

GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
LOK SABHA
UNSTARRED QUESTION NO - 609
ANSWERED ON 23/07/2025

INTELLECTUAL PROPERTY RIGHTS

609. SHRI DILESHWAR KAMAIT

Will the PRIME MINISTER be pleased to state:-

- (a) whether the Department of Atomic Energy (DAE) acquires Intellectual Property Rights (IPRs) for its invented products, procedures and technologies;
- (b) if so, the details thereof including the number of respective patents each in India and outside India;
- (c) whether any significant achievements have been made in respect of commercialisation of patented technologies; and
- (d) if so, the details thereof?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES AND PENSIONS
AND PRIME MINISTER'S OFFICE (DR. JITENDRA SINGH)

- (a) As stipulated in the Patents Act, 1970 Section 4, which stipulates: "No patent shall be granted for an invention related to atomic energy that falls within sub-section (1) of Section 20 of the Atomic Energy Act, 1962 (33 of 1962)", the intellectual property generated by the Department related to Atomic Energy can't be patented in India. However, the Department obtains a significant number of patent rights through R&D and spin-off technologies developed for the nuclear power program of India. These patents pertain to application of its products, processes and technologies in various domains other than atomic energy.
- (b) DAE has obtained 235 patent rights in India since, 1985. (Details attached as Annexure-1) DAE obtained 143 patent rights outside India since, 2001. (Details attached as Annexure -2)
- (c)&(d) There are many significant achievements with respect to commercialization of patented technologies.

The details of the significant achievements are listed below:

- (i) Electronic Voting Machine – Indian Patent No. 199087.

- (ii) A Method for Treating Exhaust Gas Emission Produced During Combustion of Coal in a Coal Combustion Plant for Reducing Suspended Particulate Matters – Indian Patent No. 194122.
- (iii) An Improved Process for the Preparation of Magnetisable Cellulose Particle – Indian Patent No. 193445.
- (iv) Nanotube Incorporated Ballistic Resistant Armour Panels and Products Thereof – Indian Patent No. 528921 (BHABHA Kavach).
- (v) Hybrid granular SBR for waste water treatment (GST) – Indian Patent No. 381341
- (vi) An Apparatus to Generate Large Plasma Arc Plume for Waste Disposal and Thermal Processing Applications – Indian Patent No. 432380.
- (vii) Plasma pyrolysis system and process for the disposal of waste using graphite plasma torch – Indian Patent No. 272122
- (viii) Plasma pyrolysis system for safe disposal of organic waste using plasma torch with a novel endogenous gas source – Indian Patent No 281527
- (ix) A Liquid Nitrogen Based Portable Refrigeration System for Carrying Refrigerated Goods – Indian Patent No. 502550 (SHIVAY).
- (x) Ultrafiltration Membrane Water Purification Device– Indian Patent No. 195961
- (xi) Process for Preparation of Anti-Leprosy Vaccine– Indian Patent No. 153031.
- (xii) A Penetration Enhancing Flux Formulation for Tungsten Inert Gas (TIG) Welding of Austenitic Stainless Steel and its Application– Indian Patent No. 266346.

