Letters

Corrections to "Unified Approach to Solve a Class of Strip and Microstrip-Like Transmission Lines"

B. BHAT AND S. K. KOUL

In the above referenced paper,[1] the factor P_n is missing in (17c). The corrected equation should read as

$$A\begin{pmatrix}\text{even-even}\\ \text{even-odd}\\ \text{odd-even}\\ \text{odd-odd}\end{pmatrix} = -\frac{\sum_n \begin{pmatrix}\text{odd}\\ \text{odd}\\ \text{even}\\ \text{even}\end{pmatrix} (L_n - 4M_n) L_n P_n / Y \begin{pmatrix}\text{even}\\ \text{odd}\\ \text{even}\\ \text{odd}\end{pmatrix}}{\sum_n \begin{pmatrix}\text{odd}\\ \text{odd}\\ \text{even}\\ \text{even}\end{pmatrix} (L_n - 4M_n) M_n P_n / Y \begin{pmatrix}\text{even}\\ \text{odd}\\ \text{even}\\ \text{odd}\end{pmatrix}}. \tag{17c}$$

Manuscript received June 23, 1982.

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[1] B. Bhat and S. K. Koul, *IEEE Trans. Microwave Theory Tech.*, vol. MTT-30, pp. 679–686, May 1982.

Patent Abstracts

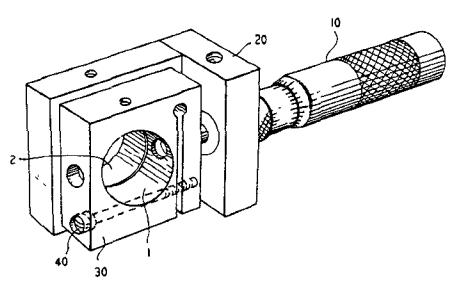
4,327,966 May 4, 1982

Variable Attenuator for Laser Radiation

Inventor: David M. Bloom.
Assignee: Bell Telephone Laboratories, Inc.
Filed: Feb. 25, 1980.

Abstract—The invention relates to a variable attenuator having two phase gratings (1 and 2) with rectangular grooves. In a first embodiment of the present invention the gratings are slidably mounted (10, 20, 30) so that the gratings have the grooves parallel and the faces in close proximity. As one grating is translated relative to the other the light passing through the device may be varied from total extinction to substantially total transmittance. A single device can be fabricated to provide this attenuation for radiation spanning the visible spectrum. In other embodiments the gratings are fixed relative to one another and the entire device is moved relative to the beam to be attenuated.

7 Claims, 7 Drawing Figures



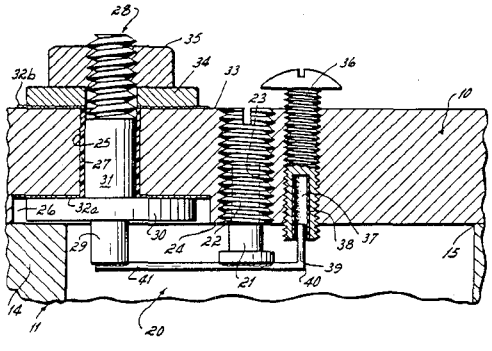
4,329,663 May 11, 1982

Back Plate Mounted Lumped Element Microwave Oscillator

Inventor: Alexander B. Bereskin.
Filed: Mar. 24, 1980.

Abstract—A lumped element microwave oscillator is mounted on the back plate secured to a wave guide for generating electromagnetic waves which propagate through the wave guide. The oscillator includes a two-terminal solid-state device, such as a Gunn diode, which exhibits negative resistance in the microwave range, connected in circuit with a dc source and lumped elements, including a variable capacitive element. The variable capacitive element is accessible without removing the back plate from the wave guide so that the capacitance can be easily adjusted for controlling the frequency of the oscillator. The power of the electromagnetic waves which propagate through the wave guide is preferably controlled by adjusting the coupling between the oscillator and the load in two ways. The physical orientation of various lumped elements mounted on the back plate can be adjusted with respect to the plane of the E field in the wave guide for controlling the coupling between the oscillator and the load in steps. Also, the lateral positional relationship of the back plate with respect to the wave guide can be adjusted for infinitely controlling the coupling between the oscillator and the load.

