

# CPC COOPERATIVE PATENT CLASSIFICATION

## F MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING (NOTE omitted)

### LIGHTING; HEATING

## F27 FURNACES; KILNS; OVENS; RETORTS (NOTES omitted)

## F27D DETAILS OR ACCESSORIES OF FURNACES, KILNS, OVENS, OR RETORTS, IN SO FAR AS THEY ARE OF KINDS OCCURRING IN MORE THAN ONE KIND OF FURNACE (combustion apparatus F23)

### NOTE

Attention is drawn to the references and Notes following the title of class [F27](#) and the Note III following the Contents of Section [H](#).

### WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

- |             |  |           |   |
|-------------|--|-----------|---|
| <b>1/00</b> | <b>Casings; Linings; Walls; Roofs</b> (refractory materials <a href="#">C04B</a> ; firebridges for combustion chambers <a href="#">F23M 3/00</a> ) | 2001/0056 | . . {Aspects of construction intended to prevent wear}  |
| 1/0003      | . {Linings or walls}   | 2001/0059 | . {Construction elements of a furnace}  |
|             | <b>NOTE</b>  | 2001/0063 | . . {Means to strengthen a part}  |
|             | not used, see subgroups  | 2001/0066 | . . {Movable or removable parts (removable parts for replacement because of wearing <a href="#">F27D 2001/005</a> )}  |
| 1/0006      | . . {Linings or walls formed from bricks or layers with a particular composition or specific characteristics}                                      | 2001/0069 | . . {Means to prevent heat conduction (heat shields <a href="#">F27D 1/0033</a> )}  |
| 1/0009      | . . . {Comprising ceramic fibre elements}  | 2001/0073 | . . . {Surrounding protection around the furnace, e.g. covers, circulation of gas}  |
| 1/0013      | . . . . {the fibre elements being in the form of a folded blanket or a juxtaposition of folded blankets}   | 2001/0076 | . . {comprising a corrugated sheet}   |
| 1/0016      | . . . . . {Interleaved multiple folded blankets}   | 2001/0079 | . {Means to assemble at least two parts of a furnace or of any device or accessory associated to its use (assembling elements for linings parts <a href="#">F27D 1/145</a> )}   |
| 1/002       | . . . . {the fibre elements being composed of adjacent separate strips}  | 2001/0083 | . . {Means to assemble a moving part to a fixed one (movements due to thermal expansion <a href="#">F27D 1/0003</a> ; movements of the cover <a href="#">F27D 1/18</a> ; movements of the container or of the support of the charge <a href="#">F27D 2003/0085</a> )} |
| 1/0023      | . . {Linings or walls comprising expansion joints or means to restrain expansion due to thermic flows}   | 2001/0086 | . . . {the moving part being in rotation}   |
| 1/0026      | . . . {the expansion joint being a resilient element, e.g. a metallic plate between two bricks}  | 2001/0089 | . . . {the moving part being in translation}  |
| 1/003       | . . {Linings or walls comprising porous bricks}  | 2001/0093 | . . . {the moving part being hinged to the fixed one}   |
| 1/0033      | . . {Linings or walls comprising heat shields, e.g. heat shields (shields protecting the charge <a href="#">F27D 5/00</a> )}                       | 2001/0096 | . . . {the moving part staying in the same plane}   |
| 1/0036      | . . {Linings or walls comprising means for supporting electric resistances in the furnace}   | 1/02      | . Crowns; Roofs   |
| 1/004       | . . {Linings or walls comprising means for securing bricks}  | 1/021     | . . {Suspended roofs}   |
| 1/0043      | . {Floors, hearths}  | 1/022     | . . . {Parts thereof, e.g. noses, arches}   |
| 2001/0046   | . {Means to facilitate repair or replacement or prevent quick wearing (repairing linings <a href="#">F27D 1/16</a> )}                              | 1/024     | . . . {having an anchored layer of lining}  |
| 2001/005    | . . {Removable part or structure with replaceable elements}  | 1/025     | . . {Roofs supported around their periphery, e.g. arched roofs}   |
| 2001/0053   | . . {Furnace constructed in modules (tunnel furnaces with add-on modules <a href="#">F27B 9/029</a> )}   | 1/027     | . . . {Skew backs}  |
|             |  | 1/028     | . . . {Means to prevent deformation of the arch}  |
|             |  | 1/04      | . characterised by the form {, e.g. shape} of the bricks or blocks used   |
|             |  | 1/042     | . . {Bricks shaped for use in regenerators}   |
|             |  | 1/045     | . . {Bricks for lining cylindrical bodies, e.g. skids, tubes}   |

