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.

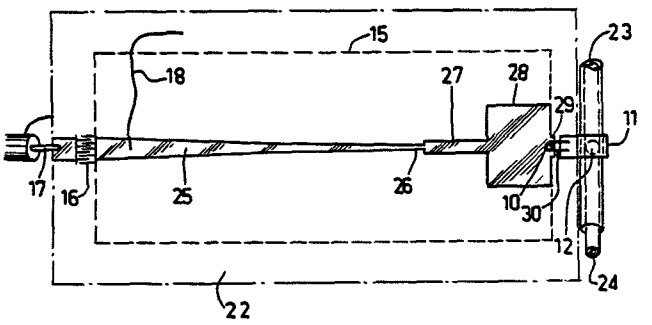
4,283,694 Aug. 11, 1981

Impedance-Matching Network Realized in Microstrip Technique

Inventor: Vlad Pauker.
Assignee: U.S. Phillips Corporation.
Filed: Jul 9, 1979.

Abstract—An impedance-matching microstrip network for matching a predetermined impedance to a lower impedance over a wide frequency band having a tapered line section for transposing the predetermined impedance to a higher impedance. At least one quarter wave line section is coupled to the narrow end of the tapered line section for transposing the higher impedance to the lower impedance.

3 Claims, 13 Drawing Figures



4,283,689 Aug. 11, 1981

Microwave Oscillator Circuit with Improved Efficiency

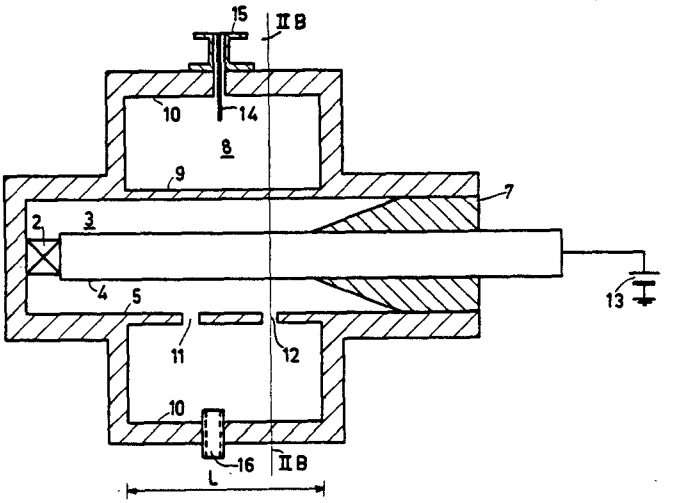
Inventor: Hindrik Tjassens.
Assignee: U.S. Phillips Corporation
Filed: May 17, 1979.

Abstract—A microwave oscillator circuit, suitable for use as the local oscillator in beam transmitters, radar systems and satellite TV receivers, comprises an active element (IMPATT, Gunn diode) at one end of a coaxial transmission line which is terminated at its other end by a matched load. At a suitable distance from the diode a high Q transmission cavity resonator is coupled to the transmission line via a first coupling hole.

A drawback of such a circuit is that a portion of the oscillator power at the required oscillator frequency f_0 is dissipated in the terminal impedance Z_0. This is obviated by coupling the transmission resonant cavity to the transmission line via a second coupling hole (12, FIG. 1 and FIG. 2). The distance between the first and the second coupling hole is $\frac{1}{4}\lambda$.

As a result the terminal impedance, which has been transformed very frequency-selective to a very high value in situ of the second coupling hole, is transformed to a very low value at the first coupling hole and very little power is dissipated in this low impedance, so that a considerable improvement of the circuit efficiency has been achieved.

6 Claims, 4 Drawing Figures



4,283,685 Aug. 11, 1981

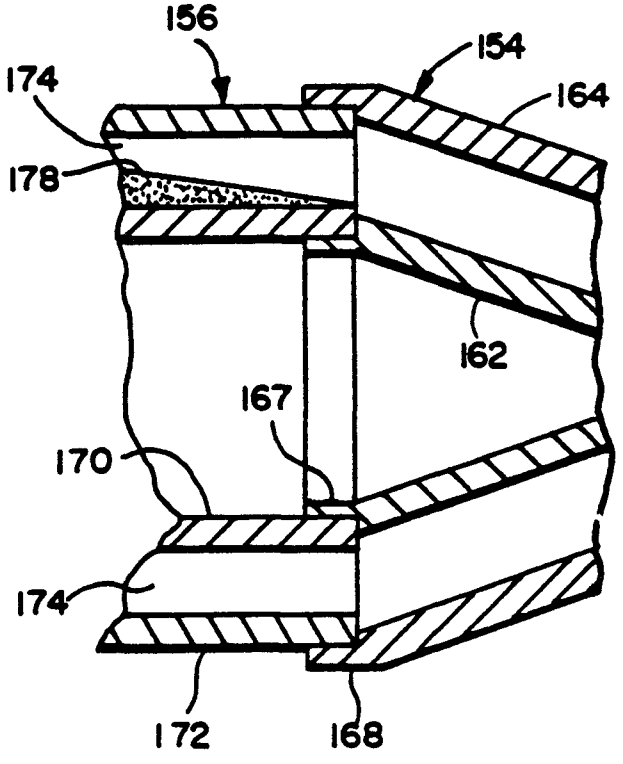
Waveguide-to-Cylindrical Array Transition

Inventors: George H. MacMaster; Lawrence J. Nichols.
Assignee: Raytheon Company.
Filed: Dec. 13, 1979.

