Patent Abstracts

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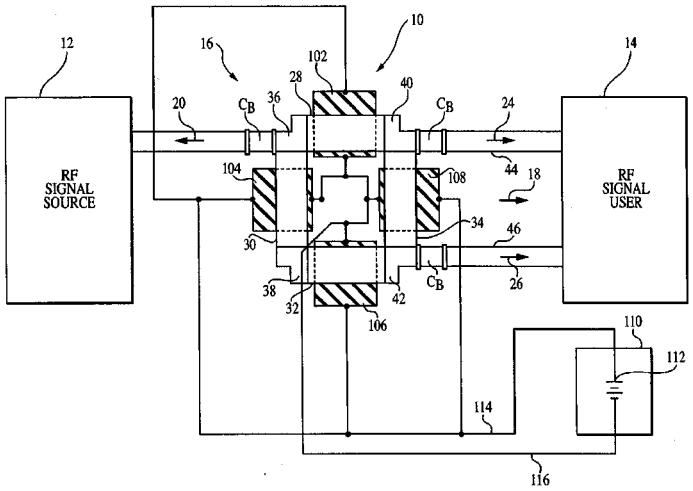
6,335,662 January 1, 2002

FERROELECTRIC-TUNABLE MICROWAVE BRANCHING COUPLERS

Inventors: Romeo D. Del Rosario, Jr. and Steven C. Tidrow.
Assignee: The United States of America as represented by the Secretary of the Army.
Filed: September 21, 1999.

***Abstract*—**The invention discloses the utilization of various transmission lines that entail a ferroelectric material as dielectric substrate to introduce an impedance shift by means of an externally applied d.c. bias, which alters the effective length between the input and output signals of the transmission lines of microwave couplers.

3 Claims, 8 Drawing Sheets



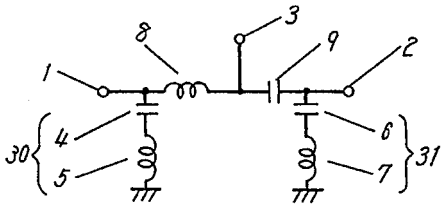
6,335,663 January 1, 2002

MULTIPLEXER/BRANCHING FILTER

Inventors: Yuki Satoh, Naoki Yuda, Hidenori Katsumura, and Tsutomu Matsumura.
Assignee: Matsushita Electric Industrial Co., Ltd.
Filed: March 16, 1999.

***Abstract*—**The present invention relates to a multiplexer/demultiplexer for use in mobile communication devices and provides a small and low-loss multiplexer/demultiplexer. The present invention provides a multiplexer/demultiplexer including a first to a third ports each externally terminated with a pure resistance, in which the second port is made to be a common port by connecting between the first port and the ground a first resonant circuit which makes serial resonance at a frequency within a first frequency band or in its proximity, and further connecting an inductive element in series between the first port and the second port, and connecting between the third port and the ground a second resonant circuit which makes serial resonance at a frequency within a second frequency band which is different from the first frequency band or in its proximity, and further connecting a capacitive element in series between the third port and the second port.

14 Claims, 10 Drawing Sheets



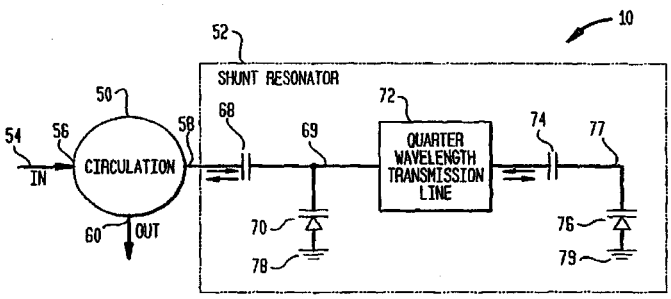
6,335,665 January 1, 2002

ADJUSTABLE PHASE AND DELAY SHIFT ELEMENT

Inventor: Joseph Patrick Mendelsohn.
Assignee: Lucent Technologies Inc.
Filed: September 28, 1999.