2001/047	. . . {Lining of cylindrical vessels}	1/1866	. . . {Door-frames}
1/06	. . Composite bricks or blocks {, e.g. panels, modules}	2001/1875	. . . {Hanging doors and walls (movable partitions <a href="#">F27D 2099/0071</a> )}
1/063	. . . {Individual composite bricks or blocks}	2001/1883	. . . . {Hanging curtains}
1/066	. . . . {Individual composite bricks or blocks made from hollow bricks filled up with another material}	2001/1891	. . . {Doors for separating two chambers in the furnace}
1/08	. . . Bricks or blocks with internal reinforcement or metal backing		
1/10	. Monolithic linings; Supports therefor	<b>3/00</b>	<b>Charging; Discharging; Manipulation of charge (moving charge through a furnace <a href="#">F27B 9/14</a>)</b>
	<b>NOTE</b>	2003/0001	. {Positioning the charge}
	{supports are classified in <a href="#">F27D 1/14</a> }	2003/0002	. . {involving positioning devices, e.g. buffers, buffer zones (involving sensors <a href="#">F27D 2019/0071</a> ; involving sequence controllers <a href="#">F27D 2019/0059</a> ; involving spacers <a href="#">F27M 2002/016</a> )}
1/12	. incorporating cooling arrangements (constructions of tube assemblies in general <a href="#">F28</a> )	2003/0003	. . {involving a system for aligning the articles through a lateral guidance, e.g. funnel}
1/14	. Supports for linings ( <a href="#">F27D 1/10</a> takes precedence)	2003/0004	. . {involving devices for measuring the article, the stack of articles or the height of the furnace passage or for adjusting the height of the passage to the charge or for putting the articles in the same position}
1/141	. . {Anchors therefor}	2003/0006	. . {Particulate materials}
1/142	. . . {Anchors made from ceramic material}	2003/0007	. . . {Circular distribution}
1/144	. . {Supports for ceramic fibre materials}	2003/0008	. . . {Longitudinal distribution}
1/145	. . {Assembling elements}	2003/0009	. . . {Separation of different types of fines, e.g. by a blower}
1/147	. . . {for bricks}	2003/001	. . . {Series of dispensers or separation in two or more parts}
1/148	. . . . {Means to suspend bricks}	2003/0012	. . {Working with piles}
1/16	. Making or repairing linings {increasing the durability of linings or breaking away linings}	2003/0013	. . . {Unstacking or making stacks}
2001/1605	. . {Repairing linings}	2003/0014	. . {involving the use of magazines}
2001/161	. . . {Hot repair}	2003/0015	. . . {the magazine being vertical}
2001/1615	. . . {through a hole in the casing, e.g. injecting refractory from outside the vessel}	2003/0016	. . . {the magazine being a rotary device}
1/1621	. . {Making linings by using shaped elements, e.g. bricks}	2003/0018	. . {comprising means to introduce or extract the charge in series of separate containers or zones}
1/1626	. . {Making linings by compacting a refractory mass in the space defined by a backing mould or pattern and the furnace wall}	2003/0019	. . . {simultaneously}
2001/1631	. . . {using an expandable core}	2003/002	. . {Transforming a single row in a multiple row}
1/1636	. . {Repairing linings by projecting or spraying refractory materials on the lining}	3/0021	. {of ceramic ware}
1/1642	. . . {using a gunning apparatus}	3/0022	. . {Disposition of the charge}
1/1647	. . . . {the projected materials being partly melted, e.g. by exothermic reactions of metals (Al, Si) with oxygen}	3/0024	. {of metallic workpieces}
1/1652	. . . . . {Flame guniting; Use of a fuel}	3/0025	. {Charging or loading melting furnaces with material in the solid state}
2001/1657	. . . . . {Solid fuel}	3/0026	. . {Introducing additives into the melt}
2001/1663	. . . . . {Fluid fuel, e.g. gas}	3/0027	. . {Charging vertically with corbs}
1/1668	. . . . . {Plasma guniting}	3/0028	. . . {Corbs}
1/1673	. . . {applied centrifugally}	3/003	. . {Charging laterally, e.g. with a charging box}
1/1678	. . {Increasing the durability of linings; Means for protecting}	3/0031	. . {Charging with tiltable dumpers}
1/1684	. . . {by a special coating applied to the lining}	3/0032	. . {using an air-lock}
2001/1689	. . . . {obtained from materials added to the melt}	3/0033	. {charging of particulate material}
1/1694	. . {Breaking away the lining or removing parts thereof}	2003/0034	. {Means for moving, conveying, transporting the charge in the furnace or in the charging facilities}
1/18	. Door frames; Doors, lids, removable covers	2003/0036	. . {comprising inflatable or extendable parts}
1/1808	. . {Removable covers}	2003/0037	. . {comprising friction surfaces}
1/1816	. . . {Removable covers specially adapted for arc furnaces}	2003/0038	. . {comprising shakers}
2001/1825	. . . {Means for moving the cover}	2003/0039	. . {comprising magnetic means}
2001/1833	. . . . {comprising a screw mechanism}	2003/004	. . . {Magnetic lifters}
2001/1841	. . . . {comprising means for rotating or moving the cover in a horizontal or quasi horizontal plane}	2003/0042	. . {comprising roller trains}
2001/185	. . . . {comprising means for tilting the cover}	2003/0043	. . . {at least one of them being driven separately}
1/1858	. . {Doors}	2003/0044	. . . {at least one of them being removable}
		2003/0045	. . . {Use of rollable bodies, e.g. balls}
		2003/0046	. . {comprising one or more movable arms, e.g. forks}
		2003/0048	. . . {Walking beams}

