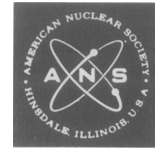


NEW PATENTS by ALFONS PUISHES

In this Section of NUCLEAR APPLICATIONS we briefly describe some recently issued patents which we think are particularly interesting. The patents themselves, which contain all the detailed descriptions of the inventions, may be obtained from the Commissioner of Patents, Washington, D.C. for 50c each. They also may be read in patent libraries in major cities.



Ed. Note: Readers' attention is invited to the increase (which became effective recently) from 25 to 50 cents each in the cost of copies of a printed patent. At the same time, other important changes in our basic patent laws were made by Congress for the first time in many years. Most important was an increase in filing fees for patent applications from the historic \$30.00 to \$65.00, plus certain, extras. The issue fee has been raised for \$30.00 to \$100.00, plus extras. Other significant changes have been made. A copy of the new law (Public Law 89-83, 89th Congress, HR 4185) may be obtained free from your Congressman. It has been reprinted also in the Official Gazette of the US Patent Office for August 24 and 31, and September 7, 1965. A summary of the new provision, with comments by Alfons Puishes, appears in a current issue of Mechanical Engineering.

Generation of electricity. The hot stainless-steel pipe of a sodium circulating loop in SGR has cobalt-alloy plate members clamped to it at two remote points. A ceramic insulator around the pipe, close to one of the points, produces a cold junction for the thermopile formed by the stainless-steel pipe and the cobalt-alloy plate members. Electrical energy generated in thermopile is conducted away for use. 3 196 047, H. A. Toulmin, Jr., Commonwealth Engineering Company of Ohio.

Irradiation of grass seed. Subjecting various common varieties of grass seed to gamma radiation to a dosage of 250 to 2000 R at specified rates stimulates growth and produces improved root systems. Cobalt-60 and ¹³⁷Cs sources are preferred. 3 197 640, C. J. Speas, Oak Ridge Atom Industries, Inc.

Irradiation pasteurization of food products. A conveyor transports packaged foodstuffs to a shielded area, where flat slabs coated with gamma-emitting isotopes are intermittently inserted between the packages. Apparatus provides efficient handling and, it is contended, better control, thereby preventing overirradiation and destruction of the texture, color, and flavor of the food product. 3 192 054, O. A. Kuhl and A. B. Oltmann, USAEC.

Odorless polyethylene package for irradiated foodstuffs. Addition of small percentages of 22-methylene-bis-(4-ethyl-6-*t*-butyl phenol) to polyethylene film prevents odor formation in the latter when the food contained in such a package is exposed to a food-sterilizing dose of high-energy ionizing radiation. 3 194 668, H. N. Schlein and B. R. LaLiberte, US Army.

Decontamination of milk containing strontium-90 and iodine-131. The contaminated milk is first acidified to a pH of 5 to 6 and then caused to flow through a movable cation-exchange resin bed, where ⁹⁰Sr cations are exchanged for calcium, magnesium, sodium, or potassium. Simultaneous regeneration of the spent resin by chloride solutions is provided, as is restoration of the original pH of the milk. Iodine-131 is subsequently removed by an anion-exchange resin bed. Greater efficiency and effectiveness over previous methods are indicated. 3 194 663, I. R. Higgins, Chemical Separations Corp.

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Measuring thickness of a substance with alpha particles. A monoenergetic alpha-particle source, such as ^{210}Po or ^{239}Pu , is positioned over substance to be measured, which usually comprises a relatively thin moving strip or film. Energy spectrum of particles passing through substance is detected by particle detector of semiconductor junction diode type responsive to alpha particles. Measurement of shift in energy spectrum of particles gives indication of thickness of substance. 3 193 680, H. L. Anderson.

Flaw detection in materials. Non-destructive apparatus utilizes source of monochromatic radiation impinging on the surface to be tested. Special detector collimator located on same side of material as radiation source facilitates the counting and measurement of backscattering photons caused by Compton effect. Presence of flaws affects the latter in a predetermined manner. Apparatus makes it possible to detect flaws such as those in the welds of large vessels, where access to only one side or surface is possible. 3 197 638, K. F. Sinclair, US Navy.