***Abstract*—**An apparatus and method provide an adjustable phase and time delay to an input signal. The apparatus includes an inverting element and first and second variable capacitors. The inverting element has a first end serially coupled with the input signal and a second end. The first variable capacitor is coupled between the first end of the inverting element and first voltage. The second variable capacitor is coupled between the second end of the inverting element and a second voltage. The first and second variable capacitors are separately adjustable to controllably vary a phase shift and a delay of a reflection of the input signal. The first and second voltages may be at the same or different potentials. The input signal may be coupled to the inverting element through a directional coupler, such as a circulator. The input signal, which is reflected by the inverting element, may be coupled back through the directional coupled and output as the output signal having a desired phase shift and delay relative to the input signal.

8 Claims, 10 Drawing Sheets



Publisher Item Identifier 10.1109/LMWC.2002.801141.

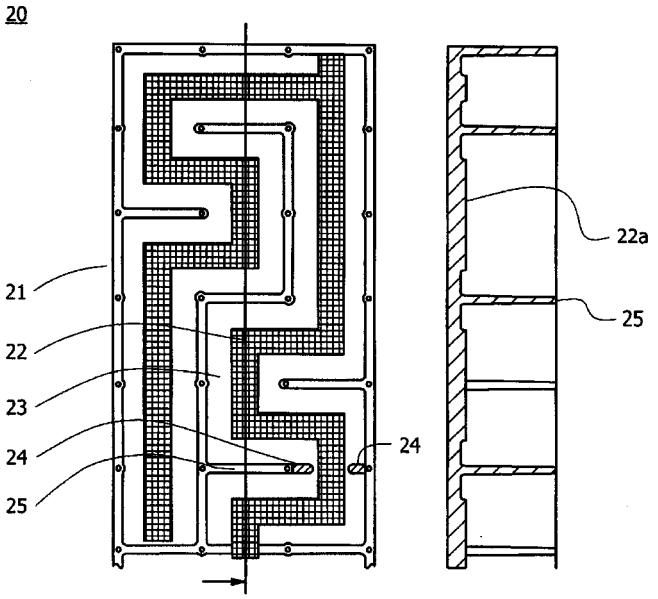
6,335,668 January 1, 2002

CAVITY FILTER

Inventors: Bo Uno Egon Henningsson and Matti Liikamaa.
Assignee: Telefonaktiebolaget LM Ericsson (publ).
Filed: December 17, 1999.

***Abstract*—**The present invention relates to a cavity filter (**20**) that includes a plurality of centre conductors which are mounted on an elevation (**22**) that extends along several cavities. The elevation can be produced on the bottom surface (**23**) of the cavity body (**21**) to a high degree of flatness in one single working step, and a precise measurement and precise parallelity between said bottom surface and the side walls (**25**) of the cavities can be obtained.

22 Claims, 5 Drawing Sheets



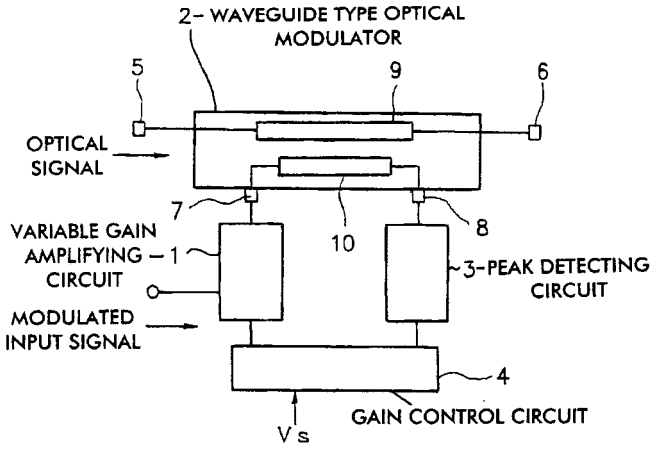
6,335,991 January 1, 2002

OPTICAL MODULATION APPARATUS AND OPTICAL MODULATION METHOD

Inventor: Yasuhisa Taneda.
Assignee: NEC Corporation.
Filed: November 24, 1997.

***Abstract*—**An optical modulation apparatus is provided with an optical modulator **2**, a variable gain amplifying circuit **1** connected to this optical modulator **2**, a detecting circuit **3** and a gain control circuit **4**. A modulated input signal is entered into the variable gain amplifying circuit **1**, and the variable gain amplifying circuit **1** amplifies this signal and delivers it to the optical modulator **2** as modulation drive signal. The detecting circuit **3** controls the variable gain amplifying circuit **1** on the basis of the detected signal. This optical modulation apparatus manifests steady optical modulation characteristics even if the amplitude of modulated input signals or ambient temperature varies.

