FOREIGN ART COLLECTIONS

FOR **CLASS-RELATED FOREIGN DOCUMENTS**

DIG 1 **ALLEGED CONTROLLED FUSION REACTORS (G21B-1/00) ** (UNCONTROLLED REACTORS DIG. 423; ARRANGEMENTS FOR HEATING OR CONFINING PLASMA H05H-1/02)**

DIG 2 .Combined fission-fusion reactors [G21B-1/00B] *** (see also DIG. 5+)

DIG 3 .Inertial confinement fusion reactor [G21B-1/00C] *** (plasma produced by laser H05H-1/22B; by particle beam H05H-1/22C)

DIG 4 .Using a beam of particles some of which react with other particles [G21B-1/02]

DIG 5 **NUCLEAR REACTORS [G21C-1/00] *** (FUSION REACTORS H05H-1/00; NUCLEAR EXPLOSIVES DIG. 423; ANALOGUE COMPUTERS THEREFOR G06G-7/54)**

DIG 6 .Integral reactors (i.e., the reactor core and the heat exchanger are placed in one vessel; the reactor vessel and the heat exchanger form an integral construction) [G21C-1/00B]

DIG 7 ..Where the prime mover is also placed in the vessel [G21C-1/00B2]

DIG 8 ..Where the heat exchanger is disposed above the core [G21C-1/00B3]

DIG 9 ..Where the heat exchanger is disposed beneath the core [G21C-1/00B4]

DIG 10 ..Where the heat exchanger is disposed beside the core [G21C-1/00B5]

DIG 11 .Fast fission reactors (i.e., reactors not using a moderator; metal cooled reactors; fast breeders) [G21C-1/02]

DIG 12 ..Characterized by the concept and properties of the core [G21C-1/02B]

DIG 13 ...Where the core is divided into zones with fuel and zones with breeding material [G21C-1/02B2]

DIG 14 ..Cooled by a not essentially pressurized coolant (e.g., tub type) [G21C-1/02D] *** (cooling arrangements DIG. 187+)

DIG 15 ..Cooled by a pressurized coolant [G21C-1/02F] *** (cooling arrangements DIG. 187+)

DIG 16 .Thermal reactors; Epithermal reactors [G21C-1/04]

DIG 17 ..Heterogeneous reactors (i.e., in which the fuel and moderator are separated) [G21C-1/06]

DIG 18 ...Pebble-bed reactors; Reactors with granular fuel [G21C-1/06B]

DIG 19 ...Moderator being highly pressurized (e.g., boiling water reactor; integral super-heat reactor; pressurized water reactor) [G21C-1/08] *** (DIG. 30 takes precedence)

DIG 20 ....Pressure regulating arrangements; "pressurizers" [G21C-1/08B]

DIG 21 ....Reactors where the coolant is overheated [G21C-1/08D]

DIG 22 ....Boiling water reactors [G21C-1/08E]

DIG 23 ....Pressurized water reactors [G21C-1/08F]

DIG 24 ....Moderator and coolant being different or separated [G21C-1/10]

DIG 25 .....Moderator being solid (e.g., Magnox reactor, gas-graphite reactor [G21C-1/12]

DIG 26 ...Moderator being substantially not pressurized (e.g., swimming-pool reactor [G21C-1/14] *** (DIG. 30 takes precedence)

DIG 27 ....Moderator and coolant being different or separated (e.g., sodium-graphite reactor, sodium-heavy water reactor, organic coolant-heavy water reactor) [G21C-1/16]

DIG 28 .....Coolant being pressurized [G21C-1/18]

DIG 29 ......Moderator being liquid (e.g., pressure-tube reactor, also the construction of the pressure-tubes) [G21C-1/20]

DIG 30 ...Using fluid or fluent fuel [G21C-1/22] *** (With granular fuel DIG. 18)

DIG 31 ..Homogeneous reactors (i.e., in which the fuel and moderator present an effectively homogeneous medium to the neutrons) [G21C-1/24]

DIG 32 ...Single-region reactors [G21C-1/26]

DIG 33 ...Two-region reactors [G21C-1/28]

DIG 34 .Subcritical reactors; Experimental reactors with exception of swimming-pool reactors, zero-energy reactors [G21C-1/30]

DIG 35 ..Experimental and irradiation arrangements inside the reactor [G21C-1/30B] *** (irradiation loops DIG. 36; material testing by neutrons G01N-23/00B)

DIG 36 ..Irradiation loops [G21C-1/30D]

DIG 37 **REACTOR FUEL ELEMENTS AND THEIR ASSEMBLIES; SELECTION OF SUBSTANCES FOR USE AS REACTOR FUEL ELEMENTS [G21C-3/00]**

DIG 38 .Fuel elements [G21C-3/02] *** (manufacturing DIG. 283)

DIG 39 ..Constructional details [G21C-3/04]

DIG 40 ...Means for removal of gases from fuel elements [G21C-3/04B]

DIG 41 ...Fuel elements comprising casings with a mass of granular fuel with coolant passages through them [G21C-3/04C]

DIG 42 ...Fuel elements with porous or capillary structure [G21C-3/04D]

DIG 43 ...Casings; Jackets; Jacket materials [G21C-3/06]

DIG 44 ....Jacket materials (e.g., alloys) [G21C-3/06B]

DIG 45 ....Provided with external means to promote heat-transfer (e.g., fins, baffles) [G21C-3/08]

DIG 46 ....End closures; means for tight mounting therefor [G21C-3/10]

DIG 47 .....Flattened end-closures [G21C-3/10B]

DIG 48 ....Means forming part of the element for locating it within the reactor core [G21C-3/12] *** (means not forming part of the element DIG. 102)

DIG 49 ....Means forming part of the element for inserting it into, or removing it from, the core; Means for coupling adjacent elements (e.g., to form a stringer) [G21C-3/14]

DIG 50 ...Details of the construction within the casing [G21C-3/16]

DIG 51 ....Means for storage or immobilization of gases in fuel elements [G21C-3/16B]

DIG 52 ....Internal spacers; Other nonactive material within the casings (e.g., compensating for expansion of fuel rod; compensating for excess reactivity) [G21C-3/18] *** (interlayers DIG. 53)

