Patent Abstracts

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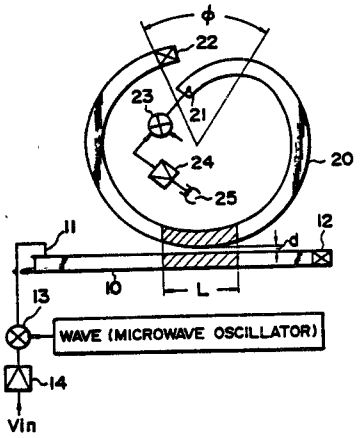
4,692,721 Sept. 8, 1987

Dielectric Rotary Coupler

Inventors: Yujiro Ito, Yasutoshi Kamatsu, and Takashi Otobe.
Assignee: Sony Corporation.
Filed: Oct. 17, 1985.

Abstract—A dielectric rotary coupler for electromagnetic waves of the microwave frequency region structured of a substantially ring-shaped rotary member and a stationary member, each member being formed of a dielectric waveguide, or line, having a rectangular cross-section. The rotary line and the stationary line are arranged to face each other with a predetermined space therebetween along a coupling length, through which a microwave, for example, a carrier microwave FM-modulated by a signal reproduced by a rotary head of a VTR, is coupled from the rotary line to the stationary line, or vice versa.

11 Claims, 15 Drawing Figures



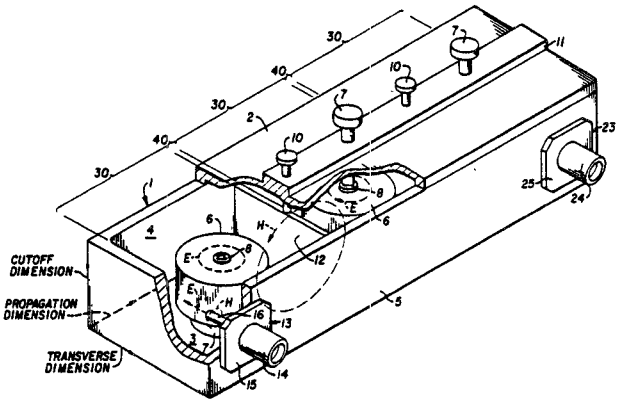
4,692,723 Sept. 8, 1987

Narrow Bandpass Dielectric Resonator Filter with Mode Suppression Pins

Inventors: Slawomir J. Fiedziuszko and Craig A. Ziegler.
Assignee: Ford Aerospace & Communications Corporation.
PCT Filed: July 8, 1985.

Abstract—An extremely narrow-band bandpass electromagnetic filter comprises a waveguide (1) dimensioned below cutoff and having two or more active sections (30) each containing a dielectric resonator (6). The number of resonators (6) corresponds to the number of poles of filtering. The physical dimensions of the waveguide (1) can advantageously be further reduced by means of passive coupling means (40), where the waveguide (1) cross-section is smaller than in the active sections (30). Each passive coupling means (40) inductively couples adjacent active sections (30). Mode suppression rods (10) electrically connect opposing waveguide walls (2, 3) midway between each pair of adjacent dielectric resonators (6). Preferred embodiments are illustrated, in which the resonators (6) are transversely oriented within the waveguide (1). Electromagnetic energy travels within the waveguide (1) in a single TE_{10} evanescent mode ($TE_{01\delta}$ within the resonators (6)). Dielectric tuning means (9) are generally aligned along the principal axis of each resonator (6). A number of such filters, exhibiting extremely narrow bandwidth, low insertion loss, and high Q, have been successfully built.

5 Claims, 2 Drawing Figures



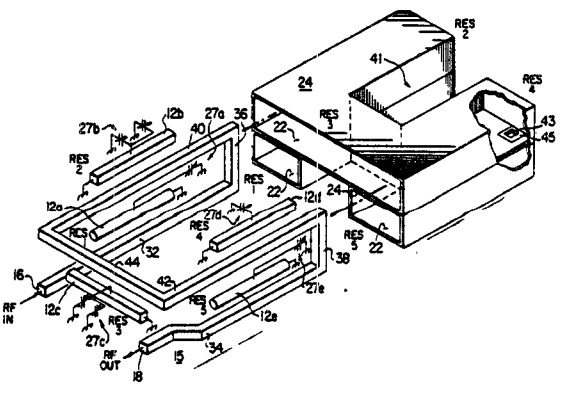
4,692,724 Sept. 8, 1987

High-Power Tunable Filter

Inventor: Mark A. Harris.
Assignee: E-Systems, Inc.
Filed: Oct. 21, 1985.