9 Claims, 4 Drawing Sheets



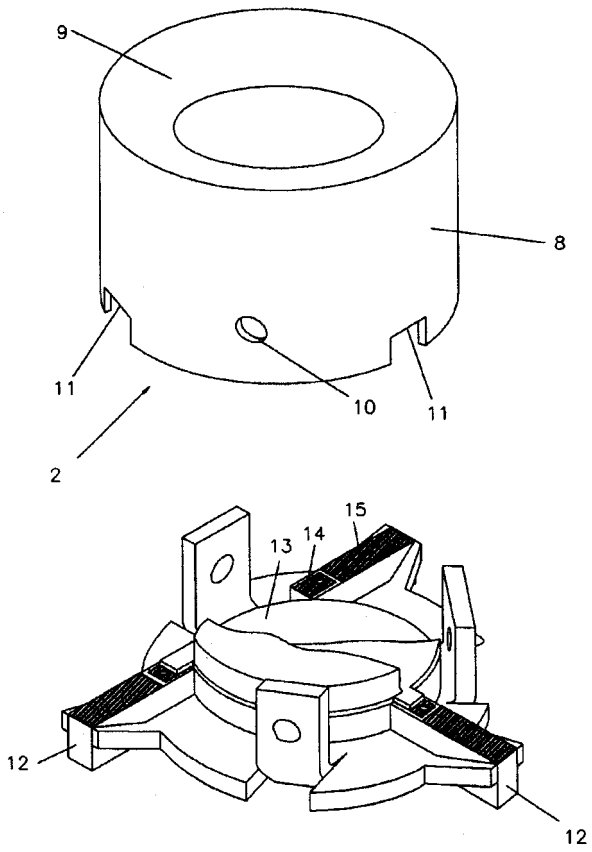
6,337,607 January 8, 2002

SURFACE MOUNTABLE LOW IMD FERRITE ISOLATOR/CIRCULATOR STRUCTURE

Inventor: German S. Genfan.
Assignee: Renaissance Electronics Corporation.
Filed: May 12, 2000.

***Abstract*—**A structure for a high power low IMD passive microwave device, mainly for automated placement. The structure includes substantially flat housing having slots and a cover having notches. Slots and notches form openings to snugly receive printed circuit boards (PCBs) having signal transmission lines on both sides. Also, on both sides of PCBs opposite to the signal lines, the ground planes are located. The passive device is disposed between the housing and the cover, and electrically connected to the signal transmission lines inside the structure that is totally closed and sturdy. Bottom surface of PCBs and that of the housing are coplanar. PCBs are reinforced on both their sides by supports extended from the housing. Such a structure provides homogeneous leads and best conditions for automated placement. Inductance in signal lines is well balanced by capacitance to ground planes that in combination with structurally homogeneous leads provides low IMD. Emittance of RF field from the high power passive device into environment is negligible due to totally closed structure.

10 Claims, 3 Drawing Sheets



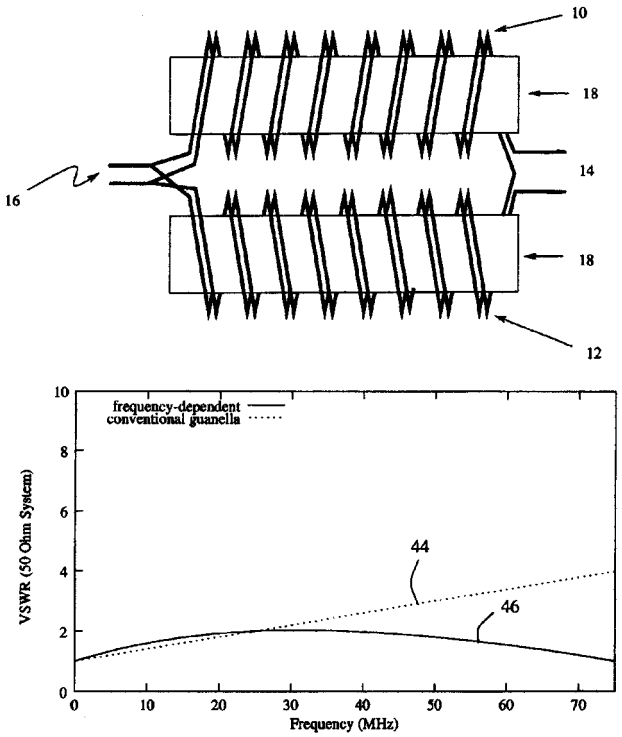
6,337,608 January 8, 2002

FORMATION OF A TRANSMISSION-LINE TRANSFORMER PROVIDING A FREQUENCY-DEPENDENT IMPEDANCE TRANSFORMATION RATIO

Inventors: James Stuart McLean and Gentry Elizabeth Crook.
Assignee: TDK RF Solutions, Inc.
Filed: September 22, 1999.

