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, D.C. 20231.

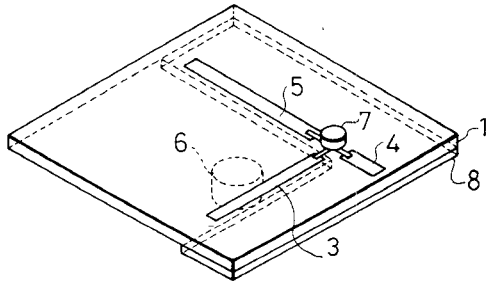
4,654,606 Mar. 31, 1987

Mounting and Ground Conductor Arrangement for a Microwave Resonance Circuit Device

Inventor: Akio Tadachi.
Assignee: Alps Electric Co., Ltd.
Filed: Oct. 9, 1985.

Abstract—A microwave resonance circuit device including plural microstrip lines provided on one side of a dielectric substrate. A dielectric resonator is mounted on the reverse side of the substrate from the microstrip lines and is disposed so as to have a coupling relation with a first one of the microstrip lines. A ground conductor is arranged on the reverse side of the substrate so as to overlap substantially one-half of the width of the first microstrip line extending in a direction away from the dielectric resonator, and to overlap entirely the other microstrip lines. A transistor is mounted on the same side of the substrate as the microstrip lines and connected therewith to form an oscillator circuit.

4 Claims, 6 Drawing Figures



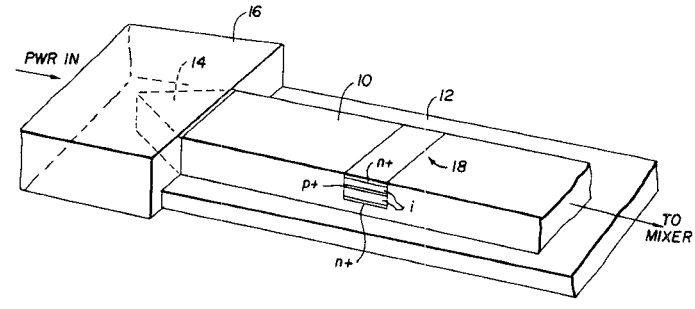
4,654,609 Mar. 31, 1987

Monolithic Planar Doped Barrier Limiter

Inventors: Samuel Dixon, Jr., Thomas R. AuCoin, and Roger J. Malik.
Assignee: The United States of America as represented by the Secretary of the Army.
Filed: Feb. 25, 1985.

Abstract—A passive millimeter wave image guide power limiter comprising a length of dielectric transmission line or waveguide for millimeter wave frequencies located on a relatively thin conductive ground plane forming thereby an image guide and including a planar doped barrier diode structure formed in the dielectric transmission line with the planar doped barrier structure being integrally grown in a slot milled in the constituent material, i.e gallium arsenide, of the waveguide transversely across the width dimension thereof so as to be oriented perpendicular to the flow of RF power being propagated along its length dimension. The planar doped barrier structure becomes conductive at a predetermined power level to reflect any further incident RF power back toward the power source.

4 Claims, 6 Drawing Figures



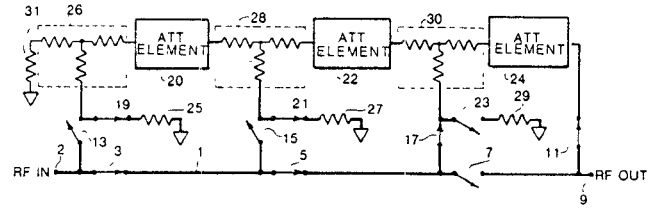
4,654,610 Mar. 31, 1987

p-i-n Diode Switched RF Signal Attenuator

Inventor: Marcus K. Dasilva.
Assignee: Hewlett-Packard Company.
Filed: July 23, 1985.

Abstract—A multi-path ladder-type variable step RF signal attenuator is provided. The ladder network is comprised of a number of asymmetric power splitting elements and p-i-pad resistor attenuator elements. The high-speed switching and long life characteristics of p-i-n diodes are utilized to switch resistive attenuator elements into or out of the ladder network to provide selectable values of signal attenuation.