Abstract—A multiple channel amplifier providing both gain and/or phase shift to a microwave signal is formed of a set of transmission lines connected in parallel by means of a power splitter at the input end and a power combiner at the output end of the set of transmission lines. The transmission lines are disposed in a cylindrical array of electrically conducting bars which support amplifying and/or phase shifting elements between the bars and withdraw heat from the amplifying and/or phase shifting elements. The transmission lines may be slotted or severed for directing power flow towards an output terminal of the amplifier. The amplifying and/or phase shifting elements are conveniently mounted on a set of heat sinks to form modules, each of which is readily inserted and detached from the cylindrical array. An enlarged region between adjacent bars serves as the site of a module, the opposed surfaces of the bars and of the heat sink providing the function of a transmission line to conduct power along opposite sides of the module resulting in a push-pull amplifier configuration. Impedance matching is provided by transitions in the

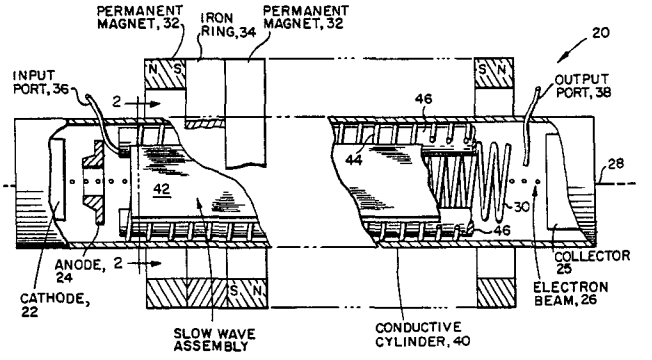
bar spacing. The splitter and the combiner may include spider-like structures for coupling the bars to a coaxial line, or a cross-slot aperture and wedge for coupling the bars to a waveguide.

6 Claims, 36 Drawing Figures



cylinder. The spacing between the turns of the winding is selected for coupling a backward wave of a specific frequency to the dielectric slabs for attenuation of the backward wave.

15 Claims, 5 Drawing Figures



4,283,697 Aug. 11, 1981

High Frequency Filter

Inventors: Yoshio Masuda: Atsushi Fukasawa; Jun Ashiwa; Takuro Sato.
Assignee: Oki Electric Industry Co., Ltd.
Filed: Nov. 9, 1979.

Abstract—A high frequency filter for frequencies higher than the VHF band comprises a closed conductive housing, a pair of input and/or output means like an antenna provided at both the extreme ends of said housing, a plurality of resonators arranged on a straight line between said antenna, each of said resonators having an elongated inner conductor and a cylinder dielectric body surrounding said inner conductor, one end of each of said resonators being fixed on the single plane of the housing and the other end of each of said resonators being free standing, and the length between each of the resonators being defined according to the specified coupling coefficient for the desired characteristics of the filter.

The present filter utilizes the coupling effect between resonators by the displacement current relating to surface TM mode and the conductive current relating to TEM mode. Therefore, no coupling means for providing the coupling between resonators is provided.

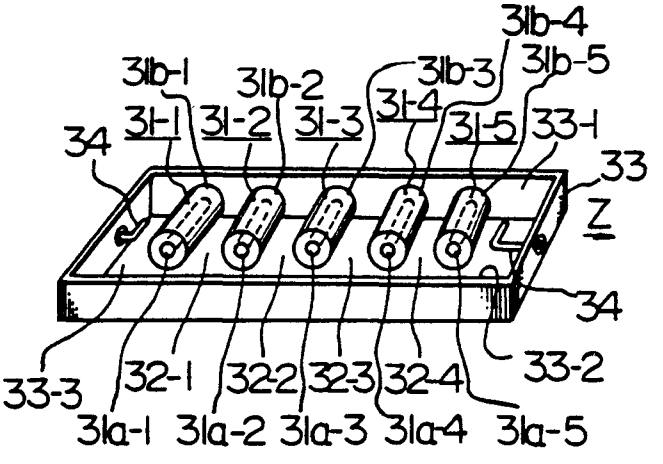
7 Claims, 15 Drawing Figures

4,282,457 Aug. 4, 1981

Backward Wave Suppressor

Inventor: Robert Harper.
Assignee: Raytheon Company.
Filed: Jun. 18, 1979.

