was shown. The relationship between physical dimensions and the capacitances per unit length of the line was used to obtain the required line spacings and widths for any arbitrary coupling ratio. It was shown that, for coupling ratios around 3 dB, the dimensions for a perfectly matched coupler are not always easily realizable, but by allowing a small mismatch the dimensions become more reasonable.

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Letters

Correction to "Coaxial Transmission Lines, Related Two-Conductor Transmission Lines, Connectors, and Components: A U.S. Historical Perspective"

JOHN H. BRYANT, FELLOW, IEEE

While revising and editing the above paper, Fig. 5 was inadvertently duplicated. The result of this oversight can be seen on p. 980, where the illustrations for Figs. 4 and 5 are the same. The intended Fig. 4, with its caption, is shown below.

Manuscript received August 8, 1984.
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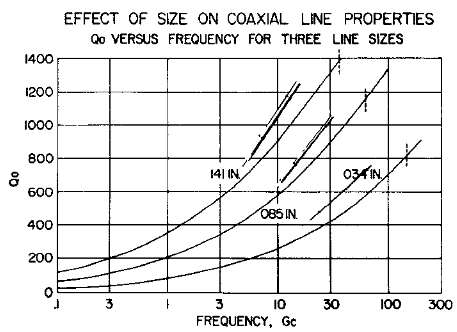


Fig. 4. Unloaded Q of coaxial line versus frequency, for three line sizes. The vertical dashed lines indicate the frequency at which the particular size of transmission line can support a higher order mode.

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.

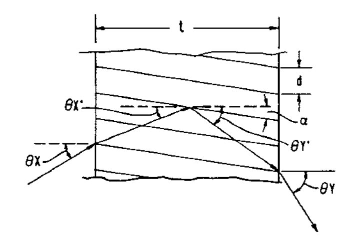
4,416,505 Nov. 22, 1983

Method for Making Holographic Optical Elements with High Diffraction Efficiencies

Inventor: LeRoy D. Dickson.
Assignee: International Business Machines Corporation.
Filed: Oct. 26, 1981.

Abstract—Production quantities of a multi-element holographic scanner disc are made by optically replicating a silver halide master disc one element at a time in a dichromated gelatin film. The dichromated gelatin film swells during processing. The swell is monitored during production by determining the shift in the angle of the Bragg surfaces within the gel. The angle of the replicating beam for each element is changed from that of the original reference beam to establish a Bragg angle at exposure which will be tilted to the proper angle after swelling in order to maximize the diffraction efficiency of the element at the original reference beam angle

4 Claims, 6 Drawing Figures



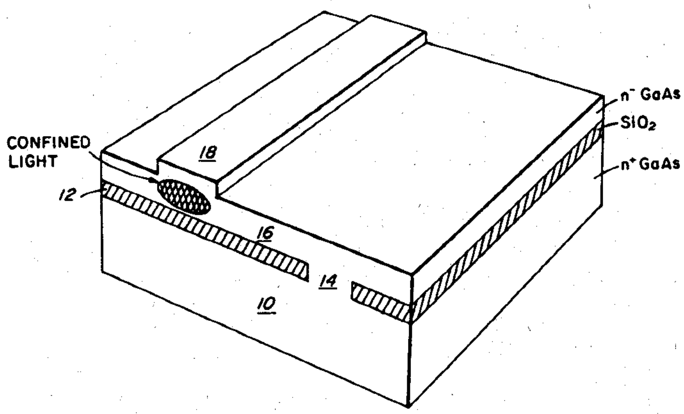
4,420, 873 Dec. 20, 1983

Optical Guided Wave Devices Employing Semiconductor-Insulator Structures

Inventors: Frederick J. Leonberger, Ivars Melngailis, Carl O. Bozler, and Robert W. McClelland.
Assignee: Massachusetts Institute of Technology.
Filed: Jan. 25, 1980.

Abstract—A method for fabricating three-dimensional optical waveguides is disclosed. In this method, a single crystal semiconductor layer is grown upon an insulator which has an index of refraction lower than the semiconductor. The semiconductor layer is deposited to a thickness which provides confinement of light propagating in the semiconductor layer in the vertical direction. An effective larger index of refraction over a cross-sectional region of the semiconductor layer is then formed to provide confinement of light in the lateral direction. In the preferred method, the growth of single crystal semiconductor upon the insulator is achieved by a vapor-phase lateral epitaxial overgrowth technique.
Devices fabricated according to the method are also disclosed.

5 Claims, 16 Drawing Figures



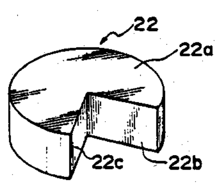
4,423,397 Dec. 27, 1983

Dielectric Resonator and Filter with Dielectric Resonator

Inventors: Toshio Nishikawa, Youhei Ishikawa Sadahiro Tamura, and Yoji Ito.
Assignee: Murata Manufacturing Co.
Filed: June 25, 1981.