Annexure-1: Details of Patents granted in India

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|--|------------|-------------|---------------------|
| 1. | A Method of Chemically Three Dimensionally Crosslinking Polyvinyl Alcohol | 153797 | 01-Nov-1985 | India |
| 2. | Process for Preparation of Anti-Leprosy Vaccine | 153031 | 26-May-1985 | India |
| 3. | A Method of Manufacturing Mechanically Stable Three Dimensionally Cross-Linked Polyvinyl Alcohol by An Ionising Radiation | 153994 | 16-Aug-1985 | India |
| 4. | A Device for Removing Human Blood Toxins | 153999 | 13-Dec-1985 | India |
| 5. | A Method of Chemically Three Dimensionally Crosslinking Polyvinyl Alcohol | 153801 | 31-Jan-1986 | India |
| 6. | A Method & Device for In-Situ Casting of a Tubular Membrane Directly on A Porous Tubule or Capillary for Use in Reverse Osmosis Tubular Modules. | 162173 | 18-Nov-1988 | India |
| 7. | A Method and A Device for In-Situ Casting of a Tubular Membrane Directly in A Porous Support Tube for Use In Reverse Osmosis Tubular Modules | 162174 | 18-Nov-1988 | India |
| 8. | A Reverse Osmosis Tubular Module for Use in A Reverse Osmosis Plant | 158830 | 25-Aug-1989 | India |
| 9. | A Method for The Manufacture of Sulphide Ion Sensitive or Selective Silver Sulphide Electrode for Use in Electrochemical Cells | 160612 | 17-Jun-1988 | India |
| 10. | An Improved Reverse Osmosis Tubular Module for Use in A Reverse Osmosis Plant | 166048 | 12-Oct-1990 | India |
| 11. | A Telescopic Electrode Seal Device for Use in A Completely Closed Electric Arc Furnace and Such A Furnace Having The Same | 166974 | 22-Mar-1991 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|--|------------|-------------|---------------------|
| 12. | A Fixed Mirror Line Focus Solar Concentrator with Cylindrical Mirror Elements. | 172328 | 27-May-1994 | India |
| 13. | An Improved Method for The Detoxification of Fluorine Containing Aqueous Effluent | 167969 | 03-Jan-1992 | India |
| 14. | A Porous Electrode for Use in a Filter-Press Type High Pressure Alkaline Water Electrolyser Cell Module and a Method of Manufacturing the Same. | 172456 | 10-Jun-1994 | India |
| 15. | An Integral Bipolar Plate for Use in a Filter-Press Type High Pressure Alkaline Water Electrolyser Cell Module and a Method of Manufacturing the Same | 172485 | 24-Jun-1994 | India |
| 16. | An Improved Filter-Press Type High Pressure Alkaline Water Electrolyser Cell Module | 172486 | 24-Jun-1994 | India |
| 17. | A Birefringent Crystal Lens Light Beam Polariser | 173464 | 16-Dec-1994 | India |
| 18. | A Collapsible Solar Dryer | 173519 | 30-Dec-1994 | India |
| 19. | A Bio Catalyst for the Preparation of Invert Sugar Syrup from Aqueous Sucrose Solution and a Method of Making the Same | 177144 | 16-May-1997 | India |
| 20. | A Continuous Single Step Bio Catalytic Process for the Preparation of Invert Sugar Syrup from Aqueous Sucrose Solution and A Bioreactor for Carrying out the Same. | 177145 | 16-May-1997 | India |
| 21. | A Process for the Preparation of An Aqueous Emulsion Pressure Sensitive Adhesive (also Refer 490/BOM/1997) | 181789 | 06-Aug-1999 | India |
| 22. | A Process for the Preparation of a Pectinolytic Enzyme Complex Comprising Polygalacturonase Pectin Esterase and Pectin Llyase | 182245 | 17-Sep-1999 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------|-------------|---------------------|
| | from a New Microbial Strain of <i>Aspergillus Niger van Tiegh</i> | | | |
| 23. | A Process for Enzymatic Liquefaction of Unconventional Fruits | 182962 | 25-Feb-2000 | India |
| 24. | A High Angular and Spatial Resolution Phase Gradient Interferometer | 183095 | 07-Apr-2000 | India |
| 25. | A Highly Cross-Linked Silicone Membrane for Liquid Support and a Method of Making the Same | 185680 | 05-Oct-2001 | India |
| 26. | A Process for the Synthesis of 5,10,15,20-tetrakis [3,4-biscarboxymethyleneoxy)phenyl] Porphyrin from 3,4-di(carbethoxymethyleneoxy) Benzaldehyde for Detection / Treatment of Tumours. | 180992 | 07-Feb-1998 | India |
| 27. | A Process for the Synthesis of 5,10,15,20-tetrakis[3,4-biscarboxymethyleneoxy)phenyl] chlorin from 5, 10, 15, 20-tetrakis[3,4-di(carbethoxymethyleneoxy)phenyl] Porphyrin for Detection / Treatment of Tumours. | 180480 | 01-Jan-1999 | India |
| 28. | A Process for the Manufacture of an Unsupported Integrally Skinned asymmetric semipermeable Polyether Amide Hydrazide Polymeric Membrane for Use in Reverse Osmosis | 186375 | 01-Mar-2002 | India |
| 29. | A Solvent Exchange cum Immersion Precipitation Process for the Manufacture of Asymmetric Semipermeable Aromatic Polyamide Polymeric Membrane for Use in Reverse Osmosis | 186210 | 08-Feb-2002 | India |
| 30. | A Hydrogen Sensor for Measurement of Diffusible Hydrogen in Weldment | 186660 | 17-May-2002 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------|-------------|---------------------|
| 31. | An Optical Probe for Qualitative Evaluation / Measurement of Defects in a Ferromagnetic Material Component | 186620 | 17-May-2002 | India |
| 32. | An Optical Probe for Quantitative Evaluation / Measurement of Defects in a Ferromagnetic Material Component | 186574 | 03-May-2002 | India |
| 33. | A Process for the Preparation of an Aqueous Emulsion Pressure Sensitive Adhesive Label (Divisional Application to 390/BOM/1994) | 182181 | 03-Sep-1999 | India |
| 34. | A Process for the Preparation of an Immunomodulator from the Ayurvedic Medicinal Plant, <i>Culvel (Tinospora Sp.)</i> | 183805 | 22-Apr-2000 | India |
| 35. | Cadmium Sulfide (CdS) Nano Crystalline Particulates and Thin Film thereof Particularly for Use as Luminescent or Visible Light Emitting Elements under UV irradiation & a Single step process for the Preparation of the Same | 187205 | 27-Sep-2002 | India |
| 36. | A Process for Isolating Podophyllotox in from the Genus Podophyllum Particularly the Plant Species Emodi Wall | 187287 | 04-Oct-2002 | India |
| 37. | A Process for the Preparation of the Anti Cancer drug N[4-{2,4diamino-6-pteridiny]methyl] methylaminobenzoyl]-L-glutamic Acid commonly known as Methotrexate& Pharmaceutically Acceptable Salts Thereof | 182947 | 16-Jun-2000 | India |
| 38. | An Acrylamide-based Gamma Ray Dosimeter Using Ultrasonic | 187206 | 06-Aug-2002 | India |
| 39. | An Ultrasonic Device for Measuring Residual Monomer in a Polymer Solution Particularly Polyacrylamide | 187485 | 15-Nov-2002 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------|-------------|---------------------|
| 40. | An Apparatus for Producing Laser-based Etching on Surfaces of Articles of Metals, Alloys and Ceramics | 189001 | 29-Aug-2003 | India |
| 41. | A Method of Preparing a Mechanically Strong Hydrophilic Polyvinyl Alcohol Hydrogel | 187486 | 15-Nov-2002 | India |
| 42. | A Process for the Preparation of Anti-Sera of Protein named PV2 for Detection of Malaria | 192707 | 01-May-2004 | India |
| 43. | A Device for Detecting Defects such as Scratches and Cracks on an Electrically Conductive Surface | 190427 | 28-Jan-2004 | India |
| 44. | A Method for Treating Exhaust Gas Emission Produced During Combustion of Coal in a Coal Combustion Plant for Reducing Suspended Particulate Matters | 194122 | 23-Feb-2005 | India |
| 45. | A Modular Device for Generating High Voltage Impulses | 191318 | 20-May-2004 | India |
| 46. | A Modular Device for Generating High Voltage Impulses | 191316 | 20-May-2004 | India |
| 47. | A Device for Transduction of Spatially Patterned Signals to and / or from Oral Surface | 192082 | 01-Aug-2004 | India |
| 48. | A System for Projection and Transmission of Spatially and Temporally Patterned Signals onto Oral Surface | 191531 | 31-May-2004 | India |
| 49. | A Device for Detection and Acquisition of Spatially & Temporally Patterned Signals from Oral Surface | 192719 | 01-Aug-2004 | India |
| 50. | A Process for the Preparation of Europium Activated Red Emitting Yttrium Phosphate Vanadate Phosphor with Boron | 194131 | 23-Feb-2005 | India |
| 51. | A Process for the Isolation of Recombinant Nucleotide Sequence Comprising 1-2381 Base Pairs (bp) for Early Detection of Oral Cancer (also Refer 868/MUM/2001) | 188744 | 08-Aug-2003 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|--|------------|-------------|---------------------|