10 Claims, 8 Drawing Figures



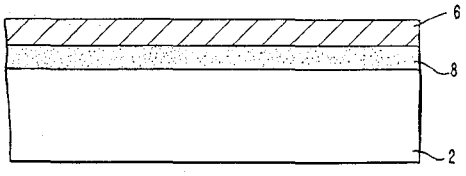
4,329,016 May 11, 1982

Optical Waveguide Formed by Diffusing Metal into Substrate

Inventor: Bor-Uei Chen.
Assignee: Hughes Aircraft Co.
Filed: Sept. 24, 1979.

Abstract—The specification describes an optical waveguide device formed by diffusing a metal into a substrate which may be either a semiconductor material or a dielectric material. The substrate is first coated with a liquid composition comprising organo-metallic solutions of the desired metal and silica. The coated substrate is then heated at an elevated temperature for a period of time sufficient to cause the organic portion of the solution to decompose, thereby leaving a composite film comprising an oxide of the desired metal and SiO_2. Upon further heating, the metal from the metal oxide diffuses into the substrate. The residual composite film may be left in place or removed.

1 Claim, 4 Drawing Figures



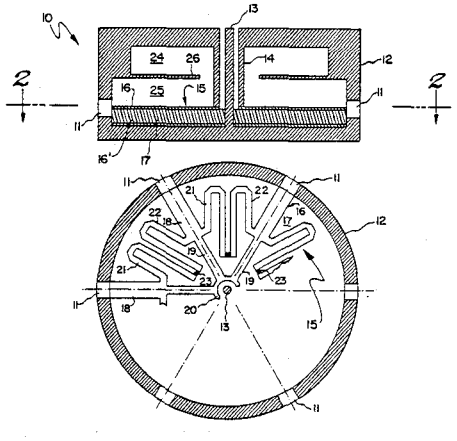
4, 328,471 May 4, 1982

Bandwidth Compensated Quarter-Wave Coupled Power Combiner

Inventor: John P. Quine.
Assignee: General Electric Co.
Filed: Sept. 15, 1980.

Abstract—A microwave power combiner/divider is matched internally and has increased bandwidth. A microwave integrated circuit disk within the housing has high impedance radially directed quarter-wavelength lines to obtain an impedance match for the desired mode at the centered coaxial port. Bridging half-wavelength lines between adjacent peripheral ports match the undesired mode and connect to absorbing resistors; these lines also provide bandwidth compensation. The housing has an annular shield with an opening near the centered coaxial line to provide a high choke impedance.

2 Claims, 3 Drawing Figures



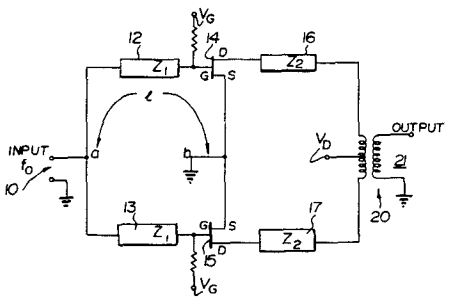
4,327,343 Apr. 27, 1982

Wideband MESFET Microwave Frequency Divider

Inventor: William D. Cornish.
Assignee: Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence.
Filed: June 10, 1980.

Abstract—A frequency divider is known which uses varactor diodes in a circuit which resonates at f_0/N where N is an even integer. Because of circuit losses within the varactor diodes, amplifiers are generally required to recover the input signal level. For systems that require cascaded frequency dividers at least one amplifier is required for each frequency divider. The present invention overcomes these problems by providing a microwave frequency divider to perform parametric frequency division and amplification simultaneously at microwave frequencies. A signal f_0 is applied to an input transmission line which forms, with the inherent frequency dependent non-linear gate-to-source capacitance of at least one MESFET, a circuit resonant at f_0/N, wherein N is an even integer such as 2. The source-drain path of the MESFET is coupled via an output transmission line to a balun transformer having an output to provide amplified signals at f_0/N. The transmission lines may be microstrip, stripline or other suitable type of transmission line

10 Claims, 9 Drawing Figures



4,325,604 Apr. 20, 1982

Input and Output Coupler Device

Inventor: Hans-H. Witte.
Assignee: Siemens Aktiengesellschaft.
Filed: Aug 20, 1979.

