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, D.C. 20231,

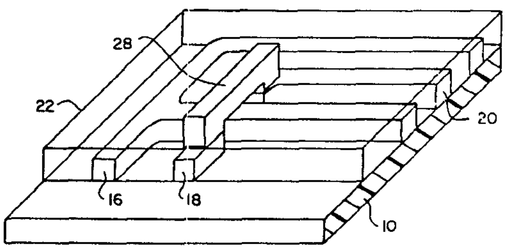
4,472,020 Sept. 18, 1984

Structure for Monolithic Optical Circuits

Inventor: Vincent L. Evanchuk.
Assignee: California Institute of Technology
Filed: Sept. 2, 1982.

Abstract—A method for making monolithic optical circuits, with related optical devices as required or desired, on a supporting surface (10) consists of coating the supporting surface with reflecting metal or cladding resin, spreading a layer of liquid radiation sensitive plastic (12) on the surface, exposing the liquid plastic with a mask (14) to cure it in a desired pattern of light conductors (16,18,20), washing away the unexposed liquid plastic, and coating the conductors thus formed with reflective metal or cladding resin. The index of refraction for the cladding (22) is selected to be lower than for the conductors so that light in the conductors will be reflected by the interface with the cladding. For multiple level conductors, as where one conductor must cross over another, the process may be repeated to fabricate a "bridge" with columns (24,26) of conductors to the next level, and conductor (28) between the columns. For more efficient transfer of energy over the bridge, faces at 45° may be formed to reflect light up and across the bridge.

6 Claims, 17 Drawing Figures



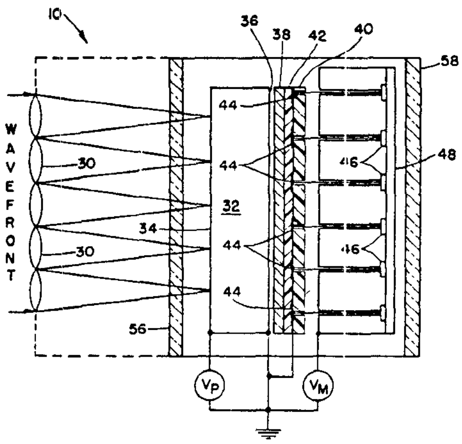
4,472,029 Sept. 18, 1984

Integrated Wavefront Compensator

Inventor: John W. Hardy.
Assignee: Itek Corporation.
Filed: Mar. 1, 1982.

Abstract—An integrated wavefront compensator for an active optics system in which the components for detecting distortions in a wavefront and the components for correcting the detected wavefront distortions are integrated into one unit. The parallel processing channels of the compensator are fabricated simultaneously using simple, solid state components.

10 Claims, 4 Drawing Figures



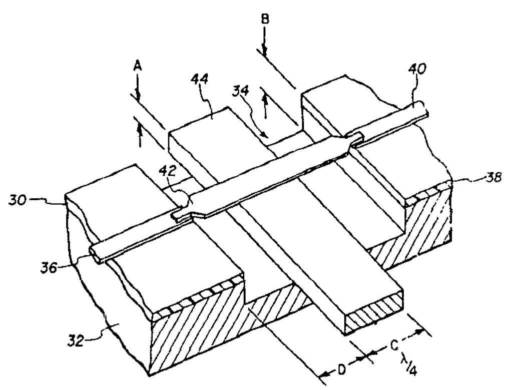
4,472,690 Sept. 18, 1984

Universal Transistor Characteristic Matching Apparatus

Inventor: Ben R. Hallford.
Assignee: Rockwell International Corporation
Filed: June 14, 1982.

Abstract—Microstrip transistor characteristic matching apparatus is illustrated which can be altered as to design frequency, phase of reflection signal coefficient and magnitude of reflection coefficient to optimize signal transmission to or from a given transistor. After adjustment, the apparatus can be analyzed to quickly determine the characteristics required for an in-circuit commercial version of such a device.

