Patent Abstracts

These Patent Abstracts of recently issued patents are intended to provide the minimun 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.

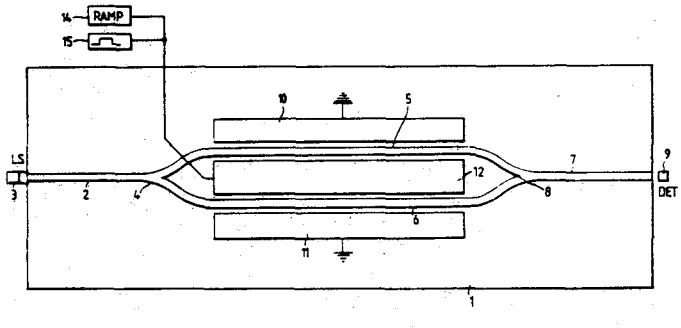
4,447,116 May 8, 1984

Controllable Electro-Optical Modulator/Phase Shifter using an Integrated Optical Interferometer

Inventors: George D. H. King and Michael C. Bone.
Assignee: International Standard Electric Corporation.
Filed: Apr. 7, 1982.

Abstract—An optical waveguide interferometer arrangement includes a single-mode optical waveguide device which diverges into two waveguide branches of identical optical length which converge into another single waveguide. The optical properties of the two branches are variable by electrical fields applied via adjacent electrodes, which are energized with a composite waveform comprising (for example) a symmetrical ramp superimposed on a square wave of the same period. The two component waveforms are in phase but of different amplitudes such that the output light is intensity modulated at a frequency which is some multiple of that of the input waveforms. Adjustment of the square wave amplitude provides the means to phase shift the optical output signal.

4 Claims, 1 Drawing Figure



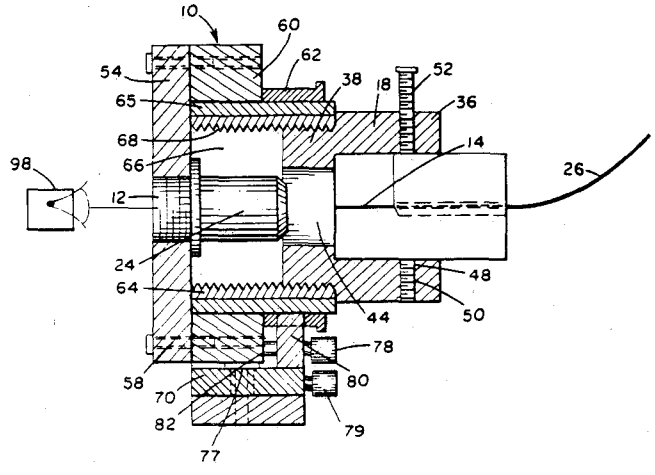
4,447,119 May 8, 1984

Apparatus for Maintaining an Optical Fiber and a Focusing Means

Inventor: J. Donald Beasley.
Assignee: Gould, Inc.
Filed: Nov. 2, 1981.

Abstract—An apparatus for maintaining one end of an optical fiber and a focusing lens is provided including means for adjustably focusing a beam of light onto the end of the fiber. The adjustable focusing means includes a means for pivoting the focusing lens and fiber to provide a very fine adjustment to direct the light beam into the core at the end of the optical fiber. The subject device includes a framework for maintaining the lens and one end of the optical fiber in a precisely controlled relationship. The adjustable focusing means may further include at least one screw in threaded engagement with the base portion of the device. One end of the screw contacts a peripheral portion of the maintaining means so that rotation of the screw causes the maintaining means to pivot about the end of the optical fiber.

9 Claims, 8 Drawing Figures



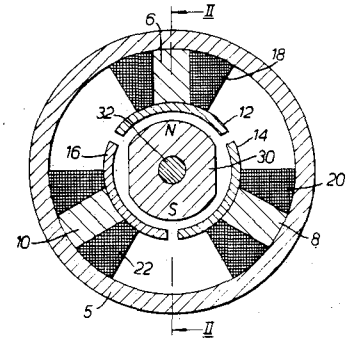
4,447,793 May 8, 1984

Rotary Actuators

Inventor: William P. Gray.
Assignee: Racal-Mesl Microwave Limited.
Filed: May 6, 1983.