Abstract—A high-power tunable filter, for use in a frequency hopping system, is described and includes a transmission line having an input for receiving a high power level input signal to be filtered, and an output. The filter includes a plurality of resonators, each parallel-coupled to the transmission line, and driven by an associated electronic tuning network. Each of the electronic tuning networks includes a plurality of tunable reactive elements and PIN diodes, each PIN diode connected to one of the tunable reactive elements to enable this diode to connect its associated tunable reactive element in and out of the tuning network, thereby controlling the resonant frequency of the resonator associated with the tuning network. An electronic control circuit is also provided for controlling the frequency of the tunable filter. The electronic control circuit includes appropriate input circuitry for entering a desired frequency of the tunable filter, and an addressable look-up table responsive to the input circuitry for converting the desired frequency into a unique binary codeword. Switch drive circuits are also provided, responsive to the bits of the binary codeword, for controlling the operational states of the PIN diodes.

20 Claims, 5 Drawing Figures



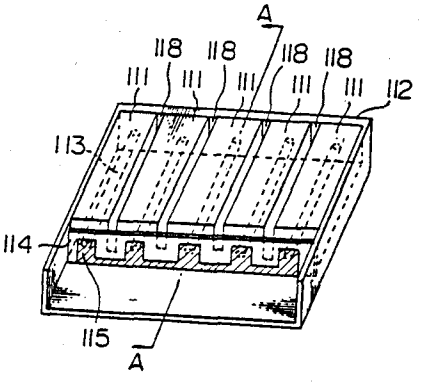
4,692,725 Sept. 8, 1987

Dielectric Filter Having Trimmable Capacitor

Inventors: Atsushi Fukasawa, Kenichiro Hosoda, and Takuro Sato.
Assignee: OKI Electronics Co., Ltd.
Filed: June 26, 1985.

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.

8 Claims, 31 Drawing Figures



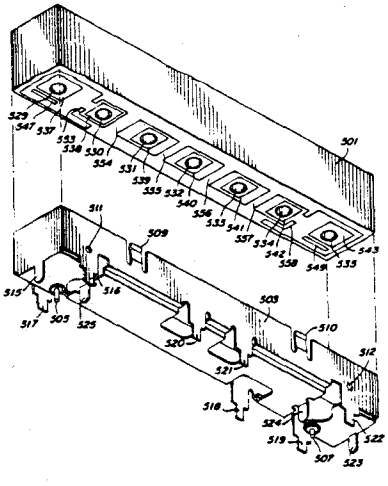
4,692,726 Sept. 8, 1987

Multiple Resonator Dielectric Filter

Inventors: Steven R. Green, David M. De Muro, and Ramond L. Sokola.
Assignee: Motorola, Inc.
Filed: July 25, 1986.

Abstract—A multiresonator dielectric block filter is disclosed in which capacitive coupling between foreshortened resonators disposed in the dielectric block is controlled by an electrode strip coupled to the conductive material covering the majority of the dielectric block surface. The electrode strip extends at least partially between two adjacent resonators to control the capacitive coupling between the resonators.

14 Claims, 16 Drawing Figures



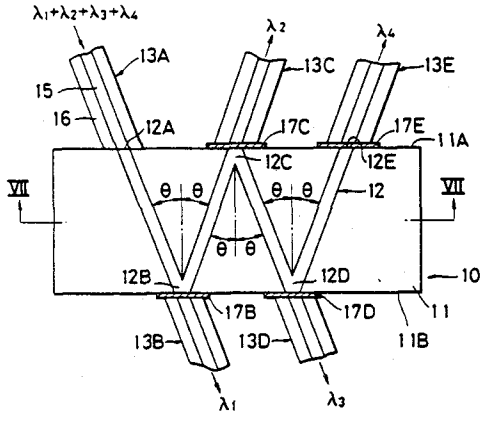
4,693,544 Sept. 15, 1987

Optical Branching Device with Internal Waveguide

Inventors: Tetsuya Yamasaki and Eiji Okuda.
Assignee: Nippon Sheet Glass Co., Ltd.
Filed: Dec. 6, 1983.

Abstract—An optical waveguide device of the invention has an optical waveguide which is a region formed in a transparent substrate and has a refractive index higher than that of the transparent substrate. The optical waveguide consists of first and second optical waveguide elements each having one end exposed to a surface of the transparent substrate and the other end connected in the vicinity of the surface of the transparent substrate, such that the connecting portion thereof is exposed to the surface of the transparent substrate.