DIG 53 ....With coating on fuel or on inside of casing; with nonactive interlayer between casing and active material; with multiple casings or multiple active layers [G21C-3/20]

DIG 54 ..Elements with fissile or breeder material in contact with coolant [G21C-3/22]

DIG 55 ..Elements with fissile or breeder material in fluid form within a nonactive casing [G21C-3/24]

DIG 56 ..Elements with fissile or breeder material in powder form within a nonactive casing [G21C-3/26] *** (DIG. 57 takes precedence)

DIG 57 ..Elements with fissile or breeder material in solid form within a nonactive casing [G21C-3/28]

DIG 58 .Assemblies of number of fuel elements in the form of a rigid unit [G21C-3/30]
DIG 59 ..Bundles of parallel pin-, rod-, or tube-shaped fuel elements [G21C-3/32]
DIG 60 ...Means to influence the coolant flow through or around the assembly [G21C-3/32B] *** (DIG. 246 takes precedence)
DIG 61 ...Coats and envelope surrounding the assembly [G21C-3/32C]
DIG 62 ...Made of moderator-material [G21C-3/32D]
DIG 63 ...Comprising fuel-elements of various compositions; comprising other pin-, rod-, or tube-like forms [G21C-3/32G] *** (elements influencing the coolant flow DIG. 60)
DIG 64 ....Special arrangements of elements in the assembly-lattice (e.g., fissile rods, fertile rods, water rods, poison rods, dummy-rods) [G21C-3/32G2]
DIG 65 ...Supporting or hanging the elements in the assembly [G21C-3/32H] *** (Spacer grids DIG. 71); Means forming part of the assembly for inserting it into, or removing it from, the core; Means for coupling adjacent assemblies (means forming part of the element for inserting it into, or removing it from, the core; or means for coupling adjacent elements DIG. 49)
DIG 66 ....Supports for spacer grids [G21C-3/32H2]
DIG 67 ...Means for the storage or removal of fission gases [G21C-3/32K] *** (means for the storage of fission gases in the elements DIG. 50; means for the removal of fission gases from elements DIG. 39+)
DIG 68 ...Assembling the bundle; Exchange of elements in the bundle [G21C-3/32L]
DIG 69 ...Spacer elements [G21C-3/32M] *** (spacer grids DIG. 71)
DIG 70 ....Helicoidal spacer elements [G21C-3/32M2]
DIG 71 ...Spacer grids; other spacer devices [G21C-3/34]
DIG 72 ....Compact spacer grids (e.g., made of a plate or a blade) [G21C-3/34A]
DIG 73 ....Spacer grids formed of assembled tubular elements [G21C-3/34B]
DIG 74 ....Spacer grids wherein each cell has a circular cross section; cells formed of assembled metallic nonintersecting strips [G21C-3/34C]
DIG 75 ....Spacer grids wherein each cell has a polygonal (e.g., square cross section) ; cells formed of assembled metallic nonintersecting strips [G21C-3/34D]
DIG 76 .....Polygonal cells formed of intersecting strips [G21C-3/34D2]
DIG 77 ......The cells being provided with fuel element supporting members [G21C-3/34D2A]
DIG 78 ....Supporting members formed only by deformations in the intersecting strips [G21C-3/34D2A2]
DIG 79 ....Supporting members formed only of elements fixed on the strips (e.g., by welding) [G21C-3/34D2A4]
DIG 80 ....Spacer grids formed by metallic wires (e.g., springs) [G21C-3/34E]
DIG 81 ....Fabrication of spacer grids [G21C-3/34F]
DIG 82 ..Assemblies of plate-shaped fuel elements or coaxial tubes [G21C-3/36]
DIG 83 .Fuel units consisting of a single fuel element in a supporting sleeve or in another supporting element [G21C-3/38]

DIG 84 .Structural combination of fuel element with thermoelectric element for direct production of electric energy from fission heat; or with another arrangement for direct production of electric energy (e.g., a thermionic device) [G21C-3/40] *** (temperature measurement DIG. 236; combination with thermoelements for temperature measurements DIG. 241)

DIG 85 .Selection of substances for use as reactor fuel [G21C-3/42]

DIG 86 ..Fluid or fluent reactor fuel [G21C-3/44]

DIG 87 ...Aqueous compositions [G21C-3/46]

DIG 88 ....True or colloidal solutions of the active constituent [G21C-3/48]

DIG 89 ....Suspensions of the active constituent; Slurries [G21C-3/50]

DIG 90 ...Liquid metal compositions [G21C-3/52]

DIG 91 ...Fused salt, oxide or hydroxide compositions [G21C-3/54]

DIG 92 ...Gaseous compositions; Suspensions in a gaseous carrier [G21C-3/56]

DIG 93 ..Solid reactor fuel; Pellets made of fissile material [G21C-3/58]

DIG 94 ...Metallic fuel; Intermetallic dispersions [G21C-3/60]

DIG 95 ...Ceramic fuel [G21C-3/62]

DIG 96 ....Oxide fuels [G21C-3/62B]

DIG 97 ....Coated fuel particles [G21C-3/62J]

DIG 98 ....Ceramic dispersion fuel (e.g., cermet) [G21C-3/64]

DIG 99 **MODERATOR OR CORE STRUCTURE; SELECTION OF MATERIALS FOR USE AS MODERATOR [G21C-5/00]**

DIG 100 .Details [G21C-5/02]

DIG 101 ..Spatial arrangements allowing for Wigner growth [G21C-5/04]

DIG 102 ..Means for locating or supporting fuel elements [G21C-5/06] *** (means forming part of the element DIG. 48)

DIG 103 ..Means for preventing undesired asymmetric expansion of the complete structure (e.g., stretching devices, pins) [G21C-5/08]

DIG 104 ..Means for supporting the complete structure [G21C-5/10] *** (arrangements for supporting vessels and core structure DIG. 168)

DIG 105 .Characterized by composition (e.g., the moderator containing additional substances which ensure improved heat resistance of the moderator [G21C-5/12] *** (purification of fluid moderators during the operation of the reactor DIG. 266)

DIG 106 ..Moderators made of organic materials [G21C-5/12B]

DIG 107 ..Carbonic moderators [G21C-5/12G]

DIG 108 .Characterized by shape [G21C-5/14]

DIG 109 ..Shape of its constituent parts [G21C-5/16]