Abstract—An actuator has a rotor with permanently magnetized North and South poles. A housing supports three pole members having respective coils and pole pieces. The first pole piece is always a North pole but the coils on the second and third pole pieces are arranged such that each can be of either polarity with the other simultaneously being of the opposite polarity. The rotor therefore has two stable positions, one when the second pole piece is a North pole and the third pole piece is a South pole and the other being 120° from this position in the clockwise direction (when the second pole piece is South pole and the third pole piece is a North pole). The rotor movement may however be stopped 15° short of each such position by mechanical detents, so as to limit the maximum angular movement to 90°. The actuator may be used to drive a switchable microwave coupling arrangement.

11 Claims, 5 Drawing Figures



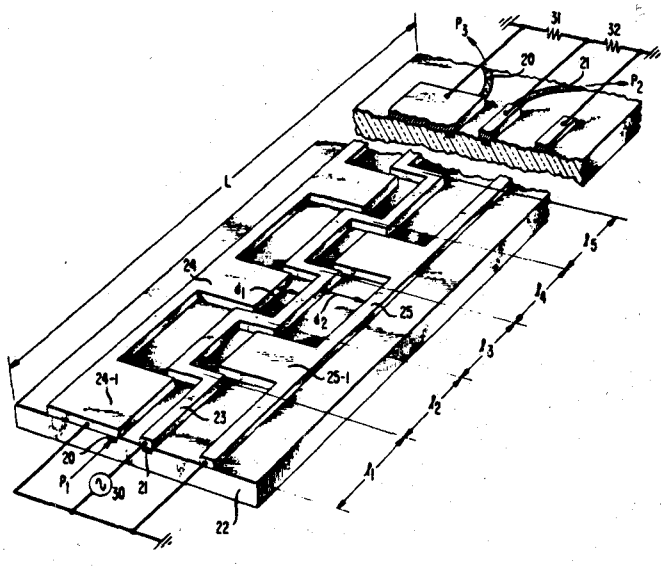
4,448,479 May 15, 1984

Traveling Wave, Electrooptic Devices with Effective Velocity Matching

Inventor: Rodney C. Alferness.
Assignee: Bell Telephone Laboratories, Incorporated.
Filed: Nov. 16, 1981.

Abstract—A simulated velocity match between a traveling optical wave and a traveling electrical modulating wave is obtained in traveling wave, velocity mismatched electrooptic devices by introducing, at longitudinally spaced intervals along the electrical signal wavepath, means for producing the equivalent of a 180 degree phase shift in the effect of the modulating signal upon the operative electrooptic parameter of said device. This technique is employed to minimize the effect of walk-off due to velocity mismatch in modulators, phase shifter and mode converters.

10 Claims, 12 Drawing Figures



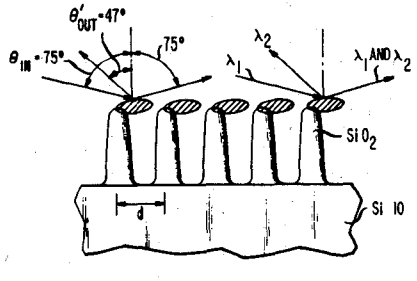
4,448,485 May 15, 1984

Harmonic Generation using a Surface of Metal Particles

Inventors: John G. Bergman, Paul F. Liao, and Alexander J. Wokaun.
Assignee: Bell Telephone Laboratories, Incorporated.
Filed: July 10, 1981.

Abstract—Metal ellipsoidal particles are deposited on an ordered array of silicon dioxide posts. Each of the particles has dimensions that are less than the wavelength of a fundamental beam to be used in the generation of second harmonic radiation. The rows of particles in the ordered array are spaced at a distance that is less than one-half of the fundamental wavelength and greater than one-half of the second harmonic wavelength.