12 Claims, 18 Drawing Figures



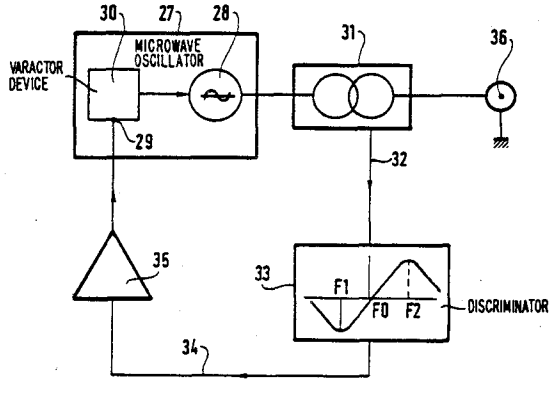
4,694,260 Sept. 15, 1987

Microwave Discriminator and Devices Using Said Discriminator

Inventors: Lazare Argintaru and Denis Hebrard.
Assignee: Alcatel Thomson Faisceaux Hertziens.
Filed: Jan. 29, 1986.

Abstract—A microwave frequency discriminator, i.e. an electronic device for directly transforming frequency modulation on a microwave carrier into a demodulated lower frequency signal. The discriminator is similar to a Travis discriminator and includes an inlet microstrip line, two resonant circuits (R_1, R_2) constituted by dielectric resonators and coupled to said inlet microstrip line to receive the modulated microwave signal, two outlet microstrip lines coupling each resonator to a respective microwave detector circuit, said detector circuits including loads (r_1, r_2) in series-opposition in the manner of a Travis discriminator.

7 Claims, 10 Drawing Figures



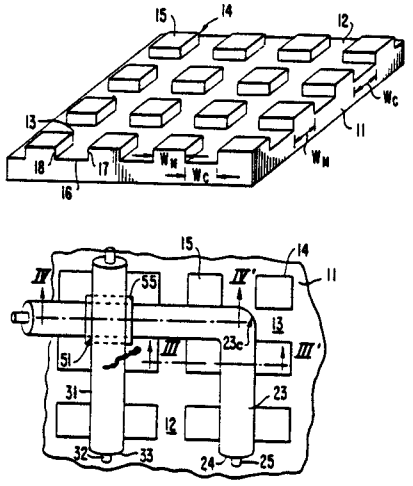
4,695,810 Sept. 22, 1987

Waffleline-Configured Microwave Transmission Link

Inventors: Douglas E. Heckaman, Roger H. Higman, Jeffrey A. Frisco, and Edward J. Bajgrowicz.
Assignee: Harris Corporation.
Filed: Oct. 22, 1984.

Abstract—A miniaturized transmission link architecture for intercoupling high frequency miniaturized integrated circuit components comprises a thin conductive plate in one surface of which a matrix or grid work of rectilinear grooves or channels are formed, creating "waffle-iron"-like pattern in one surface of the conductive plate. The spacing between channels corresponds to the width of a channel which, in turn, may be sized to substantially match the outer diameter of insulation jacketed wire that is placed in the channels. The depth of a channel or groove is slightly larger than the outer diameter of the wire to accommodate wire crossovers at intersections of the channels. The top surface of the "waffle-plate" is provided with a conductive foil to complete the shielding for the wires. Because the waffle structure has the same periodicity along either of the orthogonal directions of the channels, the characteristic impedance of the transmission link is readily defined by the size of the lands or mesas that are bounded by the channels and the widths of the channels themselves.

32 Claims, 13 Drawing Figures



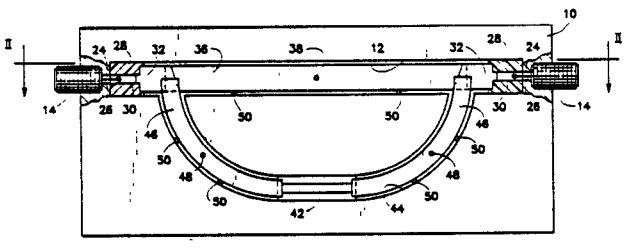
4,695,811 Sept. 22, 1987

High-Frequency Coaxial Switch

Inventors: Heinz E. Grellmann and Leonard A. Roland.
Assignee: Tektronix, Inc.
Filed: July 28, 1986.