DIG 110 .Characterized by the provision of more than one active zone [G21C-5/18]

DIG 111 ..Wherein one zone contains fissile material and another zone contains breeder material [G21C-5/20]

DIG 112 ..Wherein one zone is a superheating zone [G21C-5/22]

DIG 113 **CONTROL OF NUCLEAR REACTION [G21C-7/00]**

DIG 114 .Flux flattening [G21C-7/00B]

DIG 115 .By using self-regulating properties of reactor materials (e.g., Doppler effect) [G21C-7/02] *** (arrangements that involve temperature stability DIG. 136)

DIG 116 ..Of burnable poisons [G21C-7/04]

DIG 117 .By application of neutron-absorbing material (i.e., material with absorption cross section very much in excess of reflection cross section) [G21C-7/06]

DIG 118 ..By displacement of solid control elements (e.g., control rods) [G21C-7/08]
DIG 119 ...Construction of control elements [G21C-7/10]
DIG 120 ....Control assemblies containing one or more absorbant as well as other elements (e.g., fuel or moderator elements) [G21C-7/10B]
DIG 121 ....Control elements adapted for pebble bed reactors [G21C-7/10C]
DIG 122 ....Deformable control elements (e.g., flexible, telescopic or articulated) [G21C-7/10D]
DIG 123 ....Control elements made of flat elements; Control elements having cruciform cross section [G21C-7/10E]
DIG 124 ....Cluster or spider control rods [G21C-7/10F]
DIG 125 ...Means for moving control elements to desired position [G21C-7/12]
DIG 126 ....Mechanical drive arrangements [G21C-7/14]
DIG 127 ....Hydraulic or pneumatic drive [G21C-7/16]
DIG 128 ...Means for obtaining differential movement of control elements [G21C-7/18]
DIG 129 ...Disposition of shock-absorbing devices; Braking arrangements [G21C-7/20] *** (shock absorbers in general F16F)
DIG 130 ..By displacement of a fluid or fluent neutron-absorbing material (e.g., by adding neutron absorbing material to the coolant) [G21C-7/22]
DIG 131 ..Selection of substances for use as neutron-absorbing material [G21C-7/24]
DIG 132 .By displacement of the moderator or parts thereof; by changing the moderator concentration [G21C-7/26]
DIG 133 ..Spectral shift control [G21C-7/26B]
DIG 134 .By displacement of the reflector or parts thereof [G21C-7/28]
DIG 135 .By displacement of the reactor fuel or fuel elements [G21C-7/30]
DIG 136 .By varying flow of coolant through the core; by adjusting the coolant or moderator temperature [G21C-7/32]
DIG 137 .By utilization of a primary neutron source [G21C-7/34]
DIG 138 .Control circuits [G21C-7/36]
DIG 139 **EMERGENCY PROTECTION ARRANGEMENTS STRUCTALLY ASSOCIATED WITH THE REACTOR (E.G., SAFETY VALVES PROVIDED WITH PRESSURE EQUALIZATION DEVICES) [G21C-9/00] *** (EMERGENCY COOLING ARRANGEMENTS DIG. 196)**
DIG 140 .Pressure suppression [G21C-9/00B]
DIG 141 ..By rupture discs or diaphragms [G21C-9/00B2]
DIG 142 ..By stream condensation or by thermal accumulation [G21C-9/00B4]
DIG 143 .Core catchers [G21C-9/00D]
DIG 144 .Against explosions (e.g., blast shields) [G21C-9/00F]
DIG 145 .Against Na- or Ka- reactions [G21C-9/00I]
DIG 146 .Means for effecting very rapid reduction of the reactivity factor under fault conditions (e.g., reactor fuse, control elements having arrangements activated in an emergency) [G21C-9/02] *** (control elements, per se, DIG. 113+)
DIG 147 ..By fast movement of a solid (e.g, pebbles) [G21C-9/02B]
DIG 148 ..By an absorbant fluid [G21C-9/02D]
DIG 149 ..Reactor fuses [G21C-9/02F]
DIG 150 ..Rupture diaphragms [G21C-9/02H]
DIG 151 .Means for suppressing fires; Earthquake protection [G21C-9/04]
DIG 152 **SHEILDING STRUCTURALLY ASSOCIATED WITH THE REACTOR [G21C-11/00]**
DIG 153 .Biological sheilding; Neutron and gamma shielding [G21C-11/02] *** (in general DIG. 319+)
DIG 154 ..Inside the reactor vessel [G21C-11/02B]
DIG 155 ...Structurally combined with the casing [G21C-11/02B2]
DIG 156 ..In apertures or channels through a wall [G21C-11/02D]

