Patent Abstracts

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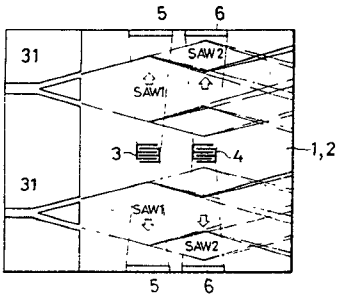
4,491,384 Jan. 1, 1985

Optical Switch Device

Inventors: Tsukasa Yamashita, Masaharu Matano, Kazuhiko Mori, and Norihiro Ota
Assignee: Omron Tateisi Electronics Co.
Filed: Jan. 15, 1982.

Abstract—By an electro-optical switch or an optical switch element utilizing diffraction by a surface acoustic wave, an input light beam is first switched over to one of light beams two or a multiple of two in number and propagating in different directions. By a surface acoustic wave which is discretely variable in frequency, the light beam in each of the different propagation direction is deflected at angles in accordance with the varying frequencies while propagating through an optical waveguide layer. It is possible to obtain by switching a very large total number of output light beams which are equal in number to the number of resolvable deflected light beams obtained in the frequency bandwidth of one surface acoustic wave, multiplied by the number of light beams obtained by switching with the optical switch element.

10 Claims, 7 Drawing Figures



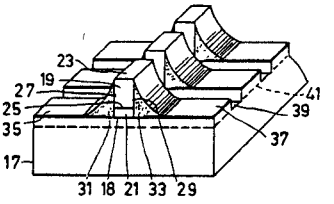
4,491,393 Jan. 1, 1985

Switching Device for Light Beams

Inventor: Marc M. M. Roelants.
Assignee: U.S. Philips Corporation.
Filed: Apr. 29, 1982.

Abstract—The switching device comprises a switching member with a row of windows, each of which is formed by a separate block of electrooptical material (19) which is connected to a first surface (18) of a rigid carrier (17) by means of an intermediate layer of flexible material (21). Each block comprises two oppositely situated, parallel, light-transmissive principal surfaces (23,25) and two side surfaces (27,29) which are also oppositely situated and which extend from one principal surface to the other. On the side surfaces there are provided two electrodes (31,33) which are connected to two conductors (35,37) which are constructed as surface wiring. The electrodes and/or the connection between the carrier and the conductors are preferably also formed to be flexible. This construction offers the advantage that the various blocks cannot mechanically or electrically interact with one another.

11 Claims, 5 Drawing Figures



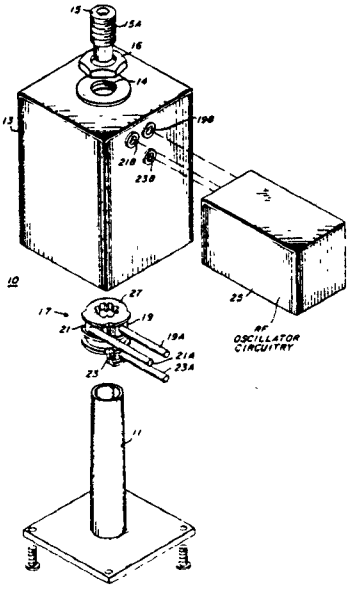
4,491,806 Jan. 1, 1985

Resonant Cavity with Integrated Microphonic Suppression Means

Inventors: Gary R. Reynolds, Thomas R. Gaynor, Raul Olivera, Ross E. Ruthenberg, Jay G. Smith, Christopher N. Kruby, and Terry K. Mansfield.
Assignee: Motorola, Inc.
Filed: Oct. 6, 1982.

Abstract—The invention is a microphonics suppression means for a high frequency resonant cavity. The resonant cavity is used in a RF oscillator to generate UHF/VHF frequencies. The resonant cavity comprises an outer wall portion, a center conductor portion, a tuning slug and a plurality of coupling probes. The coupling probes, tuning slug and center conductor are held in a fixed relationship by a microphonics suppression means made of a low dielectric material which fits over and around the center conductor and encapsulates the coupling probes and collars the tuning slug. The micorphonics suppression means reduces the effect of microphonics on the output signal of the RF oscillator, thus allowing a clean output signal suitable for high power applications.