6 Claims, 8 Drawing Figures



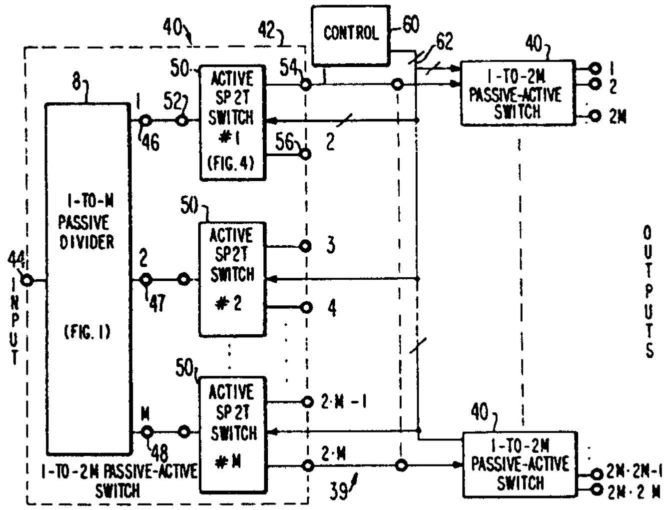
4,472,691 Sept. 18, 1984

Power Divider/Combiner Circuit as for Use in a Switching Matrix

Inventors: Mahesh Kumar and Lakshminarasimha C. Upadhyayula.
Assignee: RCA Corporation.
Filed: June 1, 1982.

Abstract—A one port-to-M port passive signal power divider circuit (or combiner circuit) where $M > 2$ and $\neq 2^N$, M and N are integers, includes $M-1$ two-way in-phase passive power dividers having a signal delay D through each path in one or more delay devices having delay D. Each output of each two-way power divider is coupled to an input of another power divider, a delay line or an output port, the arrangement being such that the delay through all ports of the power divider are equal. In accordance with a further embodiment of the invention the outputs of a passive power divider are connected to two-way switches using active components. The switches under control of a control circuit are utilized to switch the input signal to the power divider to any one of 2-M output terminals of the switches.

5 Claims, 6 Drawing Figures



4,472,695 Sept. 18, 1984

Bandpass Filter Tunable to a Predetermined Number of Discrete Frequencies Spread Over a Broad Frequency Band

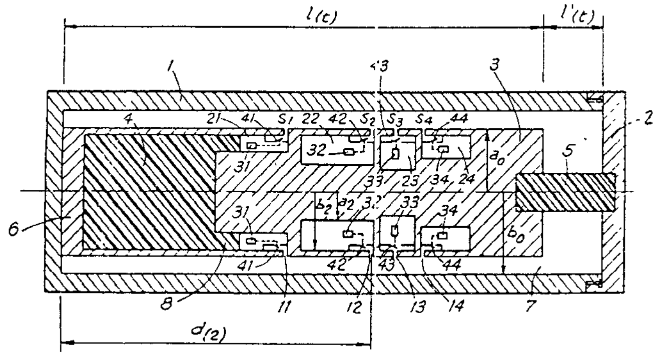
Inventors: Gilles Beauquet, Vasudeo Devarhubli, Gérard Dubost, and Michel Nicolas
Assignee: Societe SNECMA.
PCT Filed: Dec. 9, 1981.

Abstract—Coaxial filter having at least one of the internal and external conductors which is divided into sections (S_1 to S_4) separated by breaks having to form of annular slits whose thickness is very slight in relation to the wavelength.

Each section comprises at least one reactive tuning element such as an open- or short-circuited coaxial line portion and at least one switch element located in the vicinity of the corresponding break in order selectivity to short-circuit the said break or bring about the insertion of the corresponding reactive tuning element in response to electronic control devices.

Application to telecommunications.