Abstract—A coupler device for use with light conducting fibers to couple-out and couple-in a light signal to the fibers comprises at least three optical fibers and a physical structure for holding the fibers in a plane with the first and second fibers converging together to have a portion of each of the fibers adjacent the end faces extending in parallel side-by-side relationship with the end faces being flush and the end face of the third fiber being positioned in abutting relationship against the end faces of the first and second fibers. In one embodiment, the amount of offset between the third fiber and the pair of first and second fibers is adjustable so that the coupler can be changed from a direct coupler of one of the first and second fibers being directly coupled to the third fiber to a branching coupler with the third fiber being connected to both the first and second fibers.

9 Claims, 2 Drawing Figures

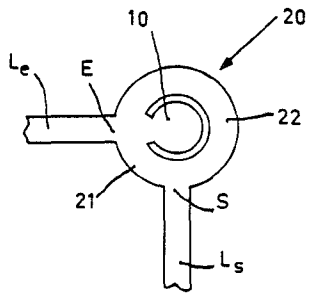
4,327,342 Apr. 27, 1982

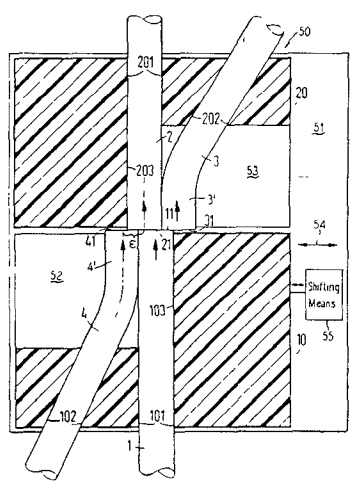
Bandstop Filter for Very High Frequency Transmission Lines and Biassing Circuit for a Very High Frequency Transistor Comprising this Filter

Inventor: Frans. C. De Ronde.
Assignee: U.S. Philips Corp.
Filed: July 10, 1980.

Abstract—A bandstop filter for very high frequency transmission lines having distributed constants, having several filtering element each intended to prevent the transmission of a specific frequency band. The first filtering element is a quarter-wave filter, the second element an assembly of two transmission paths of a length such that the signals present at the outputs have opposite phases and cancel other, the third element being a quarter-wave filter, these elements being grouped such that they form an extremely compact filter which is little sensitive to proximity effects.

5 Claims, 4 Drawing Figures





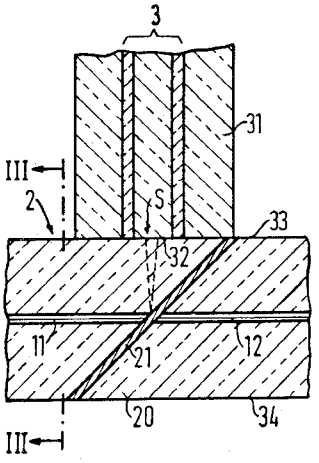
4,325,605 Apr. 20, 1982

Branching Element for Monomode Light Waveguides and the Method of Manufacture

Inventors: Gerhard Winzer; Franz Auracher.
Assignee: Seimens Aktiengesellschaft.
Filed: Nov. 1, 1979.

Abstract—A branching element for a single mode light waveguide characterized by monomode guides extending from a semi-transmissive reflective layer that is inclined to the axis thereof and the branching light waveguide is a multimode light waveguide which is positioned to receive light reflected by the layer from one of the monomode guides. The device has a good coupling efficiency and can be manufactured by a cheap and simple process.