DIG 157 ..Characterized by the form or by the material [G21C-11/02F]
DIG 158 ..On waterborne craft [G21C-11/04]
DIG 159 .Reflecting shields (i.e., for minimizing loss of neutrons) [G21C-11/06]
DIG 160 .Thermal shields; Thermal linings (i.e., for dissipating heat from gamma radiation which would otherwise heat an outer biological shield); Thermal insulation [G21C-11/08]
DIG 161 ..Consisting of a nonmetallic layer of insulating material [G21C-11/08B]
DIG 162 ..Consisting of one or more metallic layers [G21C-11/08D]
DIG 163 ...Consisting exclusively of several metallic layers [G21C-11/08D2]
DIG 164 ..Consisting of a combination of nonmetallic and metallic layers (e.g., metal-sand-metal-concrete) [G21C-11/08E]
DIG 165 ..Consisting of a stagnant or a circulating fluid [G21C-11/08F]
DIG 166 **PRESSURE VESSELS; CONTAINMENT VESSELS [G21C-13/00] *** (CHEMICAL OR PHYSICAL PROCESSES B01J-3/00; PRESSURE VESSELS IN GENERAL F16J-12/00)**
DIG 167 .Details (e.g., seals, supporting constructions, ventillating arrangements, tube joints with a vessel wall) [G21C-13/02]
DIG 168 ..Supporting constructions for pressure vessels or containers [G21C-13/02B]
DIG 169 ..Seals (e.g., for pressure vessels or containers [G21C-13/02D]
DIG 170 ...For container apertures [G21C-13/02D2]
DIG 171 ..Tube joints with a vessel wall (e.g., taking into account thermal stresses) [G21C-13/02F]
DIG 172 ..Ventillating arrangements [G21C-13/02G]
DIG 173 ..Tube crossings through a vessel wall [G21C-13/02H]
DIG 174 ..Arrangements for expansion and contraction [G21C-13/04]
DIG 175 ..Sealing plugs [G21C-13/06]
DIG 176 ...For tubes (e.g., standpipes; Locking-devices for the plugs included) [G21C-13/06B]
DIG 177 ....Seals for the plugs [G21C-13/06B2]
DIG 178 ...Closures for reactor-vessels (also rotatable) [G21C-13/06D]
DIG 179 ....Seals for closures or for rotatable closures [G21C-13/06D2]
DIG 180 .Vessels characterized by the material; Selection of materials for pressure vessels [G21C-13/08]
DIG 181 ..Metallic vessels [G21C-13/08B]
DIG 182 ...Tube-type vessels (e.g., for not essentially pressurized coolants) [G21C-13/08B2]
DIG 183 ..Concrete vessels [G21C-13/08D]
DIG 184 ...Made of prestressed-concrete [G21C-13/08D2]
DIG 185 ....Particulars concerning pre-stressing devices (and cables) [G21C-13/08D2B]
DIG 186 .Means for preventing contamination in the event of leakage (e.g., double wall) [G21C-13/10]
DIG 187 **COOLING ARRANGEMENTS WITHIN THE PRESSURE VESSEL CONTAINING THE CORE; SELECTION OF SPECIFIC COOLANTS [G21C-15/00]**
DIG 188 .Arrangements or disposition of passages in which heat is transferred to the coolant; Coolant flow control devices [G21C-15/02] *** (DIG. 246 takes precedence); (coolant flow control through fuel assemblies (e.g., flow restrictors) DIG. 60)
DIG 189 ..From fissile or breeder material [G21C-15/04] *** (DIG. 59 takes precedence)
DIG 190 ...In fuel elements [G21C-15/06]
DIG 191 ..From moderating material [G21C-15/08]
DIG 192 ..From reflector or thermal shield [G21C-15/10]
DIG 193 ..From pressure vessel; from containment vessel [G21C-15/12]
DIG 194 ..From headers; from joints in ducts [G21C-15/14]
DIG 195 .Comprising means for separating liquid and steam [G21C-15/16]

DIG 196 .Emergency cooling arrangements; Removing shut-down heat [G21C-15/18]
DIG 197 .Partitions or thermal insulation between fuel channel and moderator [G21C-15/20]
DIG 198 .Structural association of coolant tubes with headers [G21C-15/22]
DIG 199 .Promoting flow of the coolant [G21C-15/24]
DIG 200 ..For liquids [G21C-15/24B]
DIG 201 ...For liquid metals [G21C-15/24B2]
DIG 202 ...Jet-pumps [G21C-15/24B4]
DIG 203 ..For gases (ventilators) [G21C-15/24D]
DIG 204 ..Heat-pipes [G21C-15/24F]
DIG 205 ..By convection (e.g., using chimneys, using divergent channels [G21C-15/26]
DIG 206 .Selection of specific coolants; additions to the reactor coolants (e.g., against moderator corrosion) [G21C-15/28] *** (if serving as the moderator DIG.105, Compositions, per se, C09K-5/00; Organic coolants DIG. 106; purification and regeneration of the reactor coolants DIG. 266)
DIG 207 **MONITORING; TESTING; MAINTAINING [G21C-17/00]**
DIG 208 .Mechanical simulators [G21C-17/00B] *** (electrical or magnetic simulators G06G-7/54)
DIG 209 .Detection of leaks [G21C-17/00C] *** (by testing the coolant or the moderator DIG. 224)
DIG 210 .Remote inspection of vessels (e.g., pressure vessels) [G21C-17/00D]
DIG 211 ..Inspection of outer surfaces of vessels [G21C-17/00D1]
DIG 212 ..Inspection of inner surfaces of vessels [G21C-17/00D2]
DIG 213 ..Inspection vehicles [G21C-17/00D3]
DIG 214 .Inspection or maintenance of pipe-lines or tubes in nuclear installations [G21C-17/00F]
DIG 215 .Devices or arrangements for monitoring coolant or moderator [G21C-17/02]
DIG 216 ..For monitoring liquid coolants or moderators [G21C-17/02B]
DIG 217 ...For monitoring liquid metal coolants [G21C-17/02B2] *** (molten metal sampling in general G01N-1/12B)
DIG 218 ....Liquid metal leaks detection [G21C-17/02B2B] *** (detecting leaks in pipe-line systems in general F17D-5/00)
DIG 219 ..For monitoring gaseous coolants [G21C-17/02D]
DIG 220 ..Solid moderators testing (e.g., graphite) [G21C-17/02F]
DIG 221 ..Reactor coolants flow measuring or monitoring [G21C-17/02H] *** (measuring volume or mass flow in general G01F)
DIG 222 ..Moderator or coolant level detection devices [G21C-17/02K] *** (indicating or measuring liquid level in general G01F-23/00)
DIG 223 ..Moderator or coolant boiling detection [G21C-17/02M]
DIG 224 ..Detecting burst slugs [G21C-17/04]
DIG 225 ...Characterized by (matrix) systems for checking the coolant channels [G21C-17/04B]
DIG 226 ...Devices for selective sampling (e.g., valves, shutters, rotatable selector valves) [G21C-17/04D]
DIG 227 ...Detectors and metering devices for the detection of fission products [G21C-17/04F]
DIG 228 ....Precipitation chambers [G21C-17/04F2]
DIG 229 ....Detection and metering circuits [G21C-17/04F4]
DIG 230 ...Characterized by a special construction of fuel elements (e.g., by a confined "tracer") [G21C-17/04H]
DIG 231 .Devices or arrangements for monitoring or testing fuel or fuel elements (e.g., for burn-up, for contamination, for leak-tightness) not during reactor operation [G21C-17/06] *** (DIG. 235, DIG. 236 take precedence) (detection of leaking fuel elements during reactor operation DIG. 224)