7 Claims, 3 Drawing Figures



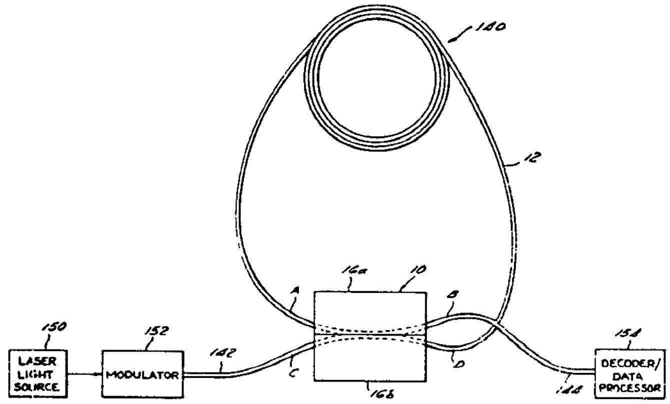
4,473,270 Sept. 25, 1984

Splice-Free Fiber Optic Recirculating Memory

Inventor: Herbert J. Shaw.
Assignee: Leland Stanford Junior University.
Filed: Oct. 23, 1981.

Abstract—A fiber optic recirculating memory is disclosed which utilizes a single splice-free single mode optical fiber coupled to itself to form a loop which acts as a delay line. A single signal supplied as an input to the device will result in a series of output signals identical to the input signal, although at smaller, decreasing amplitudes. In addition to being useful as a recirculating memory device for use in a system where data is generated at a rate faster than it can be accepted by a data processor, the invention may be used as a tap filter to pass a selected fundamental frequency and its harmonics, and to attenuate all other frequencies.

28 Claims, 7 Drawing Figures



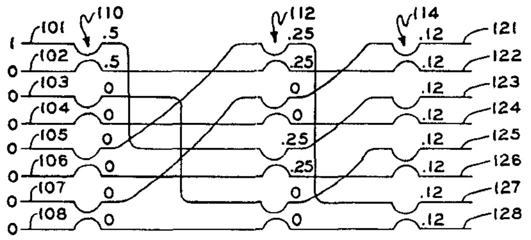
4,473,271 Sept. 25, 1984

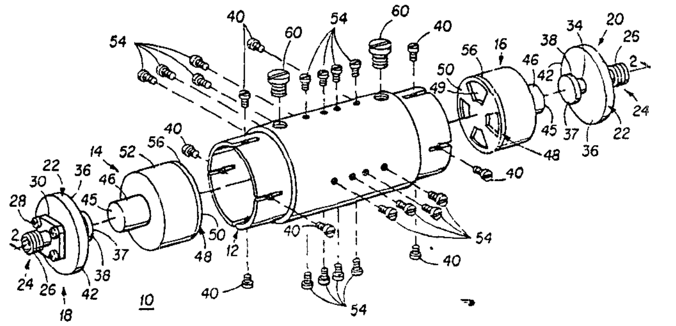
Method and Apparatus for Fiber Optic Coupling

Inventor: Gordon L. Mitchell.
Assignee: Honeywell Inc.
Filed: Dec. 17, 1981.

Abstract—An optical coupler for use with a plurality of fiber optics to couple any signal which may appear on any one or more of the input ends of the fibers so that at least a portion of such signal appears at the output ends of such fibers.

3 Claims, 6 Drawing Figures





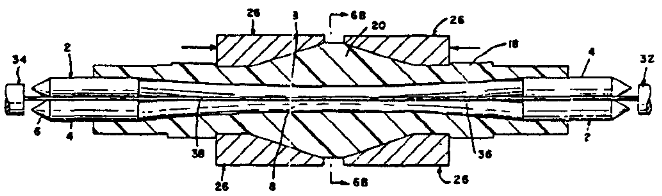
4,473,272 Sept. 25, 1984

Biconical Optical Waveguide Splice

Inventor: Tore R. Johnson.
Assignee: AMP Incorporated.
Filed: Nov. 29, 1982.