3 Claims, 3 Drawing Figures



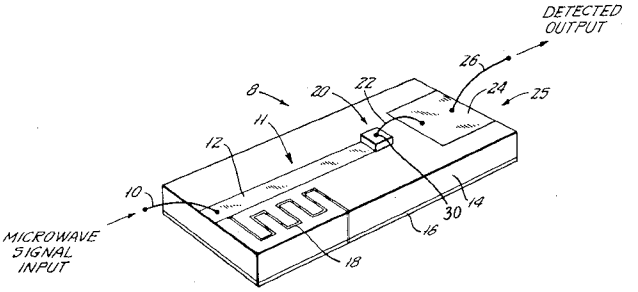
4,326,180 Apr. 20, 1982

Microwave Backdiode Microcircuits and Method of Making

Inventor: Romano I. Ferri.
Assignee: Microphase Corp.
Filed: Nov. 5, 1979.

Abstract—After a circuit is completely configured, including the mounting of semiconducting material onto a conductive layer and the connection of a conductor lead from a dot on the semiconducting material to the circuit, the required backdiode e/i characteristic is obtained by subjecting the whole circuit assembly to etching processing. The entire circuit is immersed into an electrolytic solution for etching away the semiconducting material to form the fragile narrow neck of the backdiode, thereby obtaining the required backdiode characteristic while advantageously obtaining an irreducible minimum of parasitic reactances associated with the resultant backdiode. Subsequent handling of the fragile backdiode as a component has been avoided because it is advantageously fabricated "in situ" pre-joined and integrated with the other components of the desired electronic circuit.

10 Claims, 7 Drawing Figures



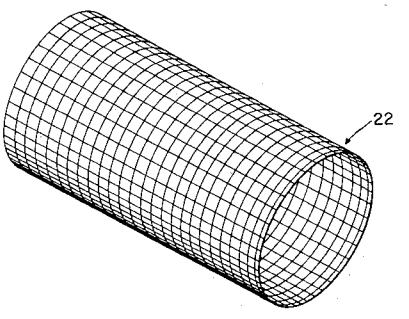
4,323,867 Apr. 6, 1982

Fragment-Tolerant Transmission Line

Inventor: Clifford L. Temes.
Assignee: The United States of America as represented by the Secretary of the Navy.
Filed: Aug. 27, 1980.

Abstract—An improved transmission line or waveguide that can tolerate damage from ordnance fragments without severe degradation of performance. Ordnance fragment penetration into a waveguide tends to produce jagged inward protrusions or loose metal chips of the type which can cause arc-over and high standing wave ratios. The present invention provides a transmission line or waveguide made of a brittle nonconductive material such as plastic or composite material which is coated on the surfaces bordering the interior volume with a solder, conductive paint, or other conductive material. Thus, any penetration of the waveguide will leave a clean hole without jagged protrusions which could precipitate arcing and degrade the waveguide VSWR. An alternative embodiment comprises the construction of the waveguide walls from a brittle conductive material which would leave a clean hole after penetration.

1 Claim, 4 Drawing Figures



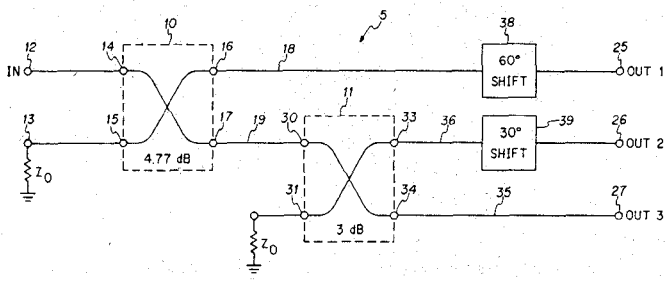
4,323,863 Apr. 6, 1982

N-Way Power Divider/Combiner

Inventor: Robert J. Weber.
Assignee: Rockwell International Corp.
Filed: Sept. 27, 1979.