23 Claims, 4 Drawing Figures



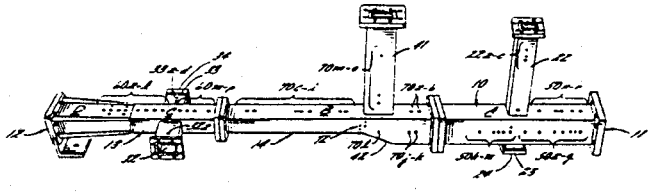
4,491,810 Jan. 1, 1985

Multiport, Multifrequency Microwave Combiner with Overmoded Square Waveguide Section

Inventor: Saad M. Saad.
Assignee: Andrew Corporation.
Filed: Jan. 28, 1983.

Abstract—A multiport, multifrequency combiner comprising a main waveguide having a cross section in the shape of a right-angle parallelogram and dimensioned to simultaneously propagate co-polarized signals in different frequency bands and at least one signal that is orthogonally polarized with respect to the co-polarized signals, at least a portion of the waveguide being overmoded; a plurality of junctions spaced along the length of the main waveguide for coupling selected signals in the different frequency bands in and out of the waveguide, at least one of the junctions being located in an overmoded portion of the waveguide, each of the junctions having an unbalanced or pseudo-balanced feed with only a single side-arm waveguide for transmitting and receiving the signals; and filtering means disposed within the main waveguide and operatively associated with each junction therein for signals in the highest frequency band, the filtering means having (1) a stopband characteristic for coupling signals in the highest frequency band between the main waveguide and the junction and the side-arm waveguide connected thereto, and (2) a passband characteristic for passing signals in lower frequency bands past the junction. In the preferred embodiment of the invention, the waveguide has an overmoded section with a square cross section and a single-moded section with a rectangular cross section, with the overmoded and singlemoded sections being joined by a transition section having at least one side wall which is tapered to effect the transition from the square cross section to the rectangular cross-section.

22 Claims, 8 Drawing Figures



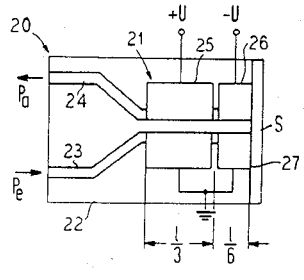
4,492,425 Jan. 8, 1985

Device for Deflecting Light Through 180 Degrees

Inventors: Ralf T. Kersten, Karl H. Tietgen, and Helmut F. Schlaak.
Assignee: Siemens Aktiengesellschaft.
Filed: Jan. 8, 1982.

Abstract—A device for deflecting light through 180° characterized by a directional coupler comprising a pair of strip waveguides formed on a substrate with the end faces of the pair of strip waveguides being provided with a mirror. The directional coupler may be formed as a half of a coupler with the mirror effectively bisecting the length of the coupler, or it may be a $\Delta\beta$ reversible directional coupler which is the whole length or as a half of a directional coupler. In addition, the directional coupler may be a controllable power dividing coupler and a phase shifter may be applied on one of the waveguides of the coupler. The device can also be utilized in a spectral comb filter.

19 Claims, 9 Drawing Figures



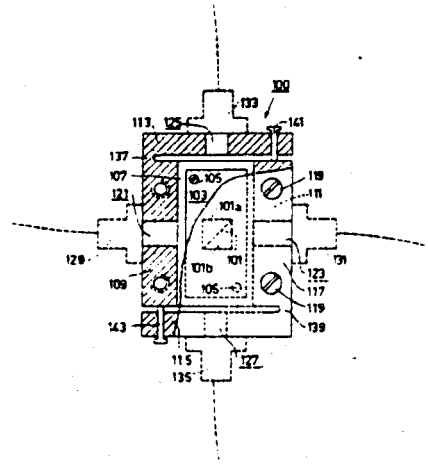
4,492,426 Jan. 8, 1985

Optical Branch Coupler

Inventors: Antonius J. A. Nicia and Cornelis J. T. Potters.
Assignee: U.S. Philips Corporation.
Filed: Apr. 27, 1982.

Abstract—An optical branch coupler comprising a semi-transparent mirror which is tiltable about an axis which is situated substantially in the plane of the mirror and substantially parallel to the plane determined by the directions of the transmitted and the reflected light beams. A wall toward which the reflected beam is directed is adjustable about an axis which is at right angles to the plane of the light beams.

