

Countersunk Rivet Method Is Patented for Airplanes

Process Automatically Creates 'Dimple' for Fastener With One Hammer Blow—Ring of Bullets Protects Plane

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WASHINGTON, March 8.—A "dimple" method for quickly riveting together the thin metallic skins which cover airplane wings, fuselages and other parts of aircraft has been developed by the Douglas Aircraft Company, Inc., Santa Monica, Calif., it is revealed in a patent (No. 2,233,520) issued to Vladimir H. Pavlecka of the same city.

The method automatically forms a "dimple" or cavity in the overlapping metal sheets being riveted so that the rivet is countersunk until it is flush with the surface, thus causing no wind resistance. The dimple is formed by driving the rivet in place with a single impact of the riveting hammer.

The method is said to give a fluid tight joint, which is not loosened by vibration of the plane and one which is not likely to corrode. A specially designed rivet is used, one having an inverted conical head, the cone merging into the shank. The head angle, or spread of the cone, is between 95 to 100 degrees.

In carrying out the dimple riveting, the rivet is inserted in the drilled opening. It is then struck with a sharp blow. The conical head, due to the impact, causes the metal around the hole to form a dimple or cavity in which the head of the rivet is simultaneously seated by the blow. At the same time a reinforcing bead is formed by the blow around the head of the rivet so that it does not split.

After this step the shank of the rivet is upset or flattened out over the hole to complete the riveting operation.

Ring of Bullets Protects Plane

How the fuselages of war planes may be protected by a ring or sphere of bullet fire that completely protects the aircraft in all directions from enemy attack is revealed in a patent (No. 2,233,542) issued to John C. Sanders of Seattle, Wash.

The patent is assigned to the Boeing Aircraft Company of the same city.

Spaced around the longitudinal axis of the fuselage at angles of 120 degrees are three streamlined turrets. In each is mounted a gun projecting laterally from the turret. The turrets may be swung around a longitudinal axis of more than 120 degrees.

In this way, it is said, the fields of fire of the guns can be made to overlap so that the fuselage is literally surrounded by a ring or sphere of bullets when the guns are fired. An enemy craft attacking the plane from any direction would be shot down if it came within the range of the ring of bullets surrounding the fuselage.

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pilot can tell at a glance on what side of the beam he is off course and how far. When the pilot is off course the two rings merge so that he sees only a single ring.

Static and spurious signals produce a different picture. The pilot is thus instantly warned when these interfere with proper reception of the radio beam signals.

The indicator is also operative with marker beacons to guide the pilot to a safe landing when flying blind.

The patent is assigned to the Radio Corporation of America, New York City.

Method Reveals Wear of Parts

A "dent" method for quickly determining the wear in airplane engine cylinders, pistons, shafts and bearings has been developed by two Department of Commerce employes, it is revealed in a patent (No. 2,233,403) issued to Hobart C. Dickinson of Washington and Samuel A. McKee of Bethesda, Md.

Wearing away of surface thicknesses of as little as one ten-thousandth of an inch are readily detected by the new method, the patent declares.

The method involves making a "dent" or depression of the shape of an inverted pyramid in the surface of the shaft, piston or cylinder before the part is mounted in the engine. The length and depth of the dent are made of definite dimensions by an accurately controlled diamond "indenter." As the surface wears away the dent becomes smaller. Since the length of the depression bears a definite relationship to the depth, one need only measure the former after the surface has been subjected to wear or grinding to determine exactly the thickness of surface worn away.

The dents are made so small that they do not interfere with the operation of the shafts, cylinders or pistons. By making a number of dents, each of a different depth, one can quickly determine the thickness of surface worn away without actual measurement by merely noticing which dents remain, it is declared.

The inventors permit the government to use their invention without the payment of royalties.

Pure Vitamin C Isolated

The two scientists who first isolated pure anti-scurvy vitamin C and identified the crystalline, tasteless compound which they obtained as being the one long sought by man in its pure form, have just won a patent (No. 2,233,417) for their method of isolating it from lemon juice. They are Drs. Charles G. King and William A. Waugh of Pittsburgh, Pa.

The vitamin is a true chemical compound, called ascorbic acid,

Science

Detecting Viruses by Color

A pool of oil or gasoline suggests mother-of-pearl in its surface colors. Almost any solution on which a film floats is iridescent. The color of a film depends on its thickness. One which has a thickness of 47/10,000,000 of an inch looks purple, in reflected white light. If the film is made slightly thicker, the color verges toward blue. It follows that changes in thickness can be measured by observing changes in color.

The Nobel Prize winner, Dr. Irving Langmuir, has applied this method to the identification of viruses, toxins and poisons. First of all, he dips a clean slide repeatedly into a tank until forty-seven layers of transparent barium stearate each 1/10,000,000 of an inch thick have accumulated. Then the slide is dipped into a 1 per cent solution of barium nitrate. Lastly, a substance with a specific reaction to the particular toxin, virus, poison, or other substance for which the test is to be made, is applied.

If the suspected substance is present in the solution tested, a single layer of uniformly thick atoms or molecules will cling to the slide surface and produce both an increase in film thickness and a corresponding change in color.

In actual practice the films are illuminated by sodium light and the changes in brightness of the yellow light are measured. Each type of substance in solution is expected to produce a characteristic increase in film thickness and correspondingly change in color of the "conditioned" slide. Once these characteristic thicknesses and colors for known substances have been determined, identification of suspected substances is a matter of checking at comparison.

Newspaper Science Praised

In the Scientific Monthly Dr. Austin Clark says some kind word about newspaper science and expresses a high opinion of the National Association of Science Writers, a group of about forty reporters and editorial writers who specialize in presenting the latest advances in science and technology. He thinks the press is doing a very essential work of telling even the scientists what is going on in the laboratories and observatories for the reason that "research workers are running the risk of coming isolated from the general mass of the population in our social order."

If science is to prosper and advance in a democracy he holds that "the population as a whole must take an interest in and appreciate the work done by our scientific men and women. The people must value their scientific work something to themselves. They must value science as continually leading the way to better things—to easier, safer, more satisfying existence."

Cooperation between research workers and the National Association of Science Writers has benefited both science and the public. "Frequently it has happened the story written by one or more of our writers has been read by a