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 USA.

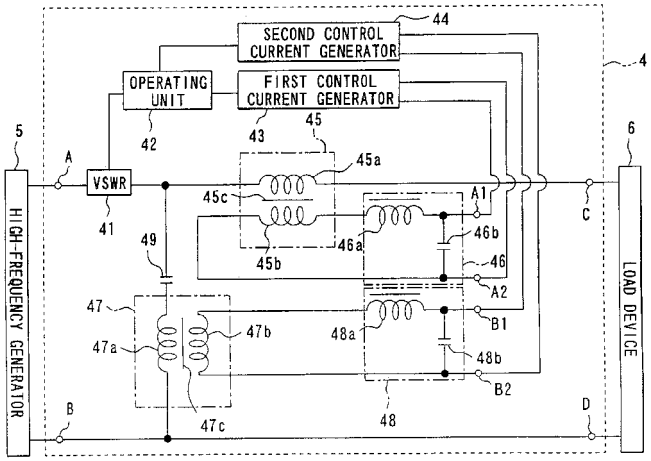
6,211,749 Apr. 3, 2001

Impedance Matching Device

Inventors: Itsuo Yuzurihara and Satoru Matsukawa.
Assignee: Kyosan Electric Mfg. Co., Ltd.
Filed: May 12, 1999.

***Abstract*—**An impedance matching device provided between a high-frequency generator and a load device matches an impedance of the high-frequency generator with an impedance of the load device and includes at least a coupled circuit which comprises a core, and a main winding and a control winding which are wound around the core. The coupled circuit changes an impedance of the impedance matching device by changing an inductance value of the main winding which depends on a magnitude of direct current flowing in the control winding.

19 Claims, 11 Drawing Sheets



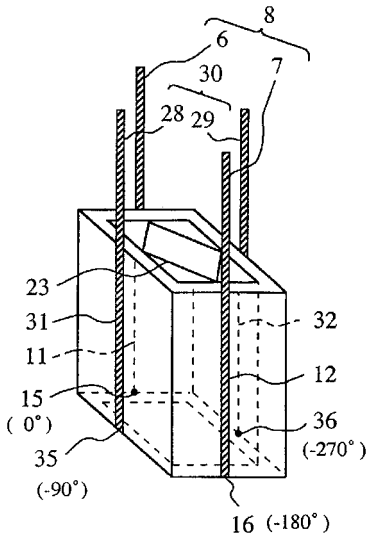
6,211,751 Apr. 3, 2001

Microstrip Broadband Balun With Four Ground Plates

Inventor: Katsuhiko Aoki.
Assignee: Mitsubishi Denki Kabushiki Kaisha.
Filed: July 16, 1999.

***Abstract*—**A balun is used in electric communications for supplying power to a balanced line from an unbalanced circuit, a power feeder consisting of a microstrip line. Two microstrip center conductors are connected to the balanced line, and are supplied with signals of opposite phases. This makes it possible to convert an unbalanced current flowing through the microstrip line to a balanced current flowing through the balanced line.

2 Claims, 13 Drawing Sheets



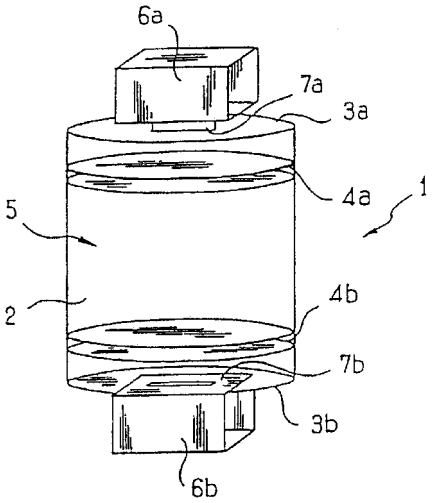
6,211,752 Apr. 3, 2001

Filtering Device With Metal Cavity Provided With Dielectric Inserts

Inventors: Sandra Gendraud, Pierre Guillon, and Serge Verdeyme.
Assignee: Alcatel.
Filed: November 3, 1997.

Abstract*—**A filter device including a metal cavity (**1**, **11**) closed by two end walls (**3a*, **3***b*; **13**, **13***b*) extending transversely relative to the axis of said cavity (**1**, **11**) and at least two dielectric inserts (**4***a*, **4***b*; **14***a* to **14***d*) defining a resonator (**5**, **15***a*, **15***b*) in said cavity, characterized in that it includes at least one coupling iris (**7***a*, **7***b*; **17**) which also extends transversely relative to said axis.

9 Claims, 2 Drawing Sheets



Publisher Item Identifier S 1531-1309(01)10293-X.

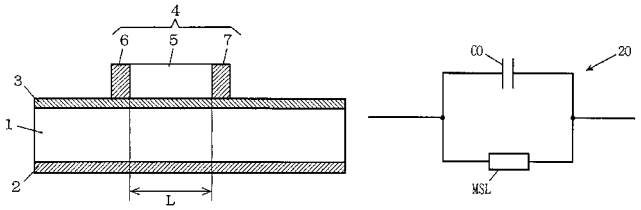
6,211,754 Apr. 3, 2001

Integrated Resonance Circuit Consisting of a Parallel Connection of a Microstrip Line and a Capacitor

Inventors: Masao Nishida and Tetsuro Sawai.
Assignee: Sanyo Electric Co., Ltd.
Filed: June 3, 1998.

***Abstract*—**A chip capacitor is arranged on a microstrip conductor forming a microstrip line. The chip capacitor has a dielectric material and electrodes provided on both ends thereof. The electrodes of the chip capacitor are connected to the microstrip conductor. A resonance frequency is decided by the length of the microstrip conductor between the electrodes of the chip capacitor, the dielectric constant and the thickness of the dielectric substrate and the capacitance value of the chip capacitor.

14 Claims, 16 Drawing Sheets



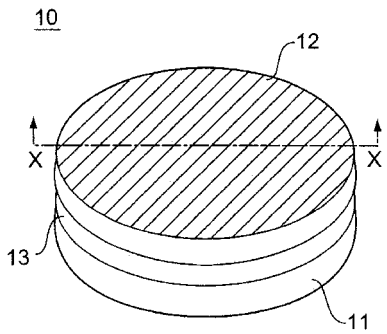
6,211,755 Apr. 3, 2001

Dielectric Resonator, Dielectric Filter, Dielectric Duplexer, Communication Device, and Method of Producing Dielectric Resonator

Inventors: Kazuhiko Kubota and Tomoyuki Ise.
Assignee: Murata Manufacturing Co., Ltd.
Filed: April 28, 1999.