***Abstract*—**A transformer for connection between a generator and a load may be formed by connecting n transmission lines together, in series at one end and in parallel at the other end. The transmission lines are configured to each have a characteristic impedance of $\sqrt{R_G|Z_L(f_0|}$, where f_0 is the frequency at which each transmission line is one quarter of a wavelength long (quarter-wavelength frequency), $|Z_L(f_0)|$ is the magnitude of the load impedance at the quarter-wavelength frequency, and R_G is the generator resistance. The transformer exhibits a frequency-dependent impedance transformation ratio, allowing a more efficient impedance match of a generator to a load having a frequency-dependent impedance, such as an antenna.

16 Claims, 4 Drawing Sheets



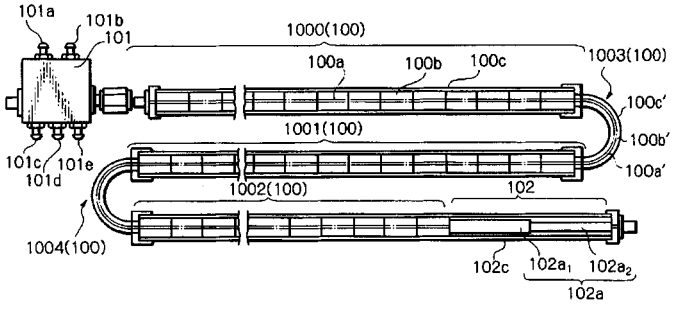
6,337,609 January 8, 2002

DELAY COMPENSATION DEVICE, DELAY LINE COMPONENT AND MANUFACTURING METHOD OF THE DELAY LINE COMPONENT

Inventors: Kenji Endou, Yoshiyuki Yasukawa, and Tadao Fujii.
Assignee: TDK Corporation.
Filed: July 14, 1997.

***Abstract*—**A delay line component having merits of small physical size and small insertion loss in a radio frequency. The delay line component with coaxial cable structure includes a center conductor, a dielectric which surrounds the center conductor and an outer conductor which is formed outside the dielectric. The dielectric is made of a ceramic dielectric with a large dielectric constant.

32 Claims, 10 Drawing Sheets



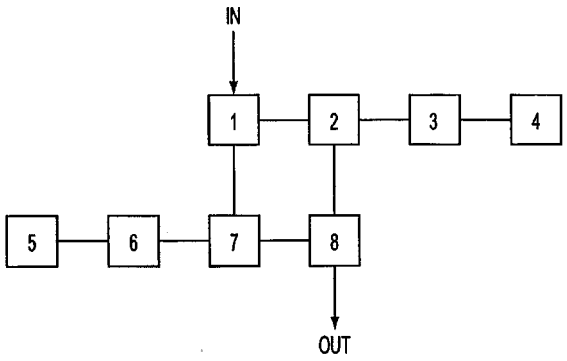
6,337,610 January 8, 2002

ASYMMETRIC RESPONSE BANDPASS FILTER HAVING RESONATORS WITH MINIMUM COUPLINGS

Inventors: Albert Edward Williams, John Irving Upshur, and Mohammed Mahbubur Rahman.
Assignee: Comsat Corporation.
Filed: November 22, 1999.

***Abstract*—**Asynchronously-tuned coupled resonator cavities are implemented having a minimum set of inter-resonator couplings, wherein the filter design incorporates only series and parallel couplings. By way of example, 8th order filter topologies having three transmission zeros, no cross-couplings, and only eight series and/or parallel couplings can be achieved.

