

Current U.S. Patents

► **THE BEST** way to make sure that a communication satellite comes in "loud and clear" is to track the satellite by using its own radio signals.

The U.S. Patent Office has issued a patent covering one method now being used to insure receiving radio waves on earth from spacecraft orbiting many hundreds or thousands of miles above the surface.

The patent covers the use of systems in which the surface transmitting and receiving antennas are continually aimed in the direction necessary to provide the strongest possible radio signals at the ground station and the satellite.

A direction finder is used to determine at all times the actual direction of the radio signals beamed from a satellite, which differs from the apparent visual direction for many reasons. The inventors found that the radio waves from satellites were changed by such factors as spin fading, amplitude scintillations, frequency scintillations, polarization fading, reflection, ducting and blackouts.

Patent 3,262,116 was issued to Drs. Henry P. Hutchinson of Weston, Mass., and P. R. Arendt of Eatontown, N.J., who assigned rights to Satellite and Space Communications Systems, Inc., Newark, N.J. The company name and the patent title are the same, except for the "Inc."

Rubber-like Plastics Used Widely

Rubber-like plastics that are now being widely used industrially and are expected to have even more widespread use in the future are covered by a patent granted by the U.S. Patent Office.

The plastics contain three ingredients, one being the key to vulcanizing the materials with the same chemicals and same equipment as natural rubbers. The key ingredient falls into the class known as cyclic polyenes.

The ingredients and the process for making the rubber-like plastics were patented by 1963 Nobel Prize winner Dr. Giulio Natta, professor of industrial chemistry at the Polytechnic Institute of Milan, Italy, and his associates, Giorgio Mazzanti, Alberto Valvassori, Guido Sartori and Nazzarene Cameli, also of Milan.

Rights to patent 3,260,708 were assigned to Montecatini Societa Generale per l'Industria Mineraria e Chimica, Milan.

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The plastic compounds can replace natural or synthetic rubber for most uses, although not yet for automobile tires. They are most valuable when resistance to oxygen or ozone is desired or when products have to withstand high temperatures.

One advantage of combining the three ingredients is that the amount of "rubberiness" can be tailor-made to fit the requirements of the final product. The other two ingredients are ethylene and propylene or other aliphatic alpha-olefins products of petroleum refining.

Device Amplifies Low Current

A device that amplifies the very low electrical current resulting when light hits a photocell earned patent 3,260,945 for Drs. Henry P. Kalmus and George O. Striker, who lived in Budapest, Hungary, when the patent application was filed in 1958.

Dr. Kalmus, who now holds more than 40 patents, is chief scientist at the U.S. Army's Harry Diamond Laboratories in Washington, D.C. He developed the amplifying device with Dr. Striker in his home laboratory.

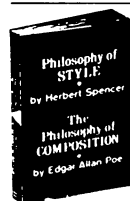
The device is so constructed that only the current made by the light being measured is amplified, making it possible to detect much lower currents than had been possible previously. This is accomplished with an alternating magnetic field to modulate the photocell output to a certain distinctive frequency.

Only the distinctive signal is picked up and amplified, thus eliminating any signals due to background "noise."

Other Interesting Patents

A varying magnetic field can be used to extract the energy generated by the fusion of atoms in a plasma in a controlled thermonuclear reaction, Dr. Laurence S. Hall of the University of California Livermore Laboratory, Livermore, has found. For this invention he received patent 3,260,869, rights to which were assigned to the Government through the U.S. Atomic Energy Commission, which supported the research leading to the method.

A process for the recovery of rhodium by electrolysis, devised by Philip E. Churchward of Salt Lake City, Utah, was granted patent 3,260,658. Mr. Churchward assigned rights to the Government through the Secretary of the Interior.



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Nature Note

Tsunami

► **ONCE EVERY** 10 or 12 years, a powerful wave races across the Pacific Ocean at speeds up to 600 miles an hour, rising to heights of 50, 100 or even 200 feet as it reaches the edge of the sea, causing enormous destruction of lives and property.

This is a tsunami, caused by an undersea earthquake, an erupting volcano or a landslide. Strangely enough, these enormous devastating waves can scarcely be seen or felt by ships on the high seas, where the water is several miles deep. As they approach shore, however, the bottom of the wave drags on the sea floor while the crest continues to travel, and the thundering mass of tons of water crashes upon the shore.

A tsunami can occur as a single wave, but it usually consists of a series of waves, sometimes spanning several hundred miles between crests, although they measure only a few feet high from crest down to the trough. Actually a tsunami reaches all the way from the top of the surface water to the bottom of the sea and moves the entire vertical section of ocean through which it speeds.

A tsunami can be called a seismic sea wave but should not be confused with a tidal wave, which is a constant part of the restless sea, caused by the gravitational attraction of the moon and sun upon the large masses of the earth's water.

The largest disaster caused by a tsunami was in Indonesia on Aug. 27, 1883, when a huge wave set off by the exploding volcano Krakatoa swept over the low-lying coasts of western Java and southern Sumatra and killed 36,500 people. In May 1960, a series of violent earthquakes in Chile sent a tsunami pulsing across the Pacific that reached Hawaii in 14 hours with a 35-foot-high wave killing 61 people. The wave continued across the Pacific, striking ocean islands one by one and taking Japan by surprise, for until that time, no one believed that tsunami of such distant origin could produce devastating effects 9,000 miles away.



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