Patent Abstracts

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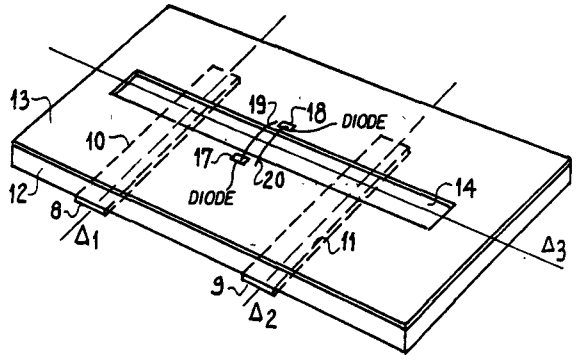
4,361,819 Nov. 30, 1982

Passive Semiconductor Power Limiter Formed on Flat Structure Lines, and an Ultra-High Frequency Circuit Using Such a Limiter

Inventors: Gilles Sillard; Michel Baril.
Assignee: Thomson-CSF.
Filed: Aug. 7, 1980.

Abstract—The passive limiter is formed by at least two parallel micro-strip lines, a slot line orthogonal to the two micro-strip lines and a pair of diodes having the same polarity and placed on each edge of the slot line facing one another, the assembly of these three lines and the diodes forming at least two micro-strip line-slot line transitions.

11 Claims, 7 Drawing Figures



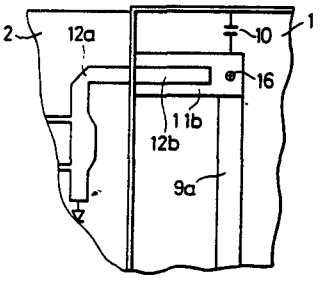
4,361,820 Nov. 30, 1982

Hybrid Microwave Circuit

Inventors: Morikazu Sagawa; Mitsuo Makimoto; Sadahiko Yamashita.
Assignee: Matsushita Electric Industrial Company, Ltd.
Filed: Oct. 15, 1980.

Abstract—A coaxial type microwave filter having an outer conductor and at least one inner conductor supported in the outer conductor has a strip transmission line extending from an external strip-line circuit to the inner conductor through an opening in the outer conductor. The strip transmission line includes a dielectric member forming an integral part of the dielectric substrate of the external circuit and a thin layer of conductive strip also forming an integral part of the conductive film pattern of the external circuit. The extending strip transmission line is electromagnetically coupled with the inner connector to permit the two microwave circuits to be interconnected with no use of a connector.

5 Claims, 5 Drawing Figures



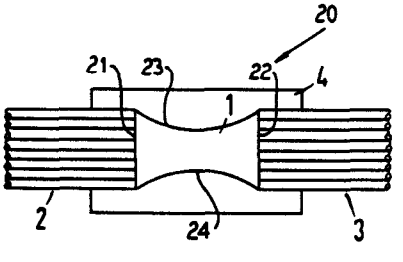
4,362,357 Dec. 7, 1982

Optical Star Coupler for Multi-Mode Light Conducting Fibers

Inventors: Michael Stockmann; Hans-Hermann Witte.
Assignee: Siemens Aktiengesellschaft.
Filed: Apr. 2, 1980.

Abstract—A three dimensional star coupler for interconnecting a first bunch of optical waveguides such as fibers to a second bunch of optical waveguides or optical fibers characterized by a mixing element being a planar waveguide having a thickness approximately equal to the fiber diameter and having input and output surfaces coupled to the incoming and outgoing fibers which are all supported in the same plane. The mixing element consists for example of an elongated rectangular plate but also can have a configuration of arcs of a circular configuration.

6 Claims, 3 Drawing Figures



4,362,359 Dec. 7, 1982

Coupling Device for Coupling Signals Into and Out of a Transmission Glass-Fiber

Inventors: Hans Dammann; Ulrich Killat.
Assignee: U.S. Philips Corporation.
Filed: Apr. 21, 1980.

Abstract—A device for coupling a first optical signal of a first wavelength into a transmission glass-fiber and for coupling a second optical signal, which has a second wavelength which differs from the first wavelength, out of the fiber. The two signals travel in the transmission glass-fiber in opposite directions. The optical signals also travel in other, spatially separated glass fibers. The device includes an imaging device arranged between the transmission glass-fiber and the other glass fibers. In the pupil of the imaging device, a binary optical grating is disposed. Other glass fibers receive the second optical signals which have been diffracted into the diffractions orders of the grating.