Abstract—An *n*-way power divider, particularly useful where $n \neq 2^x$, includes an input and a plurality of outputs. The power applied to the input is coupled to the outputs, and phase shifters are associated with at least some of the outputs. The phase shift provided by each of the phase shifters is determined such that the reflected power waves from each of the outputs appearing at the input cancel. Because the circuit is reciprocal, it can also be used as a signal combiner with appropriately phased power-wave vectors at the inputs.

4 Claims, 6 Drawing Figures



Asian Abstracts

Papers from Journals Published in Australia, India, and Japan

Compiled by Prof. E. Yamashita, University of Electro-Communications, Tokyo, 182 Japan.

The periodicals investigated are: 1) Transactions of the Institute of Electronics and Communication Engineers of Japan (Trans. IECEJ), 2) Journal of the IECEJ, 3) Journals of the Institution of Engineers (JIE (India)), Electronics and Telecommunication Engineering Division (Part ET), 4) The Journal of Electrical and Electronics Engineering, Australia, and 5) Australian Telecommunication Research (ATR).

As for the Japanese papers in the Trans. IECEJ, which carry volume numbers J64B or J64C, single-page English summaries (1/4 page for Letters) will be found in the "Transactions of IECEJ, Section E", issued in the same month, where "E" denotes English. Papers carrying volume number E64 are papers written originally in English and will be found in Section E. These issues are published from the IECEJ, Kikai Shinko Kaikan, 3-5-8 Minato-ku, Tokyo 105, Japan.

The full translations of some Japanese papers will appear in Electronics and Communications in Japan, published by Scripta Publishing Co., 7961 Eastern Avenue, Silver Spring, MD 20910.

At the beginning of 1981, the Institution of Radio and Electronics Engineers, Australia, and the Electrical College of the Institution of Engineers, Australia, ceased to publish their separate journals. The former's Proceedings and the latter's Transactions were combined into a single journal, The Journal of Electrical and Electronics Engineering, Australia.

Active Microwave Devices

1

CW-CH_3F Metallic Waveguide Laser at 496 μm, by Y. Kokubo, S. Yoshimori, and M. Kawamura (Faculty of Engineering, Tokyo Institute of Technology, Tokyo, 152 Japan): *Trans. IECEJ*, vol. J64-C, no. 1, pp. 16–23, January 1981.

The optimization of a CW 496-μm optically pumped CH_3F laser with a metallic waveguide is discussed. The dominant oscillation is of the TE_{11} mode and the optimum waveguide diameter is 10 mm.

2

Amplification Characteristics of Injection-Locked Oscillator Having an Opposite Phase Self-Injection Circuit, By Y. Iida and M. Morita (Faculty of Engineering, Kansai University, Suita, 564 Japan): *Trans. IECEJ*, vol. J64-B, no. 4, pp. 287–294, April 1981.

The steady-state and transient response of the injection-locked oscillator having an additional circuit of opposite phase self-injection are described. Experimental results on an *X*-band Gunn diode oscillator are given.

3

The Optimum Cavity Length with CH_3F Metallic Waveguide Laser (Letters), by Y. Kokubo and M. Kawamura (Faculty of Engineering, Tokyo Institute of Technology, Tokyo, 152 Japan): *Trans. IECEJ*, vol. J64-C, no. 6, pp. 398–399, June 1981.

The optimum length of a metallic waveguide used in a CH_3F laser to produce the maximum output power is discussed theoretically, and the results of experiments are shown.

4

A Microwave Multiple-Diode Ladder Oscillator, by K. Fukui and S. Nogi (School of Engineering, Okayama University, Okayama-shi, 700 Japan): *Trans. IECEJ*, vol. 64-B, no. 8, pp. 816–823, August 1981.

A high-power microwave oscillator is proposed which is composed of a series connection of several waveguide sections having a pair of diode-mounts placed symmetrically with the waveguide axis.

5

Response of Pb Thin Film Microbridge Josephson Device Under Microwave and Millimeter Wave Radiations (Letters), by S. Yoshimori and M. Kawamura (Faculty of Engineering, Tokyo