

# CPC COOPERATIVE PATENT CLASSIFICATION

## H ELECTRICITY

(NOTE omitted)

## H01 BASIC ELECTRIC ELEMENTS

(NOTE omitted)

## H01P WAVEGUIDES; RESONATORS, LINES, OR OTHER DEVICES OF THE WAVEGUIDE TYPE (operating at optical frequencies [G02B](#); aerials [H01Q](#); {modulating electromagnetic waves in transmission line, waveguide, cavity resonator or radiation field of aerial [H03C 7/02](#)}; networks comprising lumped impedance elements [H03H](#))

### NOTE

In this subclass, the following expression is used with the meaning indicated :

- "waveguide type" as applied to transmission lines includes only high-frequency coaxial cables or Lecher lines, and as applied to resonators, delay lines, or other devices includes all devices having distributed inductance and capacitance.

### 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>Auxiliary devices (coupling devices of the waveguide type <a href="#">H01P 5/00</a>)</b>   | <b>1/10</b> | • for switching or interrupting {(in systems using reflection or reradiation of radio, acoustic or other waves <a href="#">G01S 7/034</a> )}                      |
| 1/005       | • {Diode mounting means}  | 1/11        | • • by ferromagnetic devices  |
| 1/02        | • Bends; Corners; Twists  | 1/12        | • • by mechanical chopper   |
| 1/022       | • • {in waveguides of polygonal cross-section ( <a href="#">H01P 1/065</a> takes precedence)}   | 1/122       | • • • {Waveguide switches}  |
| 1/025       | • • • {in the E-plane}  | 1/125       | • • • {Coaxial switches}  |
| 1/027       | • • • {in the H-plane}  | 1/127       | • • • {Strip line switches}   |
| 1/04        | • Fixed joints ({pipe joints <a href="#">F16L</a> }; line connectors <a href="#">H01R</a> ; cable fittings <a href="#">H02G 15/00</a> )   | 1/14        | • • by electric discharge devices (discharge devices <a href="#">H01J 17/64</a> )   |
| 1/042       | • • {Hollow waveguide joints}   | 1/15        | • • by semiconductor devices  |
| 1/045       | • • {Coaxial joints}  | 1/16        | • for mode selection, e.g. mode suppression or mode promotion; for mode conversion (linking dissimilar lines or devices <a href="#">H01P 5/08</a> )               |
| 1/047       | • • {Strip line joints}   | 1/161       | • • sustaining two independent orthogonal modes, e.g. orthomode transducer {(combining or separating polarisations and frequencies <a href="#">H01P 1/2131</a> )} |
| 1/06        | • Movable joints, e.g. rotating joints  | 1/162       | • • absorbing spurious or unwanted modes of propagation   |
| 1/061       | • • {the relative movement being a translation along an axis common to at least two rectilinear parts, e.g. expansion joints}   | 1/163       | • • specifically adapted for selection or promotion of the TE <sub>01</sub> circular-electric mode  |
| 1/062       | • • {the relative movement being a rotation}  | 1/165       | • for rotating the plane of polarisation  |
| 1/063       | • • • {with a limited angle of rotation}  | 1/17        | • • for producing a continuously rotating polarisation, e.g. circular polarisation  |
| 1/064       | • • • • {the axis of rotation being perpendicular to the transmission path, e.g. hinge joint}   | 1/171       | • • • {using a corrugated or ridged waveguide section}  |
| 1/065       | • • • • {the axis of rotation being parallel to the transmission path, e.g. stepped twist}  | 1/172       | • • • {using a dielectric element}  |
| 1/066       | • • • {with an unlimited angle of rotation}   | 1/173       | • • • {using a conductive element}  |
| 1/067       | • • • • {the energy being transmitted in only one line located on the axis of rotation}   | 1/174       | • • • {using a magnetic element ( <a href="#">H01P 1/175</a> takes precedence)}   |
| 1/068       | • • • • {the energy being transmitted in at least one ring-shaped transmission line located around the axis of rotation, e.g. "around the mast" rotary joint ( <a href="#">H01P 1/069</a> takes precedence; coaxial line with solid inner conductor <a href="#">H01P 1/067</a> )} | 1/175       | • • using Faraday rotators  |
| 1/069       | • • • • {the energy being transmitted in at least one ring-shaped transmission line located around an axial transmission line; Concentric coaxial systems}  | 1/18        | • Phase-shifters ( <a href="#">H01P 1/165</a> takes precedence; coupling devices with variable coupling factor <a href="#">H01P 5/04</a> )                        |
| 1/08        | • Dielectric windows (coupling devices for transit time tubes <a href="#">H01J 23/36</a> )  | 1/181       | • • {using ferroelectric devices}   |

