

# 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.

4,396,900

Aug. 2, 1983

4,398,122

Aug. 9, 1983

## Thin Film Microstrip Circuits

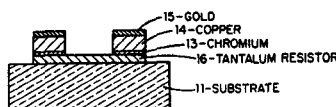
Inventor: Ronald D. Hall.

Assignee: The United States of America as  
represented by the Secretary of the Navy.

Filed: Mar. 8, 1982.

**Abstract**—A four layer thin film metallization system is comprised of layers of tantalum, chromium, copper and gold and is useful in high resolution, low loss microstrip circuits. The metallization system is compatible with lead-tin solder and, in addition, provides low insertion losses at X-band frequencies.

1 Claim, 2 Drawing Figures



## Multistage Depressed Collector for Microwave Tube

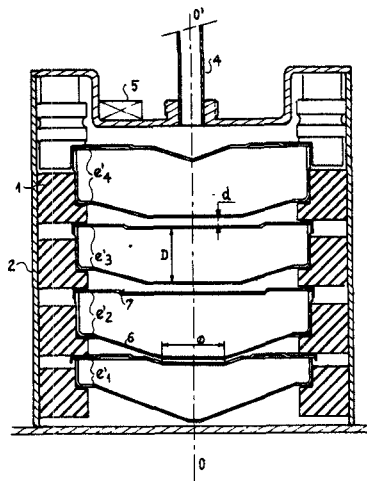
Inventor: Philippe Gosset.

Assignee: Thomson-CSF.

Filed: Apr. 14, 1981.

**Abstract**—The present invention relates to multistage vacuum collectors for ultra-high frequency tubes. Each electrode of the collector comprises two walls which are axially symmetrical with respect to the beam propagation axis and which are superimposed along said axis. The retarding path of the electrons due to the decreasing potentials of the electrodes is thus located in a small volume space between the facing walls of two adjacent electrodes. A plurality of permanent magnets positioned outside the vacuum enclosure above the final electrode produce an asymmetrical magnetic field with respect to the propagation axis. Application to travelling-wave tubes and klystrons.

4 Claims, 2 Drawing Figures



4,398,121

Aug. 9, 1983

## Mode Suppression Means for Gyrotron Cavities

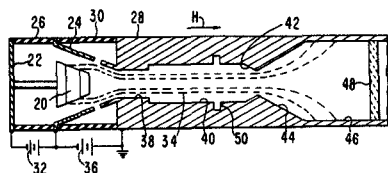
Inventors: Marvin Chodorow and Robert S. Symons.

Assignee: Varian Associates, Inc.

Filed: Feb. 5, 1981.

**Abstract**—In a gyrotron electron tube of the gyro-klystron or gyro-monotron type, having a cavity supporting an electromagnetic mode with circular electric field, spurious resonances can occur in modes having noncircular electric field. These spurious resonances are damped and their frequencies shifted by a circular groove in the cavity parallel to the electric field.

4 Claims, 5 Drawing Figures



4,398,792

Aug. 16, 1983

## Holographic Coupler for Fiber Optic Systems

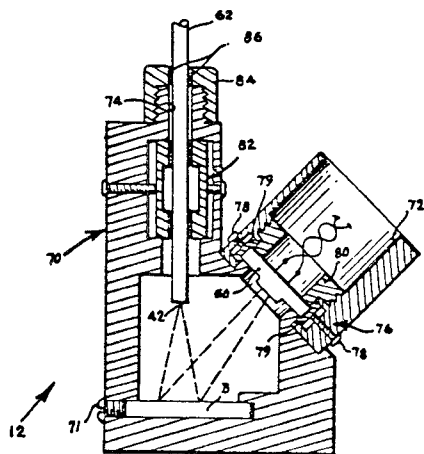
Inventors: Joseph L. Horner and  
Jacques E. Ludman.Assignee: The United States of America as  
represented by the Secretary of the  
Air Force.

Filed: Feb. 3, 1981.

**Abstract**—A holographic coupler for fiber optic systems having a holographic element utilized in conjunction with an optical source and an optical

fiber in order to direct and couple the beam emanating from the optical source into the fiber. The holographic element, source and optical fiber have the same relative position with respect to each other as (1), a photosensitive medium, (2) a means for sizing and shaping a beam of temporally and spatially coherent radiation to the same geometry as the optical source before the beam impinges upon the photosensitive medium, and (3) the focal point of a converging beam of temporally and spatially coherent radiation impinging upon the photosensitive medium during the making of the holographic element used with the coupler

#### 4 Claims, 4 Drawing Figures



4,398,794

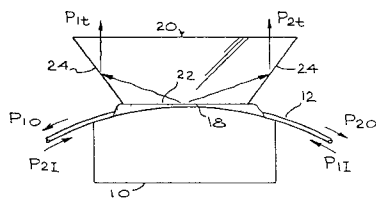
Aug. 16, 1983

### Dual Directional Tap Coupler

Inventors: John P. Palmer and Phillip B. Ward, Jr.  
 Assignee: General Dynamics, Pomona Division.  
 Filed: Nov. 18, 1981.