DIG 232 ..Leak-tightness control [G21C-17/06B] *** (DIG. 234 takes precedence)
DIG 233 ..Burn-up control [G21C-17/06D] *** (DIG. 234 takes precedence)
DIG 234 ..Control of spherical elements [G21C-17/06F]
DIG 235 .Structural combination of reactor core or moderator structure with viewing means (e.g., with television camera, periscope, window) [G21C-17/08]
DIG 236 .Structural combination of fuel element, control rod, reactor core, or moderator structure with sensitive instruments (e.g., for measuring temperature) [G21C-17/10]
DIG 237 ..Measuring reactivity [G21C-17/10B]
DIG 238 ..Measuring the reactor flux within the reactor (e.g., within its pressure vessel) [G21C-17/10D]
DIG 239 ..Measuring the temperature [G21C-17/10E]
DIG 240 ..Passages and insulators for electric cables and for measuring purposes [G21C-17/10G]
DIG 241 ..The sensitive element being part of a fuel element or a fuel assembly [G21C-17/10S] *** (structural combination with a thermoelectric element for direct production of electrical energy DIG. 84)
DIG 242 ..Sensitive element forming part of control element [G21C-17/12]
DIG 243 .Period meters [G21C-17/14]
DIG 244 **ARRANGEMENTS FOR TREATING, FOR HANDLING, OR FOR FACILITATING THE HANDLING OF, FUEL OR OTHER MATERIALS WHICH ARE USED WITHIN THE REACTOR (E.G., WITHIN ITS PRESSURE VESSEL) [G21C-19/00]**
DIG 245 .Details of handling arrangements [G21C-19/02]
DIG 246 ..Means for controlling flow of coolant over objects being handled; Means for controlling flow of coolant through channel being serviced (e.g., for preventing "blow-out") [G21C-19/04]
DIG 247 ..Magazines for holding fuel element or control elements [G21C-19/06]
DIG 248 ...Storage racks; Storage pools [G21C-19/06B]
DIG 249 ...Rotatable magazines [G21C-19/06D]
DIG 250 ..Means for heating fuel elements before introduction into the core; Means for heating or cooling fuel elements after removal from the core [G21C-19/08]
DIG 251 ..Lifting devices or pulling devices adapted for cooperation with fuel elements or with control elements [G21C-19/10]
DIG 252 ...With grasping or spreading coupling elements [G21C-19/10B]
DIG 253 ...With revolving coupling elements (e.g., socket coupling) [G21C-19/10D]
DIG 254 ...With latching devices and ball couplings [G21C-19/10F]
DIG 255 ..Arrangements for exerting direct hydraulic or pneumatic force on fuel element or on control element [G21C-19/12]
DIG 256 .Characterized by their adaptation for use with horizontal channels in the reactor core [G21C-19/14]
DIG 257 .Articulated or telescopic chutes or tubes for the connection to channels in the reactor core [G21C-19/16]
DIG 258 .Apparatus for bringing fuel elements to the reactor charge area (e.g., from a storage place) [G21C-19/18]
DIG 259 .Arrangements for introducing object into the pressure vessel; Arrangements for handling objects within the pressure vessel; Arrangements for removing objects from the pressure vessel [G21C-19/20]

DIG 260 ..Arrangements for handling ball-form (i.e., pebble fuel) [G21C-19/20A]

DIG 261 ..Interchanging of fuel elements in the core (fuel shuffling) [G21C-19/20B]

DIG 262 ..Arrangements for obtaining access to the interior of a pressure vessel while the reactor is operating [G21C-19/22]

DIG 263 ...By using an auxiliary vessel which is temporarily sealed to the pressure vessel [G21C-19/24]

DIG 264 .Arrangements for removing jammed or damaged fuel elements or control elements; Arrangements for moving broken parts thereof [G21C-19/26]

DIG 265 .Arrangements for introducing fluent material into the reactor core; Arrangements for removing fluent material from the reactor core [G21C-19/28] *** (pumping coolant DIG. 199+ and 294)

DIG 266 ..With continuous purification of circulating fluent material (e.g., by extraction of fission products, deterioration or corrosion products, impurities (e.g., by cold traps) [G21C-19/30] *** (purification of circulating fluid fuels DIG. 281; separation in general B01D)

DIG 267 ...Specially adapted for gases [G21C-19/30B] *** (decontamination of gases DIG. 378)

DIG 268 ...Specially adapted for liquids [G21C-19/30D] *** (decontamination of liquids DIG. 379)

DIG 269 ....For molten metals [G21C-19/30D2]

DIG 270 .....Using "cold traps" [G21C-19/30D2B]

DIG 271 ...Recombination devices [G21C-19/30R]

DIG 272 .Apparatus for removing radioactive objects or materials from the reactor discharge area (e.g., to a storage place); Apparatus for handling radioactive objects or materials within a storage place or removing them therefrom [G21C-19/32] *** (disposal of waste material DIG. 375+)

DIG 273 .Apparatus or processes for removing canning or casings from fuel; Separation of fuel and jacket material; also fuel elements, perforation (e.g., for sampling); Separation of fuel elements and fuel element-jackets in pieces; removal of end closures [G21C-19/34] *** (shielded cells DIG. 355+)

DIG 274 ..Mechanical means only [G21C-19/36]

DIG 275 ..Chemical means only [G21C-19/38]

DIG 276 .Arrangements for preventing occurence of critical conditions (e.g., during storage) [G21C-19/40]

DIG 277 .Reprocessing of irradiated fuel [G21C-19/42]

DIG 278 ..Of irradiated solid fuel [G21C-19/44]

DIG 279 ...Aqueous processes (e.g., by using organic extraction means, including the regeneration of these means) [G21C-19/46]

DIG 280 ...Nonaqueous processes [G21C-19/48]

DIG 281 ..Of irradiated fuel; also the regeneration of the fuels while the reactor is in operation [G21C-19/50]

DIG 282 **APPARATUS OR PROCESSES SPECIALLY ADAPTED TO THE MANUFACTURE OF REACTORS OR PARTS THEREOF [G21C-21/00] *** (IN GENERAL SECTION B, E.G., B23)**

DIG 283 .Manufacture of fuel elements or breeder elements contained in nonactive casings [G21C-21/02]

DIG 284 ..By vibrational compaction or tamping of fuel in the jacket [G21C-21/04]

