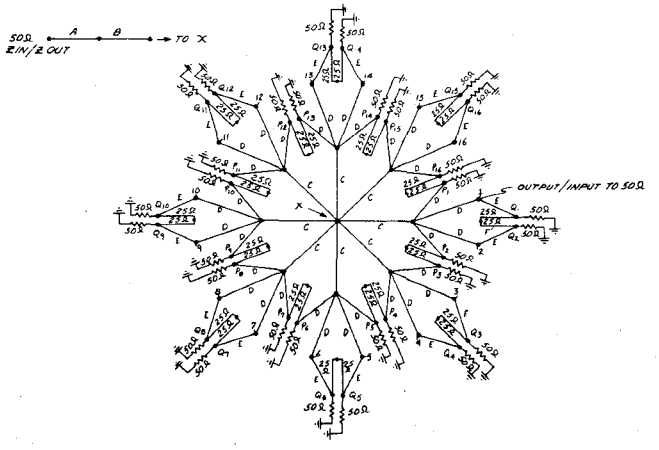
4,543,545 Sept. 24, 1985

Microwave Radio Frequency Power Divider Combiner

Inventors: Richard W. Craine and Joseph P. Drabick.
Assignee: ITT Corporation.
Filed: Mar. 15, 1984.

Abstract—The microwave radio frequency power divider/combiner comprises a signal input/output matching network coupled between a signal input/output and a central point of the power divider/combiner. M impedance transformer sections are connected in parallel to the central point and radiate outwardly therefrom with each of the M transformer sections having a first predetermined length, where M is integer greater than one. M pairs of impedance transformers sections are provided with each pair being coupled to an end of a different one of the M transformer sections remote from the central point with each of the transformer sections of the M pairs of transformers sections having the first predetermined length. N output/input ports are each coupled to an end of a different one of the transformer sections of the M pairs of transformer sections remote from the M transformer sections. Each of the N ports are matched to a given impedance and N is equal to $2M$. $2N$ isolation networks include $2N$ termination impedances each having one terminal thereof connected to ground. The other terminal of each of a given N of the $2N$ termination impedances are coupled by a different one of first N impedance transformer sections to the N ports. The other terminal of each of the remaining N of the $2N$ termination impedances are connected by a different one of second N impedance transformer sections to the end of the N transformer sections remote from the central point with each of the first and second N transformer sections having the first predetermined length. N transmission-line sections each having a second predetermined length different than the first predetermined length interconnect different adjacent ones of the $2N$ isolation networks in pairs.

29 Claims, 8 Drawing Figures



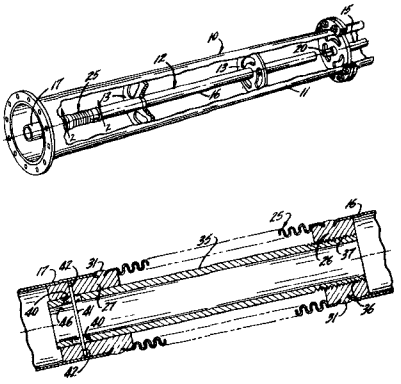
4,543,548 Sept. 24, 1985

Coaxial Transmission Line Having an Expandable and Contractible Bellows

Inventors: William W. Seal and Laddie A. Basa.
Assignee: Andrew Corporation.
Filed: Apr. 2, 1984.

Abstract—A rigid coaxial transmission line in which the inner conductor is formed by axially spaced sections. Adjacent sections are connected by a conductive bellows which permits thermal expansion and contraction of the inner conductor sections relative to one another and relative to the outer conductor of the transmission line. A rigid auxiliary connecting member is disposed within the bellows and is slidably connected to one of the conductor sections. The auxiliary connecting member limits expansion and contraction of the bellows to a safe range to prevent the bellows from being overstressed.

7 Claims, 6 Drawing Figures



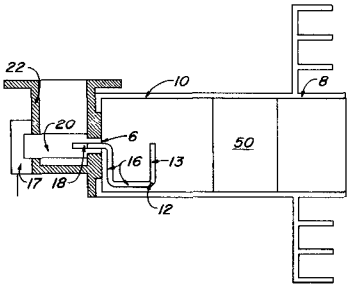
4,544,900 *Oct. 1, 1985

Polarized Signal Receiver System

Inventor: H. Taylor Howard.
Assignee: Chaparral Communications, Inc.
*Notice: The portion of the term of this patent subsequent to Nov. 8, 2000 has been disclaimed.
Filed: July 30, 1982.

Abstract—A rotatable polarized signal receiver, having a rectangular waveguide orthogonally coupled to a circular waveguide, has a receiver probe portion oriented in the circular waveguide and a signal launch probe portion extending into the rectangular waveguide. A dielectric insert located in the circular waveguide transforms circularly polarized signals to linearly polarized signals. Since the receiver probe portion can be rotated right circular or left circular polarization can be selected and received.