***Abstract*—**A dielectric resonator including a substantially columnar dielectric, thin film multi-layer electrodes each formed around two faces opposite to each other of the dielectric, and a concave portion formed substantially evenly on the peripheral side-face of the dielectric.

19 Claims, 11 Drawing Sheets



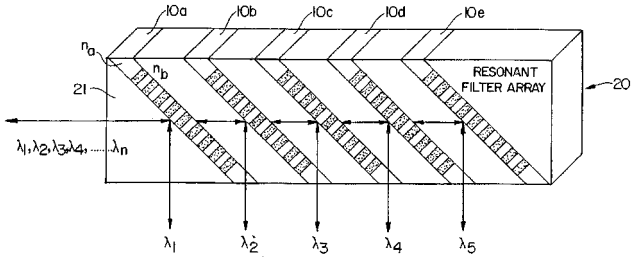
6,212,312 Apr. 3, 2001

Optical Multiplexer/Demultiplexer Using Resonant Grating Filters

Inventors: Eric B. Grann and L. Curtis Maxey.
Assignee: U.T. Battelle, LLC.
Filed: September 17, 1999.

Abstract*—**A wavelength division multiplex/demultiplexer (WDM) has a plurality of narrow-band zeroth order resonant grating filters (**10a*–**10***e*) to multiplex or demultiplex multiple wavelengths that have very close channel spacing. In one embodiment, a plurality of these filters (**10***a***14 10***e*) are assembled in a block (**20**) in parallel and at an angle to a propagation axis to reflect signals for a plurality of discrete frequency channels. The block spacing material (**21**) can be liquid or solid. In another embodiment, the angular orientation of the resonant grating filters (**10***f*–**10***g*) is varied slightly to provide reflected signals for the plurality of discrete frequency channels. Crosstalk between channels can be reduced by reflecting each signal three times. Individual filters can be of binary structure or a sinusoidal grating (**16**) and can be made using thin film techniques.

19 Claims, 6 Drawing Sheets



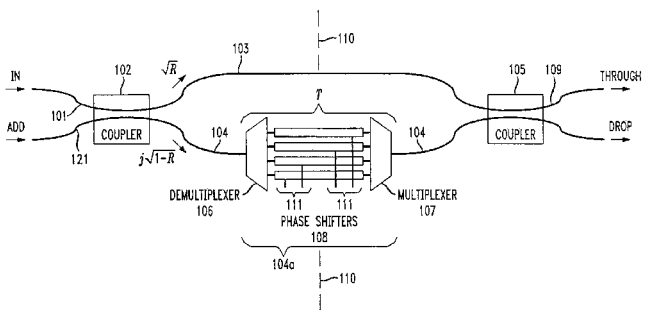
6,212,315 Apr. 3, 2001

Channel Power Equalizer for a Wavelength Division Multiplexed System

Inventor: Christopher Richard Doerr.
Assignee: Lucent Technologies Inc.
Filed: July 7, 1998.

***Abstract*—**A dynamically and chromatically variable transmissivity apparatus (e.g., a channel equalizer or an add–drop circuit) controls channel powers in wavelength-division multiplexed systems. The input WDM signal is split into two components, in one component a phase shift is added to the wavelengths needing equalizing, the two signal components are then recombined. The phase shift added at each wavelength determines the amount of equalization obtained for that wavelength. For a decrease in equalization (i.e., attenuation) range the apparatus exhibits a decrease in insertion loss.

25 Claims, 5 Drawing Sheets



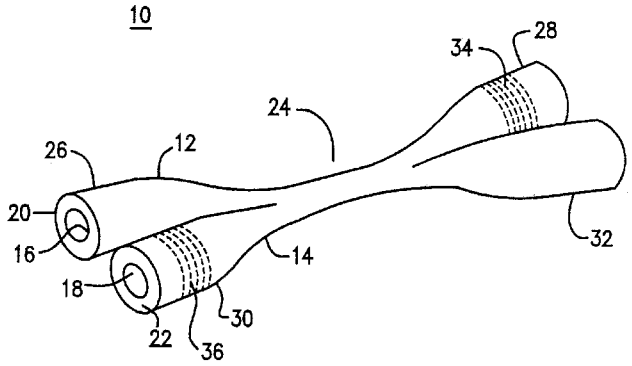
6,212,318 Apr. 3, 2001

Add/Drop Filters and Multiplexers Fabricated From Cladding Mode Couplers and Fiber Bragg Gratings

Inventor: Colm V. Cryan.
Assignee: Thomas & Betts International, Inc.
Filed: October 19, 1999.

***Abstract*—**An optical fiber add/drop filter includes a first and second elongate photosensitive optical fiber, each optical fiber having opposed first and second ends and including a core and a cladding. The cladding of the first optical fiber is optically coupled to the cladding of the second optical fiber at a coupler. A first fiber Bragg grating is etched into a second end of the first fiber for converting light propagating in a first direction through either of the core of cladding of the first fiber into light propagating in an opposite direction through the other of said core and cladding of said second fiber. A second fiber Bragg grating is etched into a first end of the second fiber for converting light propagating in a first direction either of the core or cladding of the second fiber into light propagating in an opposite direction through the other of the core and cladding of the second fiber. The first and second fiber Bragg gratings are located to opposite sides of the coupler. The add/drop filter of the present invention may be cascaded to form an optical add/drop multiplexer.

19 Claims, 2 Drawing Sheets



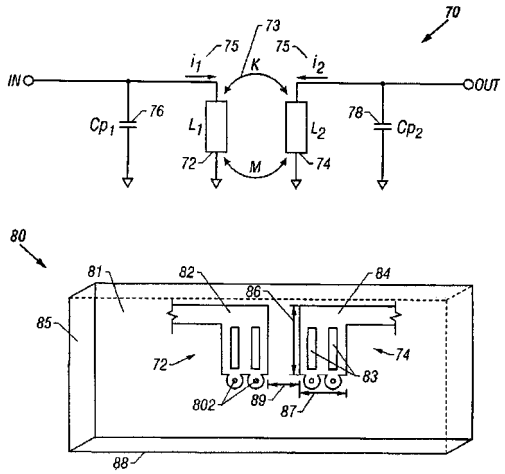
6,215,374 Apr. 10, 2001

Magnetically Coupled Resonators for Achieving Low Cost Narrow Band Pass Filters Having High Selectivity, Low Insertion Loss and Improved Out-of-Band Rejection

Inventor: Branislav A. Petrovic.
Assignee: Broadband Innovations, Inc.
Filed: March 16, 1998.

