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.

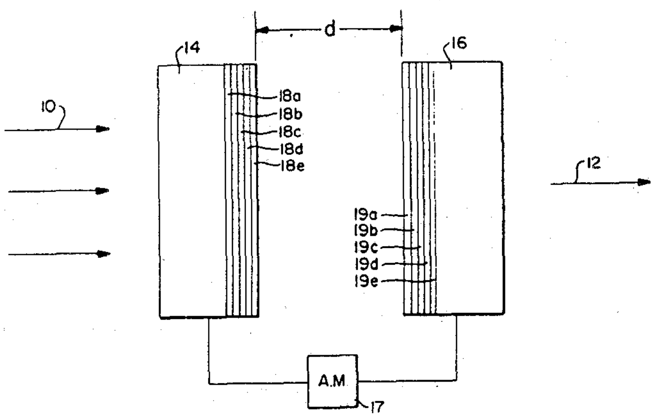
4,377,324 Mar. 22, 1983

Graded Index Fabry-Perot Optical Filter Device

Inventors: William W. Durand; Anil K. Jain; Ronald E.Peterson.
Assignee: Honeywell Inc.
Filed: Aug. 4, 1980.

Abstract—A Fabry-Perot Filter device comprising a pair of low index substrates having a refractive index of less than 2.4 and mounted in parallel relationship so as to present facing sides to each other in an optical path. A coating is placed on the facing sides of each of said low index substrates, the coating having an increasing index of refraction away from the sides from about that of the substrate to above 4.0 such that the index increases in increments of from at least 2 steps to continuously. The total coating thickness is on the order of the light wavelength or more. Means are also provided to adjust the distance between the two faces, at least from a distance of from substantially less than a desired wavelength to at least one-half of the desired wavelength.

5 Claims, 2 Drawing Figures



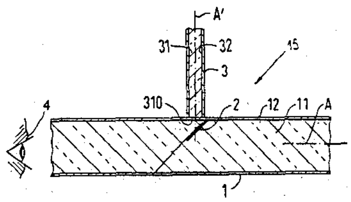
4,378,143 Mar. 29, 1983

Device for Coupling Radiation into an Optical Waveguide

Inventor: Gerhard Winzer.
Assignee: Siemens Aktiengesellschaft.
Filed: Sep. 4, 1980.

Abstract—An optical device coupling light between a first light waveguide and either a second light waveguide or a radiation source characterized by the first light waveguide having a core of a predetermined cross-sectional area, a reflective layer or mirror of a high reflectance being disposed on an angle to the axis of the waveguide and occupying only a small portion of the total cross-sectional area of the core so that only a small portion of the light traveling in the core of the first waveguide will be blocked by the presence of the mirror. The second waveguide will have a core diameter substantially smaller than that of the first waveguide and the mirror is mounted in the first core adjacent to the connection with the second core. The radiation source may be either a laser diode, semi-conductor laser or a light emitting diode.

11 Claims, 5 Drawing Figures



4,378,144 Mar. 29, 1983

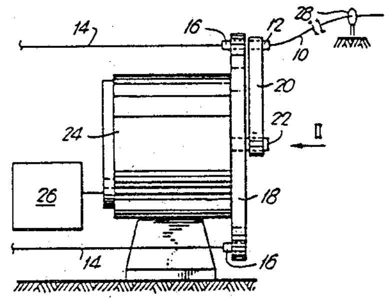
Optical Switch

Inventors: Gary S. Duck; Masamichi Yataki; Jozef Straus, William J. Sinclair.
Assignee: Northern Telecom Limited.
Filed: Dec. 22, 1980.

Abstract—An optical switch having a light input side and a light output side where there are a plurality of optical waveguides with light collimating lenses on one of the sides with the lenses in spaced positions and, on the other side there is an optical waveguide with a light collimating lens. To enable light to be transferred between the latter waveguide and any of the other lenses, it is movable to bring its lens into any of a plurality of switch positions, each corresponding to the position of one of the other lenses, and means is provided to move the lens selectively between positions. In preferred arrangements, the plurality of lenses are arranged around at least one pitch circle but a linear

arrangement of lenses is also possible. An electric stepping motor is ideally used for the switching operation.

5 Claims, 9 Drawing Figures



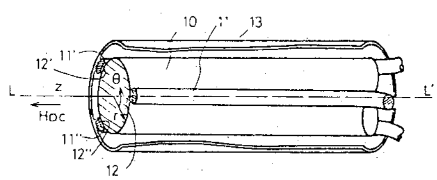
4,378,951 Apr. 5, 1983

Traveling Wave Coupled Type Optical Wave Circulators

Inventor: Tsukasa Nagao.
Filed: Jun. 19, 1980.

