

**CPC****COOPERATIVE PATENT CLASSIFICATION****G21F**

**PROTECTION AGAINST X-RADIATION, GAMMA RADIATION, CORPUSCULAR RADIATION OR PARTICLE BOMBARDMENT; TREATING RADIOACTIVELY CONTAMINATED MATERIAL; DECONTAMINATION ARRANGEMENTS THEREFOR** ([radiation protection by pharmaceutical means A61K 7/40](#); in cosmonautic vehicles [B64G](#) ; combined with a reactor [G21C 11/00](#); combined with X-ray tubes [H01J 35/16](#); combined with X-ray apparatus [H05G 1/02](#))

**Guidance heading:****G21F 1/00****Shielding characterised by the composition of the materials**

- G21F 1/02 . Selection of uniform shielding materials
- G21F 1/023 .. {Liquids }
- G21F 1/026 .. {Semi-liquids, gels, pastes }
- G21F 1/04 .. Concretes; Other hydraulic hardening materials
- G21F 1/042 ... {Concretes combined with other materials dispersed in the carrier }
- G21F 1/045 .... {with organic substances }
- G21F 1/047 .... {with metals }
- G21F 1/06 .. Ceramics; Glasses; Refractories ([cermets G21F 1/08](#))
- G21F 1/08 .. Metals; Alloys; Cermets, i.e. sintered mixtures of ceramics and metals
- G21F 1/085 ... {Heavy metals or alloys }
- G21F 1/10 .. Organic substances; Dispersions in organic carriers
- G21F 1/103 ... {Dispersions in organic carriers }
- G21F 1/106 .... {metallic dispersions }
- G21F 1/12 . Laminated shielding materials
- G21F 1/125 .. {comprising metals }

**G21F 3/00****Shielding characterised by its physical form, e.g. granules, or shape of the material**

- G21F 3/02 . Clothing ([protective garments in general A41D 13/00](#))
- G21F 3/025 .. Clothing completely surrounding the wearer
- G21F 3/03 .. Aprons
- G21F 3/035 .. Gloves ([mounting means on glove boxes G21F 7/053](#))
- G21F 3/04 . Bricks; Shields made up therefrom

**G21F 5/00****Transportable or portable shielded containers**

- G21F 5/002 . Containers for fluid radioactive wastes

- G21F 5/005 . Containers for solid radioactive wastes, e.g. for ultimate disposal
- G21F 5/008 . . Containers for fuel elements
- G21F 5/012 . . . Fuel element racks in the containers
- G21F 5/015 . for storing radioactive sources, e.g. source carriers for irradiation units; Radioisotope containers
- G21F 5/018 . . Syringe shields or holders (syringe shielding for applying radioactive material to the body {A61M 5/1785 } )
- G21F 5/02 . with provision for restricted exposure of a radiation source within the container
- G21F 5/04 . . Means for controlling exposure, e.g. time, size of aperture (controlling exposure to X-radiation H05G 1/30)
- G21F 5/06 . Details of, or accessories to, the containers
- G21F 5/065 . . {Containers provided with a rotatable drum }
- G21F 5/08 . . Shock-absorbers, e.g. impact buffers for containers
- G21F 5/10 . . Heat-removal systems, e.g. using circulating fluid or cooling fins
- G21F 5/12 . . Closures for containers; Sealing arrangements
- G21F 2005/125 . . . Means to monitor or detect the leak-tightness of the closure
- G21F 5/14 . . Devices for handling containers or shipping-casks, e.g. transporting devices {loading and unloading, filling of containers (Cranes, load-engaging elements or devices for cranes, capstans, winches or tackles B66C ) }
- G21F 7/00** **Shielded cells or rooms** (chambers provided with manipulating devices in general B25J )
- G21F 7/005 . Shielded passages through walls; Locks; Transferring devices between rooms (between glove-boxes G21F 7/047)
- G21F 7/01 . . Transferring by fluidic means
- G21F 7/015 . Room atmosphere, temperature or pressure control devices
- G21F 7/02 . Observation devices permitting vision but shielding the observer { (optical systems per se G02 ) }
- G21F 7/03 . . Windows, e.g. shielded
- G21F 7/04 . Shielded glove-boxes (glove-boxes in general B25J 21/02)
- G21F 7/041 . . {Glove-box atmosphere, temperature or pressure control devices (in general G21F 7/015) }
- G21F 7/043 . . {Lighting }
- G21F 7/045 . . {Transportable glove-boxes }
- G21F 7/047 . . Shielded passages; Closing or transferring means between glove-boxes
- G21F 7/053 . . Glove mounting means
- G21F 7/06 . Structural combination with remotely controlled apparatus, e.g. with manipulators (manipulators B25J ; remote control in general G05 )
- G21F 7/061 . . {Integrated manipulators }