Abstract—A field appliable connector for splicing a pair of optical waveguides is disclosed. Three stepped profiled, parallel rods are adapted having larger diametered end portions, with smaller diametered segments extending therebetween. Radially compressive means is disclosed for preliminarily biasing the smaller diametered segments inwardly, whereby an interstitial passageway defined between the rods is made to assume a biconical profile for accommodating guided entry of two waveguides therein. Subsequently, further radial crimping of the smaller diameter rod segments proximate the abutment of the waveguide ends establishes a peripheral clamp upon the waveguides and effectuates their colinear axial alignment.

3 Claims, 11 Drawing Figures



4,473,807 Sept. 25, 1984

Coaxial K Inverter

Inventors: Robert J. Weber and James C. Cozzie.
Assignee: Rockwell International Corporation.
Filed: Oct. 18, 1982.

Abstract—An improved coaxial K inverter is disclosed for use in forming coaxial microwave filters. A filter including a K inverter may be constructed using at least one resonator including a conductor terminated at one end by an apertured plate and coaxially surrounded by a dielectric material. The resonator may be enclosed in a conductive housing electrically coupled to the apertured plate and capacitively coupled at the other end of the conductor to an input terminal for receiving microwave energy. A second conductor terminated at one end in a second apertured plate is positioned within the housing such that the apertured plates are adjacent one another forming a K inverter. The other end of the second conductor is capacitively coupled to an output terminal forming the electrical output from the filter.

10 Claims, 3 Drawing Figures

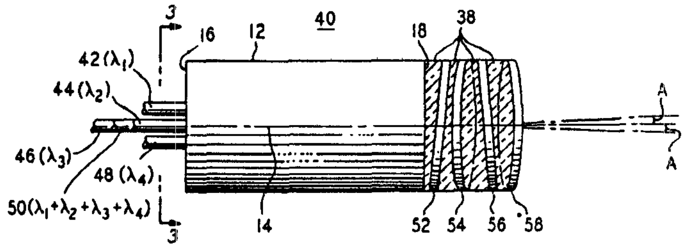
4,474,424 Oct. 2, 1984

Optical Multi/Demultiplexer Using Interference Filters

Inventor: Richard E. Wagner.
Assignee: AT&T Bell Laboratories.
Filed: Mar. 20, 1981.

Abstract—The disclosed multiplexer/demultiplexer (10,40) features input and output optical fibers (20,22,24,42,44,46,48,50) coupled to one face (16) of a graded refractive index rod collimating lens (12). Associated with the other face (18) of the lens (12) are a plurality of multilayer dielectric interference filters (26,32,52,54,56,58) which selectively reflect the input signals at different angles according to the wavelength and thereby direct them back through the lens (12) to the appropriate output fiber.

1 Claim, 3 Drawing Figures



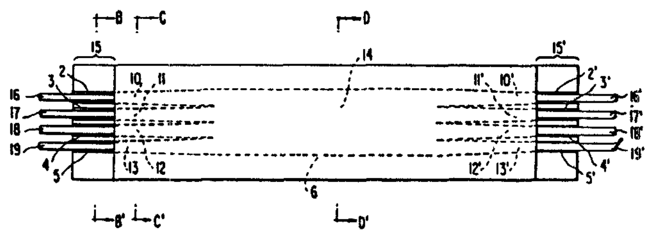
4,474,425 Oct. 2, 1984

Planar, Optical Star Coupler for Optical Fibers

Inventor: Kazuhisa Kaede.
Assignee: Nippon Electric Co., Ltd.
Filed: Nov. 13, 1981.

Abstract—An optical coupler formed on a substrate including a plurality of input and output guide channels and an immediate mixing guide channel connecting the input and output guide channels wherein the optical coupler comprises substantially V-shaped grooves on the substrate disposed in the ends of the input and output guide channels for receiving optical fibers.