2003/0049	. . . . {comprising eccentrics or lever arms}	2003/045	. . {used to pull the charge}
2003/005	. . . . {comprising ramps}	3/06	. Charging or discharging machines on travelling carriages
2003/0051	. . {comprising means to pick up the charge and put it down}	3/08	. Screw feeders; Screw dischargers
2003/0053	. . {comprising a device for charging with the doors closed}	3/10	. Charging directly from hoppers or shoots
2003/0054	. . {Means to move molten metal, e.g. electromagnetic pump}	2003/105	. . {using shutters}
2003/0055	. . . . {with flow regulation}	3/12	. Travelling or movable supports or containers for the charge
2003/0056	. . . . {through a syphon in a vacuum chamber, e.g. involving aspiration or pressure on the bath}	2003/121	. . {Band, belt or mesh}
2003/0057	. . {Fast-outlet or inlet means}	2003/122	. . . . {Band made from longitudinal wires or bars}
2003/0059	. . {comprising tracks, e.g. rails and wagon}	3/123	. . {Furnace cars}
2003/006	. . . . {with a return track}	2003/124	. . {Sleds; Transport supports}
2003/0061	. . . . {with means for changing track}	2003/125	. . {Charging cars, lift trolleys}
2003/0062	. . {using devices for tilting or rocking the charge}	2003/126	. . . . {with long arms, charging forks}
2003/0063	. . {comprising endless belts}	2003/127	. . . . {for carrying pots (slag pots <a href="#">F27D 2099/0095</a> )}
2003/0065	. . {Lifts, e.g. containing the bucket elevators}	2003/128	. . . . {for carrying stacks of articles, e.g. bricks}
2003/0066	. . {comprising scrapers or systems to pull out}	3/14	. Charging or discharging liquid or molten material
2003/0067	. . {comprising conveyors where the translation is communicated by friction from at least one rotating element, e.g. two opposed rotations combined}	3/145	. . {Runners therefor}
2003/0068	. . {comprising clamps or tongs}	3/15	. Tapping equipment; Equipment for removing {or retaining} slag
2003/0069	. . {the device being suspended, e.g. from a crane}	3/1509	. . {Tapping equipment}
2003/0071	. . {Use of a comminuting device, e.g. grinding mill}	3/1518	. . . . {Tapholes}
2003/0072	. . {Use of a pinion and a rack}	3/1527	. . . . {Taphole forming equipment, e.g. boring machines, piercing tools}
2003/0073	. . {the charge floating on a liquid, e.g. water}	3/1536	. . . . {Devices for plugging tap holes, e.g. plugs stoppers}
2003/0074	. . . . {floating on water}	<b>NOTE</b>	
2003/0075	. . {Charging or discharging vertically, e.g. through a bottom opening}	{ the devices fixed permanently to the melt container are classified in <a href="#">F27D 3/1509</a> }	
2003/0077	. . {Use of centrifugal devices}	3/1545	. . {Equipment for removing or retaining slag}