8 Claims, 3 Drawing Figures



4,654,611 Mar. 31, 1987

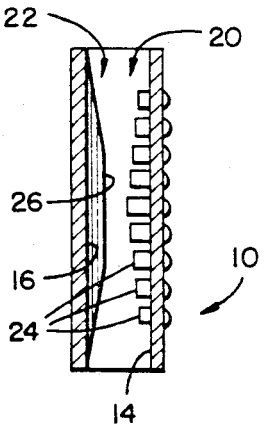
Broad-Band Waveguide Phase Shifter

Inventors: Mon N. Wong and Jeffrey D. Steele.
Assignee: Hughes Aircraft Company.
Filed: Oct. 2, 1985.

Abstract—A phase shifter for microwave electromagnetic energy propagating through a waveguide has a composite structure of a series of capacitive phase shifting posts positioned within the waveguide diametrically across from

a symmetrically tapered ridge. The series of posts introduce a nominal value of phase shift with an incremental value which increases with increasing frequency of the electromagnetic energy. The tapered ridge introduces a nominal value of phase shift plus an incremental value which decreases with increasing frequency of the electromagnetic energy. The rates of increase and decrease of the incremental values of phase shift cancel so as to provide a resultant phase shift which is substantially invariant with frequency.

18 Claims, 5 Drawing Figures



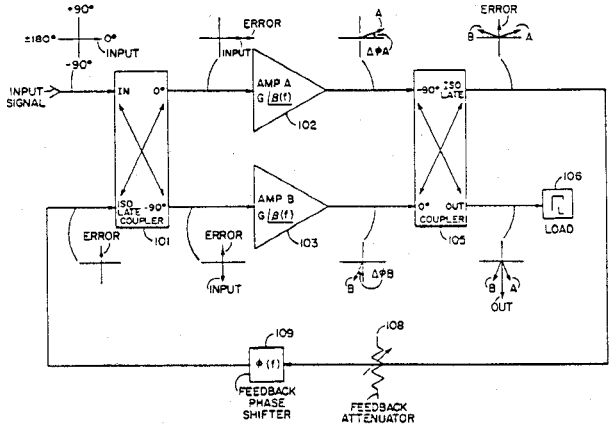
4,656,434 Apr. 7, 1987

RF Power Amplifier with Load Mismatch Compensation

Inventor: John R. Selin.
Assignee: Raytheon Company.
Filed: Feb. 3, 1986.

Abstract—An RF power amplifier for delivering power to a load including a first quadrature hybrid coupler driving two class C amplifiers operating with high input compression, a second quadrature hybrid coupler coupled to the outputs of the amplifiers, an attenuator, and a phase shifter. An impedance mismatch by the load causes phase-pulling of the amplifiers which reduces output to the load. This is compensated for by feeding an error signal, indicating the magnitude and phase of the phase-pulling of the two amplifiers, from the second quadrature hybrid coupler through the attenuator and the phase shifter back to the first quadrature hybrid coupler. The attenuated and phase shifted error signal adds to or is subtracted from the input signals to the two amplifiers. Therefore, one of the two amplifiers is driven with more signal and the other amplifier is driven with less signal to phase-push the two amplifiers to compensate for the phase-pulling to thereby increase the output to the load.

5 Claims, 1 Drawing Figure



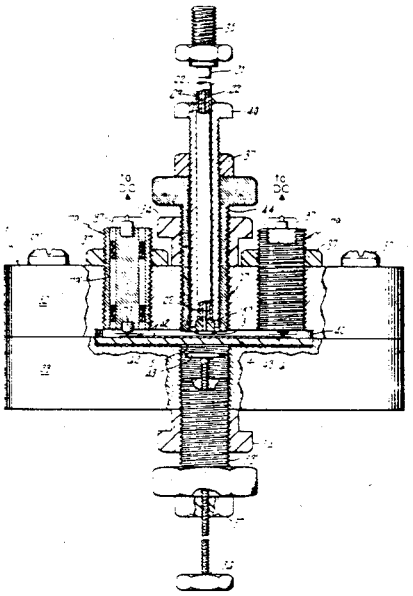
4,656,438 Apr. 7, 1987

Power Combining Cavity

Inventor: Samuel Levinson.
Assignee: United Technologies Corporation.
Filed: Mar. 19, 1984.