11 Claims, 10 Drawing Figures



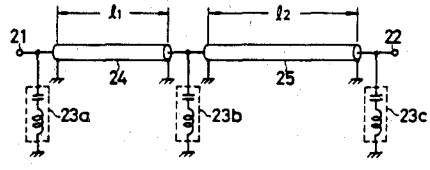
4,449,108 May 15, 1984

Band-Stop Filter for VHF-UHF Band

Inventors: Haruyoshi Endo, Mitsuo Makimoto, Ko Kikuchi, and Sadahiko Yamashita.
Assignee: Matsushita Electric Industrial Company, Limited.
Filed: Feb. 16, 1982.

Abstract—A band-stop filter for VHF-UHF band comprises at least three series resonance circuits and at least two transmission lines each connected between the series resonance circuits. One of the transmission lines, which is connected to the input terminal of the band-stop filter, has an electrical length which is shorter or longer than the quarter wavelength of the center frequency of the stop band by more than 20 but less than 50 percent. When a band-stop filter comprises four transmission lines, one of the transmission lines, which is connected to the output terminal of the band-stop filter, has the same length as the transmission line connected to the input terminal. With this arrangement, the band-stop filter exhibits a sharp attenuation characteristic in a frequency range below or above the center frequency. Other transmission lines, which are not directly connected to either the input terminal or the output terminal, may have a length which is shorter or longer than the quarter wavelength by 5 to 20 percent so as to provide a sharper attenuation characteristic.

7 Claims, 7 Drawing Figures



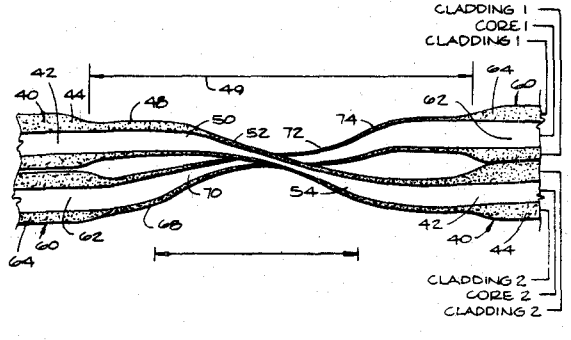
4,449,781 May 22, 1984

Multimode Optical Fiber Coupler

Inventors: Alexander W. Lightstone, H. Keith Eastwood, and Frank Szarka.
Assignee: Her Majesty the Queen in Right of Canada as represented by the Minister of National Defense.
Filed: Nov. 20, 1981.

Abstract—An optical fiber coupler is described for operatively coupling together two or more optical fibers. Each coupler consists of several biconically tapered fibers. The biconical sections of each fiber are placed side by side or twisted around one another, and fused together. The couplers are typically made of optical fibers having a diameter in the range from about 100 to about 300 microns. The fiber comprises a core of glass having a high index of refraction and cladding of glass with a low index of refraction. The cladding of each biconical section has been reduced by chemical etching, plasma etching, ion-milling, abrasion or the like, to a thickness not exceeding 25 percent of the core diameter, more preferably less than 10 percent and most preferably from about 5 percent to about 10 percent of the core diameter. The couplers are of step or graded index optical fiber. The design can be adapted as multiport access couplers when more than two fibers are involved. The reduction of cladding thickness is essential to produce optical fiber couplers with a coupling coefficient of about 40 percent and an average loss of about 10 percent.

11 Claims, 5 Drawing Figures



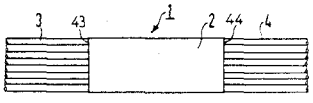
4,449,783 May 22, 1984

Optical Star Coupler with a Planar Mixer Element

Inventor: Hans H. Witte.
Assignee: Siemens Aktiengesellschaft.
Filed: Mar. 5, 1981.

