

**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}

<b>G21F 9/00</b>	<b>Treating radioactively contaminated material; Decontamination arrangements therefor</b>
G21F 9/001	<ul style="list-style-type: none"> <li>• {Decontamination of contaminated objects, apparatus, clothes, food; Preventing contamination thereof}</li> </ul>
G21F 9/002	<ul style="list-style-type: none"> <li>• • {Decontamination of the surface of objects with chemical or electrochemical processes}</li> </ul>
G21F 9/004	<ul style="list-style-type: none"> <li>• • • {of metallic surfaces}</li> </ul>
G21F 9/005	<ul style="list-style-type: none"> <li>• • {Decontamination of the surface of objects by ablation}</li> </ul>
G21F 9/007	<ul style="list-style-type: none"> <li>• {Recovery of isotopes from radioactive waste, e.g. fission products (separating different isotopes of the same chemical element <a href="#">B01D 59/00</a>)}</li> </ul>
G21F 9/008	<ul style="list-style-type: none"> <li>• {Apparatus specially adapted for mixing or disposing radioactively contaminated material (<a href="#">G21F 9/305</a> and <a href="#">G21F 9/308</a> take precedence)}</li> </ul>
G21F 9/02	<ul style="list-style-type: none"> <li>• Treating gases</li> </ul>
G21F 9/04	<ul style="list-style-type: none"> <li>• Treating liquids</li> </ul>
	<b>NOTES</b>
	<ol style="list-style-type: none"> <li>1. In this group the following term is used with the meaning indicated: <ul style="list-style-type: none"> <li>– "liquids" mean compounds being liquid under normal temperature and pressure conditions.</li> </ul> </li> <li>2. Molten metals and corium are classified as solids. Muds are classified as liquids as long as they are not dried</li> </ol>
G21F 9/06	<ul style="list-style-type: none"> <li>• • Processing (separating different isotopes of the same chemical element <a href="#">B01D 59/00</a>)</li> </ul>
G21F 9/08	<ul style="list-style-type: none"> <li>• • • by evaporation; by distillation</li> </ul>
G21F 9/10	<ul style="list-style-type: none"> <li>• • • by flocculation</li> </ul>
G21F 9/12	<ul style="list-style-type: none"> <li>• • • by absorption; by adsorption; by ion-exchange</li> </ul>
G21F 9/125	<ul style="list-style-type: none"> <li>• • • • {by solvent extraction}</li> </ul>
G21F 9/14	<ul style="list-style-type: none"> <li>• • • by incineration; by calcination, e.g. desiccation</li> </ul>
G21F 9/16	<ul style="list-style-type: none"> <li>• • • by fixation in stable solid media {(<a href="#">G21F 9/305</a> takes precedence)}</li> </ul>
G21F 9/162	<ul style="list-style-type: none"> <li>• • • • {in an inorganic matrix, e.g. clays, zeolites}</li> </ul>
G21F 9/165	<ul style="list-style-type: none"> <li>• • • • • {Cement or cement-like matrix (compositional aspects <a href="#">C04B</a>)}</li> </ul>
G21F 9/167	<ul style="list-style-type: none"> <li>• • • • {in polymeric matrix, e.g. resins, tars}</li> </ul>
G21F 9/18	<ul style="list-style-type: none"> <li>• • • by biological processes</li> </ul>
G21F 9/20	<ul style="list-style-type: none"> <li>• • Disposal of liquid waste</li> </ul>
G21F 9/22	<ul style="list-style-type: none"> <li>• • • by storage in a tank or other container</li> </ul>
G21F 9/24	<ul style="list-style-type: none"> <li>• • • by storage in the ground; by storage under water, e.g. in ocean</li> </ul>
G21F 9/26	<ul style="list-style-type: none"> <li>• • • by dilution in water, e.g. in ocean, in stream</li> </ul>
G21F 9/28	<ul style="list-style-type: none"> <li>• Treating solids</li> </ul>
G21F 9/30	<ul style="list-style-type: none"> <li>• • Processing (separating different isotopes of the same chemical element <a href="#">B01D 59/00</a>)</li> </ul>
G21F 9/301	<ul style="list-style-type: none"> <li>• • • {by fixation in stable solid media}</li> </ul>
G21F 9/302	<ul style="list-style-type: none"> <li>• • • • {in an inorganic matrix}</li> </ul>
G21F 9/304	<ul style="list-style-type: none"> <li>• • • • • {Cement or cement-like matrix (compositional aspects <a href="#">C04B</a>)}</li> </ul>

- 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