***Abstract*—**Parallel and series tuned resonator circuit topologies are disclosed that permit implementation of narrow band-pass filters having high loaded Q and optimal coupling (for low insertion loss) at frequencies in approximately the 50 MHz to 1 GHz. The topologies employ an additional series capacitor for the parallel-tuned topology, and an additional series capacitor for the series-tuned topology, the capacitors having values counterintuitive to those of skill in the art to produce 6th order transfer functions out of what were once lower order resonators. Multistrip transmission lines are exploited in the parallel-tuned circuit to reduce the inductance of the resonators to achieve a very large skew in the ratios of inductance to capacitance, to increase Q while maintaining optimal coupling between the resonators of the tuned resonator circuits. Air coils are used in the series-tuned topology to achieve the large inductor values desirable for this topology.

18 Claims, 26 Drawing Sheets



6,215,376 Apr. 10, 2001

Filter Construction and Oscillator for Frequencies of Several Gigahertz

Inventors: Panu Hagström and Jari Pelkonen.
Assignee: LK-Products Oy.
Filed: May 7, 1999.

***Abstract*—**A radio-frequency filter (**400**, **500**, **600**) comprises

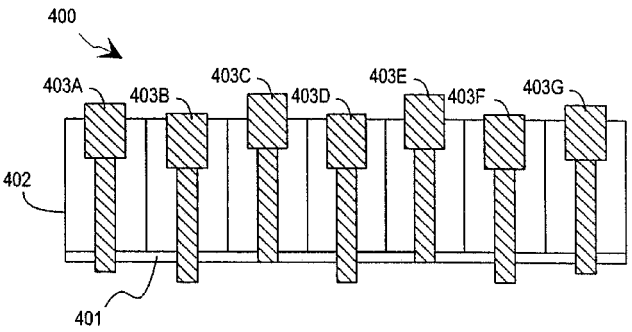
a base plate (**401**, **603**) and an electrically conductive ground plane in connection with it,

a predetermined number of inner conductors (**403A**–**403G**, **501**, **502**, **601**) attached substantially perpendicularly to the base plate which have a first end and second end, and

an electrically conductive casing (**402**, **503**, **602**) which is connected at one side to the base plate and substantially surrounds said inner conductors.

A first end of each inner conductor is in contact with said ground plane and a second end is in contact with said electrically conductive casing so that the resonators comprising the inner conductors, ground plane and casing function as half-wave resonators.

8 Claims, 3 Drawing Sheets



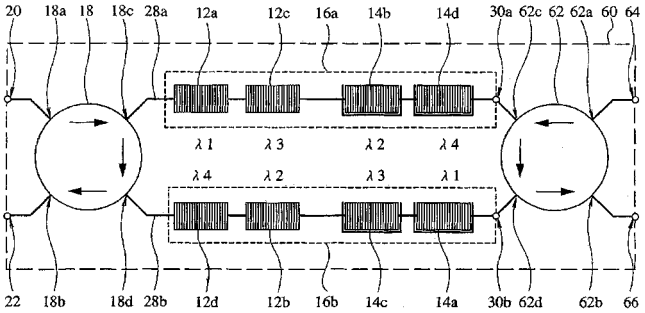
6,215,922 Apr. 10, 2001

Lightwave Filter and Lightwave Selective Router

Inventor: Hideaki Okayama.
Assignee: Oki Electric Industry Co., Ltd.
Filed: January 29, 1998.

***Abstract*—**A lightwave filter which allows optical signals of a plurality of wavelength channels to be extracted even in the case of high-density multiplexing. It is provided with two rows of gratings, each with two fixed gratings, wherein the reflection wavelength is fixed, and two variable gratings, wherein the reflection wavelength can be shifted, connected rectilinearly to each other. It also has an optical circulator which guides optical signals of wavelength channels reflected by the first row of gratings to the second row of gratings. Of the variable gratings, the reflection wavelengths of those having basic reflection wavelengths which correspond to wavelength channels not selected from among the input optical signals are shifted to wavelengths other than the basic reflection wavelengths of the other variable gratings of the same row. This allows optical signals of selected wavelengths to be selected, while those of unselected wavelengths pass through.

29 Claims, 6 Drawing Sheets



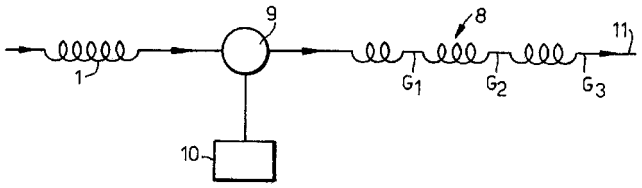
6,215,929 Apr. 10, 2001

Dispersion Compensating Waveguide for Optical Transmission Systems

Inventor: Kevin Christopher Byron.
Assignee: Nortel Networks Limited.
Filed: July 3, 1997.

***Abstract*—**In order to use one dispersion compensating fiber element for selecting a given value of dispersion, one or more frequency or wavelength dependent optical reflection gratings (G_1, G_2, G_3) is located at such a position along the unit (**8**) that the double traversal of a section results in a desired value of dispersion at a frequency. A directional coupler (**9**) diverts the reflected wave to utilization means (**10**) for its recovery. If a different value of dispersion at the same wavelength, or if some value of dispersion at a different frequency, is required, a reflection grating effective to reflect at the appropriate frequency andat the appropriate position, gives the required values.

6 Claims, 1 Drawing Sheet



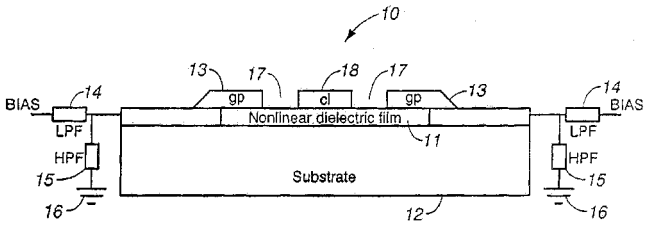
6,216,020 Apr. 10, 2001

Localized Electrical Fine Tuning of Passive Microwave and Radio Frequency Devices

Inventor: Alp T. Findikoglu.
Assignee: The Regents of the University of California.
Filed: September 30, 1998.