Abstract—A method and arrangement for enhancing the level of supplied microwave energy including a resonant ring capacitively coupled to a microwave coupling device effective for connecting to a microwave transmission line, the arrangement being mounted in a shield structure. Amplification is effected by IMPATT diodes capacitively coupled to the resonant ring. The microwave coupling device is variably setable with respect to the transfer structure, thereby promoting the establishment of impedance matching therebetween.

4 Claims, 7 Drawing Figures



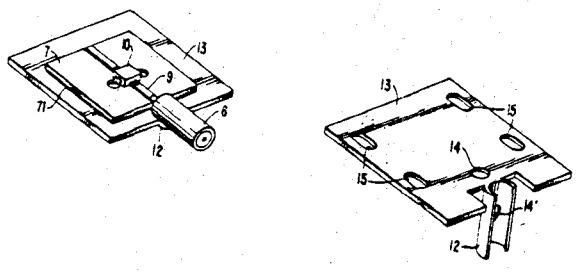
4,656,441 Apr. 7, 1987

Coaxial Line to Microstrip Line Transition Device

Inventors: Hiroshi Takahashi, Tomoki Uwano, Takashi Machida, and Hirokazu Kitamura.
Assignee: Matsushita Electric Industrial Co., Ltd.
Filed: Aug. 1, 1984.

Abstract—A coaxial line-to-microstrip line transition device including a coaxial line, a microstrip line circuit, and a conductive connection part. The inner conductor of the coaxial lines is connected with a microstrip line of the microstrip line circuit. The connection part includes a semi-cylindrical plate which is connected with the outer conductor of the coaxial line by grasping it, and a flat plate which is connected at a surface thereof with an earth layer surface of the microstrip line circuit. The microstrip line is mounted on one surface of a dielectric substrate, and the earth layer is mounted on the other surface of the dielectric substrate. The dielectric substrate is mounted on a chassis which is either provided separately or shared by the flat plate of the connection part which is extended in size. Preferably, a throughhole is provided at least one of the semi-cylindrical plate and the flat plate to be filled with a conductive material.

14 Claims, 12 Drawing Figures



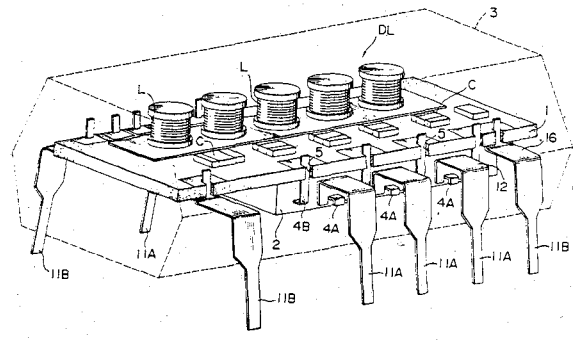
4,656,442 Apr. 7, 1987

Hybrid Circuit Device

Inventor: Yasumitsu Hayakawa.
Assignee: Toko, Inc.
Filed: Feb. 13, 1985.

Abstract—A hybrid circuit device comprising a flat package incorporating an integrated circuit therein, and a delay line circuit constituted by a plurality of coils and a plurality of capacitors. A base plate supporting the delay line circuit is disposed on the flat package. First terminals which are upwardly bent and second terminals are led out of the flat package. The upwardly-bent terminals connect the integrated circuit and delay line circuit to each other at side portions of the base plate. Furthermore, separate external terminals, which are attached to the base plate and connected to the second terminals of the flat package, are provided in two rows holding the flat package therebetween. The device is encapsulated with the free end portion of each of the separate external terminals being exposed through the encapsulation at a position substantially equidistant from the top and bottom surfaces of the encapsulated device.

