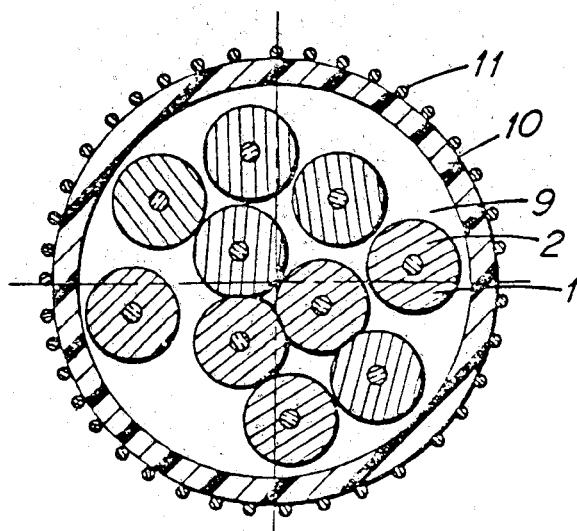


corresponding increase of the elongation at break of the fiber. The fiber can be provided with an intermediate protective layer, and an intermediate adhesive layer can be used. Optical transmission means comprising one or more optical elements in a sheath are described.

#### 11 Claims, 4 Drawing Figures



4,290,009

Sep. 15, 1981

#### Standing Wave Ratio Detecting Apparatus

Inventors: Konomu Sanpei; Tadaaki Fujii.

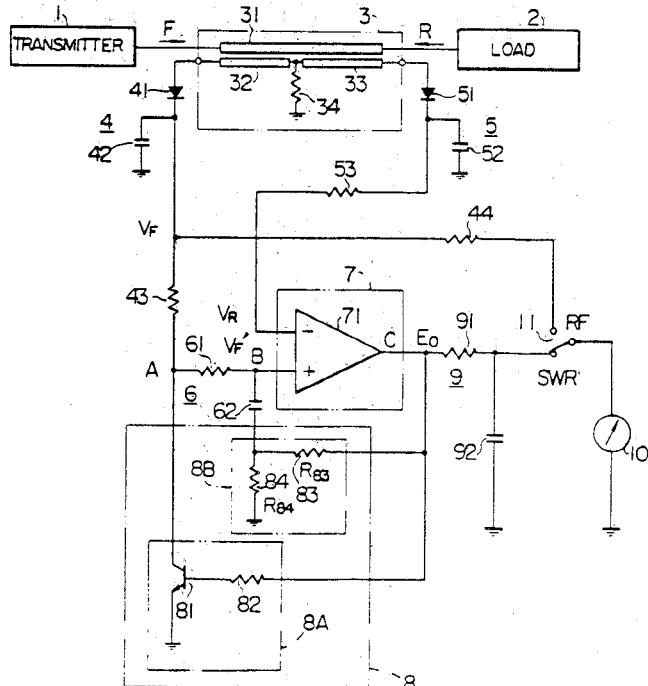
Assignee: Hitachi, Ltd.

Filed: May 11, 1979.

**Abstract**—A standing wave ratio detecting apparatus is disclosed which comprises an integration circuit for integrating a traveling wave detection voltage  $V_F$ , a comparator circuit for comparing the output voltage  $V_F'$  of the

integration circuit with a reflected wave detection voltage  $V_R$  to a voltage  $E_O$  proportional to the voltage ratio  $V_R/V_F$ , a control circuit receiving the output voltage  $E_O$  of the comparator circuit and turned on or off according as the output voltage  $E_O$  is put in a high level or in a low level to lower or raise the output voltage  $V_F'$  of the integration circuit, thereby conducting such a control as making the output voltage  $V_F'$  approximately equal to said reflected wave detection voltage  $V_R$  and maintaining the amplitude of the output voltage  $E_O$  constant, a smoothing circuit for deriving an average voltage corresponding to the ratio  $V_R/V_F$  of the reflected wave detection voltage  $V_R$  to the traveling wave detection voltage  $V_F$  from the output voltage  $E_O$  of the comparator circuit, and a meter for indicating the average voltage from the smoothing circuit.

#### 5 Claims, 6 Drawing Figures



## Announcements

**Low-Noise Microwave Transistors and Amplifiers, a Book of Selected Reprints**—H. Fukui, Ed. (IEEE Press, 1981, 472 pp. Paperback member edition: \$16.95. Clothbound edition: \$33.95 (discounted to \$25.45 for IEEE members). Available postpaid from IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. Payment should accompany orders.) *Description provided by Reed Crone, IEEE Publishing Services, New York, NY 10017.*

Low-noise amplification at microwave frequencies is of great importance in a number of applications, including satellite and terrestrial communications, radioastronomy, and radar. The use of transistors in these applications has resulted in improved

performance, simplified operation, increased reliability, reduced maintenance, and better cost efficiency.

This book, sponsored by the IEEE Microwave Theory and Techniques Society, brings together a collection of sixty of the best papers on the subject, divided by subject matter into the following five parts: Noise Characterization and Measurements, Noise Properties of Bipolar Transistors, Noise Properties of Field-Effect Transistors, Low-Noise Amplifier Design, and Practical Amplifier Techniques.

Selections of reprints were made with both device and circuit engineers, as well as graduate students, in mind. The aim of the editor was to provide a basic understanding of noise characterization, its representation and measurement in active linear two-ports, noise performance of microwave transistors, and the design and use of practical low-noise transistor amplifiers.