DIG 285 ..By rotatable swaging of the jacket around the fuel [G21C-21/06]
DIG 286 ..By a slip-fit cladding process; by crimping the jacket around the fuel [G21C-21/08]
DIG 287 ..By extrusion, drawing, or stretching; by rolling (e.g., "picture frame" technique) [G21C-21/10]
DIG 288 ..By hydrostatic or thermo-pneumatic cannings (in general by pressing without lenthening, e.g., explosive coating) [G21C-21/12]
DIG 289 ..By plating the fuel in a fluid [G21C-21/14]
DIG 290 ..By casting or dipping techniques [G21C-21/16]
DIG 291 ..Manufacture of control elements covered by DIG. 113+ [G21C-21/18]
DIG 292 **DETAILS OF NUCLEAR POWER PLANT [G21D-1/00] *** (CONTROL DIG. 296)**
DIG 293 .Nuclear facilities decommissioning arrangements [G21D-1/00B] *** (decontamination arrangements; treating radioactively contaminated material DIG. 375+)
DIG 294 .Arrangements of auxiliary equipment [G21D-1/02]
DIG 295 .Pumping arrangements [G21D-1/04] *** (within the reactor pressure vessel DIG. 199+; electrodynamic pumps H02K-44/02)
DIG 296 **CONTROL OF NUCLEAR POWER PLANT [G21D-3/00] *** (CONTROL OF NUCLEAR REACTION IN GENERAL DIG. 113)**
DIG 297 .Manual control [G21D-3/02]
DIG 298 .Safety arrangements [G21D-3/04] *** (emergency protection of reactor DIG. 139+)
DIG 299 ..Responsive to faults within the plant [G21D-3/06] *** (in the reactor DIG. 139+)
DIG 300 .Regulation of any parameters in the plant [G21D-3/08]
DIG 301 ..By a combination of a variable derived from neutron flux with other controlling variables (e.g., derived from temperature, cooling flow, pressure) [G21D-3/10]
DIG 302 ..By adjustment of the reactor in response only to changes in engine demand [G21D-3/12]
DIG 303 ...Varying flow of coolant [G21D-3/14]
DIG 304 ...Varying reactivity [G21D-3/16]
DIG 305 ..By adjustment of plant external to the reactor only in response to change in reactivity [G21D-3/18]
DIG 306 **ARRANGEMENTS OF REACTOR AND ENGINE IN WHICH REACTOR-PRODUCED HEAT IS CONVERTED INTO MECHANICAL ENERGY [G21D-5/00]**
DIG 307 .Reactor and engine structurally combined (e.g., portable) [G21D-5/02]
DIG 308 .Reactor and engine not structurally combined [G21D-5/04]
DIG 309 ..With engine working medium circulating through reactor core [G21D-5/06]
DIG 310 ..With engine working medium heated in a heat exhanger by the reactor coolant [G21D-5/08]
DIG 311 ...Liquid working medium partially heated by reactor and vaporized by heat source external to the core (e.g., with oil heating) [G21D-5/10]
DIG 312 ...Liquid working medium vaporized by reactor coolant [G21D-5/12]
DIG 313 ....And also superheated by reactor coolant [G21D-5/14]
DIG 314 ....Superheated by separate heat source [G21D-5/16]
DIG 315 **ARRANGEMENTS FOR DIRECT PRODUCTION OF ELECTRIC ENERGY FROM FUSION OR FISSION REACTIONS [G21D-7/00] *** (OBTAINING ELECTRIC ENERGY FROM RADIOACTIVE SOURCES DIG. 410)**
DIG 316 .Using magneto-hydrodynamic generators [G21D-7/02]

DIG 317 .Using thermoelectric elements and/or thermoionic converters [G21D-7/04] *** (structural combination of fuel element with thermoelectric element and/or thermoionic converter DIG. 84; structural combination of fuel element with thermoelectric element DIG. 415, DIG. 84)

DIG 318 **ARRANGEMENTS TO PROVIDE HEAT FOR PURPOSES OTHER THAN CONVERSION INTO POWER (E.G., FOR HEATING BUILDINGS) [G21D-9/00]**

DIG 319 **SHIELDING CHARACTERIZED BY THE COMPOSITION OF THE MATERIALS [G21F-1/00]**

DIG 320 .Selection of uniform shielding materials [G21F-1/02]

DIG 321 ..Liquids [G21F-1/02B]

DIG 322 ..Semi-liquids, gels, pastes [G21F-1/02C]

DIG 323 ..Concretes; Other hydraulic hardening materials [G21F-1/04]

DIG 324 ...Combined with other materials dispersed in the carrier [G21F-1/04B]

DIG 325 ....With organic substances [G21F-1/04B2]

DIG 326 ....With metals [G21F-1/04B4]

DIG 327 ..Ceramics; Glasses; Refractories [G21F-1/06] *** (cermets DIG. 328)

DIG 328 ..Metals; Alloys; Cermets (i.e., sintered mixtures of ceramics and metals) [G21F-1/08]

DIG 329 ...Heavy metals or alloys [G21F-1/08B]

DIG 330 ..Organic substances; Dispersions in organic carriers [G21F-1/10]

DIG 331 ...Dispersions in organic carriers [G21F-1/10B]

DIG 332 ....Metallic dispersions [G21F-1/10B2]

DIG 333 .Laminated shielding materials [G21F-1/12]

DIG 334 ..Comprising metals [G21F-1/12B]

DIG 335 **SHIELDING CHARACTERIZED BY ITS PHYSICAL FORM (E.G., GRANULES OR SHAPE OF THE MATERIAL) [G21F-3/00]**

DIG 336 .Clothing [G21F-3/02]

DIG 337 ..Clothing surrounding the wearer completely [G21F-3-02B]

DIG 338 ..Aprons [G21F-3/02C]

DIG 339 ..Gloves [G21F-3/02D] *** (mounting means on glove boxes DIG. 363)

DIG 340 .Bricks; Shields made up therefrom [G21F-3/04]

DIG 341 **TRANSPORTABLE OR PORTABLE SHIELDED CONTAINERS [G21F-5/00]**

DIG 342 .Containers for fluid wastes [G21F-5/00A]

DIG 343 .Containers for solid radioactive wastes (e.g., ultimate disposal containers) [G21F-5/00B] *** (DIG. 347 takes precedence)

DIG 344 ..Containers for fuel elements [G21F-5/00B2]

