

**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 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