| 52. | An Electronic Device for Recording Blood Flow Signal Variability | 195350 | 07-Jun-2005 | India |
| 53. | A Spiral Wound Dry Polyamide Element for Membrane Filtration and a Method of Making the Same | 194106 | 22-Feb-2005 | India |
| 54. | A Method of Making a Supported Dry Asymmetric Polyamide Membrane for Membrane Filtration | 194101 | 09-May-2005 | India |
| 55. | A High-Pressure Vessel for Membrane Filtration | 195317 | 07-Jun-2005 | India |
| 56. | A Device for Detecting Leaks in Tubes | 193457 | 22-Feb-2005 | India |
| 57. | A Split Coil Probe for Steel Wire Rope Inspection | 193458 | 29-Mar-2005 | India |
| 58. | A Device for Dynamic Compensation of Slow Responding Transducer | 196522 | 22-Dec-2005 | India |
| 59. | An Impedance Cardio Vasograph | 196540 | 12-Jan-2006 | India |
| 60. | A One Stage Irradiation Process for Manufacture of Hydrogel Dressing Free of Synthetic Plasticizers | 192136 | 29-Sep-2004 | India |
| 61. | An Improved Process for the Preparation of Magnetisable Cellulose Particle | 193445 | 20-Jan-2005 | India |
| 62. | A Composition of Magnetisable Microcrystalline Cellulose Particle | 193912 | 22-Feb-2005 | India |
| 63. | An Improved Process for Producing Mixed Oxide Coated Titanium Electrodes having Enhanced Life in Electrochemical Applications and the Electrodes so Prepared | 195371 | 07-Jun-2005 | India |
| 64. | System for Deposition of Carbon Films and Process for the Same | 204221 | 09-Feb-2007 | India |
| 65. | A Process for Manufacture of Polymeric Films with Electro-Active Patterns Printed on Them | 204360 | 15-Feb-2007 | India |
| 66. | Preloaded Parabolic Dish Antenna and the Method of Making it | 207809 | 28-Jun-2007 | India |
| 67. | An Apparatus for Electro-Reflectance and Surface Photo | 204169 | 12-Jan-2007 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|--|------------|-------------|---------------------|
| | Voltage Spectroscopies in Soft Contact Mode | | | |
| 68. | An Improved Process for Preparing Stabilized Biological Preparation such as Oral Polio Vaccine (OPV) | 197836 | 09-Mar-2006 | India |
| 69. | A Process for Depositing electronic Ceramic Oxide Thin Films with Controlled Oxygen Stoichiometry on Different Substrate Materials | 205887 | 12-Apr-2007 | India |
| 70. | Online Process Instrumentation Loop Calibrator | 197786 | 17-Jan-2006 | India |
| 71. | A Process for Preparation of Banana Juice and Banana Powder from Ripe Bananas (<i>Musa Cavendish</i>) | 189999 | 05-Jan-2004 | India |
| 72. | A Process for the Preparation of Insect Communication Modifier from <i>Zanthoxylum Alatum</i> Seed Oil | 190566 | 20-Apr-2004 | India |
| 73. | Electronic Voting Machine | 199087 | 06-Mar-2006 | India |
| 74. | A Low-Cost Digital Pocket Dosimeter | 197797 | 01-Feb-2006 | India |
| 75. | An Improved Process for Providing Hard Chromium Nitride Coating on Substrates and a Coated Substrate so Obtained. | 198325 | 06-Apr-2006 | India |
| 76. | A Process for the Preparation of MgO Stabilised Beta Alumina | 215156 | 20-Feb-2008 | India |
| 77. | A Compact Kit for the Rapid Detection and Estimation of Protonophoric Pollutants in Waste Waters | 198326 | 06-Apr-2006 | India |
| 78. | A Process for Production of Zinc Oxide based Varistor from Zinc Ore | 204633 | 28-Feb-2007 | India |
| 79. | A Process for Preparation of High Purity Zinc Oxide Powder from Zinc Calcine | 204974 | 01-Mar-2007 | India |
| 80. | A Process for Producing Disilicides of Molybdenum, Tungsten and their Solid Solution | 206958 | 16-May-2007 | India |
| 81. | A Process for the Preparation of a Kit Comprising Recombinant | 189625 | 30-Sep-2003 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------|-------------|---------------------|
| | Nucleotide Sequence comprising 1-2381 Base Pairs (bp) for Early Detection of Oral Cancer (Divisional App. To 392/BOM/1999) | | | |
| 82. | An Improved Room Temperature Chemical Vapour Deposition Process for the Deposition of Poly(phenylenevinylene) in the Manufacture of Organic based Electronic Devices | 215159 | 21-Feb-2008 | India |
| 83. | Process for In-Situ Preparation of Electrolyte for Measuring Hydrogen in High Temperature Fluids | 198013 | 01-Feb-2006 | India |
| 84. | A Measuring System for Online Measurement of Corrosion Rate of Metals in an Aqueous Medium | 204092 | 06-Dec-2006 | India |
| 85. | An Improved Method of Detection of Target Nucleic Acid Sequence by Nucleic Acid Amplification | 196040 | 08-Sep-2005 | India |
| 86. | An Improved Apparatus for Measuring Forces Between Colloidal Particles or Droplets | 195921 | 03-Apr-2005 | India |
| 87. | A Tuneable Optical Filter | 196063 | 17-Oct-2005 | India |
| 88. | A Process for the Manufacture of Composites | 241751 | 23-Jul-2010 | India |
| 89. | A Process for Manufacture of Half Metallic Ferromagnet with CrO ₂ or Composites of CrO ₂ Chromium Sesquioxide | 204533 | 23-Feb-2007 | India |
| 90. | An Apparatus and A Method for Optical Tweezer-based System for Trapping and Controlled Rotation of Trapped Microscopic Objects. | 205080 | 01-Mar-2007 | India |
| 91. | A Liquid Phase Epitaxy Process for Manufacturing Separately Confined Strained Heterostructure Devices such as Diode Laser Emitting at Narrow Wavelength Region Within 650-1600 nm | 195956 | 02-Sep-2005 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------|-------------|---------------------|
| 92. | Ammonia Absorption Refrigeration System with Improved Coefficient of Performance | 205574 | 04-Apr-2007 | India |
| 93. | Ultrafiltration Membrane Water Purification Device | 195961 | 02-Sep-2005 | India |
| 94. | A Process for the Treatment of Austenitic Stainless Steel | 200100 | 17-Apr-2006 | India |
| 95. | Stabilised Magnetic Emulsion and a Process of Making it | 205114 | 01-Mar-2007 | India |
| 96. | Process for Manufacture of Novel Compound Exhibiting Magneto-Electric Coupling and High Dielectric Constant at Room Temperature | 203429 | 01-Nov-2006 | India |
| 97. | Process for the Preparation of Ceria Nano Powder Suitable for Optical Polishing | 207569 | 14-Jun-2007 | India |
| 98. | A Batch Reactor for Producing Metal Oxides | 207053 | 21-May-2007 | India |
| 99. | A Process for Treatment of Waste Water Containing Nitrate Ions | 222102 | 21-Jul-2008 | India |
| 100. | Apparatus and Method for Transport of Microscopic Object(s) | 240966 | 10-Jun-2010 | India |
| 101. | A Tuneable Laser with a single Tuning Element and a Wavelength Selector Operating in Both Side of a Dispersive Resonator | 198772 | 07-Feb-2006 | India |
| 102. | A Method for Maintaining Freshness and Extension of Shelf life of Cut-Flowers | 210507 | 05-Oct-2007 | India |
| 103. | A Novel Compound Exhibiting Magneto-Electric Coupling and High Dielectric Constant at Room Temperature | 225691 | 20-Nov-2008 | India |
| 104. | An Electro Mechanical Method for Cost Effective | 198509 | 30-Jan-2006 | India |
| 105. | A Furnace for Preparing Low Melting Metal Granules | 231518 | 05-Mar-2009 | India |
| 106. | An Improved Sub-Ambient Phase Change Composition | 234952 | 22-Jun-2009 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------|-------------|---------------------|
| 107. | A Kit for the Detection of Target Nucleic Acid Sequence by Nucleic Acid Amplification | 235792 | 27-Aug-2009 | India |
| 108. | Prism Mount Adapter | 244151 | 19-Nov-2010 | India |
| 109. | A System for Precision Angular Motion Mechanism for Alignment and Positioning of Optical Elements | 209080 | 28-Aug-2007 | India |
| 110. | Process for Direct Somatic Embryogenesis from Immature Inflorescence Segments of Sugarcane | 243371 | 08-Oct-2010 | India |
| 111. | Enzymatic Process for Debittering of Protein Hydrolysate Using Immobilised Peptidases | 252516 | 21-May-2012 | India |
| 112. | Biometric Technique for Personal Identification based on Multiple Patterns on Fingers from Nail Side of the Hand | 255627 | 12-Mar-2013 | India |
| 113. | A Penetration Enhancing Flux Formulation for Tungsten Inert Gas (TIG) Welding of Austenitic Stainless Steel and its Application | 266346 | 30-Apr-2015 | India |
| 114. | A Method and System for Non-Intrusive on-line Detection of Turbine Blade Condition | 300828 | 07-Sep-2018 | India |
| 115. | Zinc Fertilizer Formulation and Process for Producing the Same | 239929 | 12-Apr-2010 | India |
| 116. | A Phosphorus Fertilizer Formulation and a Process of Making it | 238485 | 08-Feb-2010 | India |