Abstract—A dielectric resonator has a sector shape, and a filter has a signal source for emitting signal to be filtered, signal receiver for receiving the filtered signal and a path defined between the signal source and the signal receiver. At least one sector shaped dielectric resonator is disposed in the path.

28 Claims, 26 Drawing Figures



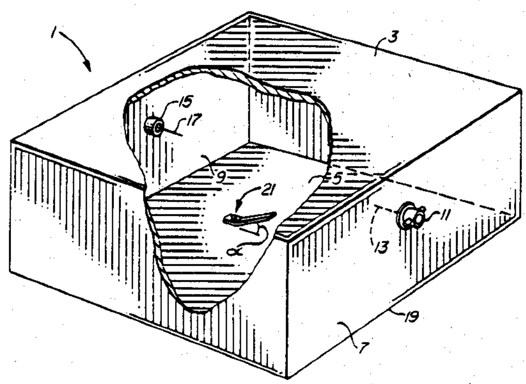
4,423,398 Dec. 27, 1983

Internal Bi-Metallic Temperature Compensating Device for Tuned Cavities

Inventors: Ronald E. Jachowski and Louis E. Brown.
Assignee: Decibel Products, Inc.
Filed: Sept. 28, 1981.

Abstract—A microwave tuned cavity has a strip of temperature sensitive bi-metallic material plated with silver attached at one end to the inner surface for the tuned cavity and having its other end extending at an inclined angle to the center of the volume bounded by the inner surface of the tuned cavity. The housing of the tuned cavity expands as its temperature increases, tending to cause the resonant frequency of the cavity to decrease. The strip of bi-metallic material bends slightly as the temperature increases, causing its free end to move toward the surface on which the strip is mounted. This decreases the amount of capacitive loading of the resonant signal in the cavity, tending to increase the resonant frequency caused by thermal expansion of the housing. When the temperature decreases, the free end of the bi-metallic strip moves slightly toward the center of the cavity, thereby compensating for slight thermal contraction of the walls due to the decrease in temperature. In another embodiment of the invention, the bi-metallic strip is attached to the inner surface of a coaxial cavity to compensate for variation in the length of a coaxial resonator as its temperature varies.

11 Claims, 10 Drawing Figures



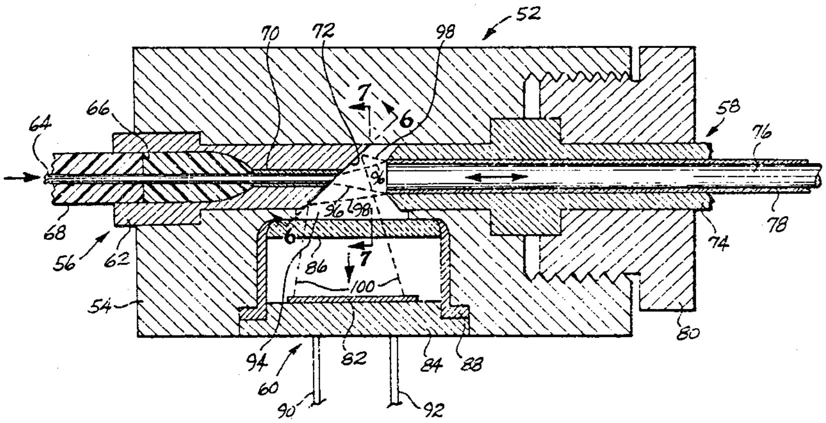
4,423,922 Jan. 3, 1984

Directional Coupler for Optical Communications System

Inventor: David R. Porter.
Assignee: The Boeing Company.
Filed: Dec. 18, 1978.

Abstract—A directional coupler for an optical communications system of the type utilizing non-collimated optical beams transmitted by waveguides. The coupler includes an input waveguide, a network waveguide, and a detector port, and has a beam-directing surface positioned between the input waveguide and the network waveguide. The beam-directing surface defines an opening aligned with and adjacent to the input waveguide, and a beam conducting medium fills the space between the two waveguides. Input optical beams are transmitted from the input waveguide through the opening to the network waveguide, and output optical beams are transmitted from the network waveguide to the beam-directing surface. The core area of the network waveguide is large relative to the opening, and the output optical beam expands as it travels through the conducting medium to the directing surface. The portion of the output beam not entering the opening is directed to the detector port, and the area of this portion is large relative to the area of the opening so that power loss is minimal.