The grating is a phase grating and is arranged on an optical axis of the imaging device. It has a duty factor of at least substantially 1:1 as well as an optical path difference, $H=(n-1)h$, which is substantially

$$(N-1)h=n_1\lambda_I$$

where

$$n_1=1,2,3,\cdots,$$

and

$$(N-1)h=\left(m_1+\frac{1}{2}\right)\lambda_k$$

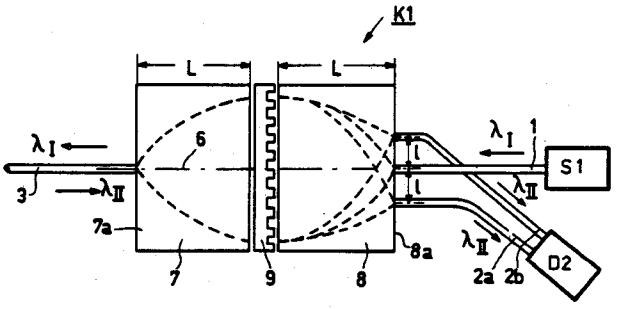
where

$$m_1=0,1,2,\cdots,$$

and

$$k=II,III,\cdots.$$

2 Claims, 4 Drawing Figures



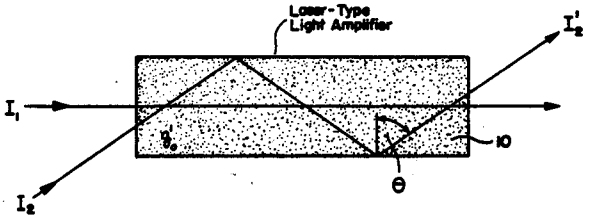
4,364,014 Dec. 14, 1982

Optical Modulator

Inventor: Richard W. Gray.
Filed: Mar. 30, 1978.

Abstract—An optical modulator is provided in which one light beam is modulated by another. The modulator of the invention includes a saturable medium which is capable of amplifying an optical signal by stimulated emission of radiation. Two optical signals, in the form of two light beams are caused to pass through the medium and to emerge from the medium in amplified form. The beams, however, are caused to have different gains in the medium either by causing the beams to have different path lengths, or by other means. The beams are intercoupled by cross-saturation of the medium. Thus, any variations in the intensity of one of the beams causes a change in intensity in the other beam. Since one of the beams has a greater gain than the other, a small change in the intensity of one of the beams will produce a large change in the intensity of the other beam, thus producing in many aspects the optical analog of the transistor. The modulator of the invention shall be referred to herein as an "opto-optic" modulator.

8 Claims, 9 Drawing Figures



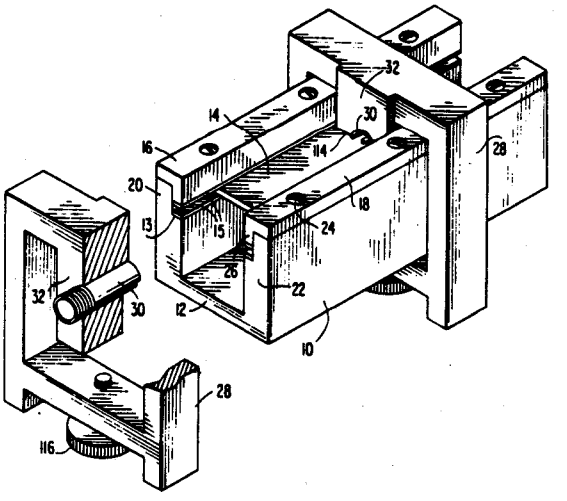
4,365,195 Dec. 21, 1982

Coplanar Waveguide Mounting Structure and Test Fixture for Microwave Integrated Circuits

Inventor: Ronald E. Stegens.
Assignee: Communications Satellite Corporation.
Filed: Dec. 27, 1979.

Abstract—A versatile test structure for coplanar waveguide (CPW) microwave integrated circuits is provided with a support structure or carrier which accommodates any length of CPW circuit. The carrier is provided with a shock mounting means for a CPW substrate which protects the substrate against physical damage, as well as damage caused by widely varying thermal coefficients of expansion. The carrier is provided at each end thereof with a sliding connector to inject or remove microwave energy from the CPW substrate via a coaxial connector. The sliding connector and the carrier together comprise a mounting structure for the substrate which may be further provided with a sliding energy sampler or a right-angle CPW transition which may be used to sample energy levels within the substrate, or test individual portions of a CPW circuit.

