Patent Abstracts

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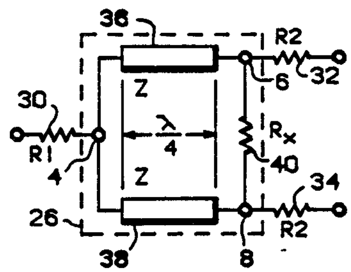
4,367,445 Jan. 4, 1983

Impedance Transforming Three Port Power Divider

Inventor: Michael Dydyk.
Assignee: Motorola Inc.
Filed: Mar. 30, 1981.

Abstract—A modification of a Wilkinson combiner/splitter is described wherein, by means of selection of the characteristic impedance of the transmission media and the value of the combining impedance, the combiner/splitter may be matched to input and output impedance which are not the same.

2 Claims, 4 Drawing Figures



4,367,446 Jan. 4, 1983

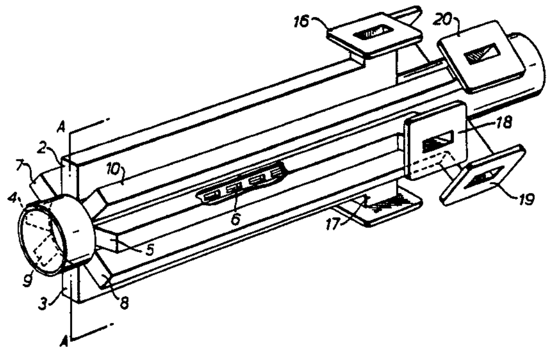
Mode Couplers

Inventor: William J. Hall.
Assignee: The Marconi Company Limited.
Filed: May 23, 1979.

Abstract—The invention provides a mode coupler arrangement comprising a main waveguide coupled via arrays of slots to two sets of subsidiary waveguides over a common length. One set of subsidiary waveguides is such as to support one mode of propagation and the other set another mode of propagation. In a preferred embodiment the slots in one set of subsidiary guides are staggered by $(1\lambda/4)$ relative to the slots in the other set of subsidiary guides and the guides of one set are longer than the guides of the other set.

For TE_{11} communications mode signals, the two sets of subsidiary guides are of different frequency, with each subsidiary guide arranged such that its variation of wavelength with frequency coincides with that of the main waveguide only in the frequency band for which that subsidiary guide is provided.

20 Claims, 7 Drawing Figures



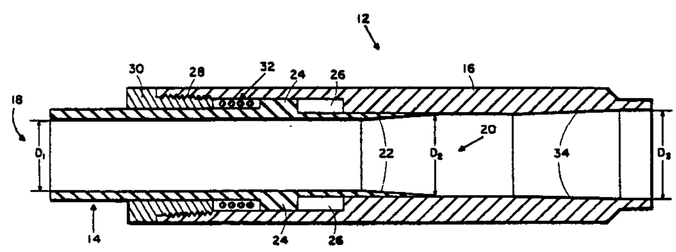
4,369,413 Jan. 18, 1983

Integrated Dual Taper Waveguide Expansion Joint

Inventors: Joseph M. Devan, Hugh Milligan.
Assignee: The United States of America as represented by the Secretary of the Navy.
Filed: Feb. 3, 1981.

Abstract—A TE_{01} circular mode waveguide expansion joint, tapered transition device in which the expansion joint includes a linear tapered section, the greatest diameter of which does not exceed the cutoff diameter for the TE_{02} spurious mode. A second taper of the cosine or other suitable type minimizes TE_{02} mode generation as the guide diameter increases past the TE_{02} cutoff value. The expansion, transition device simultaneously performs the functions of expansion section and waveguide diameter transition for the TE_{01} circular mode while minimizing spurious mode generation.

9 Claims, 2 Drawing Figures



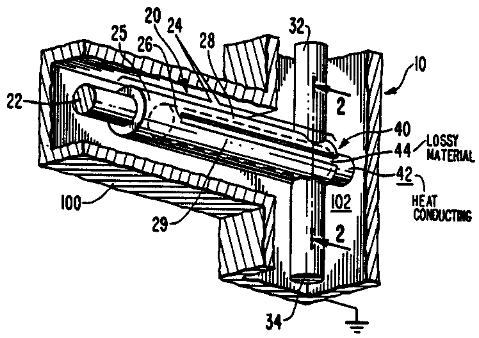
4,369,415 Jan. 18, 1983

Space-Loaded Coaxial Coupler

Inventor: Alfred Schwarzmann.
Assignee: RCA Corporation.
Filed: Feb. 9, 1981.

