

CPC COOPERATIVE PATENT CLASSIFICATION

H ELECTRICITY

(NOTE omitted)

H05 ELECTRIC TECHNIQUES NOT OTHERWISE PROVIDED FOR

H05H PLASMA TECHNIQUE (fusion reactors [G21B](#); ion-beam tubes [H01J 27/00](#); magnetohydrodynamic generators [H02K 44/08](#); producing X-rays involving plasma generation [H05G 2/00](#)); **PRODUCTION OF ACCELERATED ELECTRICALLY-CHARGED PARTICLES OR OF NEUTRONS** (obtaining neutrons from radioactive sources [G21](#), e.g. [G21B](#), [G21C](#), [G21G](#)); **PRODUCTION OR ACCELERATION OF NEUTRAL MOLECULAR OR ATOMIC BEAMS** (atomic clocks [G04F 5/14](#); devices using stimulated emission [H01S](#); frequency regulation by comparison with a reference frequency determined by energy levels of molecules, atoms, or subatomic particles [H03L 7/26](#))

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.

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|-------------|--|-----------|---|
| 1/00 | Generating plasma; Handling plasma | 1/14 | . . . wherein the containment vessel is straight and has magnetic mirrors |
| 1/0006 | . {Investigating plasma, e.g. degree of ionisation (electron temperature)} | 1/16 | . . using externally-applied electric and magnetic fields |
| 1/0012 | . . {by using radiation} | 1/18 | . . . wherein the fields oscillate at very high frequency, e.g. in the microwave range {, e.g. using cyclotron resonance} |
| 1/0018 | . . . {Details} | 1/20 | . . Ohmic heating |
| 1/0025 | . . . {by using photoelectric means (H05H 1/0031 - H05H 1/0043 take precedence)} | 1/22 | . . for injection heating {(G21B 1/15 takes precedence)} |
| 1/0031 | . . . {by interferometry} | 1/24 | . Generating plasma {(gas-filled discharge reactors H01J 37/32 ; nuclear fusion reactors G21B 1/00 ; ohmic heating H05H 1/20 ; injection heating H05H 1/22)} |
| 1/0037 | . . . {by spectrometry (see G01N 3/00)} | 1/2406 | . . {Dielectric barrier discharges} |
| 1/0043 | . . . {by using infra-red or ultra-violet radiation} | 2001/2412 | . . . {the dielectric being interposed between the electrodes} |
| 1/005 | . . . {by using X-rays or alpha rays (see G01N 23/00)} | 2001/2418 | . . . {the electrodes being embedded in the dielectric} |
| 1/0056 | . . . {by using neutrons (see G01N 23/00)} | 2001/2425 | . . . {the electrodes being flush with the dielectric} |
| 1/0062 | . . . {by using microwaves (see G01N 23/223)} | 2001/2431 | . . . {Cylindrical electrodes} |
| 1/0068 | . . {by thermal means (see G01N 25/00)} | 2001/2437 | . . . {Multilayer systems} |
| 1/0075 | . . . {Langmuir probes} | 2001/2443 | . . . {Flow through, i.e. the plasma fluid flowing in a dielectric tube} |
| 1/0081 | . . {by electric means (see G01N 27/00 , G01R)} | 2001/245 | {Internal electrodes} |
| 1/0087 | . . {by magnetic means (see G01N 27/00 , G01R)} | 2001/2456 | {External electrodes} |
| 1/0093 | . . {by acoustic, e.g. ultrasonic means (see G01N 29/02)} | 2001/2462 | {Ring electrodes} |
| 1/02 | . Arrangements for confining plasma by electric or magnetic fields; Arrangements for heating plasma ({ G21B 1/00 takes precedence;} electron optics H01J) | 2001/2468 | {Spiral electrodes} |
| 1/03 | . . using electrostatic fields | 1/2475 | . . {Acoustic pressure discharge} |
| 1/04 | . . using magnetic fields substantially generated by the discharge in the plasma | 2001/2481 | . . . {Piezoelectric actuators} |
| 1/06 | . . . Longitudinal pinch devices | 2001/2487 | . . . {Mechanical actuators} |
| 1/08 | . . . Theta pinch devices {, e.g. SCYLLA } | 2001/2493 | . . . {Horns} |
| 1/10 | . . using externally-applied magnetic fields only {, e.g. Q-machines, Yin-Yang, base-ball} | 1/26 | . Plasma torches {(metal working with constricted arc B23K 10/00 , B23K 10/02 ; metal spraying B05B 7/18 , B05B 7/20)} |
| 1/105 | . . . {using magnetic pumping} | 1/28 | . . . Cooling arrangements |
| 1/11 | . . . using cusp configuration (H05H 1/14 takes precedence) | | |
| 1/12 | . . . wherein the containment vessel forms a closed or nearly closed loop {(G21B 1/05 takes precedence)} | | |