15 Claims, 4 Drawing Sheets



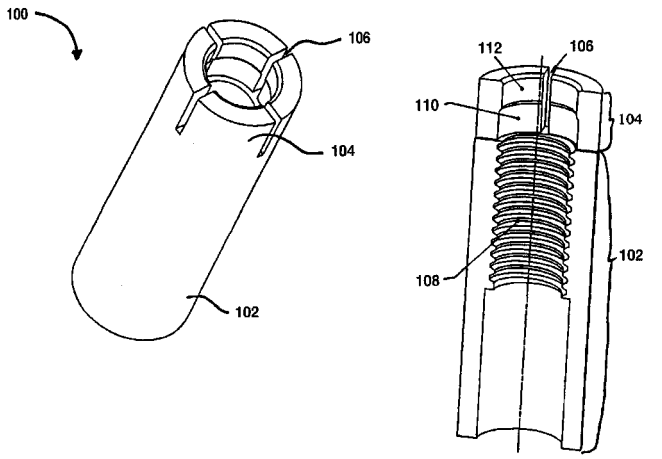
6,337,611 January 8, 2002

SLEEVE IN A RADIO FREQUENCY FILTER

Inventor: Leif Hult.
Assignee: Telefonaktiebolaget LM Ericsson (publ).
Filed: December 20, 1999.

***Abstract*—**In a sleeve in a radio frequency filter at least one portion having a lateral dimension being smaller than the diameter of a screw to be threaded through the sleeve is provided. The portion is flexible in a radial direction, so that a screw threaded through the sleeve will be secured by a clamping force. The increased friction provided by this clamping force will hold the screw in a locked position. The magnitude of the clamping force can be varied within broad ranges, and the optimum force will be different for different applications. Thus, by using such a screw and sleeve, there is no need for a lock nut and the screw does not need to be readjusted once placed in the correct position.

13 Claims, 4 Drawing Sheets



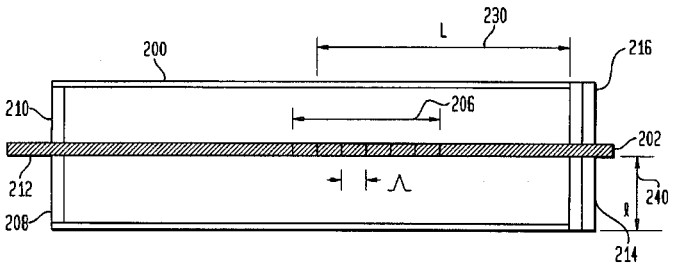
6,337,932 January 8, 2002

APPARATUS AND METHOD FOR THERMOSTATIC COMPENSATION OF TEMPERATURE SENSITIVE DEVICES

Inventor: Ephraim Suhir.
Assignee: Agere Systems Guardian Corp.
Filed: September 9, 1999.

***Abstract*—**Temperature-sensitive devices are mounted within a thermostatic structure that provides temperature compensation by applying compression or tensional forces to stabilize the performance of the device across a significant operating temperature range. In a preferred embodiment, an optical fiber refractive index grating is thermostatically compensated to minimize changes in the reflection wavelength of the grating.

33 Claims, 2 Drawing Sheets



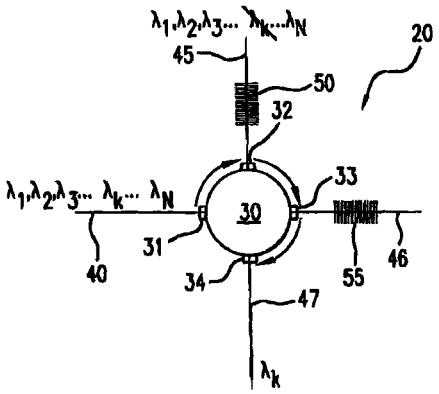
6,337,933 January 8, 2002

NARROW BANDWIDTH FIBER BRAGG GRATING APPARATUS

Inventor: Tomas Brenner.
Assignee: Ciena Corporation.
Filed: April 8, 1999.

***Abstract*—**In accordance with the present invention, an optical device is provided which selects narrowly spaced optical channels used in dense wavelength division multiplexed systems. The device includes a first and second Bragg gratings in a cascaded configuration where each grating has a length which is shorter than a single grating configured to select a channel within a narrowly spaced channel plan. When taken together, the two Bragg gratings provide a narrow bandwidth wavelength selection device for narrowly spaced optical channels while avoiding manufacturing drawbacks associated with writing long gratings.