12 Claims, 7 Drawing Figures



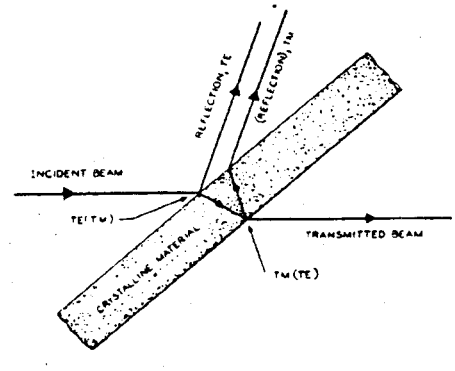
4,492,436 Jan. 8, 1985

Polarization Independent Beam Splitter

Inventor: Ernest E. Bergmann.
Assignee: AT&T Bell Laboratories.
Filed: Jan. 3, 1983.

Abstract—A new type of beam splitter is described, which is capable of producing a division of light in a polarization independent manner. Typical beam splitters (used off-axis) have a pronounced polarization dependence. The device is a thin plate of suitably oriented, birefringent material having a thickness chosen to interchange the characteristic polarizations of the beam between the faces of the plate. The reflection/refraction ratio at the two boundaries are then complementary and the combined effect is insensitive to the polarization of the incident beam.

4 Claims, 2 Drawing Figures



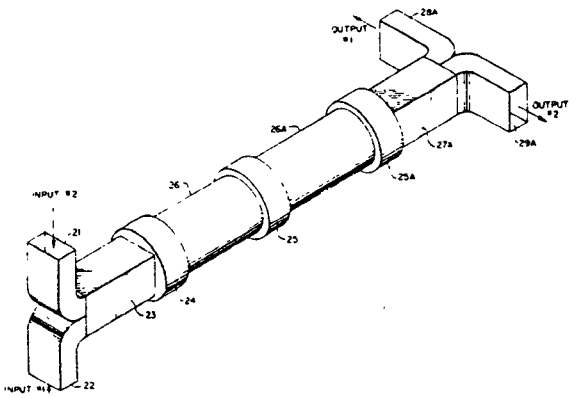
4,492,938 Jan. 8, 1985

Symmetrically-Configured Variable Ratio Power Combiner Using Septum Polarizer and Quaterwave Plate

Inventor: Lock R. Young.
Assignee: Harris Corporation.
Filed: Sept. 21, 1982.

Abstract—A variable ratio power combiner employs, as its major coupling component, one or more septum polarizers and associated 90° differential phase shifters or quarter waveplates in place of conventional OMTs. Advantageously, a septum polarizer is a relatively simple component that serves the same function as an OMT and polarizer combination. Because it has an essentially T-shaped configuration, it can bring a pair of waveguide arms together in the same plane back-to-back, so that the resulting power combiner may provide the desired symmetrical coupling. Normally the variable ratio power combiner requires only symmetrical inputs for the sources and not both symmetrical inputs and outputs, so that only a single septum polarizer and associated quarter waveplate are employed, with an OMT used for the output. For a completely symmetrical configuration, however, the other OMT may be replaced by a separate septum polarizer/rotatable quarter waveplate arrangement.

26 Claims, 4 Drawing Figures



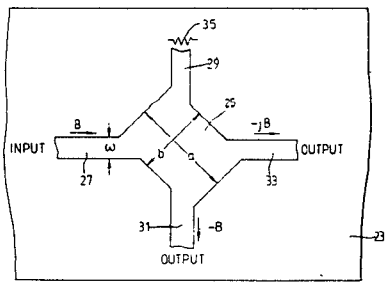
4,492,939 Jan. 8, 1985

Planar, Quadrature Microwave Coupler

Inventor: John W. Burns.
Assignee: The Marconi Company Limited.
Filed: Dec. 1, 1982.

Abstract—A microwave coupler device of planar circuit form, similar in form to a conventional branch arm coupler in that it comprises a substrate (23) having a ground plane conductor on one main face and an electrically conductive pattern on the other main face comprising a central portion (25) and four strip portions (27,29,31,33) extending therefrom, but in which the central portion, instead of comprising four limbs in a rectangular configuration, is in the form of a rectangle with the strip portions extending from positions adjacent the corners of the rectangle.