Abstract—An optical star coupler, which includes a mixing element consisting of a planar waveguide having an input and output end for interconnecting two groups of light conducting fibers with a packing density of each group of fibers being as high as possible and the planar waveguide having a thickness approximately equal to the diameter of the fibers, characterized by each fiber which is to be connected to a fiber of a fiber optical system having a diameter approximately equal to the core diameter of this fiber of the fiber optical system and, preferably, the mixing element on the surfaces, which are not connected to the fibers, are in contact with a medium having an index of refraction less than the index of refraction of the mixing element. Preferably, this medium comprises a material having substantially the same coefficient of thermal expansion and is an optical adhesive.

13 Claims, 10 Drawing Figures



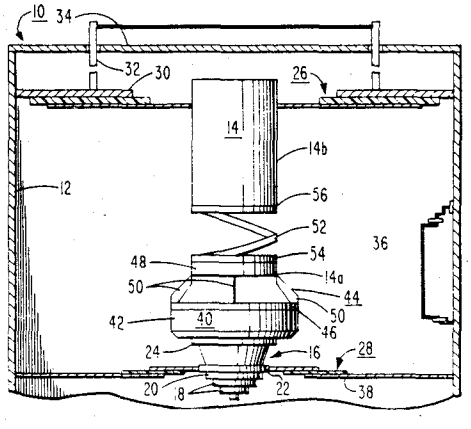
4,451,806 May 29, 1984

Tuning Means for a Transmission Line Cavity

Inventor: Claude E. Doner.
Assignee: RCA Corporation.
Filed: Apr. 30, 1982.

Abstract—A transmission line cavity comprises an outer conductor and a center conductor. The cavity is in combination with a source, such as a power tube, for establishing electromagnetic waves within the cavity. The impedance of the center conductor may be changed, for example by changing the series inductance, to vary the resonant frequency of the cavity.

5 Claims, 8 Drawing Figures



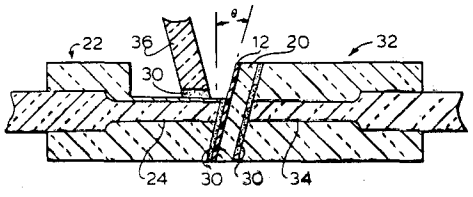
4,452,505 June 5, 1984

Bidirectional Coupler for Communication over a Single Fiber

Inventor: George A. Gasparian.
Assignee: International Telephone and Telegraph Corporation.
Filed: May 16, 1983.

Abstract—An assembly for bidirectional signal transmission over a single fiber is disclosed together with its method of manufacture. A hot coating of dichroic material is applied to a surface of a glass substrate. The substrate is processed into dichroic wafers having larger dimensions than the cross section of the fiber with which it is employed. The dichroic wafer is positioned over the end face of a polished fiber beamsplitter and secured thereto by a thin layer of optical grade epoxy. A second polished fiber beamsplitter may than be secured in a similar manner to the opposite side of the wafer. The coated wafer forms an acute angle of about 25° with a plane perpendicular to the axis of each beamsplitter half. A bidirectional coupler is thereby formed.

13 Claims, 3 Drawing Figures



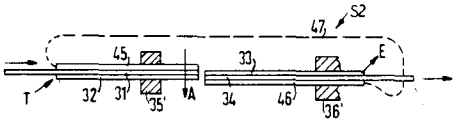
4,452,507 June 5, 1984

Fiber Optical Bypass Switch

Inventor: Gerhard Winzer.
Assignee: Siemens Aktiengesellschaft.
Filed: Sept. 17, 1981.

Abstract—A fiber optical bypass switch or relay for selectively connecting incoming and outgoing line fibers to a pair of subscriber fibers extending to a subscriber station and bypassing the subscriber station by interconnecting the line fibers together characterized by a housing having a pair of stops, an arrangement for holding at least two fibers including at least one line fiber on a plane in a movable part which is mounted for movement in the housing between the pair of stops in a contact-free manner, an arrangement for holding the remaining fibers in the housing in the desired position relative to the pair of stops and a mechanism for moving the part between the pair of stops including a biasing arrangement for urging the part in one direction between the stops so that while the part is engaged on the first of the pair of stops, the line fibers are interconnected with the subscriber fibers being bypassed and when the part is in contact with the other stop, the incoming and outgoing line fibers are connected to the subscriber fibers.