- 1/30 . . . using applied electromagnetic fields, e.g. high frequency or microwave energy ([H05H 1/28 takes precedence](#))
- 1/32 . . . using an arc ([H05H 1/28 takes precedence](#))
- 1/34 . . . Details, e.g. electrodes, nozzles {(cf. [B23K 9/24](#))}
- 1/3405 {Arc stabilising or constricting arrangements, e.g. by an additional gas flow (by externally applied magnetic field [H05H 1/40](#); by using powders or liquids [H05H 1/42](#); using coaxial protecting fluid [H05H 1/341](#))}
- 1/341 {using coaxial protecting fluid (arc stabilising or constricting arrangements [H05H 1/3405](#); introducing materials into the plasma [H05H 1/42](#))}
- 2001/3415 {indexing scheme associated with [H05H 1/34](#)}
- 2001/3421 {transferred arc mode}
- 2001/3426 {pilot arc}
- 2001/3431 {coaxial cylindrical electrodes}
- 2001/3436 {hollow cathode with internal coolant flow}
- 2001/3442 {cathode with inserted tip}
- 2001/3447 {rod-like cathode}
- 2001/3452 {supplementary electrodes between cathode and anode, e.g. cascade}
- 2001/3457 {nozzle protection devices}
- 2001/3463 {oblique nozzle}
- 2001/3468 {vortex generator}
- 2001/3473 {safety means}
- 2001/3478 {geometrical details}
- 2001/3484 {convergent/divergent nozzle}
- 2001/3489 {contact starting}
- 2001/3494 {discharge parameter control}
- 1/36 Circuit arrangements ([H05H 1/38](#), [H05H 1/40](#) take precedence)
- 1/38 Guiding or centering of electrodes
- 1/40 using applied magnetic fields, e.g. for focusing or rotating the arc {(cf. [B23K 9/08](#), [B23K 9/073](#))}
- 1/42 with provisions for introducing materials into the plasma, e.g. powder, liquid (electrostatic spraying, spraying apparatus with means for charging the spray electrically [B05B 5/00](#) {cf. [B23K 9/324](#), [B05B 7/22](#); arc stabilising or constricting arrangements [H05H 1/3405](#); coaxial protecting fluids [H05H 1/341](#)})
- 1/44 using more than one torch
- 1/46 . . using applied electromagnetic fields, e.g. high frequency or microwave energy ([H05H 1/26 takes precedence](#))
- 2001/4607 . . . {Microwave discharges}
- 2001/4615 . . . {Surface waves}
- 2001/4622 . . . {Waveguides}
- 2001/463 . . . {Antennas or applicators}
- 2001/4637 . . . {Cables}
- 2001/4645 . . . {Radiofrequency discharges}
- 2001/4652 . . . {Inductively coupled}
- 2001/466 {Electrodes}
- 2001/4667 {Coiled antennas}
- 2001/4675 {Capacitively coupled}
- 2001/4682 {Associated power generators, e. G. Circuits, matching networks}
- 2001/469 . . . {Flow through, i.e. the plasma fluid flowing in a non-dielectric vessel}
