## CPC
### COOPERATIVE PATENT CLASSIFICATION

**Y**

GENERAL TAGGING OF NEW TECHNOLOGICAL DEVELOPMENTS; GENERAL TAGGING OF CROSS-SECTIONAL TECHNOLOGIES SPANNING OVER SEVERAL SECTIONS OF THE IPC; TECHNICAL SUBJECTS COVERED BY FORMER USPC CROSS-REFERENCE ART COLLECTIONS [XRACs] AND DIGESTS

(NOTES omitted)

**Y02**

TECHNOLOGIES OR APPLICATIONS FOR MITIGATION OR ADAPTATION AGAINST CLIMATE CHANGE

(NOTES omitted)

**Y02P**

CLIMATE CHANGE MITIGATION TECHNOLOGIES IN THE PRODUCTION OR PROCESSING OF GOODS

**NOTE**

This subclass covers climate change mitigation technologies in any kind of industrial processing or production activity, including the agroalimentary industry, agriculture, fishing, ranching and the like.

<table>
<thead>
<tr>
<th>10/00</th>
<th>Technologies related to metal processing</th>
<th>10/259</th>
<th>. . . in electric arc furnaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/10</td>
<td>. Reduction of greenhouse gas [GHG] emissions</td>
<td>10/262</td>
<td>. . . in electrolytic cells</td>
</tr>
<tr>
<td>10/12</td>
<td>. CO₂</td>
<td>10/265</td>
<td>. . . by heat recovery</td>
</tr>
<tr>
<td>10/122</td>
<td>. by capturing CO₂</td>
<td>10/268</td>
<td>. . . with by-product gas in energy cycle</td>
</tr>
<tr>
<td>10/124</td>
<td>. Recycling of CO₂-rich gas</td>
<td>10/271</td>
<td>. . . low temperature heat recovery</td>
</tr>
<tr>
<td>10/126</td>
<td>. Recycling of CO₂-lean gas</td>
<td>10/274</td>
<td>. . . medium temperature heat recovery</td>
</tr>
<tr>
<td>10/128</td>
<td>. Oxycombustion</td>
<td>10/277</td>
<td>. . . high temperature heat recovery</td>
</tr>
<tr>
<td>10/132</td>
<td>. CO₂ storage</td>
<td>10/283</td>
<td>. . . using water, e.g. for cooling</td>
</tr>
<tr>
<td>10/134</td>
<td>. by CO₂ avoidance</td>
<td>10/286</td>
<td>. . . by process control or by modelling</td>
</tr>
<tr>
<td>10/136</td>
<td>. using hydrogen, e.g. H₂</td>
<td>10/29</td>
<td>. . . Additive manufacturing</td>
</tr>
<tr>
<td>10/138</td>
<td>. Electrolysis</td>
<td>10/292</td>
<td>. . . of casting moulds</td>
</tr>
<tr>
<td>10/14</td>
<td>. Greenhouse gases [GHG] other than CO₂</td>
<td>10/295</td>
<td>. . . of metals</td>
</tr>
<tr>
<td>10/143</td>
<td>. Methane [CH₄]</td>
<td>10/30</td>
<td>. . . characterised by the energy source</td>
</tr>
<tr>
<td>10/146</td>
<td>. Perfluorocarbons [PFC]; Hydrofluorocarbons [HFC]; Sulfur hexafluoride [SF₆]</td>
<td>10/32</td>
<td>. . . the energy source being renewable</td>
</tr>
<tr>
<td>10/20</td>
<td>. Process efficiency</td>
<td>10/34</td>
<td>. . . Cogeneration with other industries</td>
</tr>
<tr>
<td>10/21</td>
<td>. by recovering materials</td>
<td>20/00</td>
<td>Technologies relating to chemical industry</td>
</tr>
<tr>
<td>10/214</td>
<td>. by pyro metallurgy</td>
<td>20/12</td>
<td>. . . Energy input</td>
</tr>
<tr>
<td>10/216</td>
<td>. of Fe</td>
<td>20/121</td>
<td>. . . Energy efficiency measures, e.g. energy management</td>
</tr>
<tr>
<td>10/218</td>
<td>. of Al</td>
<td>20/122</td>
<td>. . . characterised by the type of apparatus</td>
</tr>
<tr>
<td>10/22</td>
<td>. of Cu</td>
<td>20/123</td>
<td>. . . Motor systems</td>
</tr>
<tr>
<td>10/222</td>
<td>. of Co or Ni</td>
<td>20/124</td>
<td>. . . Boilers, furnaces, lighting or vacuum systems</td>
</tr>
<tr>
<td>10/226</td>
<td>. of Mg</td>
<td>20/125</td>
<td>. . . Process integration</td>
</tr>
<tr>
<td>10/228</td>
<td>. of Sn</td>
<td>20/126</td>
<td>. . . Membrane separation</td>
</tr>
<tr>
<td>10/23</td>
<td>. of refractory metals</td>
<td>20/127</td>
<td>. . . Reactive distillation</td>
</tr>
<tr>
<td>10/232</td>
<td>. of Zn or ZnO</td>
<td>20/128</td>
<td>. . . Alternative fuel sources, e.g. for process heat or steam</td>
</tr>
<tr>
<td>10/234</td>
<td>. by hydro metallurgy</td>
<td>20/129</td>
<td>. . . Energy recovery</td>
</tr>
<tr>
<td>10/236</td>
<td>. of Cu</td>
<td>20/13</td>
<td>. . . Cogeneration</td>
</tr>
<tr>
<td>10/238</td>
<td>. by means other than pyro metallurgy or hydro metallurgy</td>
<td>20/131</td>
<td>. . . Pressure recovery turbines</td>
</tr>
<tr>
<td>10/24</td>
<td>. . . powder metallurgy</td>
<td>20/132</td>
<td>. . . H₂ recovery</td>
</tr>
<tr>
<td>10/242</td>
<td>. Slag reuse in metallurgical processes</td>
<td>20/133</td>
<td>. . . Renewable energy sources</td>
</tr>
<tr>
<td>10/25</td>
<td>. by increasing the energy efficiency of the process</td>
<td>20/134</td>
<td>. . . Sunlight</td>
</tr>
<tr>
<td>10/253</td>
<td>. using induction furnaces</td>
<td>20/135</td>
<td>. . . Photoelectrochemical processes</td>
</tr>
<tr>
<td>10/256</td>
<td>. Design or operational measures for increasing the efficiency of electric conversion</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Improvements relating to the production of products or pharmaceuticals chlorodifluoromethane, e.g. bulk or fine chemicals other than chlorine, adipic acid, caprolactam, or