Abstract—A coaxial transmission line power divider structure includes an inner conductor split to form branch legs. The split portions of the inner conductor are arranged to define a hollow interior. An odd mode power dissipation element is disposed within the hollow. A thermally conducting element carries heat from the power dissipation element to the outer conductor.

13 Claims, 14 Drawing Figures



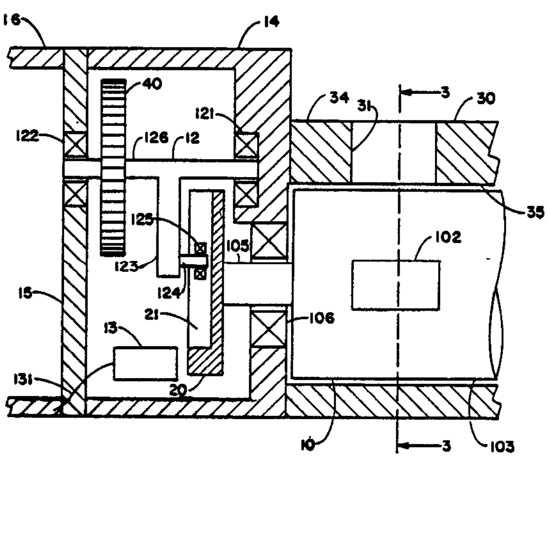
4,370,631 Jan. 25, 1983

Waveguide Switch

Inventors: Robert L. Gerber, Larry C. Raper.
Assignee: The United States of America as represented by the Secretary of the Navy.
Filed: Jan. 22, 1981.

Abstract—This invention discloses a high-speed waveguide switch for diverting energy among a plurality of waveguides. This switch is composed of a rotor, a rotor housing, biasing means, housing for the biasing means, and an electronic circuit to control the biasing means. The rotor and rotor housing are of conventional design. The biasing means is composed of two rotary solenoids mechanically linked through a geneva drive and wheel to the rotor. The electronic circuit is composed of a power supply circuit, a control circuit, and a motor circuit being the coils of the rotary solenoids. An external device such as a radar supplies a switching command signal to the control circuit. Various flip-flops are actuated based on the leading or trailing edge of the switching command signal. Signals from these flip-flops actuate switches in the power supply circuit so that a sequence of driving and braking currents is transmitted to the coils of the rotary solenoids. Upon receiving a driving current, a solenoid torques the rotor and causes it to rotate in a desired direction. Upon receiving a braking current, the other solenoid counter torques the rotor and brings it to a bounce-free stop. To return the rotor, the currents are applied to the opposite solenoids.

10 Claims, 7 Drawing Figures



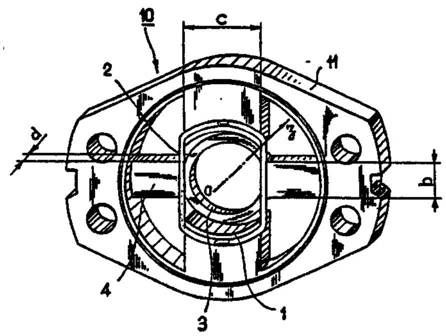
4,371,852 Feb. 1, 1983

Variable Pitch Delay Line for Travelling-Wave Tube and Travelling-Wave Tube Equipped with Such a Line

Inventors: Christian Deville, Philippe Lafuma.
Assignee: Thomson-CSF.
Filed: Jun. 27, 1980.

Abstract—A variable pitch delay line for a travelling-wave tube, is constituted by cells constructed in waveguide sections in which takes place the propagation of the electromagnetic waves which are used in the operation of the tube. All the cells are constituted by the same components, namely tops or covers, a ring, supporting rods for the ring and short circuit. The variable pitch is obtained by expansion or contraction of the dimensions within the guide cross section. A significant improvement of the tube efficiency is obtained by the use of lines formed from three sections with different pitches, which succeed one another along the path of the beam, whereof the second section has a smaller pitch and the third section a larger pitch than the first section.