| 117. | Process for Preparing Metal Complexes of 1,3 Diketones Using Ultrasound | 236638 | 13-Nov-2009 | India |
| 118. | A Method of Qualifying Niobium and/or Other Super Conducting Materials for Reliable Fabrication of Super Conducting Radio Frequency (SCRF) Cavities | 288175 | 09-Oct-2017 | India |
| 119. | A Hydraulic Micrometer System for Remote Measurement of Inside | 327440 | 16-Dec-2019 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|--|------------|-------------|---------------------|
| | Diameter of Pipes and Tubes and a Method of such Measurement | | | |
| 120. | Process for Development of a High resistance Austenitic Stainless Steel | 272698 | 20-Apr-2016 | India |
| 121. | A Process for the Treatment of Cellulose-based Waste for Removal of Hazardous Materials and Recovery of Valuables | 256258 | 23-May-2013 | India |
| 122. | A Method and Apparatus for "Block Encryption" and "Synchronous Stream Cipher (SSC)" | 396872 | 13-May-2022 | India |
| 123. | Generator of Collimated Variable Diameter Hollow Laser Beam | 269505 | 26-Oct-2015 | India |
| 124. | A Liquid based Thin Layer Cyto Preparation for Liquid-based Cytology | 282981 | 28-Apr-2017 | India |
| 125. | Single Fibre Grid with Improved Spatial Resolution in Distributed Optical Fibre Sensor System | 280741 | 27-Feb-2017 | India |
| 126. | Niobium based Super Conducting Radio Frequency (SCRF) Cavities Comprising Niobium Components Joined by Laser Welding | 341058 | 10-Jul-2020 | India |
| 127. | Biological Laser Plasma X-Ray Point Source | 356014 | 18-Jan-2021 | India |
| 128. | Improved Path Length Fibre Optic Probe for On-line and Off-line Spectrophotometric Assay | 291011 | 22-Dec-2017 | India |
| 129. | Fire Retardant Intumescent High Density Rigid Polyurethane Foam for Specialty Applications | 277138 | 11-Nov-2016 | India |
| 130. | A Flexible Magnetic Membrane based Actuation System and Devices Involving the Same | 425538 | 16-Mar-2023 | India |
| 131. | An Improved Process for Production of High-Grade Synthetic Rutile from Titaniferrous Ores | 289211 | 03-Nov-2017 | India |
| 132. | An Optical Source, its Method of Preparation and its Application Thereof | 285356 | 18-Jul-2017 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------|-------------|---------------------|
| 133. | A Finishing Device | 418577 | 19-Jan-2023 | India |
| 134. | A Single Layer Irradiated Functional Clay-Polymer Nano Composite Film and its Method of Preparation | 286015 | 02-Aug-2017 | India |
| 135. | Micromachined Metal Diaphragm based Fabry-Perot Fibre Optics Sensor System and Data Processing Involving the Same | 359492 | 25-Feb-2021 | India |
| 136. | An Improved Process for Production of High Pure Submicron Yttria Stabilized Zirconia Powder from Zircon | 286134 | 08-Aug-2017 | India |
| 137. | A Tri-Vane Spiral Vacuum Booster Device for Pumping High Volumetric Fluid at Low Pressure | 312335 | 06-May-2019 | India |
| 138. | Novel Plasmodium Protein as Malarial Vaccine and Drug Target | 310142 | 27-Mar-2019 | India |
| 139. | Improved Process for the Electrochemical Synthesis of Palladium Nano Particles in Ionic Liquid as an Electrolyte | 280179 | 13-Feb-2017 | India |
| 140. | Conformal Hydrodynamic Nano-Polishing Machine and Process | 336494 | 05-May-2020 | India |
| 141. | A Process for Producing Ultrapure Titanium Dioxide from Titan Ferrous Ore and Slag Sample | 277309 | 17-Nov-2016 | India |
| 142. | A 6-Axis Parallel Kinematic Manipulator | 395835 | 29-Apr-2022 | India |
| 143. | A Novel Method of Synthesis of Rhodium Metal Foam using Room Temperature Ionic Liquids | 279100 | 11-Jan-2017 | India |
| 144. | A Method of Preparation of Potassium Fluoroborate (KBF ₄) | 287491 | 19-Sep-2017 | India |
| 145. | A Storage Stable Microbial Decontaminated Litchi (<i>Litchi Chinensis</i>) with Extended Shelf Life Retaining Pericarp Colour and a Process Thereof | 333456 | 28-Feb-2020 | India |
| 146. | Innovative, Inexpensive and Viable Method for the Isolation of Novel | 410220 | 28-Oct-2022 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|--|------------|-------------|---------------------|
| | Antioxidant Flavonoids from the Weed, <i>Coronopus Didymus</i> | | | |
| 147. | An Apparatus and A Method for Authenticating Hard Copy Documents with Images and Template | 459083 | 13-Oct-2023 | India |
| 148. | A Dual-Purpose Atomic Device for Realising Atomic Frequency Standard and Magnetic Field Measurement | 345150 | 26-Aug-2020 | India |
| 149. | A Method for Large-Scale Synthesis of Optically Stimulated Luminescence Grade Polycrystalline Ceramic Material | 341683 | 15-Jul-2020 | India |
| 150. | A Wound Dressing Capable of In-situ NO _x Release and a Process for Manufacturing the Same | 300809 | 06-Sep-2018 | India |
| 151. | An Improved Ground Fault Protection Mechanism for Quick Detection and Isolation of a Ground Fault to Prevent Damages in Parallel or Upstream Circuits Associated with Electrical Power Supply System | 429581 | 21-Apr-2023 | India |
| 152. | Creep Machine for Conducting Creep Tests in Flowing Liquid Sodium with Enhanced Safety Features | 349533 | 19-Oct-2020 | India |
| 153. | A Method for Synthesis of Resol Beads with Good Control over their Size | 383451 | 01-Dec-2021 | India |
| 154. | Thermal Plasma Process for 'Inflight' Dissociation of Zircon Mineral | 303530 | 27-Nov-2018 | India |
| 155. | Compact Pulse Transformer with Transmission Line Embodiment | 418035 | 13-Jan-2023 | India |
| 156. | Charged Thin Film Composite Nano-Filtration Membranes and Process of its Production | 308260 | 27-Feb-2019 | India |
| 157. | A Transitional Joint Comprising of Dissimilar Metal Joint and a | 418098 | 16-Jan-2023 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|--|------------|-------------|---------------------|
| | Diffusion Bonding Shrink Fit Process for Producing the Same | | | |
| 158. | High Density Self Compacting Concrete and the Method of Preparing the Same | 503533 | 25-Jan-2024 | India |
| 159. | A Method and Device for Tuning SCRF Cavity | 371293 | 07-Jul-2021 | India |
| 160. | A Process for Production of Pure Zirconium Oxide from Zircon | 334038 | 05-Mar-2020 | India |
| 161. | Nanofiltration Membranes with Surface Negative Charge for Fractional Separation of Mono and Multivalent Ionic Species | 343289 | 04-Aug-2020 | India |
| 162. | Energy Harvest System | 448160 | 29-Aug-2023 | India |
| 163. | A Micro-Trench based Biochip Device for Screening of Infectious Diseases using Metal Nano Particles / Nano Coating | 415484 | 26-Dec-2022 | India |
| 164. | Metal Complex of Chlorophyll Derivative for Magnetic Resonance Imaging and Photodynamic Therapy | 343156 | 03-Aug-2020 | India |
| 165. | Synthesis of Fibrous Nano-Silica Spheres with controlled Particle Size, Fibre Density, and Various Textural Properties | 364791 | 16-Apr-2021 | India |
| 166. | A System and Method for Micro-Drilling with Microwaves through Metallic Concentrator | 426457 | 23-Mar-2023 | India |
| 167. | Mechanical Grippers for Handling Plurality of Micro-Components | 393042 | 25-Mar-2022 | India |
| 168. | A Method for Preparing Chlorine-Dioxide Releasing Polymer | 365155 | 22-Apr-2021 | India |
| 169. | System comprising Sun Ray Collimating Central Mirror and Heliostat | 481280 | 12-Dec-2023 | India |
| 170. | High Voltage DC Power Supply with Full Range 24 Pulsed Input and Ripple Free Output for RF Amplifiers | 436206 | 28-Jun-2023 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------|-------------|---------------------|
| 171. | A Method for Making Single Integrated Cut-Through Artistic Design on Metallic Foil | 394243 | 05-Apr-2022 | India |
| 172. | A Process for Depositing Hard, Hydrophobic, Mechanically, Thermally and Chemically Stable Polymer Films on Bell Metal | 268130 | 18-Aug-2015 | India |
| 173. | A Novel Method of Depositing Corrosion Resistant Metal Nitride Hard Coating with Nano Particle Strengthened Nickel-Based Composite Coatings as Interlayer on Steel Substrates | 290986 | 22-Dec-2017 | India |
| 174. | Identification of Surrogate Protein Markers for Falciparum and Vivax Malaria using Proteomic Approaches | 336131 | 20-Apr-2020 | India |
| 175. | A Process for Solvent Extraction for Separation of Rare Earth Elements (REE) Through Partial Reflux of Rare Earths in Solvent based on Separation Factor | 397001 | 17-May-2022 | India |