9 Claims, 13 Drawing Figures



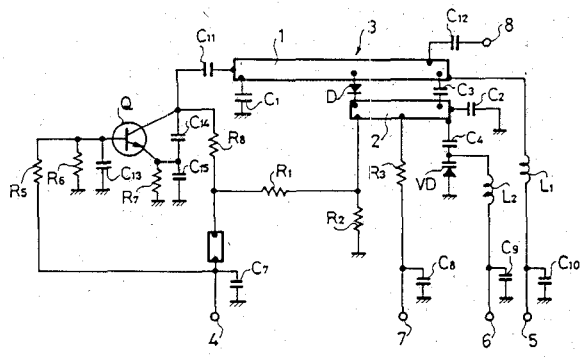
4,660,002 Apr. 21, 1987

High-Frequency Oscillator Using a Diode for Frequency Switching and FM Modulation

Inventors: Kouta Iijima and Takeshi Tanemura.
Assignee: Alps Electric Co., Ltd.
Filed: Mar. 14, 1986.

Abstract—A high frequency oscillator having an oscillation transistor connected to a resonant strip line unit consisting of a main strip line member and an auxiliary strip line member. The auxiliary strip line member is connected in parallel with or isolated from the main strip line member by a switch diode for switching the characteristic impedance of the strip line unit so as to generate a reception or transmission carrier wave output. A varactor diode connected to the strip line unit has its capacitance changed through an applied control voltage for channel switching. A modulating signal input terminal is directly connected to a portion of the auxiliary strip line member for modulating an FM transmission signal independently of the value of the control voltage applied to the varactor diode.

1 Claim, 2 Drawing Figures



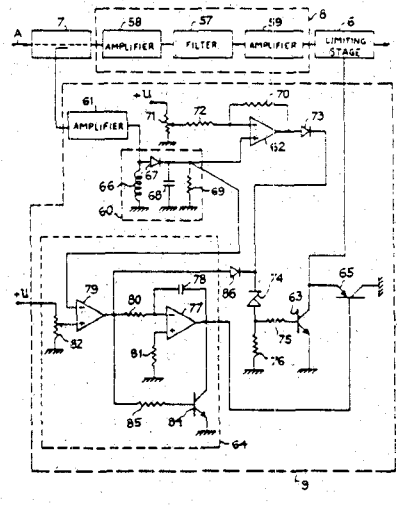
4,660,003 Apr. 21, 1987

Device for Limiting the Power Transmission of Radiowave Transmitters

Inventors: Claude Cluniat and Michel Allanic.
Assignee: Thomson-LGT.
Filed: June 17, 1985.

Abstract—The device for limiting the transmission power of radiowave transmitters comprises a limiting stage for attenuating the signal to be amplified before applying it to the input of the amplifying chain. A coupler collects part of the signal in order to apply it to the input of control means. A delay device is coupled between the coupler and the limiting stage and delays the signal to be amplified before applying it to the input of the limiting stage. The control means block the limiting stage in order to prevent transmission of the signal to be amplified to the input of the amplifying chain when the level of the signal to be amplified overshoots a predetermined amplitude and hold the limiting stage in the blocked state after the level of the signal to be amplified has fallen back below the predetermined threshold during a sufficient period of time which is calculated so as to prevent any power overshoot.

8 Claims, 10 Drawing Figures



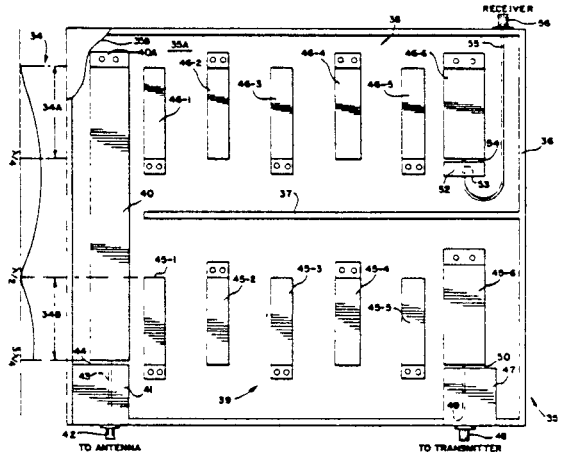
4,660,004 Apr. 21, 1987

Duplexer Including Integral Interdigital Transmitter and Receiver Filters and Three-Quarter Wavelength Antenna Transformer Section

Inventor: Ronald E. Jachowski.
Assignee: Orion Industries, Inc.
Filed: May 8, 1985.