22 Claims, 4 Drawing Sheets



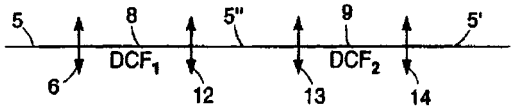
6,339,665 January 15, 2002

APPARATUS AND METHOD FOR COMPENSATION OF CHROMATIC DISPERSION IN OPTICAL FIBERS

Inventor: Yochay Danziger.
Assignee: LaserComm Inc.
Filed: February 12, 1999.

***Abstract*—**A dispersion compensation device uses at least two chromatic dispersion compensation fibers to compensate for chromatic dispersion present in an optical communication system. Two dispersion orders can be corrected using appropriate lengths of two serially coupled compensation fibers having different dispersion characteristics. The device can compensate for N additional orders of dispersion by using N additional compensation fibers with unique dispersion characteristics. The device can be coupled directly to a transmission fiber.

37 Claims, 11 Drawing Sheets



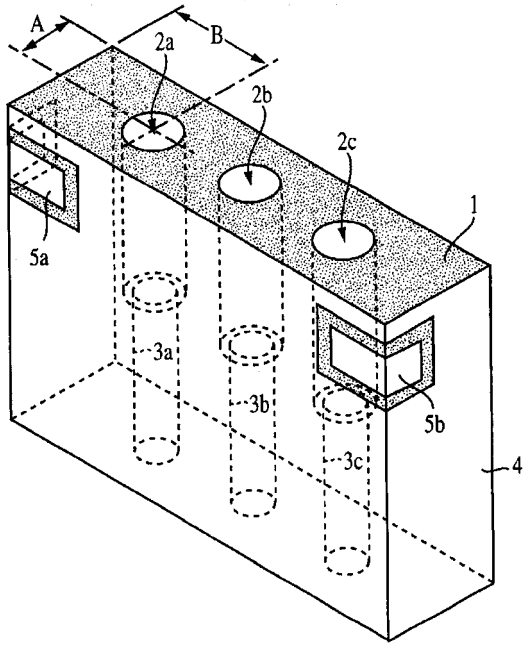
6,340,921 January 22, 2002

DIELECTRIC FILTER, DIELECTRIC DUPLEXER, AND COMMUNICATION APPARATUS USING THE SAME

Inventors: Katsuhito Kuroda, Jinsei Ishihara, and Hideyuki Kato.
Assignee: Murata Manufacturing Co., Ltd.
Filed: June 23, 2000.

***Abstract*—**A dielectric filter and a dielectric duplexer have simple structures, in each of which the resonance frequency of a TE mode is controlled in such a manner that no TE-mode spurious response occurs in a band requiring attenuation. Specifically, the distance between the central position of each of inner-conductor-formed holes and a widthwise line of a dielectric block is set to be two times or more than the distance between the central position of each of the holes and a lengthwise line thereof. With this arrangement, the resonance frequency of a spurious mode such as a TE_{101} mode is shifted to the low-frequency side to deviate the resonance frequency of the spurious mode from a band requiring attenuation, for example, from a band near the second-order harmonic of a TEM mode, as a mode to be used. In addition, a communication apparatus is formed by using one of the filter and the duplexer described above.

4 Claims, 12 Drawing Sheets



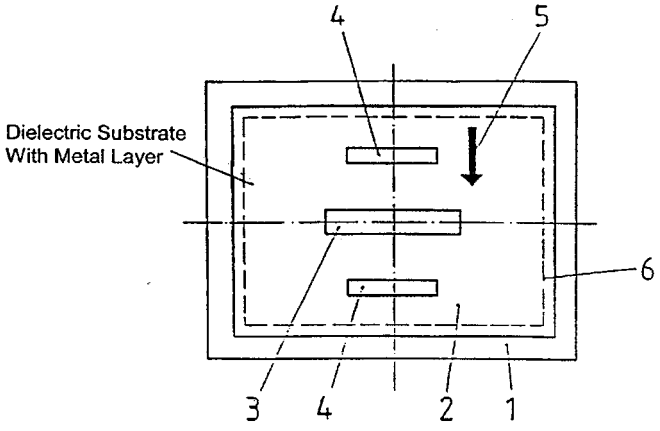
6,340,922 January 22, 2002

WAVEGUIDE FILTER WITH THREE APERTURES FOR PASSING TRANSMISSION FREQUENCIES AND BLOCKING INTERFERENCE FREQUENCIES

Inventor: Stefan Rust.
Assignee: DaimlerChrysler Aerospace AG.
Filed: June 20, 1996.