9 Claims, 2 Drawing Figures



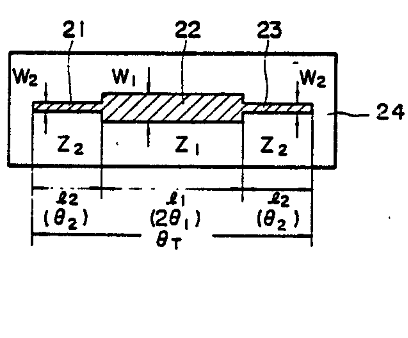
4,371,853 Feb. 1, 1983

Strip-Line Resonator and a Band Pass Filter Having the Same

Inventors: Mitsuo Makimoto, Sadahiko Yamashita.
Assignee: Matsushita Electric Industrial Company.
Filed: Oct. 29, 1980.

Abstract—The width of a strip-line conductor in a TEM mode resonator is made wider at the center portion thereof, at which current is maximum, then the open-ended widths at both end portions of the conductor so that impedance of the center portion is lower than the impedances of both end portions. The impedance may be stepwisely or continuously varied, and spurious resonance frequencies may be determined by the impedance ratio between the higher and lower impedances. Such a resonator may be included in a bandpass filter in such a manner that the bandpass filter comprises at least one resonator whose spurious resonance frequencies differ from those of remaining resonators.

18 Claims, 14 Drawing Figures



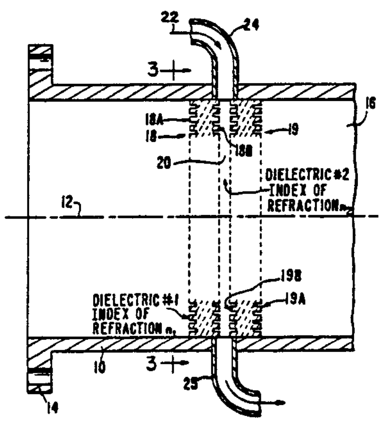
4,371,854 Feb. 1, 1983

Broadband High-Power Microwave Window Assembly

Inventors: Seymour B. Cohn. Arthur Karp, David S. Stone.
Assignee: Varian Associates, Inc.
Filed: Apr. 27, 1981.

Abstract—A window assembly for a hollow waveguide of circular cross section, with improved bandwidth and cooling capability for handling high microwave power transmissions over wide frequency ranges, is disclosed. A plate or disc of dielectric of refractive index n_1 extends sealingly across the waveguide and has two parallel faces which exhibit a pattern of corrugations. One of these faces is in contact with a dielectric fluid of refractive index n_2, and means are provided for cooling and circulating the fluid over said one face. Each of the corrugations extends into the fluid a distance proportional to the inverse of the geometric mean of the product of the refractive indices n_1, n_2. In a preferred embodiment, a second plate is included, separated from the first by a region in which said dielectric fluid is circulated, and in which at least both the faces in contact with the fluid are corrugated. The corrugations not only result in greatly improved matching over a broad band, but also greatly improved fluid flow and surface contact thereof over said one face, for enhanced cooling and thus power handling capability of the window assembly.

27 Claims, 6 Drawing Figures



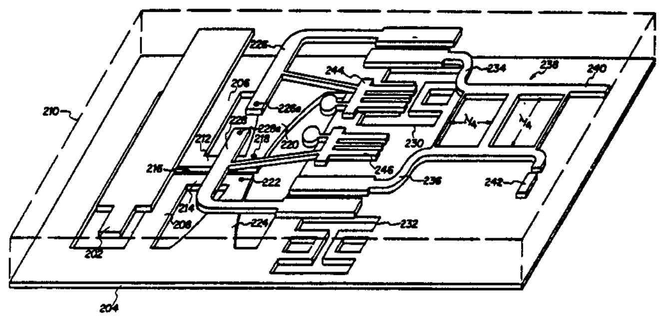
4,371,982 Feb. 1, 1983

Microwave Frequency Converter with Economical Coupling

Inventor: Ben R. Hallford.
Assignee: Rockwell International Corporation.
Filed: Mar. 13, 1981.