Reactor control device of neutron-absorbing ball type for gas-cooled reactor. Pressure chamber and lock communicate with reactor core and ball storage chamber. Suitable pipes and valves cause balls to drop on response to pressure changes in reactor and to return balls pneumatically to storage chamber. Elimination of unreliability of previous devices of this type is indicated. 3 192 123, D. Costes and J. Lebey, Commissariat a l'Energie Atomique (France).

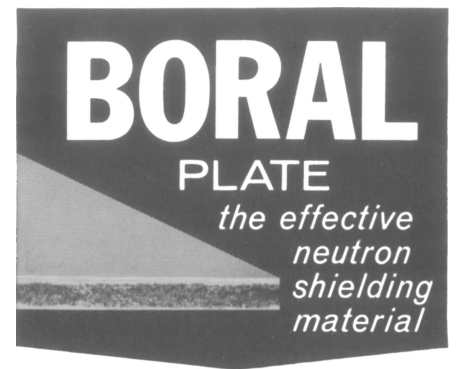
Light-core construction for mobile reactors. Special square fuel chambers are combined with cruciform-shaped control rods so that each chamber is practically surrounded by control rods. This permits use of fewer control rods and lighter and more rigid core supports. 3 192 120, J. W. Campbell, Babcock and Wilcox, Limited (England).

Boiling-water reactor utilizing primary and secondary coolant cycles. Mixture of vapor and liquid coolant is removed from boiling core. Vapor is separated and sent to "use", while liquid is circulated through another heat exchanger where it converts a secondary coolant to vapor for use at a lower temperature and pressure. Means are provided for regulating the flow of primary coolant through the heat exchanger and, hence, its temperature, and thus affecting reactor control through variation in reactivity. Of course, coolant must have negative temperature coefficient of reactivity. 3 193 468, T. S. Sprague, The Babcock and Wilcox Co.

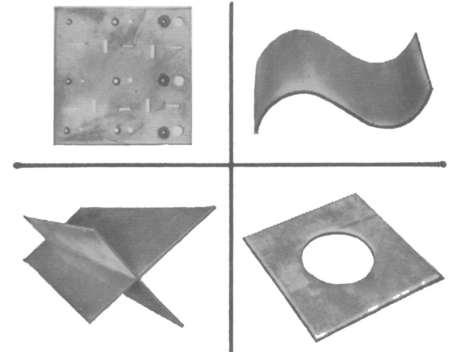
Heat dissipation control for thermionic generator. Temperature sensor actuates shutter mechanism that operates an insulating shutter closing or exposing heat radiating surface. Especially applicable to isotope-powered vehicles used in space technology. 3 192 069, J. H. Vogt, C. N. Young, and W. C. Reed, USAEC.

Epithermal thorium power breeder. This patent broadly claims this now well-known concept: breeding ratio of 0.8, accompanied by high eta and low alpha with neutrons of 1 to 10^5 eV, produces steam at 800 lb/in.²g and 900° F. 3 197 376, R. Balent and R. J. Beeley, North American Aviation, Inc.

Shutdown heat removal from OMR. This system is especially adapted for shipboard use, where compactness is essential and auxiliary power may not be available. First heat exchanger is located above reactor core to provide thermosyphon effect. Steam-generating drum is located above first heat exchanger, and combined air- and water-cooled condenser is still higher and above deck of ship providing still further thermosyphon effect. 3 190 808, J. A. Dodd, UKAEA.



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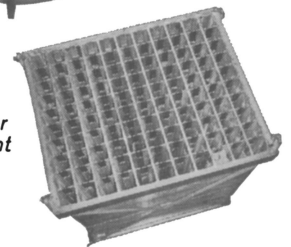
Boral plate is useful in the atomic reactor industry because of its *light weight*, its good heat conductivity, its stability up to the melting point of aluminum. Most important of all is its *power to absorb thermal neutrons* without the production of hard gamma rays.

Some typical assemblies which were made to customer requirements are pictured below.



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