2003/0078	. . {comprising jacks, e.g. hydraulic jacks}	3/1554	. . . . {for removing the slag from the surface of the melt}
2003/0079	. . {Use of cams}	3/1563	. . . . . {by the use of scrapers}
2003/008	. . {comprising cross-beams or gantry cranes}	3/1572	. . . . . {by suction}
2003/0081	. . {Series of little rams}	3/1581	. . . . . {by the use of blowers}
2003/0083	. . {Means for stirring the charge}	3/159	. . . . {for retaining slag during the pouring of the metal or retaining metal during the pouring of the slag}
3/0084	. {Charging; Manipulation of SC or SC wafers}	3/16	. Introducing a fluid jet or current into the charge {porous elements for gas flushing of molten metals <a href="#">B22D 1/005</a> }
2003/0085	. {Movement of the container or support of the charge in the furnace or in the charging facilities}	2003/161	. . {through a porous element}
2003/0086	. . {Up or down}	2003/162	. . {the fluid being an oxidant or a fuel}
2003/0087	. . {Rotation about a vertical axis}	2003/163	. . . . {the fluid being an oxidant}
2003/0089	. . {Rotation about a horizontal or slightly inclined axis}	2003/164	. . . . . {Oxygen}
2003/009	. . . . {Oscillations about a horizontal axis; Rocking}	2003/165	. . . . {the fluid being a fuel}
2003/0091	. . {Horizontally}	2003/166	. . {the fluid being a treatment gas}
2003/0092	. . . . {with a reciprocating movement}	2003/167	. . {the fluid being a neutral gas}
2003/0093	. . {Movement on a slope}	2003/168	. . {through a lance}
2003/0095	. . {the advancement being step by step}	2003/169	. . . . {Construction of the lance, e.g. lances for injecting particles}
2003/0096	. . {Advancement along the longitudinal axis of the workpiece}	3/18	. Charging particulate material using a fluid carrier
2003/0097	. . {Advancement along an axis perpendicular to the axis of the workpiece}	2003/185	. . {Conveying particles in a conduct using a fluid}
2003/0098	. . . . {Workpiece rolling on its support}	<b>5/00 Supports, screens, or the like for the charge within the furnace (travelling or movable supports <a href="#">F27D 3/12</a>)</b>	
3/02	. Skids or tracks for heavy objects	5/0006	. {Composite supporting structures}
3/022	. . {Skids}	5/0012	. . {Modules of the sagger or setter type; Supports built up from them}
3/024	. . . . {Details of skids, e.g. riders}	5/0018	. . {Separating elements}
3/026	. . {transport or conveyor rolls for furnaces; roller rails (conveyor rolls in general <a href="#">B65G</a> )}	5/0025	. . {assembled to present a three-point support}
3/028	. . . . {Roller rails or succession of small sized rollers}		
3/04	. Ram or pusher apparatus		