5 Claims, 6 Drawing Figures



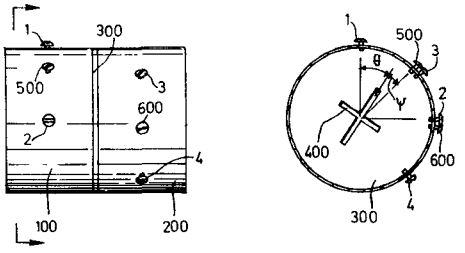
4,544,901 Oct. 1, 1985

Microwave Filter Structure

Inventors: John D. Rhodes and Richard J. Cameron.
Assignee: Agence Spatiale Europeenne.

Abstract—A structure comprising a cascade of dual mode resonance cavities wherein each cavity has a pair of tuning screws located at 90° to each other in a sectional plane of the cavity and a coupling screw located at 45° to the tuning screws for coupling the two resonances supported by the cavity. Each cavity is coupled to the adjacent cavity by means of a coupling iris set at a determined angle relative to the angular position of the tuning screws of the cavity and the adjacent cavity is positioned at a determined angle relative to the angular position of the coupling iris which couples said cavity to the former one.

3 Claims, 8 Drawing Figures



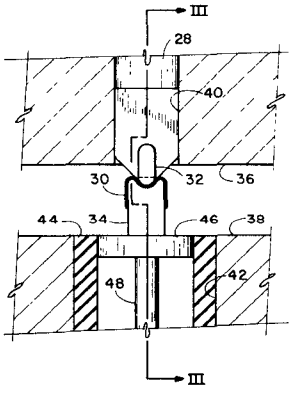
4,544,902 Oct. 1, 1985

Mount for Millimeter-Wave Application

Inventor: David L. Harris.
Assignee: Tektronix, Inc.
Filed: Dec. 21, 1983.

Abstract—A signal modifying device comprises an elongate section of waveguide and a non-linear circuit element. A lateral through-hole is formed in a wall of the waveguide, and a rod-like conductive member is fitted in the hole and has one end presented towards the opposite wall region of the waveguide. The non-linear circuit element is secured to the rod-like member with one electrode connected in electrically conductive manner to the rod-like member and with a beam-like lead (which is connected to another electrode of the circuit element) extending towards the opposite wall region of the waveguide.

8 Claims, 4 Drawing Figures



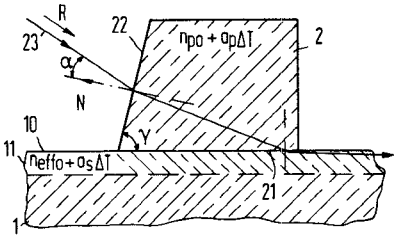
4,545,642 Oct. 8, 1985

Prism Coupler Device for an Optical Waveguide

Inventors: Franz Auracher and Rudolf Keil.
Assignee: Siemens Aktiengesellschaft.
Filed: Feb. 25, 1982.

Abstract—A prism coupler for coupling light into and out of an optical waveguide and characterized by the temperature dependency being eliminated. This is accomplished by a skillful selection of the prism angle and the prism material of a single prism or by combining two prisms of different materials whose indices of refraction and prism angles are selected to compensate for the effects of temperature on both the prism and the waveguide. Preferably, the waveguide is doped in a substrate of $LiNbO_3$ and the prism utilizes a compound prism having a first prism consisting of $LiNbO_3$ and a second prism of polystyrene.

5 Claims, 4 Drawing Figures



4,546,333 Oct. 8, 1985

Dielectric Filter

Inventors: Atsushi Fukasawa, Kenichiro Hosoda, Takuro Sato, and Tatumasa Yoshida.
Assignee: Oki Electric Industry Co., Ltd.
Filed: May 2, 1983.

Abstract—A dielectric filter (Fig. 16) for frequencies higher than VHF band comprising a closed conductive housing (112), a pair of input and output means provided at both the extreme ends of said housing (112), a dielectric body (111) with a plurality of linear parallel grooves (118) arranged in said housing (112), a plurality of conductive linear means (113) with the length of approximately $\frac{1}{4}$ wavelength mounted in said dielectric body (111) between said grooves (118) so that one end of said resonators (113) is fixed to the common plane of the housing (112), a capacitor means (114, 115) provided between the other end of resonators (111, 113, 118) and said conductive housing (112) so that an electrode (115) of said capacitor may be trimmed by a laser beam to adjust the resonating frequency of each of said resonators (111, 113, 118) and a plurality of conductive rods (137) provided in said grooves (118) for improving the spurious characteristics of the filter.

14 Claims, 27 Drawing Figures