Abstract—A traveling wave tube (TWT) has a slow wave structure in the form of a helix for amplifying the forward electromagnetic wave. The TWT is provided with an outer slow wave assembly for attenuating a backward wave to provide stability to the TWT. A set of ceramic rods are uniformly spaced circumferentially around the helix for supporting the outer slow wave assembly which is formed by an electrically conducting wire wound around the supporting rods. The wire is wound in a helical fashion with individual turns of the helix being spaced apart to form the outer slow wave structure. An electrically conducting cylinder surrounds the outer slow wave structure and is in contact therewith only at the sites of the rods. Dielectric slabs, having a slow wave structure such as a meander line disposed thereon, are inserted periodically around the outer slow wave structure in spaces between the winding and the



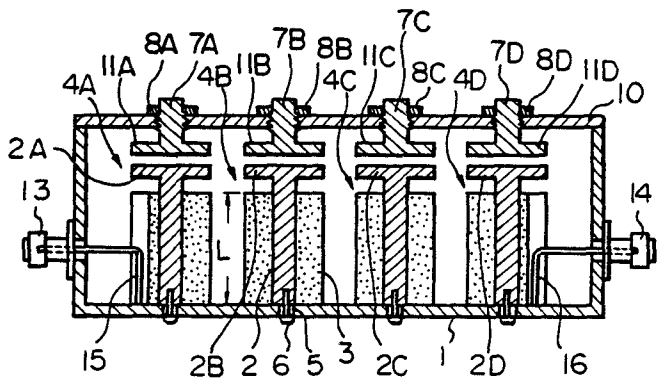
4,287,494 Sep. 1, 1981

Distributed Constant Type Filter

Inventors: Tadashi Hashimoto; Katsuya Jindou.
Assignee: TDK Electronics Co., Ltd.
Filed: Apr. 17, 1980.

Abstract—A filter operable in a microwave frequency band comprises a conductive closed housing having a bottom wall, an upper wall and side walls between said bottom wall and the upper wall, a plurality of resonators fixed on a straight line on the bottom wall inside of the housing, one end of each resonator being grounded to the bottom wall and the other end of each resonator being free standing, each resonator having at least an elongated center conductor and a dielectric body covering the center conductor at least partially in the longitudinal direction of the center conductor, a pair of connectors mounted at the opposite ends at the side walls for coupling the filter with an external circuit, a pair of loops each connected to the inner conductor of said connector and one end of the loops being grounded to the bottom wall, a pair of confronting conductive disks being provided between the free standing end of each center conductor of a resonator and the upper wall to provide the capacitance between said free standing end and the upper wall, the position of each resonator being slightly adjustable along said straight line within an elongated hole provided on the bottom wall, and the length L of the dielectric body covering the center conductor satisfying $L \leq \lambda_0/5\sqrt{\epsilon_e}$ where λ_0 being the wavelength in the free space of the center frequency of the filter and ϵ_e is the effective dielectric constant of the dielectric body.

3 Claims, 4 Drawing Figures



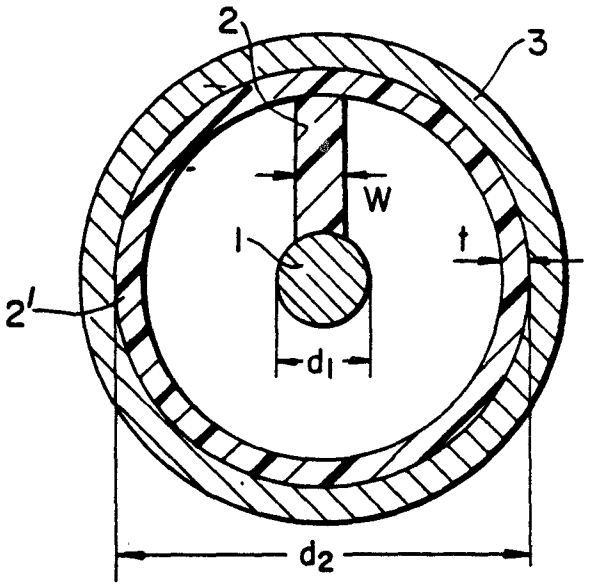
4,287,384 Sep. 1, 1981

Phase Stabilization Type Coaxial Cable

Inventor: Yasunori Saito.
Assignee: Sumitomo Electric Industries, Ltd.
Filed: Jan. 22, 1980.

Abstract—An air dielectric coaxial cable in which variations in phase characteristics due to variations in ambient temperature are minimized. An insulator is formed by welding a spiral rib which is in contact along one edge thereof with the outer wall of the inner conductor to an outer pipe of the same material. The outer conductor is provided in close contact with the outer wall of the insulating pipe. The space factor of the insulator is set between predetermined limits in accordance with a disclosed technique.