19 Claims, 7 Drawing Figures



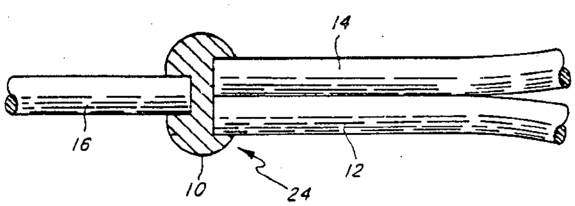
4,423,923 Jan. 3, 1984

Method and Fixture for Coupling Optical Fibers

Inventors: Gary A. Frazier and Milo R. Johnson.
Assignee: Texas Instruments Incorporated.
Filed: Oct. 5, 1981.

Abstract—Coupler for joining two optical fibers to a third fiber, while preserving good optical isolation between the first two fibers. The coupler is preferably formed of an approximately index-matching plastic, and the fiber ends are cemented in place. The two fibers which are to be isolated are located parallel and adjacent to each other, and their ends are glued into an elongated hole on one side of the coupler. Opposite to this hole is a second hole into which the union fiber is seated. Epoxy glue is used to connect the fibers in place. Plastic fibers are preferably used.

9 Claims, 2 Drawing Figures



4,423,925 Jan. 3, 1984

Graded Optical Waveguides

Inventors: Franklin W. Dabby and Ronald B. Chesler.
Assignee: Times Fiber Communications, Inc.
Filed: July 28, 1981.

Abstract—A process for preparing a glass rod having a graded refractive index for use as the start rod in the production of optical waveguides is disclosed. The process comprises depositing and sintering borosilicate particles on a glass rod to form a rod having a larger diameter than the original fused silica rod and drawing this rod to obtain a start rod having the same diameter as the original glass rod but exhibiting a partially radially graded refractive index. Optical waveguides prepared from such graded start rods have a more uniformly graded radial index of refraction profile.

3 Claims, No Drawings

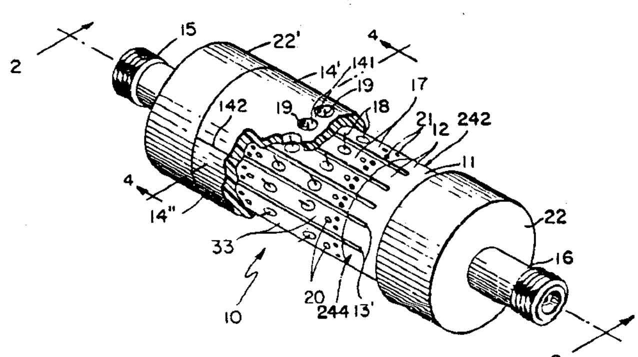
4,424,496 Jan. 3, 1984

Divider/Combiner Amplifier

Inventors: Lawrence J. Nichols and George H. MacMaster.
Assignee: Raytheon Company.
Filed: Oct. 13, 1981.

Abstract—A divider/combiner amplifier circuit divides input power through a sectored coaxial line to a plurality of longitudinal parallel channels spaced around the circumference of a cylinder; the power in each channel is amplified by a semiconductor device; and the amplified power is combined in another sectored coaxial line. A microwave waveguide connected to the input and output of each amplifying device confines the microwave energy of the operating mode to the longitudinal channel formed by said waveguide. Each waveguide extends longitudinally along the cylinder and each is circumferentially spaced from its neighboring waveguide by a space which forms a cut-off waveguide to the operating mode. In the event of a failure of one or more amplifying elements, the space allows the failure mode to propagate radially to microwave absorbing material where it is absorbed to prevent reflection back into the longitudinal waveguide and thus effectively isolates the failure to provide a gradual deterioration of the amplifier circuit performance with element failure.

12 Claims, 4 Drawing Figures



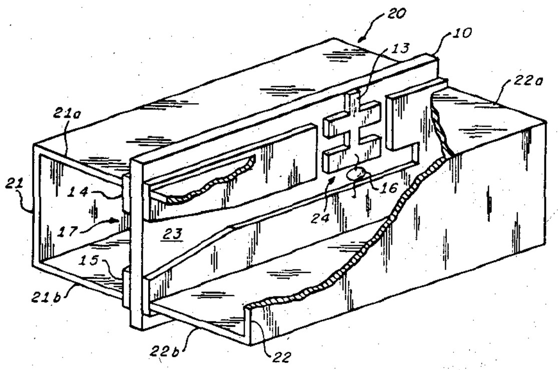
4,425,549 Jan. 10, 1984

Fin Line Circuit for Detecting RF Wave Signals

Inventors: Paul M. Schwartz and James C. Chu.
Assignee: Sperry Corporation.
Filed: July 27, 1981.

Abstract—A fin line apparatus, within a rectangular waveguide, for detecting R.F. signals utilizes metallic film conductors, disposed on both surfaces of a planar dielectric centered in the waveguide parallel to its sidewalls, for forming aligned channels, a first of which couples R.F. signals to a diode which provides rectified signals to a metallic film filter disposed in a gap in a conductor which opens into the first channel.