***Abstract*—**A band-pass filter for a waveguide, which additionally serves as a blocking filter for the concerted suppression of interference frequencies. In addition to a centrally arranged aperture (**3**), a waveguide aperture has two identically designed apertures (**4**), which are laid out for natural resonance for an interference frequency f (ind **S1**) to be blocked by the waveguide filter, and are arranged symmetrical to the central aperture opening (**3**). In waveguide devices, the invention is used to meet the statutory frequency specifications and simultaneously suppress interference frequencies.

16 Claims, 2 Drawing Sheets



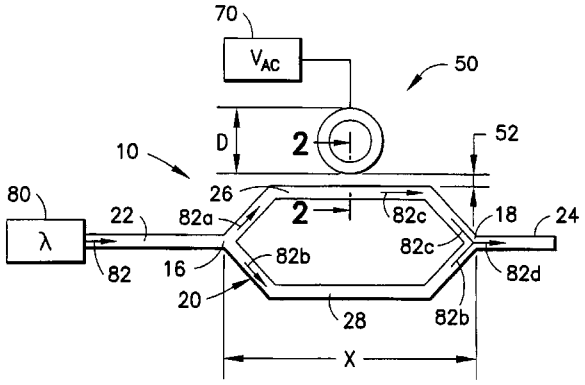
6,341,184 January 22, 2002

LOW DRIVE VOLTAGE OPTICAL MODULATOR

Inventors: Seng-Tiong Ho and Mee Koy Chin.
Assignees: Nannovation Technologies, Inc. and Northwestern University.
Filed: September 8, 2000.

***Abstract*—**An optical modulator that includes a resonator near one arm of a Mach–Zehnder interferometer and that increases the optical length of that arm so as to introduce a phase-shift in an optical signal propagating in that arm when compared to an optical signal propagating in the other arm of the interferometer. The resonator also increases the electro-optic interaction between an electrical signal (i.e., the source of information in a modulated signal) and the optical devices (e.g., waveguides). A modulator constructed in accordance with the present invention is thus physically small than prior art modulators and requires a significantly reduced drive voltage to impart information on an optical signal.

32 Claims, 6 Drawing Sheets



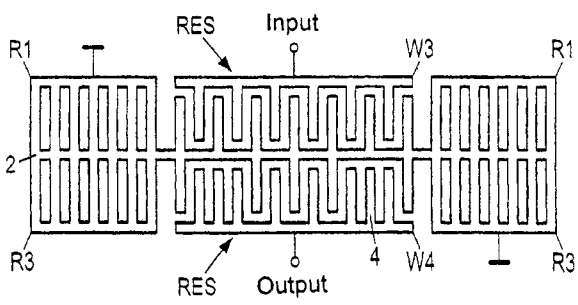
6,342,824 January 29, 2002

TRANSVERSE-MODE RESONATOR FILTER WITH THE INPUT AND OUTPUT CONVERTERS HAVING DIFFERENT IMPEDANCES

Inventors: Thomas Baier and Ulrich Bauernschmitt.
Assignee: Epcos AG.
Filed: December 9, 1999.

***Abstract*—**The transverse-mode resonator filter has reflectors and input and output converters arranged between the reflectors. The impedance of the input converter and/or the output converter is adjusted by reducing the original active finger overlap of the normal finger structure. The impedance can be increased by shortening the converter length of one converter, by reducing the active finger overlap of one converter by omission weighting, or by reducing the active finger overlap of one converter by overlap weighting.

8 Claims, 3 Drawing Sheets



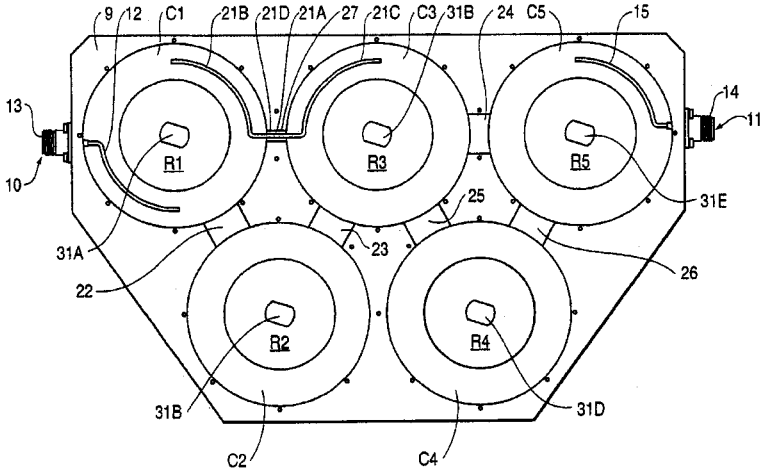
6,342,825 January 29, 2002

BANDPASS FILTER HAVING TRI-SECTIONS

Inventor: Rafi Hershtig.
Assignee: K & L Microwave.
Filed: December 20, 2000.