10 Claims, 9 Drawing Figures



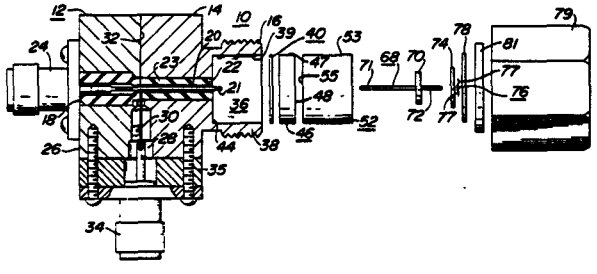
4,365,214 Dec. 21, 1982

Semiconductor Mounting and Matching Assembly

Inventor: Robert W. Shillady.
Assignee: American Electronic Laboratories.
Filed: Sept. 24, 1980.

Abstract—A semiconductor mounting and matching assembly capable of performing over a frequency range to 20 GHz and higher comprising a coaxial transmission line having a first portion with a first end for receiving radio-frequency signals and providing an input impedance and a second portion with a second signal output end providing a termination characteristic impedance. A semiconductor diode which is hermetically sealed within and removable with the second portion is mounted at the second end and has a load resistance terminating the transmission line. The transmission line has a plurality of sections for providing elements of a network which transforms the input impedance and matches the termination characteristic impedance of the second end of the transmission line to the load resistance of the semiconductor device. The elements of the network are provided by the configurations and discontinuities of the sections of the transmission line and the capacitive and inductive properties provided by the semiconductor device, whereby the network incorporates therein the parasitic reaction elements of the semiconductor device so that said assembly transmits radiofrequency signals from its input end to the semiconductor device at its output end with low reflection and attenuation over a wide-band of frequencies.

30 Claims, 6 Drawing Figures



4,365,222 Dec. 21, 1982

Stripline Support Assembly

Inventor: Norman R. Lampert.
Assignee: Bell Telephone Laboratories, Inc.
Filed: Apr. 6, 1981.

Abstract—In a stripline transmission assembly, precise positioning of the metallic conductor (10) within the grounded channel (11) is achieved through the use of one or more support posts (20). Each post is inserted into a hole (30) in the channel bottom and extends through a hole (31) in the metallic conductor.

6 Claims, 4 Drawing Figures

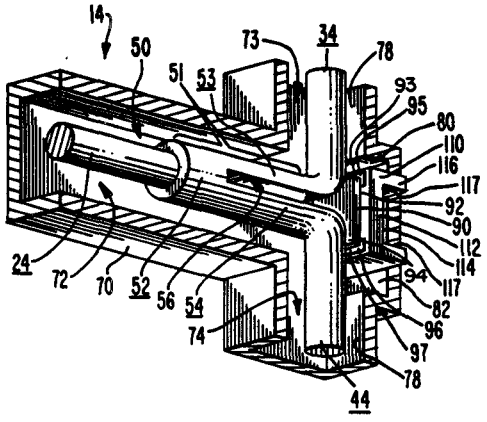
4,365,215 Dec.21, 1982

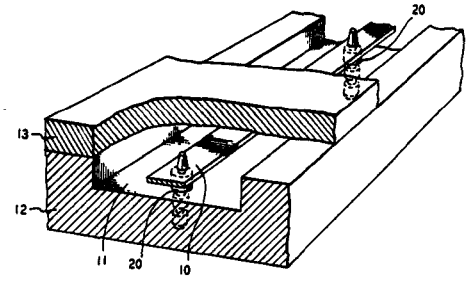
High Power Coaxial Power Divider

Inventor: Norman R. Landry.
Assignee: RCA Corporation.
Filed: Jan. 21, 1981.

Abstract—The power handling capacity of a matched coaxial transmission line power divider is increased with a minimum increase in losses by mounting the isolation resistor(s) within the dielectric volume of the coaxial transmission line and on an electrically-insulating resistor contact portion of a thermally-conducting heat sink. A low dielectric constant region is located between the resistor contact portion of the heat sink and the directly adjacent portion of the outer conductor of the coaxial transmission line.

9 Claims, 6 Drawing Figures





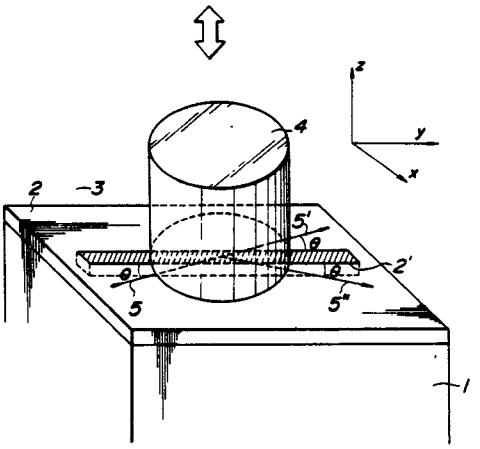
4,365,862 Dec. 28, 1982

Optical Switch

Inventors: Hiroshi Terui; Morio Kobayashi.
Assignee: Nippon Telegraph & Telephone Public Corporation.
Filed: Jan. 5, 1981.