8 Claims, 6 Drawing Figures



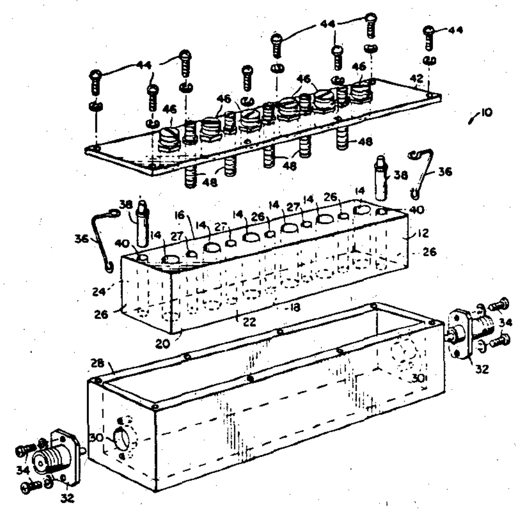
4,425,555 Jan. 10, 1984

Dielectric Filter Module

Inventors: Takeshi Meguro and Yukio Ito.
Assignee: Fujitsu Limited.
Filed: Oct. 23, 1981.

Abstract—A dielectric filter module having an open housing which supports screws for adjusting the characteristics of the dielectric filter. The dielectric filter, which includes an elongated dielectric block having internal cavities and a conductive film extending from the exterior surface of the block into the internal cavities, is mounted in an openended metal housing which surrounds three sides of the dielectric filter. Suitable housings can be inexpensively fabricated to the necessary length from segments cut from commercially available channel members having C-shaped or I-shaped crosssections. Wires extend through the open ends of the housing to connector elements on the surface of the block adjacent its ends. The connector elements can be adhesively secured metal members or locally deposited regions of metallic film. Either threaded holes on the housing or nut members mounted on the housing can be used for supporting the adjustment screws.

10 Claims, 5 Drawing Figures



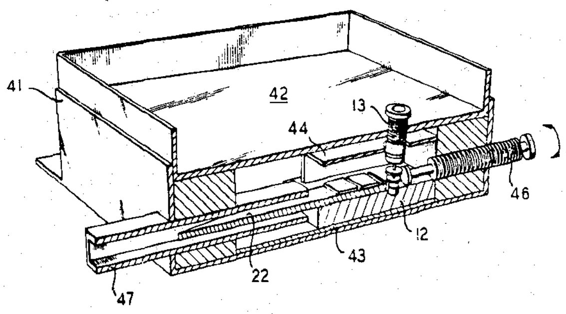
4,426,628 Jan. 17, 1984

Millimeter-Wave Oscillator with Enhanced Dielectric Coupler

Inventors: Edmund E. Malecki, and Harold Jacobs.
Assignee: The United States of America as represented by the Secretary of the Army.
Filed: Mar. 23, 1981.

Abstract—A low cost arrangement for a millimeter wave solid state diode oscillator, which obviates precise machining and uses a dielectric transmission line associated with a resonant cavity. Coupling and impedance matching are greatly facilitated by a conductive stripe structure on the end of the dielectric transmission line, extending into the resonant cavity of the solid state oscillator. Fine tuning is provided by a mechanical slide screw. Two layers of shielding surrounding the resonant cavity are provided by a convenient package suitable for various applications of the millimeter wave oscillator wherein leakage radiation is not permitted.

12 Claims, 4 Drawing Figures



4,427,953 Jan. 24, 1984

Microwave Diplexer

Inventors: Thomas Hudspeth and Harmon H. Keeling.
Assignee: Hughes Aircraft Company.
Filed: Nov. 16, 1981.

Abstract—Apparatus for processing microwave signals at two predetermined frequencies. Signals at a first predetermined frequency are received or transmitted at one end (input port) of a microwave transmission line whose other end is utilized as a common output port for transmitting and receiving signals at both predetermined frequencies. A band rejection portion is provided which comprises first and second rejection resonators orthogonally disposed along the transmission line at two predetermined positions. A bandpass portion, comprised of a plurality of collinearly alligned bandpass resonators, is disposed at a third predetermined position along the transmission line. Signals at a second predetermined frequency are transmitted or received at a second input port which is part of the bandpass portion. All resonators are capacitively coupled together and to the transmission line. Signals at both predetermined frequencies may be applied to the first and second input ports and are combined in the transmission line by the filtering action of the resonators. Conversely, signals having both predetermined frequencies may be applied to the output port and separated in the transmission line such that signals at the first predetermined frequency are provided at the first input port and signals at the second predetermined frequency are provided at the second input port. Also, signals at one frequency may be transmitted by way of the diplexer while signals at the second frequency are received thereby, or vice-versa.

9 Claims, 7 Drawing Figures