***Abstract*—**A bandpass filter having three waveguide cavities probelessly coupled in a tri-section for producing an asymmetric response about a passband. In another aspect, the bandpass filter also includes first and second waveguide tri-sections coupled in series via a common waveguide cavity, providing a bandpass waveguide filter having transmission zeros on only one side a filter passband.

5 Claims, 11 Drawing Sheets



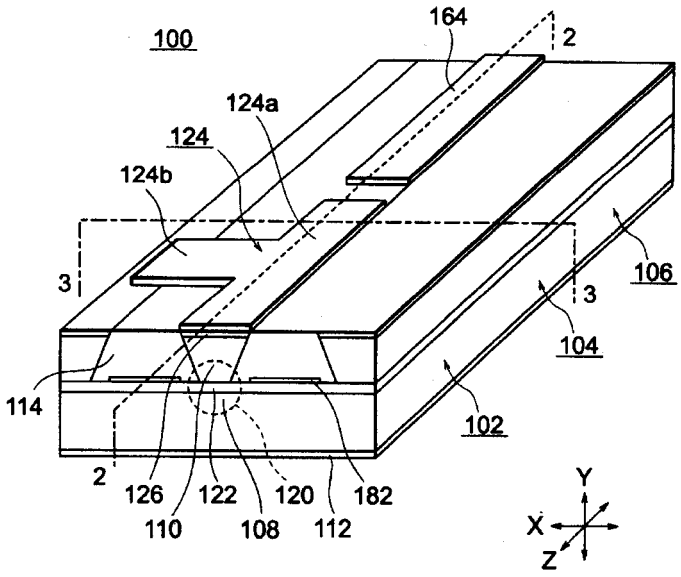
6,343,163 January 29, 2002

ELECTRO-ABSORPTION MODULATOR AND METHOD OF MANUFACTURING A SEMICONDUCTOR OPTICAL DEVICE

Inventor: Hidekazu Kawanishi.
Assignee: Oki Electric Industry Co., Ltd.
Filed: March 16, 2000.

***Abstract*—**An electro-absorption modulator is rendered capable of withstanding increased optical input power by one of the following means: incorporating a heat sink into the electro-absorption modulator structure to conduct heat away from the optical waveguide; incorporating a resistive member into the upper electrode of the electro-absorption modulator, producing a voltage drop that reduces absorption near the optical input end of the waveguide; making the bandgap energy of the absorbing layer of the waveguide higher at the optical input end than at the optical output end; and placing the electrode pad of the upper electrode near the optical input end.

26 Claims, 11 Drawing Sheets



6,343,167 January 29, 2002

PHOTONIC BAND GAP DEVICE AND METHOD USING A PERIODICITY DEFECT REGION TO INCREASE PHOTONIC SIGNAL DELAY

Inventors: Michael Scalora, Mark J. Bloemer, and Michael D. Tocci.
Filed: February 16, 1999.

***Abstract*—**A photonic band gap structure device and method for delaying photonic signals of a predetermined frequency and a predetermined bandwidth by a predetermined delay is provided. A Fabry–Perot delay line device has several regions of periodically alternating refractive material layers which exhibit a series of photonic band gaps and a periodicity defect region, interposed between the regions of periodically alternating refractive material layers. The Fabry–Perot delay line device imparts a predetermined delay to photonic signals that pass therethrough. The introduction of the periodicity defect region into this photonic band gap structure creates a sharp transmission resonance within the corresponding photonic band gap of the structure and causes at least an order of magnitude improvement in photonic signal delay for a band-edge delay line device of similar size. Variable photonic delays to multiple photonic signals are also generated by this Fabry–Perot delay line device. In addition, a photonic signal delay device based on an optical fiber grating structure is provided.

4 Claims, 7 Drawing Sheets