| 176. | A pH Measurement System for Slurries in Batch Application | 503773 | 26-Jan-2024 | India |
| 177. | A Incremental Sheet Forming Process | 502564 | 23-Jan-2024 | India |
| 178. | Air Plasma Torch | 437320 | 05-Jul-2023 | India |
| 179. | A Process for Fabricating Carbon Nanotube Incorporated Ballistic Resistant Armour Panels and Products Thereof | 528921 | 19-03-2024 | India |
| 180. | Process for Preparing Cucurbituril in High Yield | 510424 | 13-Feb-2024 | India |
| 181. | A Coupling Device for Joining Solid / Hollow Shafts | 486141 | 20-Dec-2023 | India |
| 182. | An improved Method of Manufacturing Actively Cooled Accelerator Grid with full penetration Weld Configuration | 481223 | 12-Dec-2023 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------|-------------|---------------------|
| 183. | A Filter with Developed Sorbent Composite Material for removing Toxic Metal Contaminants for Aqueous Systems | 420937 | 08-Feb-2023 | India |
| 184. | A Method of Independent Control Over Size and Density of Nanoparticles for Fabricating Metal Nanoparticle Embedded MOS Capacitor and a Metal Nanoparticle Embedded MOS Capacitor Thereof for Non-Volatile Memory Applications | 438391 | 12-Jul-2023 | India |
| 185. | High Voltage DC Power Supply Circuit | 403371 | 11-Aug-2022 | India |
| 186. | Flame Retardant Transparent liquid based on novel functionalized Graphene Quantum Dot | 369812 | 21-Jun-2021 | India |
| 187. | An Improved Laser Welding Method for Enhanced Weld Quality and Enhanced Surface Smoothness | 447308 | 25-Aug-2023 | India |
| 188. | Multifunctional Superabsorbent Cotton and Process for Preparation thereof | 353741 | 16-Dec-2020 | India |
| 189. | A liquid Nitrogen Based Portable Refrigeration System for Carrying Refrigerated Goods | 502550 | 23-Jan-2024 | India |
| 190. | A Wideband Hybrid High Power MW Level CW Radio Frequency (RF) Combiner / Splitter | 426278 | 22-Mar-2023 | India |
| 191. | MW Level CW Single Pole Double Throw (SPDT) Coaxial Radio Frequency (RF) Switch | 426292 | 22-Mar-2023 | India |
| 192. | Human Neural Precursor Cells with Inducible <i>STIM1</i> Knockdown | 399095 | 14-Jun-2022 | India |
| 193. | Splitted Plasma Anode Fire-ball based Ion Source for both Nanopatterning and Thin Film deposition | 413565 | 05-Dec-2022 | India |
| 194. | A Method for Increasing the Life of Cutting Tools | 488119 | 22-Dec-2023 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------|-------------|---------------------|
| 195. | Fixative Composition for Preservation and Recovery of Leucocytes of Biological Samples | 499818 | 16-Jan-2024 | India |
| 196. | Leak Arresting Gripper for Pipes | 469789 | 16-Nov-2023 | India |
| 197. | Displacement Decoupling Arrangement for Piping Systems | 502670 | 24-Jan-2024 | India |
| 198. | A Novel Universal Multi-Nutrient Soil Extractant for Assessing Bio-Availability of Nutrients in Soil | 358936 | 19-Feb-2021 | India |
| 199. | A Novel Cryogenic Vacuum Producing System | 504062 | 29-Jan-2024 | India |
| 200. | A Method for Diffusion Bonding of Piezoelectric Crystal to Metal Wear Plate | 508553 | 08-Feb-2024 | India |
| 201. | Process for Determination of parts per billion (ppb) levels of Total Iron in Boiler Coolant Water | 351799 | 20-Nov-2020 | India |
| 202. | A Pass-Through Type Infra-Red and Ultra-Violet Beam Visualizer Device based on Rare-Earth Doped Transparent Ceramic | 463706 | 30-Oct-2023 | India |
| 203. | Metal-Carbon Aerogel Composite Electrode, Aerogel Supercapacitors, Process of the same and Application thereof | 390312 | 24-Feb-2022 | India |
| 204. | Method for Bio-beads Development for Normal and Saline Wastewater Treatment | 381341 | 08-Nov-2021 | India |
| 205. | System and Method for Screening Chest X-Ray Image for Diagnosis | 451958 | 15-Sep-2023 | India |
| 206. | Method for Developing W-Cu Functionality Graded Composites Using High Energy Ball Milling and Spark Plasma Sintering | 523195 | 11-Mar-2024 | India |
| 207. | Developing Protocol for Depositing Adhesive, Durable and Protective Layers of Homogenous Y ₂ O ₃ coating on the Interior Surface of Quartz Tube by Solution Technique | 366061 | 04-May-2021 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|--|------------|-------------|---------------------|
| 208. | Development of Flexible High Temperature Superconductor (HTS) Cable for Shaped Coils | 501364 | 19-Jan-2024 | India |
| 209. | Magnesium Nano-Particles to Capture and Convert CO ₂ to Methane, Methanol for Formic Acid or Other Fuels or Chemicals | 484592 | 18-Dec-2023 | India |
| 210. | Process for the Creation and Tuning of Defects in Nano-Silica to produce Defected Nano-Silica | 366272 | 07-May-2021 | India |
| 211. | Process for Developing Dendritic Plasmonic Colloidosomes as Nano-Heaters and Nano-Catalysts | 404105 | 22-Aug-2022 | India |
| 212. | Remotely Operated Self-Locking Fixture for Wall Mounted Equipment for Contaminated Enclosures | 391338 | 07-Mar-2022 | India |
| 213. | Leak Tight Flange and Gasket Assembly | 485220 | 19-Dec-2023 | India |
| 214. | <i>Escherichia coli</i> Cell Factory for Producing Recombinant Phosphopeptides | 407999 | 29-Sep-2022 | India |
| 215. | A Method for producing Stable Lithium Silicates Nano-sponges for capturing CO ₂ | 507049 | 05-Feb-2024 | India |
| 216. | Apparatus for Non-Destructive Evaluation of Cylindrical Objects using Gamma-Ray Emitting Radioisotope Source | 517803 | 29-Feb-2024 | India |
| 217. | Acidic Amorphous Aluminosilicates (AAS) Solid Acid for Catalysis, Plastic Degradation and CO ₂ to Fuel Conversion | 388563 | 04-Feb-2022 | India |
| 218. | Asymmetric Rotating Impeller Extraction Column | 382169 | 22-Nov-2021 | India |
| 219. | Liposomes and A Process for Preparing the Same Using Supercooled Micelle and Emulsion | 390956 | 02-Mar-2022 | India |
| 220. | Mechanically Reliable Water Repellent Finish Breathable Cotton | 501727 | 22-Jan-2024 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------|-------------|---------------------|
| | Fabric and Electron Beam Assisted Bio-inspired Preparation Process of the Same | | | |
| 221. | Nickel Based Superalloy with Ni ₃ (Cr, Mo, Ti, W) Stoichiometry | 521226 | 07-Mar-2024 | India |
| 222. | Modular and Compact Helical Biodegradable Waste Converter | 531960 | 05-Apr-2024 | India |
| 223. | Process to Determine parts per billion levels of Ammonia in Water with Emphasis on Boiler Coolant Water | 463966 | 31-Oct-2023 | India |
| 224. | Magnetic Flowmeter for Electrically Conducting Liquids | 455892 | 29-Sep-2023 | India |
| 225. | A Chlorophyllin Containing Pharmaceutical Composition for Prevention of Pathogenesis of Coronavirus Disease | 557545 | 07-Jan-2025 | India |
| 226. | Novel Magneto-Liposomes for Active Fibrosarcoma Tumour Targeting and Combinatorial Chemo-, Radio- and Magnetic Hyperthermia Therapy of Cancer | 441803 | 31-Jul-2023 | India |
| 227. | A Method of Preparation of Forward Osmosis Membrane using Synthesized Poly(sulfone-co-amide) Polymer | 408427 | 03-Oct-2022 | India |
| 228. | An Apparatus to Generate Large Plasma Arc Plume for Waste Disposal and Thermal Processing Applications | 432380 | 22-05-2023 | India |
| 229. | Multi-tube Membrane Reactor with Provision for Molten Salt Heating for Hydrogen Production using Solar Heat | 540025 | 30-05-2024 | India |
| 230. | Epoxy Resin based Adhesive and Preparation Method thereof | 407521 | 26-Sep-2022 | India |
| 231. | Plasmonic Hybrid Nano Catalyst Including Nickel Supported on Plasmonic Colloidosomes and Methods Involving the Same | 454950 | 26-Sep-2023 | India |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------|-------------|---------------------|
| 232. | Compact Hydraulic Pinned Jaw Crusher System with High Size Reduction Ratio | 506151 | 01-Feb-2024 | India |
| 233. | A System for Carrying Out Active Microrheology to Probe Viscoelasticity of Protein | 539208 | 24-May-2024 | India |
| 234. | Copper Laden Titanium Dioxide Coated Silica Nanospheres as Active and Stable Catalyst for CO ₂ to CO Conversion with 99% Selectivity | 551864 | 03-Oct-2024 | India |
| 235. | A chlorophyllin containing pharmaceutical composition for prevention of pathogenesis of coronavirus disease | 557545 | 07-Jan-2025 | India |