Abstract—An optical wave circulator of the invention utilizes the coupled hybrid mode of split magneto-optical circular-cylindrical-transmission-line (MOTL) waves, with the biasing magnetic field applied parallel to the common axis. Coupling between waves of optical glass fiber transmission lines (GFTLs) and those of the MOTL can be made through openings of the MOTL junction. Forward-to-forward traveling wave coupling, forward-to-backward traveling wave coupling and others perform important rôles in achieving circulations. Use of more than a single operating point for circulator performance can be made to obtain broadband and diplexer operations in the optical waves.

16 Claims, 29 Drawing Figures



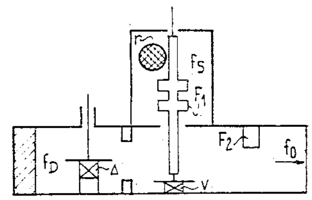
4,380,744 Apr. 19, 1983

Stabilized Oscillator for Microwaves with Frequency Conversion and its Solid State Construction

Inventor: Gérard Kantorowicz.
Assignee: Thomson-CSF.
Filed: Jun. 12, 1980.

Abstract—An oscillator including, a parametric amplifier which has three branches at the terminals of a non-linear capacitor C(V). In the pump branch there is a negative resistance dipole (D) which is able to oscillate at frequency f_p. One of the two other branches is matched to a resonant circuit (C_s) exhibiting a high Q factor at frequency f_s, and the other branch is matched to a load impedance, namely that of resonant circuit (C_0) at frequency $f_0 \cdot (f_0 = f_p - f_s)$. A high level output signal f_0 is thus provided.

7 Claims, 5 Drawing Figures



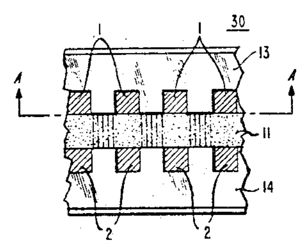
4,381,138 Apr. 26, 1983

Electrooptic Devices

Inventor: Lawrence L. Buhl.
Assignee: Bell Telephone Laboratories Incorporated.
Filed: Aug. 25, 1980.

Abstract—The response, as a function of frequency, of electrooptic mode converters using comb electrodes has been found to include several peaks at frequencies above and below the desired frequency. These spurious peaks appear to be caused by fringing of the electric field which effectively changes the spatial period of the electrode fingers. To prevent this unwanted coupling, channels have been etched between the comb fingers. The result is to confine the electric field to the narrow region between opposing electrode fingers, thereby minimizing the spurious responses. It also serves to reduce the magnitude of the applied voltage required to produce the same field strength.

6 Claims, 5 Drawing Figures



4,381,139 Apr. 26, 1983

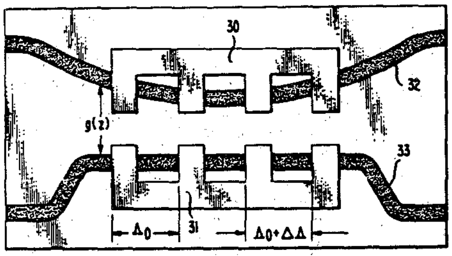
Velocity Mismatched Modulator

Inventor: Rodney C. Alferness.
Assignee: Bell Telephone Laboratories, Incorporated.
Filed: Aug. 29, 1980.

Abstract—The coupling efficiency between a pair of identical optical waveguides (11,12) is modulated by a traveling electrical wave (14,15). Because the propagating constants of the optical and modulating systems are not equal, the interaction between them is limited to periodic intervals along the optical

wavepaths. By the appropriate selection of this spatial period, a velocity match between the modulating and optical systems is simulated.

9 Claims, 3 Drawing Figures



4,382,239 May 3, 1983

Waveguide Cooling System

Inventors: Alan M. Lovelace;
Bill C. J. Chen; Robert W. Hartop.
Filed: Apr. 30, 1981.

Abstract—An improved system is described for cooling high power waveguides by the use of cooling ducts extending along the waveguide, which minimizes hot spots at the flanges where waveguide sections are connected together. The cooling duct (24) extends along substantially the full length of the waveguide section, and each flange (18,20) at the end of the section has a through hole (36) with an inner end connected to the duct and an opposite end that can be aligned with a flange hole in another waveguide section. Each flange (20) is formed with a drainage groove (60) in its face, between the through hole (36) and the waveguide conduit (16) to prevent leakage of cooling fluid into the waveguide. The ducts have narrowed sections (32,34) immediately adjacent to the flanges to provide room for the installation of fasteners closely around the waveguide channel.

7 Claims, 4 Drawing Figures