Abstract—An optical switch comprising a substrate with a refractive index n_1 which is transparent with respect to a guided light beam, an optical waveguide film with a refractive index n_2 which is formed on the substrate, a low-refractive-index region with a refractive index n_2' which is smaller by a predetermined value than the refractive index n_2 formed at a predetermined location in the optical waveguide film, a movable dielectric chip with a refractive index n_4 which is transparent with respect to the guided light beam and a relative distance of which is adjustable relative to a plane including the low-refractive-index region and a vicinal area of the optical waveguide film in the vicinity of the region, and an intermediate layer with a refractive index n_3 disposed between the plane and the movable dielectric chip wherein the refractive indices n_1, n_2, n_2', n_3, and n_4 have a relationship of $n_2 > n_2' > n_4 > (n_1, n_3)$, and effective refractive indices of the optical waveguide film and the low-refractive-index region are varied by changing a distance between the plane and the movable dielectric chip, so that guided light beam incident to the region is deflected. With such an arrangement, a deflection angle of 20° or more is obtained, so that the optical switch is suitable for the integration of the optical switch.

19 Claims, 19 Drawing Figures



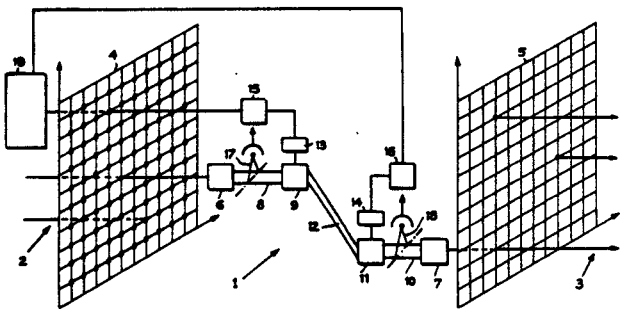
4,365,863 Dec. 28, 1982

Optical Switch for a Very Large Number of Channels

Inventor: Georges J. G. Broussaud.
Assignee: Le Materiel Telephonique Thomson-CSF.
Filed: May 29, 1980.

Abstract—An optical switching system comprising two optical fiber arrays 4 and 5 facing one another. In the space between these two arrays, a propagation mode converter 6 or 7, deflector 9 or 11, a deflector control device 13 or 14 and control logic 15 or 16 controlled by a processor 19 are placed for each fiber.

7 Claims, 3 Drawing Figures



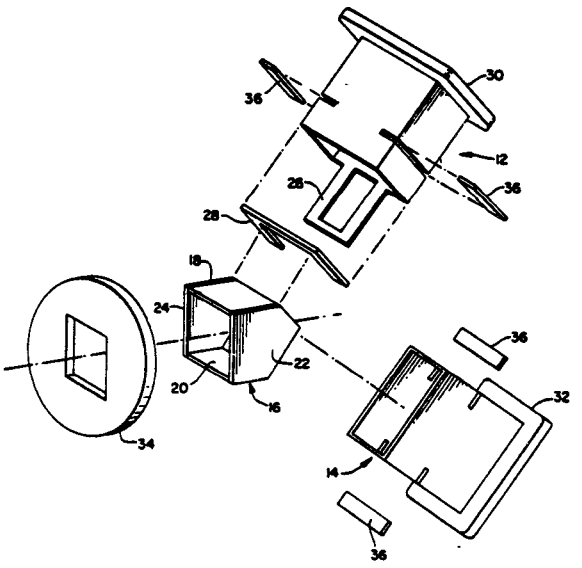
4,366,453 Dec. 28, 1982

Orthogonal Mode Transducer Having Interface Plates at the Junction of the Waveguides

Inventor: Helmut Schwarz.
Assignee: Harris Corporation.
Filed: Jan. 19, 1981.