5/0031	. {Treatment baskets for ceramic articles ( <a href="#">for metallic articles C21D 9/0025</a> )}	2009/0067	. . {Cooling element inlet and outlet tubes}
5/0037	. {Supports specially adapted for semi-conductors}	2009/007	. {Cooling of charges therein}
5/0043	. {Supports specially adapted for dental prosthesis}	2009/0072	. . {the cooling medium being a gas}
5/005	. {Supports specially adapted for holding elongated articles in an upright position, e.g. sparking plugs}	2009/0075	. . . {in direct contact with the charge}
5/0056	. {Hangers}	2009/0078	. . . {in indirect contact with the charge}
5/0062	. {Shields for the charge ( <a href="#">shields for the lining F27D 1/0033</a> )}	2009/0081	. . {the cooling medium being a fluid (other than a gas in direct or indirect contact with the charge)}
5/0068	. {Containers}	2009/0083	. . . {the fluid being water}
2005/0075	. . {Pots, e.g. slag pots, ladles}	2009/0086	. . . . {applied in spray form}
2005/0081	. {Details}	2009/0089	. . {Quenching}
2005/0087	. . {Means to prevent the adherence of the charge}	2009/0091	. . {in a fluidised bed of cooling elements}
2005/0093	. . {Means to maintain the form of the article}	2009/0094	. . {making use of already cooled material, e.g. forming a layer}
<b>7/00</b>	<b>Forming, maintaining, or circulating atmospheres in heating chambers</b>	2009/0097	. . . {the charge being used as a coolant}
7/02	. Supplying steam, vapour, gases, or liquids	<b>11/00</b>	<b>Arrangement of elements for electric heating in or on furnaces (<a href="#">electric heating per se H05B</a>)</b>
2007/023	. . {Conduits}	11/02	. Ohmic resistance heating
2007/026	. . {Dampers ( <a href="#">registers for granular flows F27D 2099/0071</a> )}	11/04	. . with direct passage of current through the material being heated
7/04	. Circulating atmospheres by mechanical means	11/06	. Induction heating, i.e. in which the material being heated, or its container or elements embodied therein, form the secondary of a transformer
2007/045	. . {Fans}	11/08	. Heating by electric discharge, e.g. arc discharge
7/06	. Forming or maintaining special atmospheres or vacuum within heating chambers ( <a href="#">F27D 7/02 takes precedence</a> )	11/10	. . Disposition of electrodes ( <a href="#">automatic control of temperature G05D 23/00</a> ; <a href="#">electric discharge apparatus H01T</a> ; <a href="#">arrangements for feeding or guiding electrodes H05B 7/10</a> ; <a href="#">automatic control of power by positioning of electrodes H05B 7/144</a> )
2007/063	. . {Special atmospheres, e.g. high pressure atmospheres}	11/12	. with electromagnetic fields acting directly on the material being heated
2007/066	. . {Vacuum}	<b>13/00</b>	<b>Apparatus for preheating charges; Arrangements for preheating charges</b>