or regulating the tube furnaces

using low temperature distillation

using absorption or adsorption techniques

Compression

Technologies relating to the processing of minerals

Production of cement

Clinker production

Energy efficiency measures, e.g. improving or optimising the production methods

Integrated production plants

Fuels from renewable energy sources

Waste

Biomass

Reduction of clinker content in cement

Blended cements

Clinker replacement by slag

Clinker replacement by combustion residues

Clinker replacement by ground limestone

Belite cements

Non-limestone based cements, e.g. alkali-activated cements

Geopolymers

Carbon capture and storage [CCS]

Cement grinding

Manufacturing or processing of sand or stone

Production or processing of lime

Limestone calcination

Regeneration of lime in pulp and sugar mills

using fuels from renewable energy sources

Reduction of lime consumption, e.g. in sugar industry

Limestone grinding

Glass production

Producing or shaping of glass

Use of cullet or other waste

Reusing waste heat during processing or shaping

Regenerative heating

Oxy-fuel

Batch or cullet pre-heating

Reduction of reject rates; Improving the yield

Fuels from renewable energy sources

CO₂ capture, e.g. for large oxy-fuel furnaces

Production of ceramic materials or ceramic elements
60/00 Technologies relating to agriculture, livestock or agroalimentary industries

60/10 . Agricultural machinery or equipment
60/12 . using renewable energies
60/122 . for irrigation, e.g. solar water pumping
60/124 . Collecting solar energy in greenhouses
60/14 . Measures for saving energy
60/141 . in irrigation, i.e. motor control
60/142 . Reduction of fuel consumption
60/144 . Combined machines, e.g. seeder combined with fertilizers
60/146 . in greenhouses
60/147 . Heating, ventilation or air conditioning
60/148 . Constructive measures, e.g. light structures or improved insulation
60/149 . Efficient lighting, e.g. LED lighting
60/15 . in preparing or milling grain
60/16 . Machines for direct seeding, i.e. sod or grassland seeding
60/18 . Activities not otherwise provided for, e.g. storage
60/20 . Reduction of greenhouse gas [GHG] emissions in agriculture
60/21 . N₂O
60/212 . Reducing the use of fertilizers
60/214 . Efficient applying machines
60/215 . Efficient spraying methods
60/216 . Aquaponics or hydroponics
60/218 . use of additives, e.g. nitrification inhibitors, biochar
60/22 . Reducing methane [CH₄] emissions from agricultural lands, e.g. from rice paddies
60/23 . Reduction of CO₂ emissions from biota and soils
60/24 . Enhancing carbon sequestration in biota and soils
60/242 . Roof greening
60/244 . Wall greening
60/246 . Use of plant growth regulators to improve carbon dioxide uptake by crop plants
60/247 . Plants with high carbon sequestration potential
60/25 . Biomass with low greenhouse gas [GHG] emissions
60/30 . Land use policy measures
60/40 . Afforestation or reforestation
60/50 . Livestock or poultry management
60/52 . use of renewable energies
60/521 . Solar lighting, e.g. for poultry
60/524 . for pumping or supplying water to livestock
60/526 . for electric energy supply
60/528 . for electric livestock fences
60/54 . Environmental control in livestock or poultry housing
60/542 . using renewable energy
60/56 . Methane [CH₄] capture
60/60 . Fishing

60/62 . Fishing equipment
60/64 . Aquaculture; Aquafarming
60/642 . combined with aquaponics or hydroponics
60/70 . Apiculture
60/80 . Food processing
60/81 . Use of renewable energies or variable speed drives in handling, conveying or stacking
60/83 . Warming or cooking
60/831 . using steam
60/833 . using microwave ovens
60/835 . by boiling