Abstract—In orthogonal mode transducers, typically a first rectangular waveguide capable of carrying a signal having a first polarization and a second rectangular waveguide capable of carrying a signal having a second polarization orthogonal to the first polarization are coupled to a common central waveguide which is capable of carrying signals having both the first and second polarizations. However, in the past, difficulties have been encountered in manufacturing such orthogonal mode transducers because of the necessity of matching these respective waveguides which do not have the same cross-sectional shape and which must be oriented in a particular manner relative to one another to achieve the desired result. To overcome this difficulty in manufacturing, the present invention couples the first and second rectangular waveguides to the central waveguide so that the longitudinal axes of the first and second rectangular waveguides are symmetrically arranged relative to the longitudinal axis of the central waveguide to form a symmetrical *Y*-configuration.

11 Claims, 2 Drawing Figures



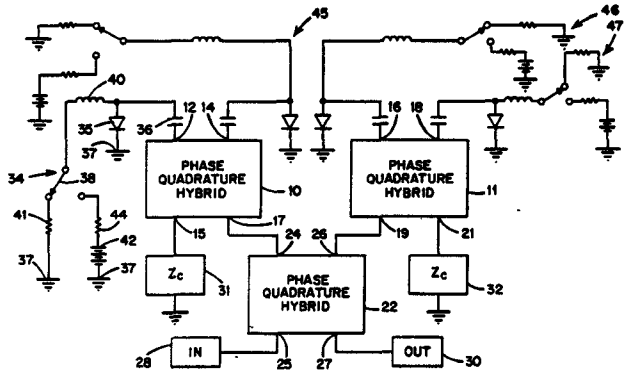
4,366,454 Dec. 28, 1982

Microwave Hybrid Phase Modulators

Inventor: Edward Salzberg.
Filed: Dec. 9, 1980.

Abstract—Microwave phase modulators are described utilizing three or more hybrid junctions, two of which are phase quadrature hybrids each having one pair of conjugate terminals terminated with switching means and each having one of the remaining terminals connected to a respective terminal of a third hybrid junction. With power in at a third terminal of the third hybrid junction, power out at the 4th terminal of the third hybrid junction can be selectively shifted 180° or switched off by operation of the switching means. Broad band operation is achieved and reflections by the switching means do not have to have a precise phase tolerance as long as they are similar.

5 Claims, 2 Drawing Figures



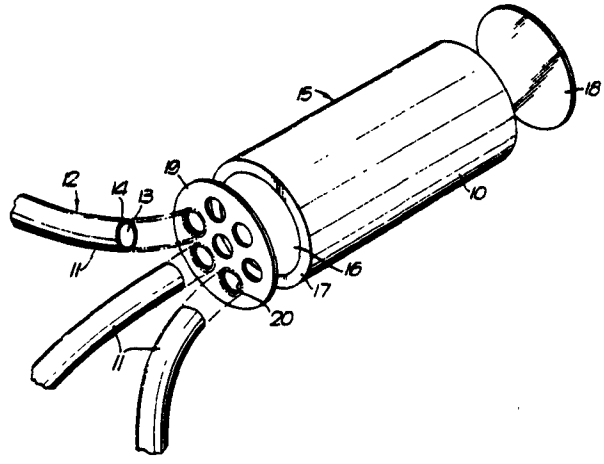
4,365,864 Dec. 28, 1982

Optical Fibre Multiport Couplers

Inventors: Andrew G. Cowley; David N. Payne; Paul M. Watson.
Assignee: National Research Development Corporation.
Filed: Aug. 1, 1980.

Abstract—A star coupler for distributing light from an input optical fibre to one or more output fibres comprises a glass mixer rod interfaced with an optical fibre array and provided with a coating of highly reflective material at the array/mixer rod interface. The coating is provided with apertures which correspond to the fibre core positions such that the coating masks the cladding and interstitial regions of the fibre array. The end face of the mixer rod remote from this interface can be either uniformly mirrored or can be coupled with a second fibre array by a similar reflecting array/mixer rod interface.

14 Claims, 3 Drawing Figures



4,366,452 Dec. 28, 1982

Multi-Position Waveguide Switch

Inventors: William J. Dittman; Calvin R. Jameson.
Assignee: Georgia Tech Research Institute.
Filed: Jan 12, 1981.

Abstract—A multi-position waveguide switch including a cylindrical housing supporting radially extending waveguides, a switching assembly composed of a stack of disks each having input and output ports interconnected by waveguide sections, and a mechanism for selectively translating the stack of disks to selected axial positions within the cylindrical housing such that a selected disk is in alignment and communication with certain predetermined ports of the radially extending waveguides. By selective axial translation of the disk assembly, a selected disk may be interposed between the radially extending waveguide supported by the housing to provide a selected routing path for microwave energy to the waveguides supported by the housing and through the selected disk.

2 Claims, 9 Drawing Figures