Abstract—A high-frequency coaxial switch has a coaxial connector mounted on a housing to provide electrical access to a cavity within the housing, the cavity being small to suppress moding. The coaxial connector is electrically connected to a microstrip conductor on a hybrid circuit board within the cavity, and switching is accomplished by compensated contact striplines which electrically make or break contact with the microstrip conductor.

6 Claims, 5 Drawing Figures



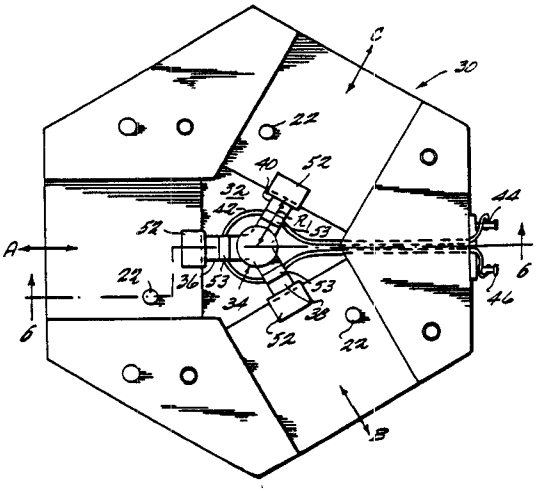
4,697,158 Sept. 29, 1987

Reduced Height Waveguide Circulator

Inventors: John C. Hoover and David E. Giese.
Assignee: Electromagnetic Sciences, Inc.
Filed: Apr. 15, 1986.

Abstract—A conductive waveguide structure has a central cavity of full height and input/output ports of a second reduced height emanating therefrom. A smaller ferrite circulator element is centrally disposed within the cavity and has outer extremities spaced from the inner edges of the reduced height input/output ports by a predetermined gap dimension G which is chosen to achieve an appropriate impedance match between the impedance of the ferrite element and the higher impedance of the waveguide without the necessity for the usual quarter-wave dielectric impedance matching transformer sections.

21 Claims, 12 Drawing Figures



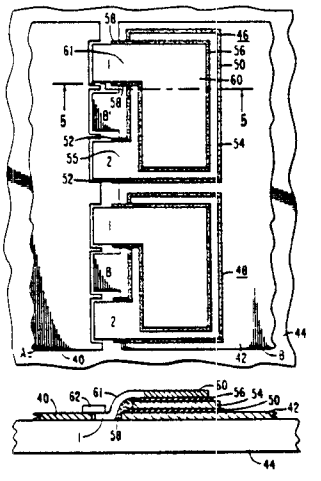
4,697,159 Sept. 29, 1987

Tuning Capacitors with Selectable Capacitance Configurations for Coupling Between Microwave Circuits

Inventors: Franco N. Sechi and David Kalokitis.
Assignee: RCA Corporation.
Filed: Oct. 31, 1984.

Abstract—A tuning capacitor arrangement for a microwave circuit including, on a substrate, first and second conductors to be capacitively joined. The tuning capacitor arrangement includes first and second capacitors each having connective tabs terminating on the substrate in the space between the first and second conductors. One or more connective pieces electrically connect one or more tabs to the conductors to determine the total capacitance between the first and second conductors.

4 Claims, 6 Drawing Figures



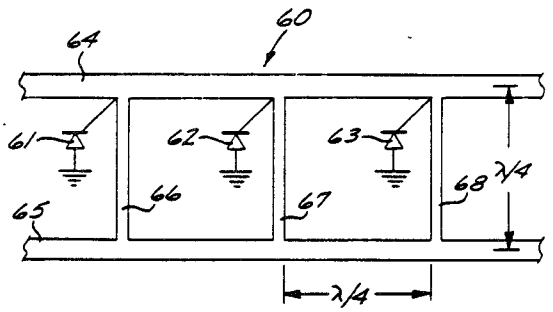
4,697,160 Sept. 29, 1987

Hybrid Power Combiner and Amplitude Controller

Inventor: Robert T. Clark.
Assignee: Hughes Aircraft Company.
Filed: Dec. 19, 1985.

Abstract—A hybrid power combiner and controller device is disclosed. The device includes a multiple branch hybrid network, with PIN diodes employed to selectively short circuit the midpoints of the branch lines to ground. With the PIN diodes biased to the open circuit condition, the device behaves as a conventional hybrid combiner, for example, to combine the power produced by two input sources at the device output port. With the PIN diodes biased to the conductive condition, thereby shorting the branch line midpoints to ground, the device behaves as a matched multiple stub filter tuned to the desired band. Substantially all the power provided by one input power source will be provided at the device output in this case.