<b>9/00</b>	<b>Cooling of furnaces or of charges therein (<a href="#">F27D 1/00</a>, <a href="#">F27D 3/00 take precedence</a>)</b>	13/002	. {Preheating scrap ( <a href="#">preheating of scrap for steel making C21C 5/565</a> )}
2009/0002	. {Cooling of furnaces}	13/005	. {Drying of green clay prior to baking}
2009/0005	. . {the cooling medium being a gas}	2013/007	. {using a rotary furnace}
2009/0008	. . . {Ways to inject gases against surfaces}	<b>15/00</b>	<b>Handling or treating discharged material; Supports or receiving chambers therefor</b>
2009/001	. . {the cooling medium being a fluid other than a gas}	15/02	. Cooling
2009/0013	. . . {the fluid being water}	15/0206	. . {with means to convey the charge}
2009/0016	. . . . {Water-spray}	15/0213	. . . {comprising a cooling grate}
2009/0018	. . {the cooling medium passing through a pattern of tubes}	15/022	. . . . {grate plates}
2009/0021	. . . {with the parallel tube parts close to each other, e.g. a serpentine}	2015/0226	. . . . . {Support, fixation of the grate}
2009/0024	. . . . {with contiguous tubes, which may be separately welded one to the other}	2015/0233	. . . . . {with gas, e.g. air, supply to the grate}
2009/0027	. . . . {linked by elements}	2015/024	. . . . {Multiple grates}
2009/0029	. . . . {fixed, e.g. welded to a supporting surface}	2015/0246	. . . . {Combination of fixed and movable grates}
2009/0032	. . . {integrated with refractories in a panel}	2015/0253	. . . . . {Gratin grates}
2009/0035	. . . {arranged for the covering of a cylindrical surface}	2015/026	. . . . {Means to discharge the fines}
2009/0037	. . {the cooling medium passing a radiator}	15/0266	. . . {on an endless belt}
2009/004	. . {the cooling medium passing a waterbox}	15/0273	. . . {on a rotary hearth}
2009/0043	. . . {Insert type waterbox, e.g. cylindrical or flat type}	15/028	. . . {comprising a rotary drum}
2009/0045	. . {the cooling medium passing a block, e.g. metallic}	15/0286	. . {in a vertical, e.g. annular, shaft ( <a href="#">shafts including rotating parts F27D 15/0273</a> )}
2009/0048	. . . {incorporating conduits for the medium}	2015/0293	. . . {including rotating parts}
2009/0051	. . {comprising use of studs to transfer heat or retain the liner}	<b>17/00</b>	<b>Arrangements for using waste heat (<a href="#">heat-exchangers per se F28</a>); Arrangements for using, or disposing of, waste gases</b>
2009/0054	. . . {adapted to retain formed bricks}	17/001	. {Extraction of waste gases, collection of fumes and hoods used therefor ( <a href="#">in general B08B 15/00</a> )}
2009/0056	. . {Use of high thermoconductive elements}		
2009/0059	. . . {made mostly from graphite}		
2009/0062	. . . {made from copper or copper alloy}		
2009/0064	. . {Cooling of furnace arches}		