***Abstract*—**A method and apparatus for the localized electrical fine tuning of passive multiple element microwave or RF devices in which a nonlinear dielectric material is deposited onto predetermined areas of a substrate containing the device. An appropriate electrically conductive material is deposited over predetermined areas of the nonlinear dielectric and the signal line of the device for providing electrical contact with the nonlinear dielectric. Individual, adjustable bias voltages are applied to the electrically conductive material allowing localized electrical fine tuning of the devices. The method of the present invention can be applied to manufactured devices, or can be incorporated into the design of the devices so that it is applied at the time the devices are manufactured. The invention can be configured to provide localized fine tuning for devices including but not limited to coplanar waveguides, slotline devices, stripline devices, and microstrip devices.

26 Claims, 8 Drawing Sheets



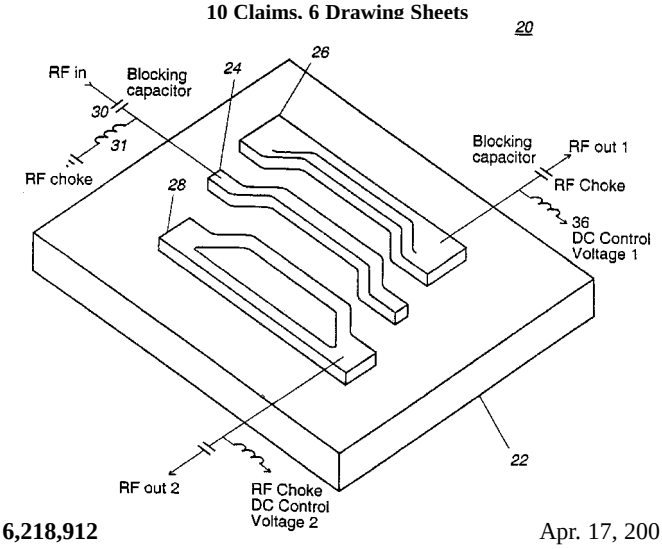
6,218,911 Apr. 17, 2001

Planar Airbridge RF Terminal MEMS Switch

Inventors: Alvin M. Kong, Robert B. Stokes, Joseph P. Trieu, Rahil U. Bhorania, and Michael D. Lammert.
Assignee: TRW Inc.
Filed: July 13, 1999.

***Abstract*—**An RF switch and a process for fabricating an RF switch which includes multiple throws and can be fabricated utilizing only a single layer of metallization. The switch in accordance with the present invention includes an airbridge suspended beam disposed adjacent to one or more metal traces. One or more control pads are disposed adjacent to the airbridged suspended beam to operate the switch electrostatically. The suspended beam as well as the metal traces and contact pads are all fabricated with a single metallization layer. The switch is configured such that deflection of the beam is in a plane generally parallel to the plane of the substrate. By eliminating multiple metallization layers, the complexity for fabricating the switch is greatly reduced. Moreover, the switch configuration also allows multiple throws and multiple poles using a single level of metallization.

10 Claims, 6 Drawing Sheets



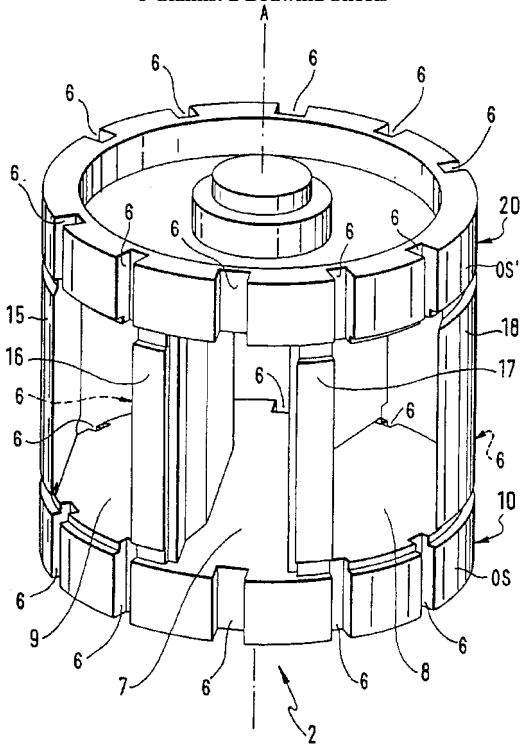
6,218,912 Apr. 17, 2001

Microwave Switch With Grooves for Isolation of the Passages

Inventor: Bernd Mayer.
Assignee: Robert Bosch GmbH.
Filed: April 14, 1999.

***Abstract*—**The microwave switch includes a housing (**1**) and a rotor (**2**) having a rotor axis (A). The rotor (**2**) includes respective plate-shaped parts (**10**, **20**) having corresponding ring-shaped outer surfaces (OS, OS′) and walls (**15** to **18**) extending between the plate-shaped parts. The rotor (**2**) is provided with through-going passages (**7**, **8**, **9**) extending transversely to the rotor axis (A) between the plate-shaped parts (**10**, **20**) and the walls (**15** to **18**). Grooves (**6**) for improving isolation of the passages (**7**, **8**, **9**) are provided only in the ring-shaped outer surfaces (OS, OS′) and extend longitudinally substantially parallel to the rotor axis (A). The grooves (**6**) open into the passages and the passages are bounded by the plate-shaped parts (**10**, **20**) in both directions of the rotor axis.

6 Claims, 2 Drawing Sheets



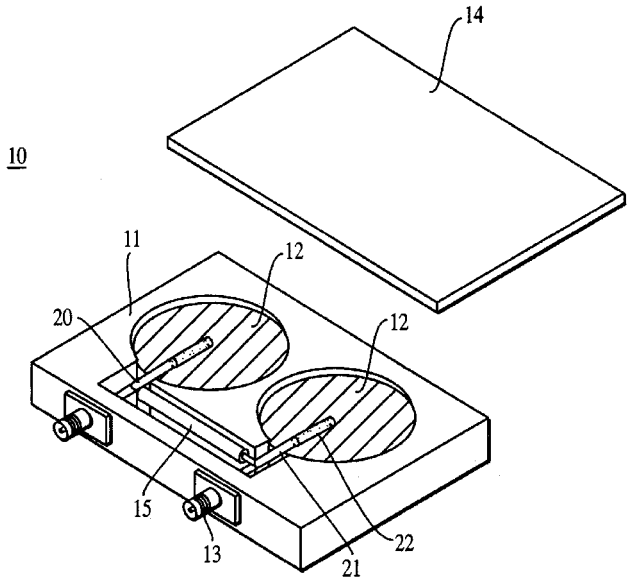
6,218,914 Apr. 17, 2001

Dielectric Filter and Dielectric Duplexer Including a Movable Probe

Inventors: Kazuhiko Kubota and Tomoyuki Ise.
Assignee: Murata Manufacturing Co., Ltd.
Filed: January 20, 1999.