DIG 345 ...Fuel element racks in the container [G21F-5/00B2B]

DIG 346 .Shock absorbers, specially adapted therefor (e.g., impact buffers for containers) [G21F5-00D]

DIG 347 .Containers provided with a rotatable drum [G21F-5/00F]

DIG 348 .Specially adapted heat removal systems (e.g., by a circulating fluid or by cooling fins.); Specially adapted protection against external fire [G21F-5/00H]

DIG 349 .Closures for containers or corresponding sealing arrangements [G21F-5/00J]

DIG 350 .For storing radioactive sources (e.g., source carriers for irradiation units); Radio isotope containers [G21F-5/00L]

DIG 351 ..Syringe shields and holders [G21F-5/00L2]

DIG 352 .Specially adapted containers or shipping cask handling devices (e.g., transporting devices) [G21F-5/00N]

DIG 353 .With provision for restricted exposure of a radiation source within the container [G21F-5/02]

DIG 354 ..Means for controlling exposure (e.g., time, size of aperture) [G21F-5/04]

DIG 355 **SHIELDED CELLS OR ROOMS [G21F-7/00]**
DIG 356 .Shielded passages through walls; Locks; Transferring devices between rooms [G21F-7/00B] *** (between glove-boxes DIG. 362)
DIG 357 ..Transferring by fluidic means [G21F-7/00B2]
DIG 358 .Room atmosphere, temperature or pressure control devices [G21F-7/00C] *** (glove-boxes DIG. 364)
DIG 359 .Observation devices permitting vision but shielding the observer (e.g., window, periscope) [G21F-7/02]
DIG 360 ..Windows (e.g., shielded) [G21F-7/02B]
DIG 361 .Shielded glove-boxes [G21F-7/04]
DIG 362 ..Shielded passages through walls; Locks; Closing or transferring means between glove-boxes [G21F-7/04B] *** (in general DIG. 356)
DIG 363 ..Glove mounting means [G21F-7/04C]
DIG 364 ..Glove-box atmosphere, temperature or pressure control devices [G21F-7/04D] *** (in general DIG. 358)
DIG 365 ..Lighting [G21F-7/04F]
DIG 366 ..Transportable glove-boxes [G21F-7/04G]
DIG 367 .Structural combination with remotely controlled apparatus (e.g., with manipulators) [G21F-7/06]
DIG 368 ..Integrated manipulators [G21F-7/06B]
DIG 369 ...Mounted in a wall (e.g., pivotably mounted) [G21F-7/06B2]
DIG 370 ..Remotely manipulated measuring or controlling devices [G21F-7/06C] *** (combined with window DIG. 359)
DIG 371 ..Remotely manipulated machinery [G21F-7/06D]
DIG 372 ..Remotely manipulated tools [G21F-7/06F]
DIG 373 ..Transferring devices within cells or boxes [G21F-7/06G] *** (between cells DIG. 356, 362)
DIG 374 ..Remotely manipulating devices for fluids [G21F-7/06H]
DIG 375 **DECONTAMINATION ARRANGEMENTS; TREATING RADIOACTIVELY CONTAMINATED MATERIAL [G21F-9/00]**
DIG 376 .Decontamination of contaminated objects, apparatus, clothes, food; Preventing contamination thereof [G21F-9/00B]
DIG 377 .Recovery of isotopes from radioactive waste (e.g., fission products [G21F-9/00C]
DIG 378 .Treating gases [G21F-9/02]
DIG 379 .Treating liquids [G21F-9/04]
DIG 380 ..Processing [G21F-9/06]
DIG 381 ...By evaporation; by distillation [G21F-9/08]
DIG 382 ...By flocculation [G21F-9/10]
DIG 383 ...By absorption; by adsorption; by ion exchange [G21F-9/12]
DIG 384 ...By incineration; by calcination (e.g., desiccation) [G21F-9/14]
DIG 385 ...By fixation in stable solid media [G21F-9/16]
DIG 386 ...By biological processes [G21F-9/18]
DIG 387 ..Disposal of liquid waste [G21F-9/20]
DIG 388 ...By storage in a tank or other container [G21F-9/22]
DIG 389 ...By storage in the ground; by storage underwater (e.g., in ocean) [G21F-9/24]
DIG 390 ...By dilution in water (e.g., in ocean, in stream) [G21F-9/26]
DIG 391 .Treating solids [G21F-9/28]
DIG 392 ..Processing [G21F-9/30]
DIG 393 ...By incineration [G21F-9/32]
DIG 394 ..Disposal of solid waste [G21F-9/34]
DIG 395 ...By packaging; by baling [G21F-9/36]
DIG 396 **ARRANGEMENTS FOR CONVERTING CHEMICAL ELEMENTS BY ELECTROMAGNETIC RADIATION, CORPUSCULAR RADIATION OR PARTICLE BOMBARDMENT (E.G., PRODUCING RADIOACTIVE ISOTOPES) [G21G-1/00]**
DIG 397 .In nuclear reactors {G21G-1/02]
DIG 398 .Outside of nuclear reactors or particle accelerators [G21G-1/04]
DIG 399 ..By neutron irradiation [G21G-1/06]

DIG 400 ...Accompanied by nuclear fission [G21G-1/08]

DIG 401 ..By bombardment with electrically charged particles [G21G-1/10] *** (irradiation devices DIG. 440+)

DIG 402 ..By electromagnetic irradiation (e.g., with gamma or X-rays) [G21G-1/12] *** (applications of radiation DIG. 421; irradiation devices DIG. 440+)

DIG 403 **RADIOACTIVE SOURCES [G21G-4/00] *** (PRODUCING NEUTRONS OR OTHER SUBATOMIC PARTICLES, X- OR GAMMA RAYS, IN FUSION REACTORS DIG. 1+, IN NUCLEAR REACTORS DIG. 5+; IN ACCELERATORS H05H; X-RAY TUBES H01J-35/00; GAMMA MASERS H01S-4/00)**

DIG 404 .Neutron sources [G21G-4/02]

DIG 405 .Radioactive sources other than neutron sources [G21G-4/04]

DIG 406 ..Characterized by constructional features [G21G-4/06]

DIG 407 ...Specially adapted for medical application [G21G-4/08]