3 Claims, 4 Drawing Figures



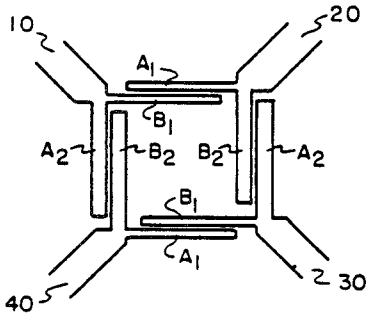
4,697,161 Sept. 29, 1987

Directional Couplers of the Branchline Type

Inventor: Carlo Buoli.
Assignee: 501 GTE Telecomunicazioni S.p.A.
Filed: Sept. 5, 1985.

Abstract—A directional coupler of the 3 DB and 90 degree branchline type with four ports. Four pairs of coupled lines of microstrip construction provide the connections between the ports. The first and third ports are opposite each other as are the second and fourth ports, with the first and third ports connected to associated circuits and the second and fourth ports unconnected.

2 Claims, 5 Drawing Figures



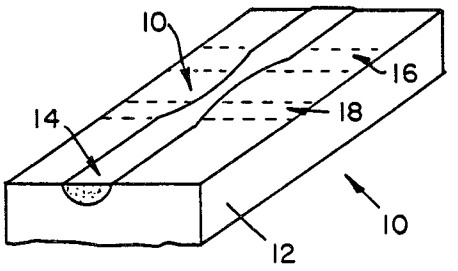
4,697,868 Oct. 6, 1987

Integrated Optical Waveguide Polarizer

Inventor: Suwat Thanivavarn.
Assignee: TRW Inc.
Filed: Aug. 12, 1985.

Abstract—A single-mode optical waveguide polarizer for use in conjunction with electrooptical devices that operate best when presented with only a single polarization mode. The polarizer is fabricated on a conventional substrate, such as lithium niobate, using a waveguide strip of indiffused material, such as titanium. To achieve polarization discrimination, a polarizer section of the waveguide strip is made small enough in width to support only a single polarization mode, specifically the TM mode, but not the orthogonal TE mode. Losses are minimized by the use of tapered waveguide sections adjacent to the polarizer section.

6 Claims, 1 Drawing Figure



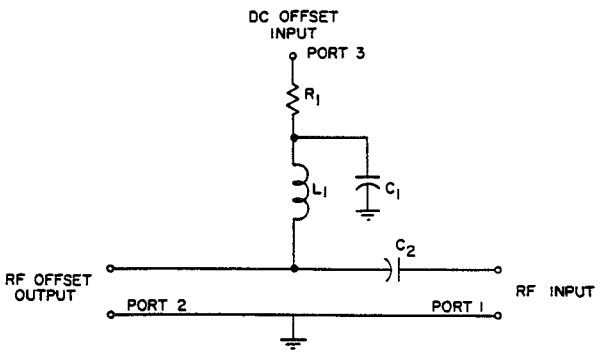
4,698,603 Oct. 6, 1987

RF Amplitude Modulator/Mixer

Inventor: George A. Clarius.
Assignee: Grumman Aerospace Corporation.
Filed: May 5, 1986.

Abstract—A method and apparatus are disclosed for offsetting the dc level of a modulating signal input to a dual balanced modulator. The circuit is adapted to offset a high frequency modulation signal by an amount sufficient to provide the optimum percent modulation of a carrier signal applied to the dual balanced modulator. The offset level to be applied is dependent upon the desired percent modulation and is further affected by the operating modulation and carrier frequencies as well as their respective input power levels.

11 Claims, 10 Drawing Figures



4,698,604 Oct. 6, 1987

Nonreciprocal Microwave Device for Surface Waves and an Isolator Having High Isolation for the Utilization of Said Device

Inventors: Gérard Forterre and Bernard Guerin.
Assignee: Thomson-CSF.
Filed: Dec. 24, 1985.

Abstract—A nonreciprocal microwave device for surface electromagnetic waves (SEW waves) as applicable to isolators which provide high isolation comprises a flat metallic core, part of which is placed between two plates of gyromagnetic material and part of which is placed between two absorption loads. Parasitic volume waves are generated by resonance but resonance of waves of higher modes is prevented by forming in the core at least one zone for strong coupling with the SEW waves which propagate in the direction opposite to the low-loss direction at the edge of the core opposite to the edge at which the SEW wave propagates in the forward direction.

7 Claims, 6 Drawing Figures