***Abstract*—**A dielectric filter includes a shielding cavity frame having electric conductivity, a dielectric having electrodes formed on two opposing faces and disposed in the shielding cavity frame, and external coupling means, wherein the external coupling means includes an electric probe at least a part of which is covered with a covering dielectric.

10 Claims, 5 Drawing Sheets



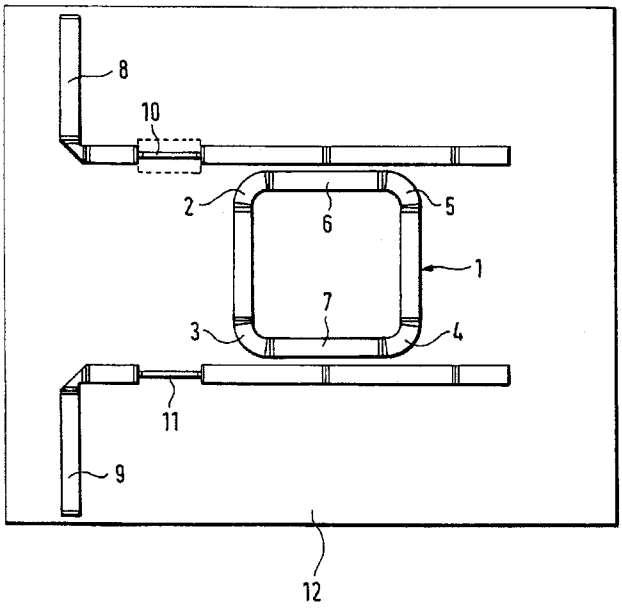
6,218,915 Apr. 17, 2001

Dual-Mode Ring Resonator

Inventor: Martin Schallner.
Assignee: Robert Bosch GmbH.
Filed: April 14, 1999.

***Abstract*—**A dual-mode ring resonator including a planar conductor ring (**1**) of an approximately square shape with rounded corners (**2**, **3**, **4**, **5**) has a better resonator quality factor than has previously been obtained. The circumference or length of the conductor ring (**1**) is dimensioned so that the resonator is operated in one of its even-numbered harmonic modes.

4 Claims, 1 Drawing Sheets



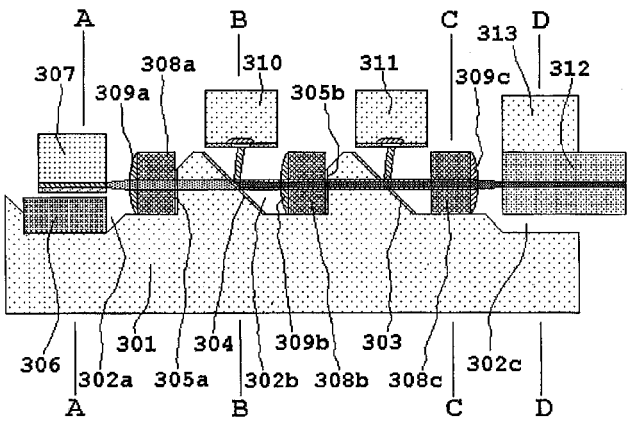
6,219,470 Apr. 17, 2001

Wavelength Division Multiplexing Transmitter and Receiver Module

Inventor: Xiang Zheng Tu.
Filed: September 23, 1999.

***Abstract*—**A wavelength division multiplexing transmitter and receiver module utilizes a micromachined silicon substrate as the mounting platform for its optical components and optoelectronic devices including an optical fiber, a transmitter, two receivers, and three microlenses. The micromachined silicon substrate has a V-groove for placing an optical fiber so that it is aligned with the mounted transmitter and the mounted receivers passively and has more V-grooves with slanted end side walls and opposite vertical end side walls used to form a dielectric multilayered filter, a half-mirror, and two anti-reflectors thereon which are eventually incorporated to be a multiplexer and/or a demultiplexer. The microlenses are disposed on V-supports. The transmitter is pre-mounted mounted on a V-submount. The microlens and the transmitter are then mounted into the V-grooves of the micromachined silicon substrate and aligned with the mounted optical fiber passively.

22 Claims, 10 Drawing Sheets



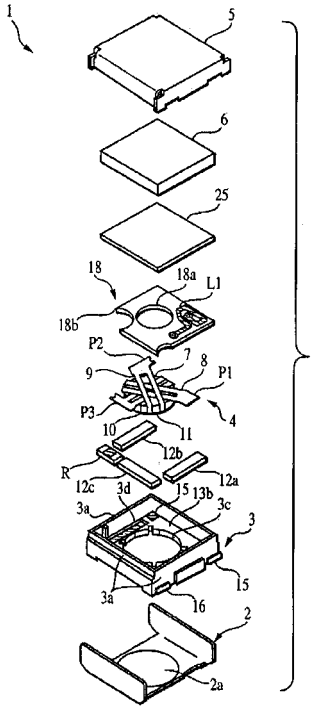
6,222,425 Apr. 24, 2001

Nonreciprocal Circuit Device With a Dielectric Film Between the Magnet and Substrate

Inventors: Takekazu Okada, Toshihiro Makino, Takashi Kawanami, and Takashi Hasegawa.
Assignee: Murata Manufacturing Co., Ltd.
Filed: March 30, 1999.

***Abstract*—**A nonreciprocal circuit device having a circuit element on a dielectric substrate providing at least part of a low-pass filter, the nonreciprocal circuit device having less interference and irregular operation caused by spurious radiation, and in addition, with reduced insertion loss. A lumped constant isolator (an example of a nonreciprocal circuit device) includes a magnet provided for applying a DC magnetic field to a magnetic assembly, which in turn has multiple intersecting central electrodes provided adjacent to a ferrite body. A dielectric substrate is disposed in between the permanent magnet and the magnetic assembly. An inductor forming part of a π-type low-pass filter is provided as an example of a circuit element on the dielectric substrate, a dielectric layer or film being disposed between the dielectric substrate and the magnet.