DIG 408 ..With radium emanation [G21G-4/10]

DIG 409 **ALLEGED CONVERSION OF CHEMICAL ELEMENTS BY CHEMICAL REACTION [G21G-5/00]**

DIG 410 **ARRANGEMENTS FOR OBTRAINING ELECTRICAL ENERGY FROM RADIOACTIVE SOURCES (E.G., FROM RADIOACTIVE ISOTOPES, NUCLEAR OR ATOMIC BATTERIES) [G21H-1/00] *** (FUSION REACTORS DIG. 1+; NUCLEAR REACTORS DIG. 5+)**

DIG 411 .Cells charged directly by beta radiation [G21H-1/02]

DIG 412 .Cells using secondary emission induced by alpha radiation, beta radiation, or gamma radiation [G21H-1/04] *** (discharge tubes H01J-40/00)

DIG 413 .Cells wherein radiation is applied to the junction of different semiconductor materials [G21H-1/06]

DIG 414 .Cells in which radiation ionizes a gas in the presence of a junction of two dissimilar metals (i.e., contact potential difference cells) [G21H-1/08] *** (discharge tubes H01J)

DIG 415 .Cells in which radiation of disintegration heats a thermoelectric junction or a thermionic converter [G21H-1/10] *** (devices where heating occurs from fission reactions DIG. 39; discharge tubes functioning as thermionic generators H01J-45/00; thermoelectric devices comprising a junction of dissimilar materials H01L-35/00)

DIG 416 ..Cells provided with thermoelectric generators [G21H-1/10B]

DIG 417 ..Cells provided with thermionic generators [G21H-1/10C]

DIG 418 .Cells using conversion of the radiation into light combined with subsequent photoelectric conversion into electric energy [G21H-1/12]

DIG 419 **ARRANGEMENTS FOR DIRECT CONVERSION OF RADIATION ENERGY FROM RADIOACTIVE SOURCES TO FORMS OF ENERGY OTHER THAN ELECTRIC ENERGY (E.G., LIGHT) [G21H-3/00]**

DIG 420 .In which material is excited to luminesce by the radiation [G21H-3/02]

DIG 421 **APPLICATIONS OF RADIATION FROM RADIOACTIVE SOURCES OR ARRANGEMENTS THEREFOR [G21H-5/00] *****

DIG 422 .As tracers [G21H-5/02] *** (medicinal preparations containing radioactive substances A61K-43/00; investigating or analyzing biological material G01N-33/16)

DIG 423 **NUCLEAR EXPLOSIVE DEVICES; "ATOMIC BOMBS") [G21J-1/00]**

DIG 424 **PEACEFUL APPLICATIONS OF NUCLEAR EXPLOSIVE DEVICES [G21J-3/00] *** (OBTAINING OIL, GAS, WATER, SOLUBLE OR MELTABLE MATERIAL FROM DEEP WELLS BY MEANS OF NUCLEAR ENERGY E21B-43/236F, 43/24F)**

DIG 425 .For excavation [G21J-3/02]

DIG 426 **DETECTION ARRANGEMENTS FOR NUCLEAR EXPLOSIONS [G21J-5/00] *** (INDIVIDUAL MEASURING DEVICES G01N)**

DIG 427 **ARRANGEMENTS FOR HANDLING RADIATION OR PARTICLES (E.G., FOCUSING, MODERATING [G21K-1/00] *** (RADIATION FILTERS DIG. 435)**

DIG 428 .Using diaphragms, collimators [G21K-1/02]

DIG 429 ..Using multiple collimators (e.g., Bucky screens); other devices for eliminating undesired or dispersed radiation [G21K-1/02B]

DIG 430 ..Using variable diaphragms, shutters, choppers [G21K-1/04]

DIG 431 .Using diffraction, refraction or reflection, e.g., monochromators [G21K-1/06] *** (DIG. 435, 445 take precedence)

DIG 432 .Deviation, concentration or focusing of the beam by electric or magnetic means [G21K-1/08] *** (electron-optical arrangements in electric discharge tubes H01J-29/46; details (e.g., electric or magnetic deviating means for direct voltage accelerators or in accelerators using single pulses) H05H-5/02; arrangements for injecting particles into orbits H05H-7/08; arrangements for ejecting particles from orbits H05H-7/10)

DIG 433 ..By electrical means [G21K-1/087]

DIG 434 ..By magnetic means [G21K-1/093]

DIG 435 .Scattering devices; Absorbing devices [G21K-1/10]

DIG 436 ..Resonant absorbers or driving arrangements therefor (e.g., for Moessbauer-effect devices) [G21K-1/12] *** (motors with reciprocating, oscillating or vibrating magnet, armature or coil system in general H02K-33/00)

DIG 437 .Using charge exchange devices (e.g., for neutralizing or changing the sign of the electrical charges of beams) [G21K-1/14] *** (producing or accelerating neutral particle beams H05H-3/00)

DIG 438 .Using polarizing devices (e.g., for obtaining a polarized beam) [G21K-1/16] *** (ion sources, ion guns H01J-27/02; polarized targets for producing nuclear reactions H05H-6/00B)

DIG 439 **CONVERSION SCREENS FOR THE CONVERSION OF THE SPATIAL DISTRIBUTION OF X-RAYS OR PARTICLE RADIATION INTO VISIBLE IMAGES (E.G., FLUOROSCOPIC SCREENS) [G21K-4/00] *** (PHOTOGRAPHIC PROCESSES USING X-RAY INTENSIFIERS G03C-5/17; DISCHARGE TUBES COMPRISING LUMINESCENT SCREENS H01J-1/62; CATHODE-RAY TUBES FOR X-RAY CONVERSION WITH OPTICAL OUTPUT H01J-31/50)**

DIG 440 **IRRADIATION DEVICES [G21K-5/00] *** (DISCHARGE TUBES FOR IRRADIATING H01J-37/00)**

DIG 441 .Having no beam-forming means [G21K-5/02]

DIG 442 .With beam-forming means [G21K-5/04]

DIG 443 .Holder for targets or for other objects to be irradiated [G21K-5/08]

DIG 444 .With provision for relative movement of beam source and object to be irradiated [G21K-5/10]

DIG 445 **GAMMA- OR X-RAY MICROSCOPES [G21K-7/00]**