- 1/182 . . {Waveguide phase-shifters ([H01P 1/181](#), [H01P 1/185](#), [H01P 1/19](#) take precedence)}
- 1/183 . . {Coaxial phase-shifters ([H01P 1/181](#), [H01P 1/185](#), [H01P 1/19](#) take precedence)}
- 1/184 . . {Strip line phase-shifters ([H01P 1/181](#), [H01P 1/185](#), [H01P 1/19](#) take precedence)}
- 1/185 . . using a diode or a gas filled discharge tube
- 1/19 . . using a ferromagnetic device
- 1/195 . . . having a toroidal shape
- 1/20 . Frequency-selective devices, e.g. filters ({variable impedance transformers, e.g. slug tuners or stub tuners [H01P 5/04](#)}; resonators [H01P 7/00](#))
- 1/2002 . . {Dielectric waveguide filters ([H01P 1/212](#), [H01P 1/213](#), [H01P 1/215](#), [H01P 1/219](#) take precedence)}
- 1/2005 . . {Electromagnetic photonic bandgaps [EPB], or photonic bandgaps [PBG]}
- 1/2007 . . {Filtering devices for biasing networks or DC returns}
- 1/201 . . Filters for transverse electromagnetic waves ([H01P 1/212](#), [H01P 1/213](#), [H01P 1/215](#), [H01P 1/219](#) take precedence)
- 1/2013 . . . {Coplanar line filters}
- 1/2016 . . . {Slot line filters; Fin line filters}
- 1/202 . . . Coaxial filters (cascaded coaxial cavities [H01P 1/205](#))
- 1/203 . . . Strip line filters
- 1/20309 . . . . {with dielectric resonator}
- 1/20318 . . . . . {with dielectric resonators as non-metallised opposite openings in the metallised surfaces of a substrate}
- 1/20327 . . . . . {Electromagnetic interstage coupling}
- 1/20336 . . . . . {Comb or interdigital filters}
- 1/20345 . . . . . {Multilayer filters}
- 1/20354 . . . . . {Non-comb or non-interdigital filters}
- 1/20363 . . . . . {Linear resonators}
- 1/20372 . . . . . {Hairpin resonators}
- 1/20381 . . . . . {Special shape resonators}
- 1/2039 . . . . {Galvanic coupling between Input/Output}
- 1/205 . . . Comb or interdigital filters; Cascaded coaxial cavities ([H01P 1/203](#) takes precedence)
- 1/2053 . . . . {the coaxial cavity resonators being disposed parall to each other}
- 1/2056 . . . . {Comb filters or interdigital filters with metallised resonator holes in a dielectric block}
- 1/207 . . Hollow waveguide filters ([H01P 1/212](#), [H01P 1/213](#), [H01P 1/215](#), [H01P 1/219](#) take precedence)
- 1/208 . . . Cascaded cavities; Cascaded resonators inside a hollow waveguide structure ([H01P 1/205](#) takes precedence)
- 1/2082 . . . . {with multimode resonators ([H01P 1/2086](#) takes precedence)}
- 1/2084 . . . . {with dielectric resonators}
- 1/2086 . . . . . {multimode}
- 1/2088 . . . . {Integrated in a substrate}
- 1/209 . . . comprising one or more branching arms or cavities wholly outside the main waveguide
- 1/211 . . . Waffle-iron filters; Corrugated structures
- 1/212 . . suppressing or attenuating harmonic frequencies ([H01P 1/215](#) takes precedence)
- 1/213 . . combining or separating two or more different frequencies ([H01P 1/215](#) takes precedence)
- 1/2131 . . . {with combining or separating polarisations}
- 1/2133 . . . {using coaxial filters ([H01P 1/2131](#), [H01P 1/2136](#) take precedence)}
- 1/2135 . . . {using strip line filters ([H01P 1/2131](#) takes precedence)}
- 1/2136 . . . {using comb or interdigital filters; using cascaded coaxial cavities ([H01P 1/2131](#), [H01P 1/2135](#) take precedence)}
- 1/2138 . . . {using hollow waveguide filters ([H01P 1/2131](#) takes precedence)}
- 1/215 . . using ferromagnetic material
- 1/217 . . . the ferromagnetic material acting as a tuning element in resonators
- 1/218 . . . the ferromagnetic material acting as a frequency selective coupling element, e.g. YIG-filters
- 1/219 . . Evanescent mode filters
- 1/22 . Attenuating devices (dissipative terminating devices [H01P 1/26](#))
- 1/222 . . {Waveguide attenuators ([H01P 1/23](#) takes precedence)}
- 1/225 . . {Coaxial attenuators ([H01P 1/23](#) takes precedence)}
- 1/227 . . {Strip line attenuators ([H01P 1/23](#) takes precedence)}
- 1/23 . . using ferromagnetic material
- 1/24 . Terminating devices
- 1/26 . . Dissipative terminations
- 1/262 . . . {the dissipative medium being a liquid or being cooled by a liquid}
- 1/264 . . . {Waveguide terminations ([H01P 1/262](#) takes precedence)}
- 1/266 . . . {Coaxial terminations ([H01P 1/262](#) takes precedence)}
- 1/268 . . . {Strip line terminations ([H01P 1/262](#) takes precedence)}
- 1/28 . . Short-circuiting plungers (coupling devices with variable coupling factor [H01P 5/04](#))
- 1/30 . for compensation of, or protection against, temperature or moisture effects {; for improving power handling capability ([H01P 1/04](#), [H01P 1/08](#) take precedence)}
- 1/32 . Non-reciprocal transmission devices ([H01P 1/02](#) - [H01P 1/30](#) take precedence)
- 1/36 . . Isolators
- 1/362 . . . {Edge-guided mode devices}
- 1/365 . . . Resonance absorption isolators
- 1/37 . . . Field displacement isolators
- 1/375 . . . using Faraday rotators
- 1/38 . . Circulators
- 1/383 . . . Junction circulators, e.g. Y-circulators
- 1/387 . . . . Strip line circulators
- 1/39 . . . . Hollow waveguide circulators
- 1/393 . . . using Faraday rotators
- 1/397 . . . using non- reciprocal phase shifters ([H01P 1/393](#) takes precedence)
- 3/00 Waveguides; Transmission lines of the waveguide type**
- 3/003 . {Coplanar lines}
- 3/006 . . {Conductor backed coplanar waveguides}
- 3/02 . with two longitudinal conductors

