

**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	• {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 <a href="#">B01D 59/00</a> )}
G21F 9/008	• {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)}
G21F 9/02	• Treating gases
G21F 9/04	• Treating liquids
	<b>NOTES</b>
	1. In this group the following term is used with the meaning indicated: – "liquids" mean compounds being liquid under normal temperature and pressure conditions.
	2. 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 <a href="#">B01D 59/00</a> )
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 {( <a href="#">G21F 9/305</a> takes precedence)}
G21F 9/162	• • • • {in an inorganic matrix, e.g. clays, zeolites}
G21F 9/165	• • • • • {Cement or cement-like matrix (compositional aspects <a href="#">C04B</a> )}
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 ([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