Abstract—A duplexer includes an integral interdigital transmitter filter and parallel interdigital receiver filter in a common housing. A three-quarter wavelength antenna transformer section couples rf energy from the transmitter filter to an antenna and also couples rf energy from the antenna to the receiver filter and to an antenna cable connector

3 Claims, 6 Drawing Figures



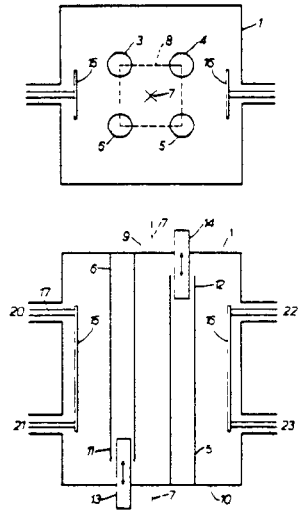
4,660,005 Apr. 21, 1987

High-Frequency Electrical Network

Inventor: Ronald Hutchinson.
Assignee: The Marconi Company Limited.
Filed: Aug. 6, 1985.

Abstract—An h.f. electrical network consists of a transmission line device in the form of a closed cavity having two end plates between which extend four quarter wave resonators positioned symmetrically about an axis passing through both end plates The device is provided with four ports connected to two pairs of transmission line loops each of which couple equally into two adjacent resonators. The device exhibits frequency selective properties and can be used to couple two carrier frequencies into a common antenna while maintaining electrical isolation between the two signal sources

19 Claims, 4 Drawing Figures



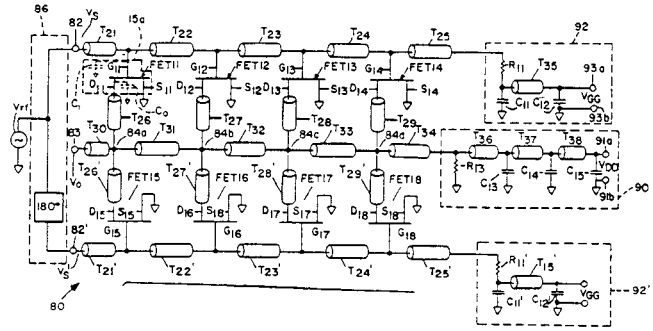
4,660,006 Apr. 21, 1987

Radio Frequency Multiplier Producing an Even Harmonic Output

Inventors: Yusuke Tajima and Robert A. Pucel.
Assignee: Raytheon Company.
Filed: Apr. 15, 1985

Abstract—A radio frequency multiplier circuit includes a first plurality of non-linear devices, each device having an input electrode and an output electrode. The input electrode of each one of the first plurality of non-linear devices is successively interconnected via a first input coupling means to a first input terminal The multiplier further includes a second like plurality of non-linear devices, each device having an input electrode and an output electrode The input electrode of each one of the second plurality of non-linear devices is successively interconnected via a second input coupling means to a second input terminal. A common output coupling means is provided to interconnect the output electrode of each one of the first plurality of devices with the output electrode of a corresponding one of the second plurality of devices. The multiplier further includes means for coupling a pair of signals having a 180° differential phase shift to the pair of input terminals. With this arrangement, an output signal having frequency components which are even harmonics of the frequency of the input signal is provided.

19 Claims, 16 Drawing Figures



4,660,008 Apr. 21, 1987

p-i-n Diode Switch Mounted in a Ridged Waveguide

Inventors: Raymond Henry, Michel Heitzmann, and Gilles Sillard.
Assignee: Thomson-CSF.
Filed: Sept. 27, 1984.

Abstract—A millimetric electromagnetic waves switch is constituted by a ridged waveguide associated to a p-i-n diode of which the layers p^+ and n^+ are very thin, of about 2 to 5 microns thickness. The width of the diode is inferior to that of the ridged part of the guide and its dimension according to the longitudinal axis of the guide is a multiple of the half-length of the guided wave.

8 Claims, 3 Drawing Figures