60/85 . Food storage or conservation
60/851 . Cooling, refrigeration or freezing
60/853 . Drying
60/855 . Ice production, e.g. for conservation purposes
60/87 . Re-use of by-products of food processing for fodder production
60/871 . from molasses
60/873 . from distillers' or brewers' waste
60/875 . from waste products of dairy plants
60/877 . from by-products of vegetable origin
60/89 . characterised by the product
60/891 . Dairy products

70/00 Climate change mitigation technologies in the production process for final industrial or consumer products

70/10 . Greenhouse gas [GHG] capture, material saving, heat recovery or other energy efficient measures, e.g. motor control, characterised by manufacturing processes
70/12 . related technologies for improving processes or machines for shaping products
70/121 . Machines for rolling metal, e.g. rolling mills
70/123 . Motor control
70/125 . Removing fumes from rolling mills
70/127 . using heat shields
70/129 . Heat recovery during rolling
70/131 . using liquid recovery devices
70/133 . for recovering coolants
70/135 . for recovering lubricants
70/137 . relating to forging, hammering, pressing or riveting
70/139 . relating to the manufacture or working of metal sheets or profiles
70/141 . relating to pressing processes or machines therefore
70/143 . Optimisation of energy consumption
70/145 . by control of drive motors
70/16 . related technologies for metal working by removing or adding material
70/161 . Power management, e.g. limiting power to tools
70/163 . Power down for energy saving
70/167 . relating to the design or operation of machining centres or machine tools
70/169 . using minimal quantities of coolants or lubricants
70/171 . Devices or processes for removing and reusing chips
70/173 . Machine centres provided for turning, boring or milling
characterised by the final manufactured product

alkaline secondary batteries

Manufacturing of lithium-ion, lead-acid or

producing renewable energy

Drying by removing liquid or fluent materials

Apparatus or processes for applying liquids or

related technologies for printing, lining or

stamping machines

Technologies for working on wood, veneer or

plywood

related technologies for saving energy and raw

materials during the production of paper or paper

articles

related technologies for working on or processing

of plastics

recovering energy or power from drive motors

in injection moulding

recovering energy or reusing materials in

extrusion moulding

related to blow moulding

Means for recycling or reusing auxiliaries or

materials

reducing blowing fluid consumption

by recycling blow fluid

recycling reactive gas

reusing heat

related to thermoforming

Recycling or reuse of materials

Reuse of pressure or vacuum

related to technologies for conveying, packing or

storing of goods or handling thin or filamentary

material

relating to mixing

relating to separation, flotation or differential

sedimentation

Recycling or reuse of a liquid sprayed or

atomised

Apparatus or processes for applying liquids or

other fluent materials

Drying by removing liquid

Drying with heating arrangements using waste

heat

Manufacturing or production processes

characterised by the final manufactured product

Manufacturing of products or systems for

producing renewable energy

Photovoltaic generators

Wind turbines

Hydropower turbines

for tidal streams or dam-less hydropower,

e.g. sea flood and ebb or stream current

Manufacturing of lithium-ion, lead-acid or

alkaline secondary batteries

Manufacturing of fuel cells

Greenhouse gas [GHG] capture, heat recovery

or other energy efficient measures relating to

manufacturing or assembling of vehicles, e.g.