- 2001/4692 {dielectric barrier discharge ([H05H 1/2406 takes precedence](#))}
- 2001/4695 {Arc discharge}
- 2001/4697 {Glow discharge}
- 1/48 . . using an arc ([H05H 1/26 takes precedence](#))
- 2001/481 . . . {Corona discharges}
- 2001/483 {Pointed electrodes}
- 2001/485 {Cylindrical electrodes, e.g. Rotary drums electrodes}
- 2001/486 {Filamentary electrodes}
- 2001/488 {Segmented electrodes}
- 1/50 . . . and using applied magnetic fields, e.g. for focusing or rotating the arc
- 1/52 . . using exploding wires or spark gaps ([H05H 1/26 takes precedence](#); spark gaps in general [H01T](#))
- 1/54 . Plasma accelerators
- 3/00 Production or acceleration of neutral particle beams, e.g. molecular or atomic beams**
- 3/02 . Molecular or atomic beam generation {(charge exchange devices [G21K 1/14](#); polarising devices [G21K 1/16](#); using resonance or molecular beams for analysing or investigating materials [G01N 24/002](#); atomic clock [G04F 5/14](#); beam masers [H01S 1/06](#))}
- 3/04 . Acceleration by electromagnetic wave pressure
- 3/06 . Generating neutron beams (targets for producing nuclear reactions [H05H 6/00](#); neutron sources [G21G 4/02](#))
- 5/00 Direct voltage accelerators; Accelerators using single pulses ([H05H 3/06 takes precedence](#))**
- 5/02 . Details (targets for producing nuclear reactions [H05H 6/00](#))
- 5/03 . . Accelerating tubes (vessels or containers of electric discharge tubes with improved potential distribution over surface of vessel [H01J 5/06](#); shields of X-ray tubes associated with vessels or containers [H01J 35/16](#))
- 5/04 . energised by electrostatic generators
- 5/042 . . {of the van de Graaf type}
- 5/045 . . {High voltage cascades, e.g. Greinacher cascade}
- 5/047 . . {Pulsed generators}
- 5/06 . Multistage accelerators
- 5/063 . . {Tandems}
- 5/066 . . {Onion-like structures}
- 5/08 . Particle accelerators using step-up transformers, e.g. resonance transformers
- 6/00 Targets for producing nuclear reactions (supports for targets or objects to be irradiated [G21K 5/08](#) {; preparation of tritium [C01B 4/00](#); targets, e.g. pellets for fusion reactions by laser or charged particles beam injection [H05H 1/22](#)})**
- 2006/002 . {Windows}
- 6/005 . {Polarised targets (polarising devices, e.g. for obtaining a polarised ion beam [G21K 1/16](#))}
- 2006/007 . {Radiation protection arrangements, e.g. screens}
- 7/00 Details of devices of the types covered by groups [H05H 9/00](#), [H05H 11/00](#), [H05H 13/00](#)**