7 Claims, 5 Drawing Figures



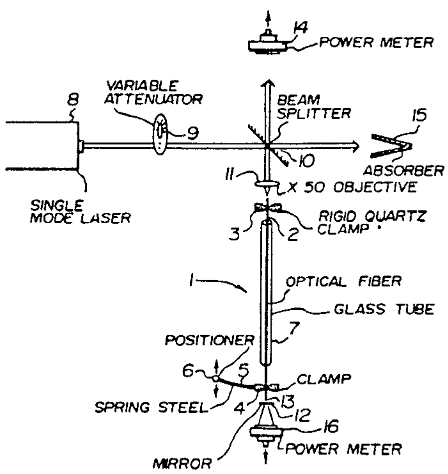
4,474,427 Oct. 2, 1984

Optical Fiber Reflective Filter

Inventors: Kenneth O. Hill, Brian S. Kawasaki, Derwyn C. Johnson, and Yoshimasa Fujii
Assignee: Canadian Patents & Development Limited.
Filed May 7, 1979.

Abstract—The optical reflective filter is made from a photosensitive optical fiber having a cladding and a core including germanium Refractive index perturbations are light induced in the fiber in the region of the guided light. The perturbations can be made to have a constant or a varying periodicity, or a series of constant periodicities. The filters are made from single mode or low order mode fibers having germanium doped silica or germania cores. The center frequency for reflective band or bands has a wavelength in the 400 nm to 550 nm range. The reflective band or bands in the filter can be shifted by stretching the filter.

17 Claims, 5 Drawing Figures



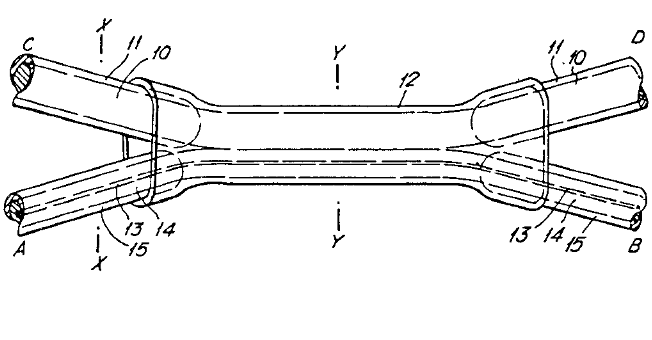
4,474,431 Oct. 2, 1984

Optical Fiber Directional Coupler

Inventor: Terry Bricheno.
Assignee: International Standard Electric Corporation.
Filed: Dec 5, 1983

Abstract—An optical fiber directional coupler has first and second optical fibers clamped together by a piece of low index heat-shrunk tubing 12 The first fiber consists solely of a core 10 and cladding 11 while the second has a core 13 a primary cladding 14 whose cross-sectional area is larger than that of the core, and a secondary cladding 15. The outermost layer of each fiber is absent over a portion of its length within the tubing 12 so that the core 10 of the first is in intimate contact with the primary cladding 14 of the second. The second fiber may have a mode stripper 45 to strip modes guided by the primary/secondary cladding interface. Fiber break detection apparatus and a single-fiber two-way transmission system are described which use such directional couplers.

8 Claims, 5 Drawing Figures



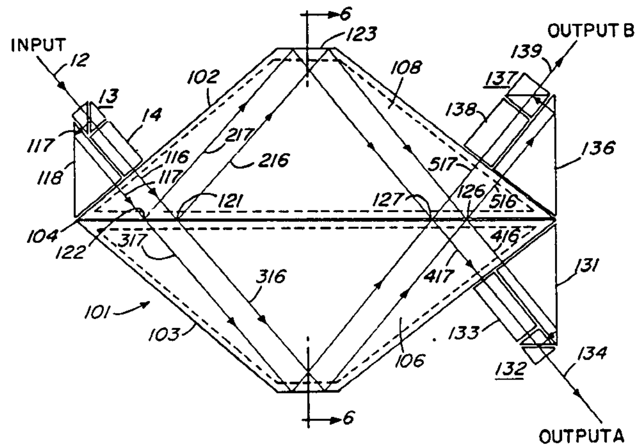
4,474,434 Oct. 2, 1984

Polarization-Insensitive Optical Switch Apparatus

Inventors: W. John Carlsen and Paul Melman.
Assignee: GTE Laboratories Incorporated.
Filed: Dec. 7, 1981.