Abstract—A microwave frequency converter is provided with cost-effectively manufacturable microstrip layout circuitry, particularly for directionally coupling the LO signal. A pair of unbalanced microstrip conductors lead from a mixer bridge respectively to a pair of balun IF rejection filters juxtaposed on the opposite side of a dielectric substrate. A second pair of unbalanced microstrip conductors lead respectively from the pair of balun IF rejection filters to a microstrip branch line coupler.

14 Claims, 6 Drawing Figures



4,372,641 Feb. 8, 1983

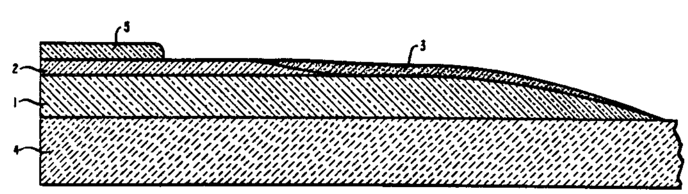
Optical Waveguide Termination

Inventors: Leo F. Johnson, LeGrand G. Van Uitert.
Assignee: Bell Telephone Laboratories, Incorporated.
Filed: Jun. 27, 1980.

Abstract—Optical communications networks may be implemented by means of a patterned layer of an optically transparent material on a substrate. Where an optical path terminates, e.g., at an on–off switch, it is desirable to optically terminate a waveguide so as to minimize spurious signals due to reflection.

The invention provides for optical termination of a waveguide by essentially complete absorption of light. Absorption is effected in a portion of the waveguide which comprises light absorbing centers such as, e.g., carbon or metal particles, anions, cations, or molecules which absorb light at desired wavelengths. Absorbing centers may be comprised in a central portion of a waveguide or, more conveniently, in a portion adjacent to a central portion. In the interest of minimizing reflections, interaction between light and absorbing centers increases gradually in a direction of light propagation as may be due to gradually increasing concentration of absorbing centers or to taper in a waveguide cladding portion, core portion, or absorbing portion.

13 Claims, 8 Drawing Figures



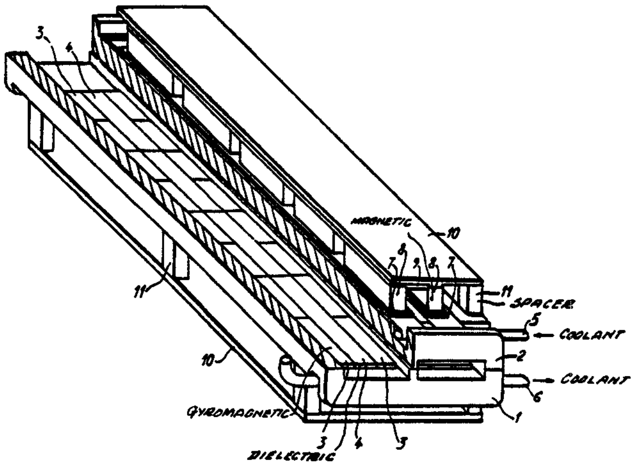
4,374,367 Feb. 15, 1983

Non-Reciprocal Microwave-Frequency Device for High-Level Operation

Inventor: Gerard Forterre.
Assignee: Thomson-CSF.
Filed: Dec. 9, 1980.

Abstract—A phase-shifting device for microwave frequencies is constituted by a section of a rectangular waveguide, the two large walls of the waveguide being each adapted to carry two strips of gyromagnetic material placed on each side of a strip of dielectric material. Each strip is formed by an array of small plates bonded to the waveguide walls and to each other by means of an insulating silicone adhesive.

3 Claims, 3 Drawing Figures



4,374,368 Feb. 15, 1983

Multilevel Stripline Transition

Inventors: Raymond D. Viola, Gerard L. Hanley.
Assignee: Sperry Corporation.
Filed: Dec. 29, 1980.

Abstract—A multilevel stripline transformer which transforms the center strips of a one-level stripline system to a common ground plane between levels of a multilevel stripline system. The upper and lower ground planes of the one-level system are each ribboned to form extensions of inner strips of the one-level system, which are converted alternately to upper and lower level microstrips having the common ground plane as its ground plane. These upper and lower level microstrips are then transformed to be the center conductors of the upper and lower levels of the multilevel stripline system.

2 Claims, 5 Drawing Figures