motor control

Aircraft Eco design, i.e. taking into account the

full life cycle of the aircraft including re-use,

recyclability and disposal

Greenhouse gas [GHG] capture, heat recovery

or other energy efficient measures relating to

production or assembly of electric or electronic

components or products, e.g. motor control

the product being a basic electric component

or element, i.e. cables, resistors, capacitors,

switches, connectors, relays or protections

the product being a lighting component

the product being a semiconductor or solid state
device or parts thereof

Manufacturing of electronic silicon based

components

the product being a dynamo-electric machine,

i.e. electrical generators or motors

the product being a printed circuit board [PCB]

involving the assembly of several electronic

elements

related technologies for production or treatment

of textile or flexible materials or products thereof,

including footwear

Production or treatment of artificial filaments

or the like

Energy efficient measures, e.g. motor control

or heat recovery

Recovery of starting material, waste material

or solvents during the manufacturing process

of cellulose, cellulose derivatives or

proteins

of synthetic polymers

Production or treatment of lace, e.g. knitting or

braiding

Saving materials

Saving energy by reducing inertia of moving

parts

Treatment of textiles

Energy efficient measures, e.g. motor control

or heat recovery

Recovery of solvents

Treatment of textiles using a short bath ratio

Manufacturing of wall or floor covering

materials or the like

Energy efficient measures, e.g. motor control

or heat recovery

using scraps or recycled materials

the materials being particles

Footwear made at least partially of recyclable

material

Greenhouse gas [GHG] capture, use of renewable

energies, heat recovery or other energy efficient

measures for manufacturing or preparation of

tobacco products, e.g. motor control

Climate change mitigation technologies for sector-

wide applications

Efficient use of energy

of electric energy
Power supplies with power electronics for efficient use of energy, e.g. power factor correction [PFC] or resonant converters

Control systems or methods for efficient use of energy

Electronic drive motor controls

using compressed air as energy carrier, e.g. for pneumatic systems

using pressurized fluid as energy carrier, e.g. for hydraulic systems

District level solutions, i.e. local energy networks

On-site combined power, heat or cool generation or distribution, e.g. combined heat and power [CHP] supply

for heat recovery

for steam generation or distribution

in fluid distribution systems

Solar or wind-powered water pumping not specially adapted for irrigation

Sector-wide applications using renewable energy

Biomass as fuel

Wind energy

Solar energy

Solar thermal energy

Photovoltaic energy

Reducing waste in manufacturing processes; Calculations of released waste quantities

Minimising material used in manufacturing processes

Enabling technologies with a potential contribution to greenhouse gas [GHG] emissions mitigation

Total factory control, e.g. smart factories, flexible manufacturing systems [FMS] or integrated manufacturing systems [IMS]

characterised by the assembly processes

characterised by direct numerical control [DNC]

characterised by the cooperation between machine tools, manipulators or work piece supply systems

Manipulators cooperating with conveyors

Manipulators cooperating with machine tools

characterised by identification, e.g. of work pieces or equipment

characterised by programme execution

characterised by fault tolerance, reliability of production system

characterised by system universality, i.e. configurability or modularity of production units

characterised by the network communication

using local area networks [LAN]

characterised by job scheduling, process planning or material flow

Tool management

characterised by quality surveillance of production

characterised by computer integrated manufacturing [CIM], planning or realisation

characterised by modelling or simulation of the manufacturing system

Product design therefor

characterised by transport systems

using automatic guided vehicles [AGV]

Computing systems specially adapted for manufacturing

Fuel cell technologies in production processes

Hydrogen technologies in production processes

Energy storage in industry with an added climate change mitigation effect

Electric or hybrid propulsion means for production processes

Combining sequestration of CO\textsubscript{2} and exploitation of hydrocarbons by injecting CO\textsubscript{2} or carbonated water in oil wells

Management or planning

Energy audits or management systems therefor

Greenhouse gas [GHG] management systems

Inventory and reporting systems for greenhouse gases [GHG]

Maintenance planning

Financial instruments for climate change mitigation, e.g. environmental taxes, subsidies or financing

CO\textsubscript{2} emission certificates or credits trading