- G21F 7/062 . . . {mounted in a wall, e.g. pivotably mounted (in general [F16J 15/50](#), [F16J 15/52](#)) }
- G21F 7/063 . . {Remotely manipulated measuring or controlling devices (combined with window [G21F 7/02](#)) }
- G21F 7/065 . . {Remotely manipulated machinery }
- G21F 7/066 . . {Remotely manipulated tools }
- G21F 7/067 . . {Transferring devices within cells or boxes (between cells [G21F 7/005](#), [G21F 7/047](#)) }
- G21F 7/068 . . {Remotely manipulating devices for fluids }

## **G21F 9/00      Treating radioactively contaminated material; Decontamination arrangements therefor**

- G21F 9/001 . {Decontamination of contaminated objects, apparatus, clothes, food; Preventing contamination thereof }
- G21F 9/002 . . {Decontamination of the surface of objects with chemical or electrochemical processes }
- G21F 9/004 . . . {of metallic surfaces }
- G21F 9/005 . . {Decontamination of the surface of objects by ablation }
- G21F 9/007 . {Recovery of isotopes from radioactive waste, e.g. fission products (separating different isotopes of the same chemical element [B01D 59/00](#)) }
- G21F 9/008 . {Apparatus specially adapted for mixing or disposing radioactively contaminated material ([G21F 9/305](#) and [G21F 9/308](#) take precedence) }
- G21F 9/02 . Treating gases
- G21F 9/04 . Treating liquids

### **NOTE**

In this group the following term is used with the meaning indicated:

- "liquids" mean compounds being liquid under normal temperature and pressure conditions.

Molten metals and corium are classified as solids. Muds are classified as liquids as long as they are not dried

- G21F 9/06 . . Processing (separating different isotopes of the same chemical element [B01D 59/00](#))
- G21F 9/08 . . . by evaporation; by distillation
- G21F 9/10 . . . by flocculation
- G21F 9/12 . . . by absorption; by adsorption; by ion-exchange
- G21F 9/125 . . . . {by solvent extraction }
- G21F 9/14 . . . by incineration; by calcination, e.g. desiccation
- G21F 9/16 . . . by fixation in stable solid media {[G21F 9/305](#) takes precedence }
- G21F 9/162 . . . . {in an inorganic matrix, e.g. clays, zeolites }
- G21F 9/165 . . . . . {Cement or cement-like matrix (compositional aspects [C04B](#)) }

G21F 9/167	.... {in polymeric matrix, e.g. resins, tars }
G21F 9/18	... by biological processes
G21F 9/20	.. Disposal of liquid waste
G21F 9/22	... by storage in a tank or other container
G21F 9/24	... by storage in the ground; by storage under water, e.g. in ocean
G21F 9/26	... by dilution in water, e.g. in ocean, in stream
G21F 9/28	. Treating solids
G21F 9/30	.. Processing (separating different isotopes of the same chemical element <a href="#">B01D 59/00</a> )
G21F 9/301	... {by fixation in stable solid media }
G21F 9/302	.... {in an inorganic matrix }
G21F 9/304	..... {Cement or cement-like matrix (compositional aspects <a href="#">C04B</a> ) }
G21F 9/305	..... {Glass or glass like matrix ( <a href="#">C03B 5/005</a> takes precedence; compositional aspects <a href="#">C03C</a> ) }
G21F 9/307	.... {in polymeric matrix, e.g. resins, tars }
G21F 9/308	... {by melting the waste ( <a href="#">G21F 9/305</a> , <a href="#">G21F 9/32</a> take precedence) }
G21F 9/32	... by incineration
G21F 9/34	.. Disposal of solid waste
G21F 9/36	... by packaging; by baling