Annexure-2: Details of Patents granted outside India

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------------|-------------|---------------------|
| 1. | Switch Useful at Superconducting Temperatures and Comprising Superconducting Material | 6184765 | 06-Feb-2001 | USA |
| 2. | Preloaded Parabolic Dish Antenna and the Method of Making it | 6911958 | 28-Jun-2005 | USA |
| 3. | Preloaded Parabolic Dish Antenna and the Method of Making it | CN10041692 0C | 03-Sep-2008 | China |
| 4. | Preloaded Parabolic Dish Antenna and the Method of Making it | 2001278672 | 28-Oct-2004 | Australia |
| 5. | A Low-Cost Digital Pocket Dosimeter | 7009182 | 07-Mar-2006 | USA |
| 6. | Solvent Extraction Process for Recovery of Uranium from Phosphoric Acid (25-55% P ₂ O ₅) | 6645453B2 | 11-Nov-2003 | USA |
| 7. | MET / FRET based Method of Target Acid Detection whereby the Donor / Acceptor Moieties are on Complementary Strands | 4457001 | 12-Feb-2010 | Japan |
| 8. | Chromium Dioxide (CrO ₂) and Composites of Chromium Dioxide and Other Oxides of Chromium such as CrO ₂ /Cr ₂ O ₃ and CrO ₂ /Cr ₂ O ₅ and Process for Manufacturing the Same | 7276226 | 02-Oct-2007 | USA |
| 9. | Two-Cycle Selective Counter-Current Extraction Using bis(2-ethylhexyl) Phosphate and tri-n-Butyl Phosphate and Refined Kerosene as Synergistic Extractant System on H ₂ O ₂ Treated H ₃ PO ₄ , and Stripping the Loaded Extract with Strong H ₃ PO ₄ Containing Metallic Iron to Lower Redox Potential. | 7192563 | 20-Mar-2007 | USA |
| 10. | A Process for Recovery of High Purity Uranium from Fertiliser Grade Weak Phosphoric Acid | 1511869 | 29-Mar-2006 | EP-UK |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|--|-------------------------------|-------------|---------------------|
| 11. | A Process for Recovery of High Purity Uranium from Fertiliser Grade Weak Phosphoric Acid | 1511869 | 29-Mar-2006 | EP-Germany |
| 12. | A Process for Recovery of High Purity Uranium from Fertiliser Grade Weak Phosphoric Acid | 1511869 | 29-Mar-2006 | EP-Belgium |
| 13. | A Process for Recovery of High Purity Uranium from Fertiliser Grade Weak Phosphoric Acid | 1511869 | 29-Mar-2006 | EP-Spain |
| 14. | A Process for Recovery of High Purity Uranium from Fertiliser Grade Weak Phosphoric Acid | 1511869 | 29-Mar-2006 | EP-Italy |
| 15. | A Process for Recovery of High Purity Uranium from Fertiliser Grade Weak Phosphoric Acid | 1511869 | 29-Mar-2006 | EP-France |
| 16. | A Pulsar Driven, Helium-Free Transversely Excited Atmospheric (TEA) Pressure CO ₂ Laser | 6950453 B2 | 27-Sep-2005 | USA |
| 17. | Device for Measuring and Quantitative Profiling of Charged Particle Beams | 1649487 | 07-Mar-2007 | EP-Germany |
| 18. | Device for Measuring and Quantitative Profiling of Charged Particle Beams | 1649487 | 07-Mar-2007 | EP-Denmark |
| 19. | Device for Measuring and Quantitative Profiling of Charged Particle Beams | 1649487 | 07-Mar-2007 | EP-UK |
| 20. | Apparatus and Method for Transport of Microscopic Object(s) | (1656680) DE60334252. 3 | 15-Sep-2010 | EP-Germany |
| 21. | Apparatus and Method for Transport of Microscopic Object(s) | 1656680 | 15-Sep-2010 | EP-UK |
| 22. | Apparatus and Method for Transport of Microscopic Object(s) | 1656680 | 15-Sep-2010 | EP-France |
| 23. | Apparatus and Method for Transport of Microscopic Object(s) | 1656680 | 15-Sep-2010 | EP-Italy |
| 24. | Apparatus and Method for Transport of Microscopic Object(s) | 7502107 B2 | 10-Mar-2009 | USA |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------|-------------|---------------------|
| 25. | Calcium Potassium Ferric Amide Prophylactic Mixture Comprising this Compound and the Use thereof for Decorporation of Radiocesium in Subjects Affected by Nuclear Radiation | 7935366 B2 | 06-Jan-2011 | USA |
| 26. | Calcium Potassium Ferric Amide Prophylactic Mixture Comprising this Compound and the Use thereof for Decorporation of Radiocesium in Subjects Affected by Nuclear Radiation | 1838617 | 31-Jul-2013 | EP-Belgium |
| 27. | Calcium Potassium Ferric Amide Prophylactic Mixture Comprising this Compound and the Use thereof for Decorporation of Radiocesium in Subjects Affected by Nuclear Radiation | 1838617 | 31-Jul-2013 | EP-Germany |
| 28. | Calcium Potassium Ferric Amide Prophylactic Mixture Comprising this Compound and the Use thereof for Decorporation of Radiocesium in Subjects Affected by Nuclear Radiation | 1838617 | 31-Jul-2013 | EP-France |
| 29. | Calcium Potassium Ferric Amide Prophylactic Mixture Comprising this Compound and the Use thereof for Decorporation of Radiocesium in Subjects Affected by Nuclear Radiation | 1838617 | 31-Jul-2013 | EP-UK |
| 30. | Calcium Potassium Ferric Amide Prophylactic Mixture Comprising this Compound and the Use thereof for Decorporation of Radiocesium in Subjects Affected by Nuclear Radiation | 1838617 | 31-Jul-2013 | EP-Sweden |
| 31. | Calcium Potassium Ferric Amide Prophylactic Mixture Comprising this Compound and the Use thereof for Decorporation of Radiocesium in Subjects Affected by Nuclear Radiation | 4885877 | 16-Dec-2011 | Japan |
| 32. | Fluorescence Correlation Microscope with Real Time Alignment Readout | 1848983 | 27-Mar-2013 | EP-UK |
| 33. | Fluorescence Correlation Microscope with Real Time Alignment Readout | 1848983 | 27-Mar-2013 | EP-Germany |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|---------------------------------|-------------|---------------------|
| 34. | Fluorescence Correlation Microscope with Real Time Alignment Readout | 7705987 | 27-Apr-2010 | USA |
| 35. | Separation of No-Carrier-Added Thallium Radionuclides from No-Carrier-Added Lead & Mercury Radionuclides by Dialysis | 1842207B1 | 03-Sep-2008 | EP-UK |
| 36. | Separation of No-Carrier-Added Thallium Radionuclides from No-Carrier-Added Lead & Mercury Radionuclides by Dialysis | 1842207B1 | 03-Sep-2008 | EP-Germany |
| 37. | Separation of No-Carrier-Added Thallium Radionuclides from No-Carrier-Added Lead & Mercury Radionuclides by Dialysis | 2592374 | 04-Jan-2011 | Canada |
| 38. | Separation of No-Carrier-Added Thallium Radionuclides from No-Carrier-Added Lead & Mercury Radionuclides by Dialysis | 7799226 | 21-Sep-2010 | USA |
| 39. | A Novel Assay for Screening Anti-Psychotic Drugs | 7524639 | 28-Apr-2009 | USA |
| 40. | A Novel Assay for Screening Anti-Psychotic Drugs | (1692503) 60200402341 8.4 | 30-Sep-2009 | EP-Germany |
| 41. | A Novel Assay for Screening Anti-Psychotic Drugs | 1692503 | 30-Sep-2009 | EP-UK |
| 42. | A Novel Assay for Screening Anti-Psychotic Drugs | 1692503 | 30-Sep-2009 | EP-Italy |
| 43. | A Novel Assay for Screening Anti-Psychotic Drugs | 1692503 | 30-Sep-2009 | EP-France |
| 44. | A Novel Assay for Screening Anti-Psychotic Drugs | 1692503 | 30-Sep-2009 | EP-Sweden |
| 45. | Emergency Leak Arresting Device for a Collared Pipe | 2545993 | 26-Jun-2012 | Canada |
| 46. | Emergency Leak Arresting Device and Method for a Collared Pipe | 10-1202131 | 09-Nov-2012 | South Korea |
| 47. | A Penetration Enhancing Flux Formulation for Tungsten Inert Gas (TIG) Welding of Austenitic Stainless Steel and its Application | GB 2446905 | 16-Feb-2011 | UK |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------|-------------|---------------------|
| 48. | A Penetration Enhancing Flux Formulation for Tungsten Inert Gas (TIG) Welding of Austenitic Stainless Steel and its Application | 95076 | 11-Jul-2011 | Ukraine |
| 49. | A Penetration Enhancing Flux Formulation for Tungsten Inert Gas (TIG) Welding of Austenitic Stainless Steel and its Application | 8097826 | 17-Jan-2012 | USA |
| 50. | A Method for Non-Intrusive on-line Detection of Turbine Blade Condition | 9557210 | 31-Jan-2017 | USA |
| 51. | Single Stage Purification for Uranium Refining | 2007356815 | 13-Dec-2012 | Australia |
| 52. | Single Stage Purification for Uranium Refining | 2707460 | 20-Jan-2015 | Canada |
| 53. | Single Stage Purification for Uranium Refining | 2010/01122 | 31-Aug-2012 | South Africa |
| 54. | Stabilised Natural Circulation System with Nano Particles | 5555625 | 06-Jun-2014 | Japan |
| 55. | Non-Ionic, Porous, Solid Resin with Chemically Bonded Crown Ether | 5297462 | 21-Jun-2013 | Japan |
| 56. | Non-Ionic, Porous, Solid Resin with Chemically Bonded Crown Ether | 2205672 | 30-Apr-2014 | EP-France |
| 57. | A Process for Producing Body Centered Cubic (B2) Nickel Aluminide (NiAl) Coating of Controlled Thickness on Nickel-base Alloy Surfaces | 2452791 | 10-Jun-2012 | Russia |
| 58. | A Method of Qualifying Niobium and/or Other Super Conducting Materials for Reliable Fabrication of Super Conducting Radio Frequency (SCRF) Cavities | 2217736 | 27-Mar-2019 | EP-France |
| 59. | A Method of Qualifying Niobium and/or Other Super Conducting Materials for Reliable Fabrication of Super Conducting Radio Frequency (SCRF) Cavities | 8673820 | 18-Mar-2014 | USA |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|--|------------|-------------|---------------------|