16 Claims, 12 Drawing Sheets



6,222,426 Apr. 24, 2001

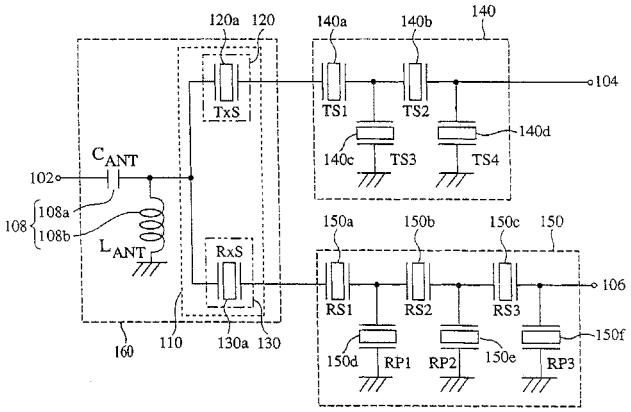
Branching Filter With a Composite Circuit of an LC Circuit and a Serial Arm Saw Resonator

Inventors: Tomokazu Komazaki, Yoshiaki Fujita, and Hajime Shimamura.
Assignee: Oki Electric Industry, Co., Ltd.
Filed: May 5, 1999.

***Abstract*—**A branching filter comprising a SAW resonator. The branching filter comprises a transmission SAW filter linked between an antenna terminal and a transmission terminal; a receiving SAW filter with different bandpass characteristics from the transmission SAW filter linked between the antenna terminal and the transmission terminal; a composite circuit that combines a

frequency adjusting LC circuit linked between the antenna terminal and the transmission and receiving SAW filters with a branching filter circuit; and the branching filter circuit being structured to have a serial arm SAW resonator.

11 Claims, 11 Drawing Sheets



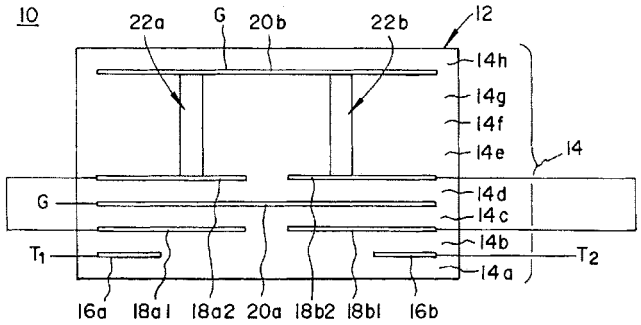
6,222,427 Apr. 24, 2001

Inductor Built-in Electronic Parts Using Via Holes

Inventors: Noboru Kato and Atsushi Tojyo.
Assignee: Murata Manufacturing Co., Ltd.
Filed: July 19, 1996.

***Abstract*—**A small inductor built-in electronic part whose Q is high is provided. An LC resonator comprises a laminate composed of a number of laminated electronic layers. Capacitor electrodes, common electrodes, and ground electrodes are formed between the dielectric layers. Two via holes are formed penetrating through the plurality of intermediate dielectric layers in the thickness direction thereof leaving a space therebetween. These via holes act as inductor elements.

14 Claims, 6 Drawing Sheets



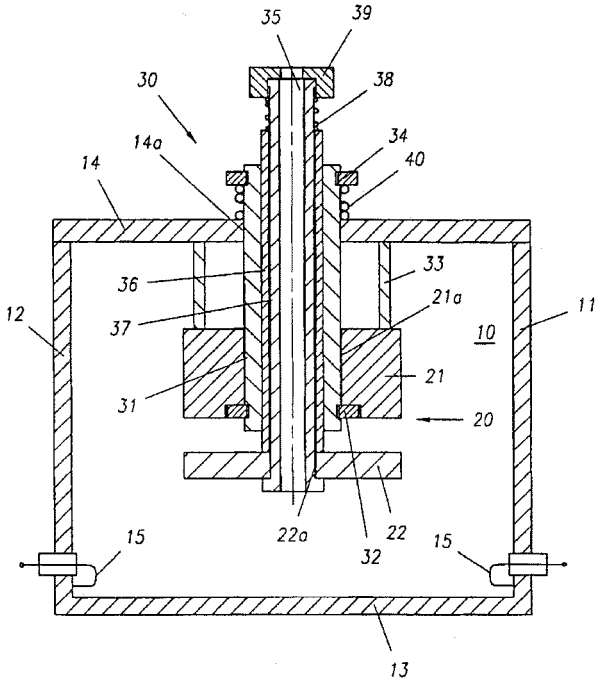
6,222,428 Apr. 24, 2001

Tuning Assembly for a Dielectrical Resonator in a Cavity

Inventors: Daniel Akesson and Jan Malmström.
Assignee: Allgon AB.
Filed: June 15, 1999.

Abstract*—**A tuning assembly for tuning the resonant frequency of a dielectric resonator in a cavity. The assembly includes a first resonator body (**21**) secured to a tubular sleeve portion (**33**) mounted in an opening (**14a*) of a mounting wall (**14**). The sleeve portion (**33**) is spring loaded so as to exert a clamping force on the first resonator body (**21**). A second resonator body (**22**) is secured to a shaft (**35**) which is journalled inside the tubular sleeve portion (**31**). The tubular sleeve portion (**33**) and the shaft (**35**) are axially slidable in relation to each other, whereby the position of one of the resonator bodies (**22**) is precisely adjustable in relation to the other resonator body (**21**).

29 Claims, 3 Drawing Sheets



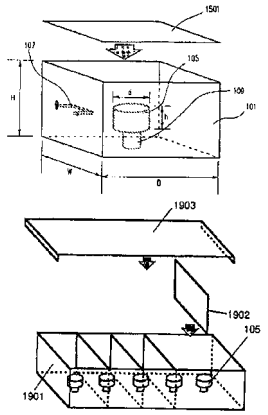
6,222,429 Apr. 24, 2001

Dielectric Resonator, Dielectric Notch Filter, and Dielectric Filter With Optimized Resonator and Cavity Dimensions

Inventors: Yuki Satoh, Masami Hatanaka, Toshio Ishizaki, Yuji Saka, and Toshiaki Nakamura.
Assignee: Matsushita Electric Industrial Co., Ltd.
Filed: March 15, 2000.