17/002	. . {Details of the installations, e.g. fume conduits or seals}	21/00	<b>Arrangements of monitoring devices; Arrangements of safety devices</b>
17/003	. . {of waste gases emanating from an electric arc furnace}	2021/0007	. {Monitoring the pressure}
17/004	. {Systems for reclaiming waste heat}	21/0014	. {Devices for monitoring temperature}
2017/005	. . {including pyrolysing the waste gases}	21/0021	. {Devices for monitoring linings for wear}
2017/006	. . {using a boiler}	21/0028	. {Devices for monitoring the level of the melt}
2017/007	. . {including regenerators}	21/0035	. {Devices for monitoring the weight of quantities added to the charge}
17/008	. {cleaning gases}	2021/0042	. . {Monitoring the level of the solid charge}
2017/009	. {Cyclone for separating fines from gas}	2021/005	. {Devices for monitoring thermal expansion}
<b>19/00</b>	<b>Arrangements of controlling devices</b>	2021/0057	. {Security or safety devices, e.g. for protection against heat, noise, pollution or too much duress; Ergonomic aspects}
2019/0003	. {Monitoring the temperature or a characteristic of the charge and using it as a controlling value}	2021/0064	. . {against noises}
2019/0006	. {Monitoring the characteristics (composition, quantities, temperature, pressure) of at least one of the gases of the kiln atmosphere and using it as a controlling value}	2021/0071	. . {against explosions}
2019/0009	. . {Monitoring the pressure in an enclosure or kiln zone}	2021/0078	. . {against the presence of an undesirable element in the atmosphere of the furnace}
2019/0012	. . {Monitoring the composition of the atmosphere or of one of their components}	2021/0085	. . {against molten metal, e.g. leakage or splashes}
2019/0015	. . . {Monitoring the composition of the exhaust gases or of one of its components}	2021/0092	. . {against a jam in the transport line or a production interruption}
2019/0018	. . {Monitoring the temperature of the atmosphere of the kiln}	21/02	. Observation or illuminating devices
2019/0021	. . . {Monitoring the temperature of the exhaust gases}	2021/023	. . {Closable inserting openings, e.g. for the introduction of lances, sensors or burners}
2019/0025	. . {Monitoring the temperature of a part or of an element of the furnace structure}	2021/026	. . {using a video installation}
2019/0028	. {Regulation}	21/04	. Arrangements of indicators or alarms
2019/0031	. . {through control of the flow of the exhaust gases}	<b>25/00</b>	<b>Devices {or methods} for removing incrustations {, e.g. slag, metal deposits, dust; Devices or methods for preventing the adherence of slag}</b>
2019/0034	. . {through control of a heating quantity such as fuel, oxidant or intensity of current}	25/001	. {comprising breaking tools, e.g. hammers, drills, scrapers (breaking away linings <a href="#">F27D 1/1694</a> ; boring machines for forming tapholes <a href="#">F27D 3/1527</a> )}
2019/0037	. . . {Quantity of electric current}	25/003	. . {used for punching tuyeres}
2019/004	. . . {Fuel quantity}	25/005	. . {used for cleaning the channels of induction furnaces}
2019/0043	. . . . {Amount of air or O <sub>2</sub> to the burner}	25/006	. {using explosives}
2019/0046	. . . . {Amount of secondary air to the burner}	25/008	. {using fluids or gases, e.g. blowers, suction units}
2019/005	. . . {Amount of heat given to the charge via a controlled heat exchanger}	<b>27/00</b>	<b>Stirring devices for molten material (<a href="#">F27D 3/14</a> takes precedence)</b>
2019/0053	. . . . {involving heating the charge in a fluid or fluidised medium}	2027/002	. {Gas stirring}
2019/0056	. . {Regulation involving cooling}	27/005	. {Pumps}
2019/0059	. . {Regulation involving the control of the conveyor movement, e.g. speed or sequences}	27/007	. . {Pulsating pumps}
2019/0062	. . . {control of the workpiece stay in different zones}	<b>99/00</b>	<b>Subject matter not provided for in other groups of this subclass</b>
2019/0065	. . {Regulation involving controlled section modification}	99/0001	. {Heating elements or systems}
2019/0068	. . {Regulation involving a measured inflow of a particular gas in the enclosure}	99/0003	. . {with particulate fuel, e.g. aspects relating to the feeding}
2019/0071	. . {Regulation using position sensors}	99/0005	. . {Injecting liquid fuel}
2019/0075	. . {Regulation of the charge quantity}	99/0006	. . {Electric heating elements or system}
2019/0078	. . {Regulation of the speed of the gas through the charge}	2099/0008	. . . {Resistor heating}
2019/0081	. {Controlling an air-lock chamber}	2099/001	. . . . {the container being the resistor}
2019/0084	. {Controlling closure systems, e.g. doors}	2099/0011	. . . . {The resistor heats a radiant tube or surface}
2019/0087	. {Automatisation of the whole plant or activity}	2099/0013	. . . . . {immersed in the charge}
2019/009	. . {Use of codes, e.g. bar codes}	2099/0015	. . . {Induction heating}
2019/0093	. {Maintaining a temperature gradient}	2099/0016	. . . . {Different magnetic fields, e.g. two coils, different characteristics of the same coil along its length or different parts of the same coil used}
2019/0096	. {involving simulation means, e.g. of the treating or charging step}	2099/0018	. . . . {Relative movement of the coil and the charge during the heat treatment}
		2099/002	. . . . {Core heating}