| 60. | A Hydraulic Micrometer System for Remote Measurement of Inside Diameter of Pipes and Tubes and a Method of such Measurement | 2690491 | 06-Nov-2012 | Canada |
| 61. | A Hydraulic Micrometer System for Remote Measurement of Inside Diameter of Pipes and Tubes and a Method of such Measurement | 8327556 | 11-Dec-2012 | USA |
| 62. | Development of a Very High Resistance to Sensitisation in Austenitic Stainless Steel through a Special Heat Treatment Resulting in Grain Boundary Microstructural Modification | 2112237 | 13-Sep-2017 | EP-France |
| 63. | Development of a Very High Resistance to Sensitisation in Austenitic Stainless Steel through a Special Heat Treatment Resulting in Grain Boundary Microstructural Modification | 2112237 | 13-Sep-2017 | EP-Germany |
| 64. | Development of a Very High Resistance to Sensitisation in Austenitic Stainless Steel through a Special Heat Treatment Resulting in Grain Boundary Microstructural Modification | 2112237 | 13-Sep-2017 | EP-Sweden |
| 65. | An Innovative 'Cut-and-Feed' Operation for Enhancing the Performance of Ion-Exchange Chromatographic Separation | 2274075 | 09-Sep-2015 | EP-France |
| 66. | An Innovative 'Cut-and-Feed' Operation for Enhancing the Performance of Ion-Exchange Chromatographic Separation | 7976708B2 | 02-Jul-2011 | USA |
| 67. | Wash Solution Suitable for Use in Continuous Reprocessing of Nuclear Fuel and a System Thereof | 5643745 | 07-Nov-2014 | Japan |
| 68. | Wash Solution Suitable for Use in Continuous Reprocessing of Nuclear Fuel and a System Thereof | 2223305 | 16-Nov-2016 | EP-France |
| 69. | Colour Indicator Dosimeter for Measurement of Ionising Radiation | 7884339 | 08-Feb-2011 | USA |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|---------------------|-------------|---------------------|
| 70. | A Polymer Composite for Extracting Cesium from Nuclear Waste and / or Other Inorganic Wastes / Solutions | 8828532 | 09-Sep-2014 | USA |
| 71. | A Polymer Composite for Extracting Cesium from Nuclear Waste and / or Other Inorganic Wastes / Solutions | 2451574 | 20-Mar-2019 | EP-France |
| 72. | Dialkyldiaza-Tetraalkyl Acetone Diamide Derivatives useful for the Separation of Trivalent Actinide from Lanthanide and Process for the Preparation Thereof | 5497174 | 14-Mar-2014 | Japan |
| 73. | Dialkyldiaza-Tetraalkyl Acetone Diamide Derivatives useful for the Separation of Trivalent Actinide from Lanthanide and Process for the Preparation Thereof | 8785691 | 01-Apr-2014 | USA |
| 74. | Dialkyldiaza-Tetraalkyl Acetone Diamide Derivatives useful for the Separation of Trivalent Actinide from Lanthanide and Process for the Preparation Thereof | 20140610004 6200 | 23-Jun-2014 | China |
| 75. | Dialkyldiaza-Tetraalkyl Acetone Diamide Derivatives useful for the Separation of Trivalent Actinide from Lanthanide and Process for the Preparation Thereof | 2459522 | 26-Jun-2013 | EP-France |
| 76. | Niobium based Super Conducting Radio Frequency (SCRF) Cavities Comprising Niobium Components Joined by Laser Welding | 9352416 | 31-May-2016 | USA |
| 77. | Niobium based Super Conducting Radio Frequency (SCRF) Cavities Comprising Niobium Components Joined by Laser Welding | 2496379 | 04-Jan-2017 | EP-France |
| 78. | Niobium based Super Conducting Radio Frequency (SCRF) Cavities Comprising Niobium Components Joined by Laser Welding | 2496379 | 04-Jan-2017 | EP-Germany |
| 79. | Niobium based Super Conducting Radio Frequency (SCRF) Cavities Comprising Niobium Components Joined by Laser Welding | 2496379 | 04-Jan-2017 | EP-Italy |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|--|------------|-------------|---------------------|
| 80. | Niobium based Super Conducting Radio Frequency (SCRF) Cavities Comprising Niobium Components Joined by Laser Welding | 5632924 | 17-Oct-2014 | Japan |
| 81. | A Flexible Magnetic Membrane based Actuation System and Devices Involving the Same | 9579434 | 28-Feb-2017 | USA |
| 82. | A Flexible Magnetic Membrane based Actuation System and Devices Involving the Same | 2542271 | 26-Feb-2014 | EP-Germany |
| 83. | A Flexible Magnetic Membrane based Actuation System and Devices Involving the Same | 2542271 | 26-Feb-2014 | EP-France |
| 84. | A TBP Nitrate Solvent Extraction Process for Producing High Purity Nuclear Grade Rare Earth Metal Oxide | 9174855 | 03-Nov-2015 | USA |
| 85. | A Dual-Purpose Atomic Device for Realising Atomic Frequency Standard and Magnetic Field Measurement | 9097750 | 04-Aug-2015 | USA |
| 86. | A Method for Large-Scale Synthesis of Optically Stimulated Luminescence Grade Polycrystalline Ceramic Material | 9523033 | 20-Dec-2016 | USA |
| 87. | Compact Pulse Transformer with Transmission Line Embodiment | 10763034 | 01-Sep-2020 | USA |
| 88. | A Method and Equipment for Separating Non-Conducting and Non-Magnetic Minerals | 2014/08875 | 25-Nov-2015 | South Africa |
| 89. | Device for Tuning SCRF Cavity | 10524346 | 31-Dec-2019 | USA |
| 90. | A Method and Device for Tuning SCRF Cavity | 6259913 | 15-Dec-2017 | Japan |
| 91. | A Method and Device for Tuning SCRF Cavity | 3266285 | 16-May-2018 | EP-France |
| 92. | A Method and Device for Tuning SCRF Cavity | 3266285 | 16-May-2018 | EP-Germany |
| 93. | A Method and Device for Tuning SCRF Cavity | 3266285 | 16-May-2018 | EP-Switzerland |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------|-------------|---------------------|
| 94. | A Decentralized Information Flow Security Model for Multilevel Security and Privacy Domains | 9507929 | 29-Nov-2016 | USA |
| 95. | A System, a Device and a Method for Passive Decay Heat Transport | 3405958 | 27-Nov-2019 | EP-France |
| 96. | A System, a Device and a Method for Passive Decay Heat Transport | 3405958 | 27-Nov-2019 | EP-Germany |
| 97. | System, a Device and a Method for Passive Decay Heat Transport | 10607740 | 31-Mar-2020 | USA |
| 98. | A System, a Device and a Method for Passive Decay Heat Transport | 6650935 | 23-Jan-2020 | Japan |
| 99. | Synthesis of Fibrous Nano-Silica Spheres with controlled Particle Size, Fibre Density, and Various Textural Properties | 11242257 | 08-Feb-2022 | USA |
| 100. | A Method of Adjuvant Treatment with Chlorophyllin Containing Therapeutic Preparation including for Radioprotection of Normal Tissues during Radiation Therapy and Kit Thereof | 10183026 | 22-Jan-2019 | USA |
| 101. | High Voltage DC Power Supply with Full Range 24 Pulsed Input and Ripple Free Output for RF Amplifiers | 10027122 | 17-Jul-2018 | USA |
| 102. | A process for the Production of Thorium Phosphate | 2937621 | 10-Oct-2023 | Canada |
| 103. | A process for the Production of Thorium Phosphate from Thorium Oxalate and recovery of Oxalic Acid | 2016210678 | 05-Jan-2023 | Australia |
| 104. | Optical Rare-Earth Doped Fibre Long Period grating Based Ionizing Radiation Dose Sensor Device | 10101467 | 16-Oct-2018 | USA |
| 105. | Method for Recovering Gold using Hollow-Fibre Membranes and Dispersion Based Back Extraction | 2327202 | 23-Jul-2010 | Spain |
| 106. | Ceramic Filler, Method of preparing the Ceramic Filler and Applications as Resonator and Laminate thereof | 9505902 | 29-Nov-2016 | USA |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|--|------------------|--------------------|---------------------|
| 107. | Process of Solvent Extraction for Separation of Rare Earth Elements (REEs) through Partial Reflux of Rare Earths in Solvent based on Separation Factor | 10227676 | 12-Mar-2019 | USA |
| 108. | A Process for the Removal of ⁹⁹ Tc from Liquid Intermediate Level Waste of Spent Fuel Reprocessing | 6949852 | 27-Sep-2021 | Japan |
| 109. | A Process for the Removal of ⁹⁹ Tc from Liquid Intermediate Level Waste of Spent Fuel Reprocessing | 10553324 | 04-Feb-2020 | USA |
| 110. | A Process for the Removal of ⁹⁹ Tc from Liquid Intermediate Level Waste of Spent Fuel Reprocessing | 3417461 | 29-Jan-2020 | EP-France |
| 111. | A Process for the Removal of ⁹⁹ Tc from Liquid Intermediate Level Waste of Spent Fuel Reprocessing | 3417461 | 29-Jan-2020 | EP-UK |
| 112. | An improved Method of Manufacturing Actively Cooled Accelerator Grid with full penetration Weld Configuration | 3424635 | 31-Aug-2022 | EP-France |
| 113. | An improved Method of Manufacturing Actively Cooled Accelerator Grid with full penetration Weld Configuration | 3424635 | 31-Aug-2022 | EP-Germany |
| 114. | An improved Method of Manufacturing Actively Cooled Accelerator Grid with full penetration Weld Configuration | 3424635 | 31-Aug-2022 | EP-Italy |
| 115. | Method of Manufacturing Actively Cooled Accelerator Grid with Full Penetration Weld Configuration | 10480863 | 19-Nov-2019 | USA |
| 116. | An Improved Laser Welding Method for Enhanced Weld Quality and Enhanced Surface Smoothness | 1,21,09,649 | 08-Oct-2024 | USA |
| 117. | A liquid Nitrogen Based Portable Refrigeration System for Carrying Refrigerated Goods | ZL201810504018.3 | 29-May-2022 | China |
| 118. | A Method of Manufacturing Radio Frequency (RF) Coil Multi-Driven RF based Negative Ion Source | 11014187 | 25-May-2021 | USA |