***Abstract*—**The dielectric notch filter of the invention includes: a transmission line for transmitting a high-frequency signal; input and output terminals provided at both ends of the transmission line; a ground conductor for supplying a ground potential; and a dielectric resonator connected to the ground conductor and the transmission line. The dielectric notch filter further includes an impedance matching element connected to the ground conductor and the transmission line in parallel with the dielectric resonator. The dielectric resonator includes: a cavity connected to the ground conductor; a dielectric block provided in the cavity; a coupling device coupled with an electromagnetic field, produced in the cavity; and a coupling adjusting line for connecting the coupling device to the transmission line and for adjusting the degree of electromagnetic coupling.

6 Claims, 27 Drawing Sheets



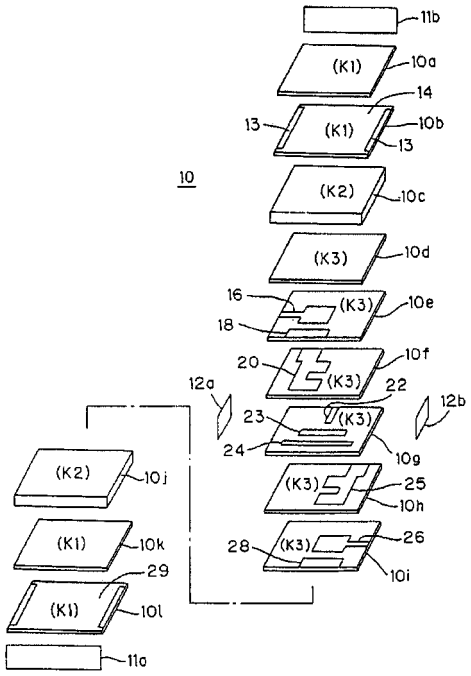
6,222,430 Apr. 24, 2001

Dielectric Filter

Inventors: Kenichi Horie and Shoichi Iwaya.
Assignee: U.S. Philips Corporation.
Filed: May 21, 1999.

***Abstract*—**A dielectric filter includes a first dielectric layer containing at least a pair of strip-line resonators to be electromagnetically coupled to each other. Second and third dielectric layers are disposed in an opposed relation to each other with the first dielectric layer sandwiched therebetween and having substantially the same dielectric constant (K1). Each of the second and third dielectric layers contains at least one shield electrode. The dielectric filter further includes fourth and fifth dielectric layers which have substantially the same dielectric constant (K2) and are interposed between the first and second dielectric layers and between the first and third dielectric layers, respectively. The dielectric constant (K2) of the fourth and fifth dielectric layers is selected to be less than any one of the dielectric constant (K1) of the second and third dielectric layers and the dielectric constant (K3) of the first dielectric layer.

15 Claims, 3 Drawing Sheets



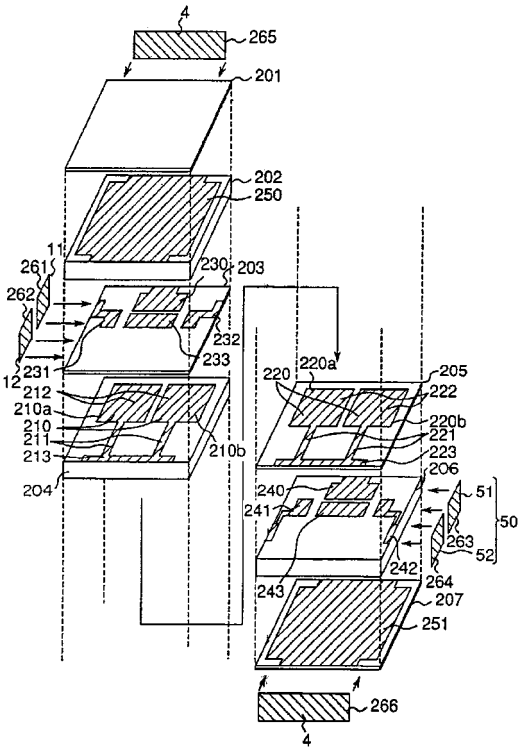
6,222,431 Apr. 24, 2001

Balanced Dielectric Filter

Inventors: Toshio Ishizaki, Toru Yamada, Hideaki Nakakubo, and Shoichi Kitazawa.
Assignee: Matsushita Electric Industrial Co., Ltd.
Filed: February 23, 1999.

***Abstract*—**The present invention relates to a balanced dielectric filter used in high-frequency circuits, such as those used for radio apparatuses, and provides a balanced dielectric filter having balanced input/output terminals. Namely, the balanced dielectric filter comprises two resonators, each comprising plural strip-line resonating elements, disposed in parallel and mutually coupled electro-magnetically, and input and output terminals coupled to each resonator so as to function as a pair of balanced input terminals and a pair of balanced output terminals, wherein the two resonators are located in a ceramic dielectric to face each other and to be mirror images of each other. The resonating element is a quarter-wavelength resonating element, the end of the strip line thereof is grounded. The strip lines and coupling electrodes are arranged among ceramic layers, whereby the filter is integrated into a ceramic-multilayered structure.

18 Claims, 9 Drawing Sheets



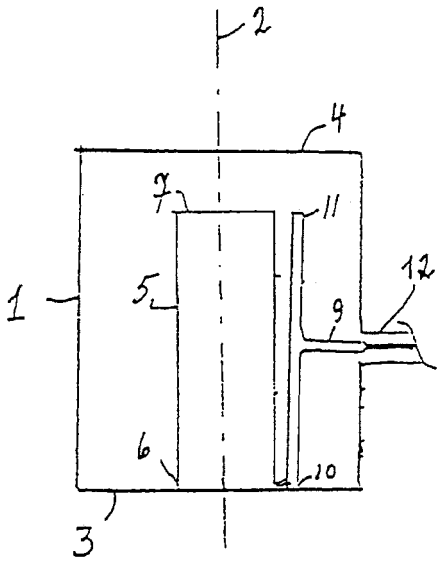
6,222,432 Apr. 24, 2001

Quarter-Wave Coaxial Cavity Resonator

Inventor: Carl Göran Wegdal.
Assignee: Telefonaktiebolaget L M Ericsson (publ).
Filed: June 24, 1999.

***Abstract*—**In a quarter-wave coaxial cavity resonator, having a cavity with a cylinder inner wall (**1**), and bottom (**3**) and top (**4**) walls and a symmetry axis (**2**) with a resonator bar (**5**), a high coupling degree to a feed line (**12**) is obtained by a T-formed antenna with two equally long arms forming the antenna proper and the stem (**9**) forming the lead to the feed line. The antenna proper has one end (**10**) electrically and mechanically connected to the bottom end (**6**) of the resonator rod, whereas the opposite end (**11**) is free, and the antenna is parallel to the resonator rod and at a small distance therefrom.

