

**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](#) )

**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 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
  
- G21F 2005/00      Transportable or portable shielded containers**
  
- G21F 2005/06 . Details of, or accessories to, the containers
- G21F 2005/12 . . Closures for containers; Sealing arrangements
- G21F 2005/125 . . . Means to monitor or detect the leak-tightness of the closure