**Abstract**—A low-loss fiber optic tap coupler including an optical fiber mounted and adhered to a curved surface and having a clad single fiber core, a planar surface extending partially into and along the fiber through the cladding, a prism mounted on the surface having two reflective surfaces positioned to receive signals from the fiber travelling in opposite directions, and photodiodes mounted adjacent to the prism to receive the reflected signals

#### 16 Claims, 8 Drawing Figures



4,398,795

Aug. 16, 1983

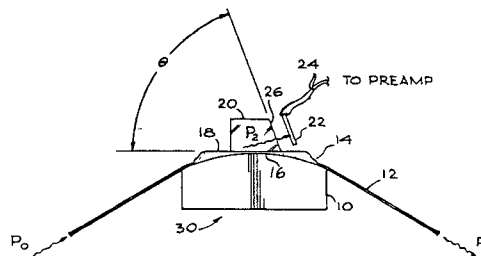
### Fiber Optic Tap and Method of Fabrication

Inventor: John P. Palmer.  
 Assignee: General Dynamics, Pomona Division  
 Filed: Jan. 23, 1981.

**Abstract**—A low-loss fiber optic tap is fabricated by mounting a portion of an optical fiber with epoxy resin along the curved surface of a solid support form. After curing of the epoxy, a planar surface extending partially into and

along the fiber is established by lapping and polishing the device to a carefully controlled depth. A prism having a preferred characteristic angle of  $70^\circ$  is attached to the planar surface along the optical fiber and a photodiode is mounted adjacent thereto. The disclosure teaches how the parameters of the device may be tailored to the specific signal tap requirements of particular fiber optic transmission lines.

#### 16 Claims, 7 Drawing Figures



4,398,796

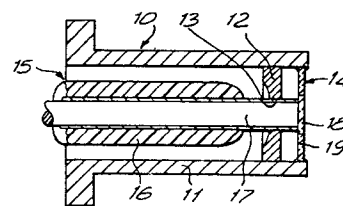
Aug. 16, 1983

### Optical Fibre Termination

Inventors: David G. Dalgoutte, John D. Archer,  
 Peter F. C. Burke, and Robert G. Pragnell  
 Assignee: International Standard Electric  
 Corporation.  
 Filed: Dec. 30, 1981.

**Abstract**—A fibre optic connector of the watch jewel type is provided with a transparent window adjacent the fibre end whereby the fibre is protected from dirt or damage. The window may be provided with a light guiding portion in alignment with the fibre.

#### 5 Claims, 3 Drawing Figures



4,398,806

Aug. 16, 1983

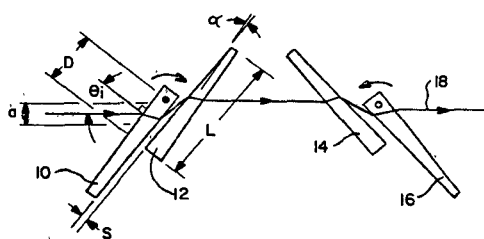
### Broadband Variable Optical Attenuator

Inventors: Keith E. Bennett and Robert L. Byer.  
 Assignee: The Board of Trustees of the Leland University  
 Filed: Oct. 23, 1980.

**Abstract**—An optical variable attenuator includes first, second, third and fourth wedge shaped plates, each of said plates having two surfaces defined by an angle of convergence, the first and second plates being supported with two of said surfaces of said first and second plates being in spaced parallel

alignment and with the angle of convergence of the two plates being in opposite directions, and the third and fourth plates being supported with two of said surfaces of said third and fourth plates being in spaced parallel alignment and with the angle of convergence of the third and fourth plates.

6 Claims, 7 Drawing Figures



4,399,562

Aug. 16, 1983

### Full Balun Mixer

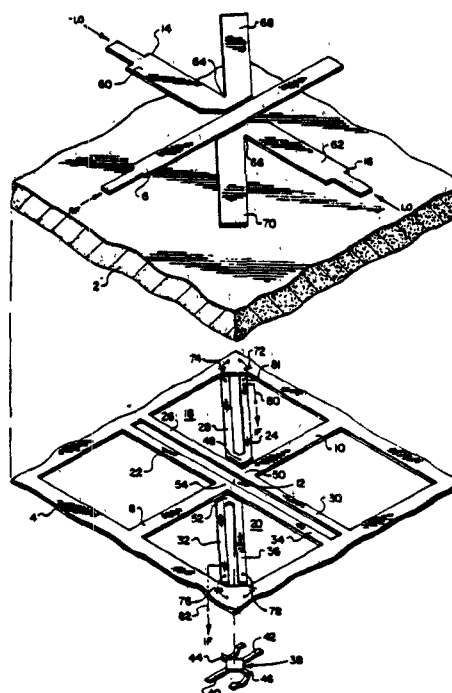
Inventor: Ben R. Hallford.

