

INVENTION

Patents of the Week

A system for changing speech into digital language understandable by electronic "brains," a gravity meter and a drag parachute were among patents granted.

► A SYSTEM for changing speech into the digital language that giant computers, or electronic "brains," can understand has been patented.

An experimental model of the system has been built and is now being tested by the U.S. Air Force's Rome Air Development Center, New York. The device was built by Scope, Inc., Fairfax, Va., to which patent Nos. 3,037,076 and 3,037,077 were assigned.

Its inventors are Richard E. Williams, Fairfax, Va., who is president of Scope, and Harold C. Glass, Falls Church, Va. The device responds to the human speaking voice, transforming the speech into so-called "digital information," which is what computers use for their calculations.

The sound waves of the voice are changed into electrical energy that is then converted so that all frequencies present are of nearly equal intensity. The electrical energy is separated into frequency bands, each of which drives a light source to provide an optical indication of that frequency.

The light sources thus energized are made to shine through a code wheel containing photographically coded images at a speed of 40 revolutions per second. The images on the code wheel are so composed that a particular sound displayed optically by the lights will be transmitted through the corresponding sound image on the code wheel to give a uniform reference intensity of light on the opposite side of the code wheel.

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display with other sound images produces transmitted light of non-uniform intensity. The transmitted light signal is then matched with the best available optical code from the code wheel, which carries a digital equivalent.

Gravity Meter

An improved gravity meter won patent No. 3,036,465 for Dr. Robert H. Dicke of Princeton University, Princeton, N. J.

The gravity meter is of the pendulum type, which is used to measure the earth's gravitational pull at desired locations around the world. The improvement patented by Dr. Dicke consists of the use of a high oscillation frequency, 20 cycles per second or more. This reduces the tendency, present in gravimeters with a low frequency of oscillation, to be disturbed by tiny vibrations from earthquakes and other sources.

Parachute Retraction System

For his method of retracting a deceleration, or drag parachute, commonly used in landing high-speed airplanes, Gordon R. Sinclair of Fallston, Md., received patent No. 3,036,795. He assigned rights to the Government through the Secretary of the Air Force.

Jet planes touch the runway at speed approaching or exceeding 160 miles an hour, so either a very long runway or external means of slowing the plane are required. Mr. Sinclair has devised a system for automatically retracting the drag parachute into the plane's fuselage. It is now either jettisoned or allowed to drag on the runway.

The winding motor is operated by the plane's hydraulic or pneumatic system.

Other Patents of Interest

Other interesting patents are:

A method and apparatus for injecting and trapping electrons in a magnetic field, for which patent No. 3,036,963 was granted to Nicholas C. Christofilos of Oakland, Calif., who assigned rights to the Atomic Energy Commission.

The method is for use with devices, such as the Astron, which are being built to test the possibility of deriving useful power from the hydrogen bomb, or fusion, reactions.

A way of conserving water in reservoirs by covering it with a vapor-inhibiting film. John D. Malkemus of Austin, Texas, assigned rights to patent No. 3,036,880 to Jefferson Chemical Company, Houston, for his use of ethylene glycol and propylene glycol monoesters of long chain fatty acids to accomplish this purpose.

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ENTOMOLOGY

Queen Bee Attracts Males With "Perfume" in Head

► THE VIRGIN QUEEN honey bee has been found to attract drones from miles around with a "perfume" from the tiny glands in her head.

The chemicals alone will bring males in a hurry and keep them buzzing around even a squashed or headless queen, Dr. Norman E. Gary, an entomologist from Cornell University, Ithaca, N. Y., found recently.

Studies of the sex habits of bees have been difficult because mating occurs in flights at heights not easily observable, Dr. Gary reported in *Science*, 136:773, 1962. To determine whether the reaction was a chemical one, he glued several queens to helium balloons and let them rise. Drones were quickly attracted.

Dismembered virgin queens were then placed on a nylon line of small diameter that was stretched between two tall poles. Even the dead queens attracted males.

The mandibular glands extracted from the heads of several queens proved to be the actual source of the sexual attractant. A further breakdown of the liquid in these glands gave an acid known as queen substance. This "perfume" and a synthetic queen substance were found to attract males.

This mating attractant may be useful for studying drone populations, genetic origin, flight distribution and range, Dr. Gary said. The results may also explain why the queen bee has unusually large glands.

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Under the North Pacific Ocean, just south of Alaska and the Aleutian Islands, lies a long chain of mountains rising 3,000 to 6,000 feet and extending over a 1,000-mile area.

Successful exploration of space requires the application of engineering techniques to biological processes, in order to construct artificial environments for the human body.

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Questions

BIOLOGY—How much greater than on the earth's surface is the carbon dioxide content on Mars? p. 378.

MEDICINE—What has been discovered regarding demyelinated cultures of mammalian brain tissue? p. 371.

SPACE—How can high altitude explosions be used to screen sneak atomic attacks? p. 376.

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