4 Claims, 2 Drawing Figures



4,286,229 Aug. 25, 1981

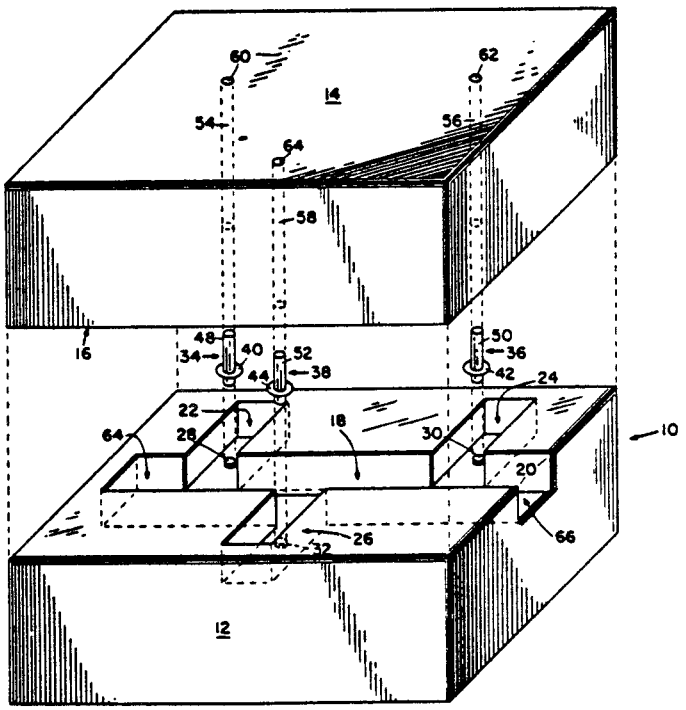
Waveguide Structure for Selectively Coupling Multiple Frequency Oscillators to an Output Port

Inventor: Alfred R. Hislop.
Assignee: The United States of American as represented by the Secretary of the Navy. Washington, D.C.
Filed: Nov. 26, 1979.

Abstract—A device for connecting plural oscillators to a single output port without the use of power dividers, switches or multiplexing filters. The plural oscillators produce multiple frequencies with only one oscillator operating at a given time. The oscillators are mounted in shunt waveguide cavities along a

central waveguide manifold at distances from the central waveguide manifold and waveguide end so as not to affect the operating oscillator.

7 Claims, 2 Drawing Figures



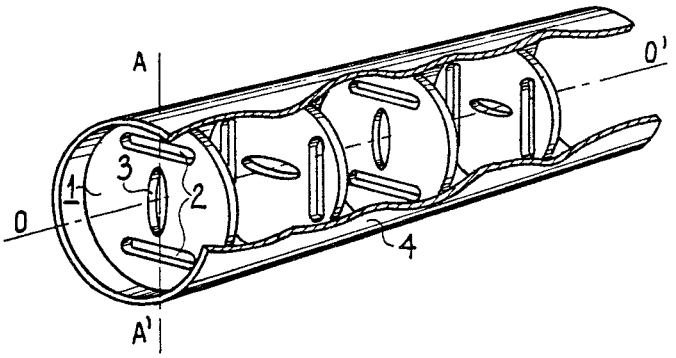
4,286,191 Aug. 25, 1981

Delay Lane With Coupled Cavities

Inventors: Bernard Epsztein; George Fleury.
Assignee: Thomson-CSF.
Filed: May 30, 1979.

Abstract—The areas of the walls 1 separating two adjacent cavities that are located on the periphery of the opening 3 for allowing through the electron beam, and whose thermal resistance is greatest, are those comprised between this opening 3 and a cavity coupling 2. Owing to the opening 3 for allowing through the electron beam (elliptical, centered on the axis of the line 00′, with the large axis of the ellipse merging with the axis of symmetry AA′ of the coupling openings 2 intersecting the axis 00′), these areas are the furthest away from the axis of the line 00′ along which the electron beam is propagated. The invention is applied to microwave tubes and in particular to travelling-wave tubes.

3 Claims, 3 Drawing Figures



4,288,759 Sep. 8, 1981

Microwave Transformer

Inventor: Harry L. Stover.
Filed: Jan. 28, 1980

Abstract—Transformer configurations especially useful in the microwave frequency range. A reliable physical centertap is achieved by the interposition of a stub at the center of an elongated member which provides electrical contact with a reactive impedance The circuit formed thereby allows the reflection of an r.f. short circuit to the center of the elongated portion without attendant fabrication thereon A loop configuration for the remaining coupling means allows adjustability of electromagnetic coupling which is less sensitive to spacing of primary and secondary than the common parallel configuration.

10 Claims, 8 Drawing Figures