

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 8/00](#); 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](#))

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 [B01D 59/00](#))
- 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 C04B)}
G21F 9/305	{Glass or glass like matrix (C03B 5/005 takes precedence; compositional aspects C03C)}
G21F 9/307	{in polymeric matrix, e.g. resins, tars}
G21F 9/308	...	{by melting the waste (G21F 9/305 , G21F 9/32 take precedence)}
G21F 9/32	...	by incineration
G21F 9/34	..	Disposal of solid waste
G21F 9/36	...	by packaging; by baling