Assignee: Rockwell International Corporation.

Filed: July 24, 1981.

**Abstract**—Microwave circuit layout structure is disclosed for a diode mixer frequency converter. Each mixer port is provided by balun circuitry, and the diodes are isolated from, and on the opposite side of the substrate from, the primary circuits of the baluns. Single and double sideband versions are disclosed, including various combinations of dual and single baluns and porting structure.

16 Claims, 4 Drawing Figures



4,399,403

Aug. 16, 1983

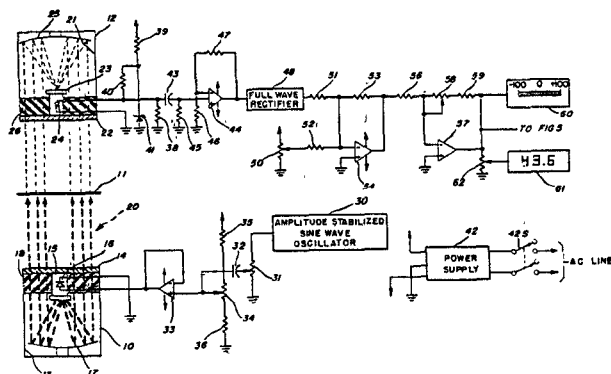
### Microwave Moisture Measuring, Indicating, and Control Apparatus

Inventors: Charles F. Strandberg, Jr., and Robert C. Strandberg.

Assignee: Strandberg Engineering Laboratories, Inc.  
Filed: Sep. 22, 1981.

**Abstract**—A microwave moisture measuring, indicating and control apparatus for measuring the moisture content of material in an inspection area, comprising a microwave transmitting transducer including a modulated signal microwave generator and parabolic reflector for directing a beam of microwave energy through the inspection area and the material to be monitored therein and including a microwave absorbing material layer in the path of the microwave beam directed from the reflector toward the inspection area. A microwave receiver transducer is located on the opposite side of the inspection area from the transmitting transducer and also includes a parabolic reflector for receiving the microwave energy monitoring beam after its passage through the inspection area and direct from the same to a microwave detector, the monitoring beam also passing through a layer of microwave absorbing material at the receiver transducer. The microwave detector produces an output signal which is processed by moisture measuring and indicating circuitry to provide an output reading which is directly proportional to the amount of moisture present in the material located in the inspection area. The device further includes a moisture control circuit for providing correctional control signals for restoring the moisture content of the material to a selected level, if desired.

9 Claims, 5 Drawing Figures



4,400,053

Aug. 23, 1983

### Optical Fiber Coupler

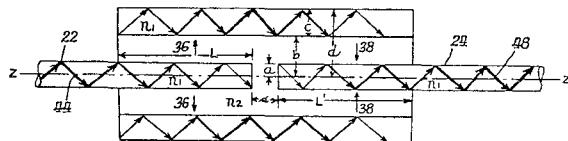
Inventor: Ghaffar Kazkaz.

Filed: July 10, 1980.

**Abstract**—An optical fiber coupler in which adjacent end portions of two optical fibers are inserted predetermined coupling lengths into recesses in

opposite and portions of a tubular waveguide. Each optical fiber comprises an optical fiber guiding core with outer cladding. The tubular waveguide comprises an annular cross-section tubular guiding core with inner and outer cladding. The adjacent end portions of the optical fiber guiding cores are aligned with one another along the axis of the tubular waveguide and are disposed concentrically within it. Their adjacent end surfaces may be spaced apart, or may abut. The optical fibers are fixed with their guiding cores concentrically aligned within the tubular waveguide guiding core by a spacer member. The optical fiber guiding cores and the tubular waveguide guiding core have the same refractive index, for example, 1.500. The spacer member and the cladding materials have a lower refractive index, for example, 1.495. Optimum relationships between the physical and optical parameters of the coupler are defined for maximum optical power transmission. These are expressed as equations in which unknown parameters such as the thickness of the tubular waveguide guiding core, and the coupling lengths (namely, the distances the optical fiber guiding cores are inserted into the tubular waveguide) can be determined from known parameters.

16 Claims, 4 Drawing Figures



4,400,054

Aug. 23, 1983

## Passive Optical Coupler

Inventors: James R. Biard, John E. Shaunfield, and Royce S. Speer.

Assignee: Spectronics, Inc.

Filed: Jan. 22, 1982

**Abstract**—Disclosed is an optical data bus employing a passive optical coupler. The optical coupler includes a scrambler rod which is rectangular in cross section and employs solid substantially inflexible side arms which are also rectangular in cross section. The side arms include a mirrored prism to bend the light path and permit separation of the ends of the distribution side arms so that flexible fiber bundles may be attached to the ends of the distribution side arms.

27 Claims, 5 Drawing Figures