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|---------|--|---------------------|-------------|---------------------|
| 119. | A Method of Manufacturing Radio Frequency (RF) Coil Multi-Driven RF based Negative Ion Source | 3553797 | 20-Apr-2022 | EP-France |
| 120. | A Method of Manufacturing Radio Frequency (RF) Coil Multi-Driven RF based Negative Ion Source | 60201803402 4.6 | 20-Apr-2022 | EP-Germany |
| 121. | A Method of Manufacturing Radio Frequency (RF) Coil Multi-Driven RF based Negative Ion Source | 50202200004 5568 | 20-Apr-2022 | EP-Italy |
| 122. | Human Neural Precursor Cells with Inducible <i>STIM1</i> Knockdown | 11851676 | 26-Dec-2023 | USA |
| 123. | Method and Electronic Device for Providing Image-Based CAPTCHA Challenge | 10949523 | 16-Mar-2021 | USA |
| 124. | Displacement Decoupling Arrangement for Piping Systems | 3604713 | 24-Feb-2021 | EP-France |
| 125. | Displacement Decoupling Arrangement for Piping Systems | 3604713 | 24-Feb-2021 | EP-Germany |
| 126. | Displacement Decoupling Arrangement for Piping Systems | 3604713 | 24-Feb-2021 | EP-Italy |
| 127. | Displacement Decoupling Arrangement for Piping Systems | 3604713 | 24-Feb-2021 | EP-Switzerland |
| 128. | Displacement Decoupling Arrangement for Piping Systems | 10738914 | 11-Aug-2020 | USA |
| 129. | Production of Dilute Pb (0.2 to 1.1 wt %) - Li Alloys | 3841231 | 17-Aug-2022 | EP-France |
| 130. | Production of Dilute Pb (0.2 to 1.1 wt %) - Li Alloys | 3841231 | 17-Aug-2022 | EP-Germany |
| 131. | Diffusion Bonding of Piezoelectric Crystal to Metal Wear Plate | 3948967 | 19-Apr-2023 | EP-France |
| 132. | Diffusion Bonding of Piezoelectric Crystal to Metal Wear Plate | 3948967 | 19-Apr-2023 | EP-UK |
| 133. | Use of Jack Bean Lectin for increasing the Abundance of Hematopoietic Stem Cells and Progenitor Cells in Bone Marrow and/or Epidermal Stem Cells in Skin in vivo | 10918695 | 16-Feb-2021 | USA |

| Sr. No. | Title of the Invention | Patent No. | Grant Date | Application Country |
|---------|---|------------------|-------------|---------------------|
| 134. | A Novel Versatile Phoswich Detector consisting of two Single Crystals to discriminate various kinds of Radiations | 10942283 | 09-Mar-2021 | USA |
| 135. | Use of 3,3'-Di-Seleno-Dipropionic Acid (DSePA) as an Anti-Cancer Agent | 11213499 | 04-Jan-2022 | USA |
| 136. | Inductively Driven Pellet Accelerator and Injector | 4086920 | 10-Jul-2024 | EP-France |
| 137. | Inductively Driven Pellet Accelerator and Injector | 4086920 | 10-Jul-2024 | EP-UK |
| 138. | Annular Centrifugal Extractor with Solid Separation Part to Separate Solid Particles Present in Solvent Extraction Fluid and A Process for the Same | 7579966 | 30-Oct-24 | Japan |
| 139. | Compact Hydraulic Pinned Jaw Crusher System with High Size Reduction Ratio | 2021103279 | 26-Sep-2024 | Australia |
| 140. | Compact Hydraulic Pinned Jaw Crusher System with High Size Reduction Ratio | 2022/09557 | 31-May-2023 | South Africa |
| 141. | Laser welding method for enhanced weld quality and enhanced surface smoothness | 12109649 | 08-Oct-2024 | USA |
| 142. | Annular centrifugal extractor with solid separation part to separate solid particles present in solvent extraction fluid and a process for the same | EP4221898 | 27-Nov-2024 | Europe |
| 143. | Annular centrifugal extractor with solid separation part to separate solid particles present in solvent extraction fluid and a process for the same | 7579966 | 30-Oct-2024 | Japan |