2099/0021	. . .	{ Arc heating }
2099/0023	. . . .	{ DC arc heating }
2099/0025	. . .	{ Currents through the charge }
2099/0026	. . .	{ with a generator of electromagnetic radiations }
2099/0028	. . .	{ Microwave heating }
2099/003	. . .	{ Bombardment heating, e.g. with ions or electrons }
2099/0031	. . .	{ Plasma-torch heating }
99/0033	. .	{ using burners (manufacture of steel in an electric arc furnace equipped with burners C21C 5/5217) }
99/0035	. . .	{ Heating indirectly through a radiant surface }
2099/0036	. . .	{ immersed in the charge }
2099/0038	. . .	{ removable }
2099/004	. . .	{ directed upon the charge, e.g. vertically }
2099/0041	. . . .	{ with a small angle, e.g. almost tangentially }
2099/0043	. . .	{ Impulse burner }
2099/0045	. . .	{ Radiant burner }
2099/0046	. . .	{ with incomplete combustion, e.g. reducing atmosphere }
2099/0048	. . . .	{ Post- combustion }
2099/005	. . .	{ Catalytic burner }
2099/0051	. . .	{ Burning waste as a fuel }
2099/0053	. . .	{ Burner fed with preheated gases }
2099/0055	. . . .	{ Fuel }
2099/0056	. . . .	{ Oxidant }
2099/0058	. .	{ Means for heating the charge locally }
2099/006	. .	{ Auxiliary heating, e.g. in special conditions or at special times }
2099/0061	. .	{ Indirect heating }
2099/0063	. . .	{ Liquid }
2099/0065	. . .	{ Gas }
2099/0066	. . .	{ Particles or solid bodies, e.g. bed of particles }
2099/0068	. .	{ Heating directly by circulation of a fluid other than a gas or by particles }
99/007	. .	{ Partitions }
2099/0071	. .	{ Partitions used as registers }
99/0073	. .	{ Seals }
99/0075	. .	{ Gas curtain seals }
99/0076	. .	{ Furnace car seals, i.e. seals used in continuous furnaces or kilns for preventing gas or heat exchange between heating chamber and the area comprising driving means }
2099/0078	. .	{ Means to minimize the leakage of the furnace atmosphere during charging or discharging }
2099/008	. . .	{ Using an air-lock (use of air-locks for charging smelt furnaces F27D 3/0032) }
2099/0081	. .	{ Joint }
2099/0083	. .	{ Drives; Auxiliary drives }
2099/0085	. .	{ Accessories }
2099/0086	. .	{ Filters, e.g. for molten metals }
2099/0088	. .	{ Apparatus to cut metal, e.g. logs, in billets }
2099/009	. .	{ Bumpers }
2099/0091	. .	{ Means to grease or oil }
2099/0093	. .	{ Means to collect ashes or dust, e.g. vessels }
2099/0095	. .	{ Means to collect the slag or spilled metal, e.g. vessels (cars to carry the pots F27D 2003/127) }
2099/0096	. .	{ Presses }
2099/0098	. .	{ Means for moving the furnace }

**2201/00 Manipulation of furnace parts****NOTE**

Indexing code [F27D 2201/00](#) can be followed by additional indexing codes preceded by a + sign. These additional indexing codes are chosen from codes of subclass [F27D](#) describing similar manipulations of furnace charges.

Example: [F27D 2201/00](#) + [F27D 2003/0036](#)