1 Claim, 2 Drawing Figures



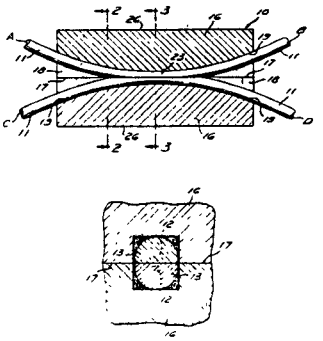
4,493,528 Jan. 15, 1985

Fiber-Optic Directional Coupler

Inventors: Herbert J. Shaw and Ralph A. Bergh.
Assignee: Board of Trustees of the Leland Stanford Junior University.
Filed: Apr. 11, 1980.

Abstract—Apparatus and method of manufacture for coupling optical power between two strands of fiber optic material in a given direction of propagation. The coupler employs generally parallel, intersecting strands of fiber optic material having the cladding removed on one side thereof to within a few microns of the fiber cores in the region of intersection to permit light transfer between the strands.

10 Claims, 7 Drawing Figures



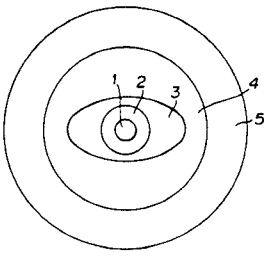
4,493,530 Jan. 15, 1985

Single Polarization Optical Fibers

Inventors: Hiroshi Kajioka, Toshihide Tokunaga, and Junkichi Nakagawa.
Assignee: Hitachi Cable, Ltd.
Filed: July 2, 1982.

Abstract—A single polarization optical fiber has an elliptical jacket composed of $SiO_2 + F_2O + P_2O_5$, whereby increase in transmission loss at a long wavelength band is prevented.

8 Claims, 4 Drawing Figures



4,494,086 Jan. 15, 1985

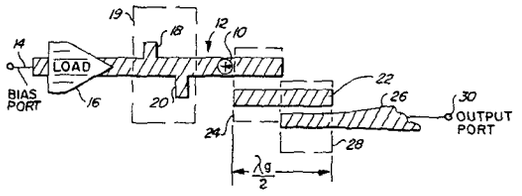
Transmission-Line Oscillator Having Independently Adjustable *Q* and Input Resistance

Inventor: Michael Dydyk.
Assignee: Motorola, Inc.
Filed: July 30, 1982.

Abstract—A transmission-line microwave oscillator having two degrees of freedom wherein the real portion R_{in} of the input impedence seen by the active device is adjustable by changing the coupling coefficient between and active device and a resonator and where the external quality Q_{EXT} of the oscillator is

adjustable by changing the coupling between the resonator and an output transmission line.

17 Claims, 7 Drawing Figures



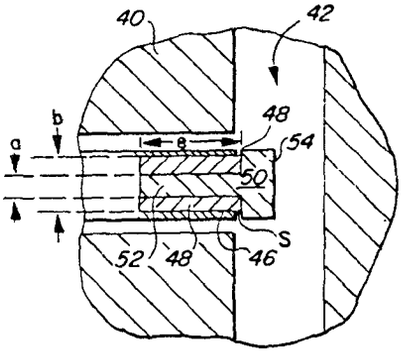
4,494,087 Jan. 15, 1985

Combiner Probe Providing Power Flatness and Wide Locking Bandwidth

Inventors: Michael Dydyk, Norman K. Enlow, Joseph R. Tuzzolino.
Assignee: Motorola, Inc.
Filed: Sept 2, 1982.

Abstract—A distributed inductive reactance is coupled to a terminating impedance at the interface of a combiner probe with a resonant cavity. The distributed reactance is implemented by a metal insert having a cavity interface and having a coupling portion, which is coaxial with a cylindrical dielectric and with a cylindrical cavity in an end of the terminating impedance.

9 Claims, 8 Drawing Figures



4,494,094 Jan. 15, 1985

High-Frequency Waveguide

Inventors: Georg Spinner and Franz X. Pitschi.
Assignee: Spinner GmbH Elektrotechnishe Fabrik.
Filed: Nov. 3, 1982.

Abstract—For a rectangular waveguide the wall thickness of the narrow sides b of the rectangle is smaller than the wall thickness of the broad sides a of the rectangle with the ratio of the wall thicknesses being so chosen that approximately the same resistance to deformation is obtained in both directions. For waveguides which consist of welded plates the broad sheet metal plates 10 are cut to the nominal inner dimension and the sheet metal plates which form the narrow sides and have a lower wall thickness abut laterally against the two plates belonging to the a side.

3 Claims, 2 Drawing Figures