13 Claims, 14 Drawing Figures



4,453,139 June 5, 1984

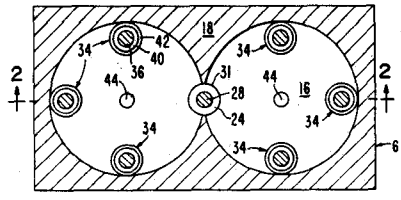
Frequency Offset Multiple Cavity Power Combiner

Inventor: Frederik Labaar.
Assignee: Ford Aerospace & Communications Corporation.
Filed: Nov. 12, 1981.

Abstract—A combiner for power combining electromagnetic energy is disclosed. At least two electromagnetic cavities are positioned having intercavity coupling among all cavities: each cavity is tangent to all other cavities and/or external transmission line connections are employed to enhance/provide intercavity coupling. Each cavity contains within it at least one power generating device. An input/output port is connected via a nonreciprocal device to an output load and an injecting oscillator which usually has a lower power level than that of the free-running combiner and a higher spectral purity. The cavities are intentionally tuned to at least two different frequencies. For the two cavity and three cavity embodiments, a greater bandwidth is obtained

compared with prior art combiners where the cavities are tuned to the same frequency. The power loss is slight. Derived formulas, based upon the injection locking ratio and the mutual injection locking ratio between cavities, are given for the maximum frequency separation between resonant frequencies of the cavities subject to the free-running single frequency condition, and for the maximum injection locking bandwidth of the frequency offset multiple cavity power combiner.

11 Claims, 9 Drawing Figures



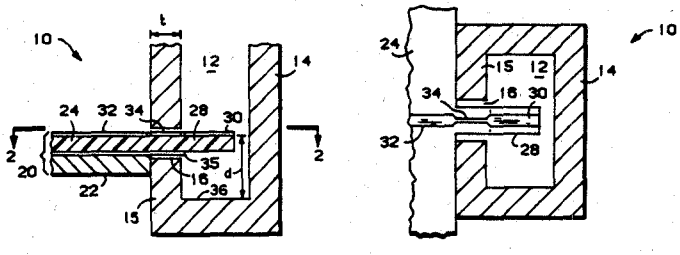
4,453,142 Jun. 5, 1984

Microstrip to Waveguide Transition

Inventor: Earl R. Murphy.
Assignee: Motorola Inc.
Filed: Nov. 2, 1981.

Abstract—A microstrip to waveguide transition is achieved by passing a portion of a microstrip circuit through an aperture in a transverse wall of a waveguide. The aperture is dimensioned and positioned so as not to significantly disturb propagation in the waveguide. A tab of the microstrip substrate extends through the aperture and into the waveguide, where a probe disposed on the tab couples to energy in the waveguide. The probe is connected to the microstrip circuit by means of a transition section on the tab within the aperture. The transition section is as narrow as possible to minimize capacitive coupling to the waveguide wall and is an integral multiple of one-half wavelength for a smooth impedance match from the probe to the microstrip.

8 Claims, 3 Drawing Figures



4,453,145 June 5, 1984

Bandpass Filter

Inventor: Harald Schuster.
Assignee: Licentia Patent-Verwaltungs-GmbH.
Filed: Sept. 21, 1982.

Abstract—A bandpass filter circuit has series elements, comprising a parallel resonant circuit and a first inductance, and shunt elements comprising a series resonant circuit and a second inductance, the resonant circuits comprising variable capacitances to permit variation of the frequency over a frequency band. The second inductance may be a transformer. The variable capacitances may be constituted by a plurality of switchable component capacitances, having switches connected between the capacitances and ground.

11 Claims, 3 Drawing Figures