Abstract—Polarization-insensitive optical switch and dual channel carrier multiplexer includes a polarization beam splitter for receiving an input collimated beam which has arbitrarily polarized components, splitting the beam into the two components. One of the components is rotated by a $\frac{1}{2}$ wave plate so as to yield a polarized beam which is polarized in the same direction as the other beam. The two polarized beams are then applied to a polarization sensitive interferometric multimode fiber optic switch and modulator. The output of the interferometric multimode fiber optic switch and modulator contains two beams, both polarized in the same direction. One of the beams is rotated ninety degrees by a 178 wave plate, and the two mutually perpendicularly polarized beams are then recombined by a polarization beam splitter operated in reverse to yield an output beam containing mutually perpendicular components

4 Claims, 6 Drawing Figures



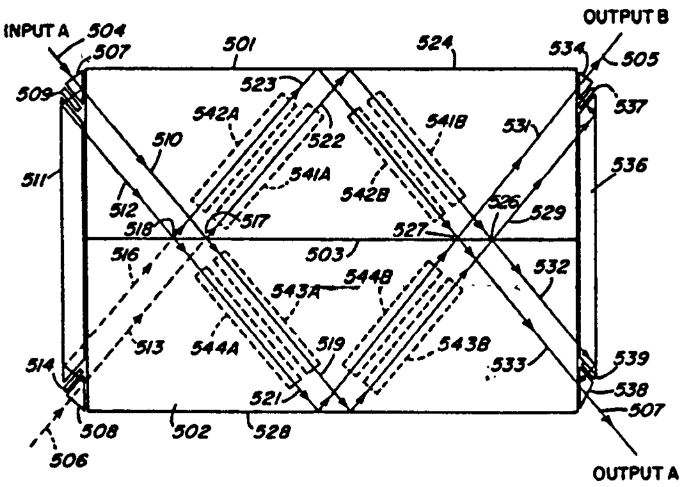
4,474,435 Oct 2, 1984

Polarization-Insensitive Optical Switch and Multiplexing Apparatus

Inventors: John W. Carlsen and Paul Melman.
Assignee: GTE Laboratories Incorporated
Filed: Dec 16, 1983.

Abstract—Polarization-insensitive optical switch and dual channel carrier multiplexer includes a polarization beam splitter for receiving an input collimated beam which has arbitrarily polarized components, splitting the beam into the two components. One of the components is rotated by a $\frac{1}{2}$ wave plate so as to yield a polarized beam which is polarized in the same direction as the other beam. The two polarized beams are then applied to a polarization sensitive interferometric multimode fiber optic switch and modulator. The output of the interferometric multimode fiber optic switch and modulator contains two beams, both polarized in the same direction. One of the beams is rotated ninety degrees by a $\frac{1}{2}$ wave plate, and the two mutually perpendicularly polarized beams are then recombined by a polarization beam splitter operated in reverse to yield an output beam containing mutually perpendicular components

2 Claims, 6 Drawing Figures



4,475,092 Oct. 2, 1984

Absorptive Resonant Cavity Filter

Inventors: Robert L. Epsom and Richard S. Kommrusch.
Assignee: Motorola Inc.
Filed: Dec. 20, 1982.

Abstract—An absorptive resonant cavity filter suitable for use on the output of a transmitter power amplifier and capable of substantially constant predetermined resistive input impedance at all frequencies. The structure comprises a bandpass cavity which instead of an input coupling loop employs a conductor coupled from the input and configured along the wall of the cavity to form a transmission line of predetermined impedance and terminated by a resistor of similar impedance value.

7 Claims, 1 Drawing Figure