6 Claims, 1 Drawing Sheets



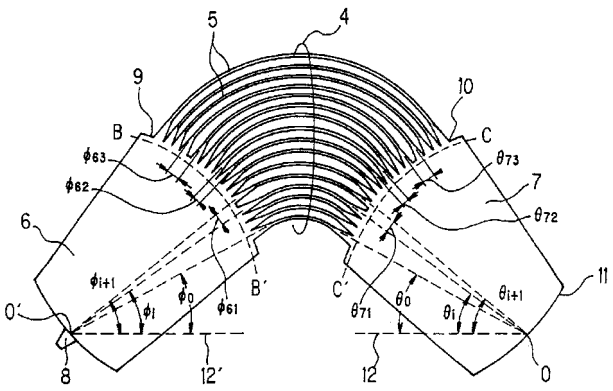
6,222,956 Apr. 24, 2001

Optical Wavelength Multiplexer/Demultiplexer

Inventors: Kenji Akiba, Kimio Inaba, and Kenichi Morosawa.
Assignee: Hitachi Cable Ltd.
Filed: November 12, 1998.

***Abstract*—**Plurality of channel waveguides of an arrayed waveguide diffraction grating are arranged such that all of intervals thereof are not constant between each two adjacent channel waveguides at a first coupling portion for coupling an input slub waveguide and the arrayed waveguide diffraction grating and a second coupling portion for coupling an output slub waveguide and the arrayed waveguide diffraction grating. Further, the plurality of channel waveguides of the arrayed waveguide diffraction grating are arranged such that all of length differences thereof are not constant between each two adjacent channel waveguides. For example, one of the channel waveguides is deleted, so that a length difference of adjacent channel waveguides is determined to be larger than that of the other two adjacent waveguides. According to this structure, it is possible to provide an optical waveguide multiplexer/demultiplexer in which an insertion loss property becomes flat in all wavelength ranges and the insertion loss characteristics are not fluctuated by the fluctuation of the wavelength.

11 Claims, 9 Drawing Sheets



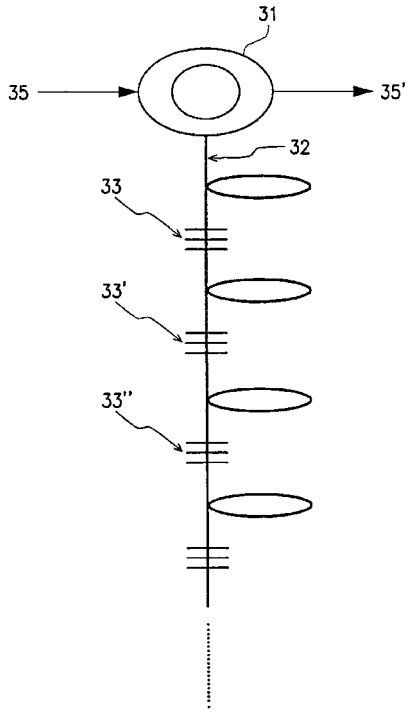
6,222,957 Apr. 24, 2001

Dispersion Slope Compensator

Inventors: Samuel I-En Lin, Win-Yann Jang, Jeng-Cherng Dung, and Sien Chi.
Assignee: Uconn Technology Inc.
Filed: Apr. 19, 1999.

***Abstract*—**A dispersion slope compensator includes a dispersion compensation fiber, an optical circulator and a plurality of fiber gratings. The optical circulator is connected between an optical fiber and the dispersion compensation fiber for introducing mixed optical signals propagating in the optical fiber into the dispersion compensation fiber. The fiber gratings are provided at predetermined positions of the dispersion compensation fiber so as to respectively reflect the mixed optical signals back to the optical fiber through the optical circulator. Thus, accumulated dispersions of the mixed optical signals are fully compensated due to different propagating distances of each of the mixed optical signals in the dispersion compensation fiber.

3 Claims, 4 Drawing Sheets



6,222,970 Apr. 24, 2001

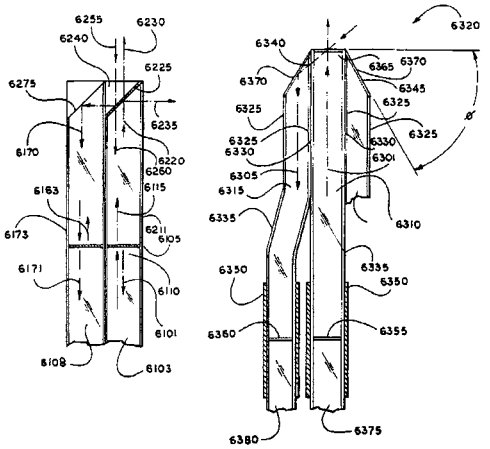
Methods and Apparatus for Filtering an Optical Fiber

Inventors: Michael Leonard Wach and Eric Todd Marple.
Assignee: Cirrex Corp.
Filed: March 12, 1999.

***Abstract*—**Filtering of optical fibers and other related devices. High-energy methods for depositing thin films directly onto the ends of optical fibers can be used to produce high-quality, high-performance filters in quantity at a reasonable cost. These high-quality filters provide the high performance needed for many demanding applications and often eliminate the need for filters applied to wafers or expanded-beam filtering techniques. Having high-quality filters applied directly to optical fiber and faces permits production of high-performance, micro-sized devices that incorporate optical filters. Devices in which these filters may be used include spectroscopic applications including those using fiber optic

probes, wavelength division multiplexing, telecommunications, general fiber optic sensor usage, photonic computing, photonic amplifiers, pump blocking and a variety of laser devices.

119 Claims, 30 Drawing Sheets



6,223,022 Apr. 24, 2001

Mobile Radio Telephone With Impedance Matching Network Having Two Transformation Factors

Inventors: Winfrid Birth, Ralf Burdenski, and Christian Wunsch.
Assignee: U.S. Philips Corporation.
Filed: December 21, 1998.

***Abstract*—**A mobile radio telephone includes a transmitter output stage and an antenna. An impedance matching network is inserted between the transmitter output stage and the antenna. The matching network has a transformation factor (T) for adjusting the transmitter load impedance (Z_{PA}) to match with the antenna input impedance (ZA_{Ant}). The impedance matching network includes at least two impedance transformers that form at least two transformation factors by alternatively connecting in parallel the two impedance transformers.

8 Claims, 2 Drawing Sheets