7/001	. {Arrangements for beam delivery or irradiation (irradiation systems per se G21K 5/00)}	11/00	Magnetic induction accelerators, e.g. betatrons
2007/002	. . {for modifying beam trajectory, e.g. gantries}	11/02	. Air-cored betatrons
2007/004	. . {for modifying beam energy, e.g. spread out Bragg peak devices}	11/04	. Biased betatrons
2007/005	. . {for modifying beam emittance, e.g. stochastic cooling devices, stripper foils}	13/00	Magnetic resonance accelerators; Cyclotrons
2007/007	. . {for focusing the beam to irradiation target}	{(strophotrons, turbine tubes H01J 25/62)}	
2007/008	. . {for measuring beam parameters}	13/005	. {Cyclotrons}
7/02	. Circuits or systems for supplying or feeding radio-frequency energy (radio-frequency generators H03B)	13/02	. Synchrocyclotrons, i.e. frequency modulated cyclotrons
2007/022	. . {Pulsed systems}	13/04	. Synchrotrons
2007/025	. . {Radiofrequency systems}	13/06	. Air-cored magnetic resonance accelerators
2007/027	. . {Microwave systems}	13/08	. Alternating-gradient magnetic resonance accelerators
7/04	. Magnet systems {, e.g. undulators, wigglers (free-electron laser H01S 3/0903)}; Energisation thereof	13/085	. . {Fixed-field alternating gradient accelerators [FFAG]}
2007/041	. . {for beam bunching, e.g. undulators}	13/10	. Accelerators comprising one or more linear accelerating sections and bending magnets or the like to return the charged particles in a trajectory parallel to the first accelerating section, e.g. microtrons
2007/043	. . {for beam focusing}	15/00	Methods or devices for acceleration of charged particles not otherwise provided for
2007/045	. . {for beam bending}	2240/00	Test
2007/046	. . {for beam deflection}	2240/10	. at atmospheric pressure
2007/048	. . {for modifying beam trajectory, e.g. gantry systems}	2240/20	. Non-thermal plasma
7/06	. Two-beam arrangements; Multi-beam arrangements {storage rings}; Electron rings	2242/00	Auxiliary systems
2007/065	. . {Multi-beam merging, e.g. funneling}	2242/10	. Cooling arrangements
7/08	. Arrangements for injecting particles into orbits	2242/1005	. . Power supply other than for plasma torches
2007/081	. . {Sources}	2245/00	test
2007/082	. . . {Ion sources, e.g. ECR, duoplasmatron, PIG, laser sources}	2245/104	. spiral electrodes
2007/084	. . . {Electron sources}	2245/12	. Applications
2007/085	. . {by electrostatic means}	2245/121	. . treatment of exhaust gas, e.g. Ambient air, ozonizers
2007/087	. . {by magnetic means}	2245/1215	. . . Exhaust gas
2007/088	. . {by mechanical means, e.g. stripping foils}	2245/122	. . medical applications {, e.g. plasma scalpels, blades, bistouri}
7/10	. Arrangements for ejecting particles from orbits	2245/1225	. . . Sterilization of objects
7/12	. Arrangements for varying final energy of beam	2245/123	. . surface treatments
2007/122	. . {by electromagnetic means, e.g. RF cavities}	2245/1235	. . . coating of large volume items
2007/125	. . {by mechanical means, e.g. stripping foils}	2245/124	. . production of nanostructures
2007/127	. . {by emittance variation, e.g. stochastic cooling}	2245/125	. . portable devices
7/14	. Vacuum chambers (H05H 5/03 takes precedence)	2277/00	Applications
7/16	. . of the waveguide type	2277/10	. Medical devices
7/18	. . Cavities; Resonators {(travelling-wave tubes H01J 23/18 ; hyperfrequency cavities in general H01P 7/04 , H01P 7/06)}	2277/11	. . Radiotherapy
7/20	. . . with superconductive walls	2277/113	. . . Diagnostic systems
7/22	. Details of linear accelerators, e.g. drift tubes (H05H 7/02 - H05H 7/20 take precedence)	2277/116	. . . Isotope production
2007/222	. . {drift tubes}	2277/12	. Ion implantation
2007/225	. . {coupled cavities arrangements}	2277/13	. High energy applications, e.g. fusion
2007/227	. . {power coupling, e.g. coupling loops}	2277/14	. Portable devices
9/00	Linear accelerators	2277/1405	. . Detection systems
9/005	. {Dielectric wall accelerators}		
9/02	. Travelling-wave linear accelerators {(travelling-wave tubes H01J 25/34)}		
9/04	. Standing-wave linear accelerators		
9/041	. . {Hadron LINACS}		
9/042	. . . {Drift tube LINACS}		
9/044	. . . {Coupling cavity LINACS, e.g. side coupled}		
9/045	. . . {Radio frequency quadrupoles}		
9/047	. . . {Hybrid systems}		
9/048	. . {Lepton LINACS}		