- 3/023 . . {Fin lines; Slot lines}
- 3/026 . . {Coplanar striplines [CPS]}
- 3/04 . . Lines formed as Lecher wire pairs
- 3/06 . . Coaxial lines (not suitable for handling frequencies considerably beyond the audio range, {coaxial cables in general} [H01B 11/18](#))

**NOTE**

This subgroup is only used for documents disclosing typical HF-features of coaxial cables, e.g. propagation of non-TEM-modes, multimoding, oversized coaxial cables, particular cross-section adapted for HF-propagation

- 3/08 . . Microstrips; Strip lines
- 3/081 . . . {Microstriplines}
- 3/082 . . . . {Multilayer dielectric}
- 3/084 . . . . {Suspended microstriplines}
- 3/085 . . . {Triplate lines}
- 3/087 . . . . {Suspended triplate lines}
- 3/088 . . . {Stacked transmission lines}
- 3/10 . Wire waveguides, i.e. with a single solid longitudinal conductor
- 3/12 . Hollow waveguides ([H01P 3/20](#) takes precedence)
- 3/121 . . {integrated in a substrate}
- 3/122 . . {Dielectric loaded (not air)}
- 3/123 . . with a complex or stepped cross-section, e.g. ridged or grooved waveguides ([H01P 3/14](#) takes precedence)
- 3/127 . . with a circular, elliptic, or parabolic cross-section
- 3/13 . . specially adapted for transmission of the TE<sub>01</sub> circular-electric mode ({selection, promotion [H01P 1/163](#)})
- 3/14 . . flexible
- 3/16 . Dielectric waveguides, i.e. without a longitudinal conductor
- 3/165 . . {Non-radiating dielectric waveguides}
- 3/18 . built-up from several layers to increase operating surface, i.e. alternately conductive and dielectric layers
- 3/20 . Quasi-optical arrangements for guiding a wave, e.g. focusing by dielectric lenses
- 5/00 Coupling devices of the waveguide type (non-reciprocal devices [H01P 1/32](#); for introducing or removing wave energy to or from the discharge in transit-time tubes [H01J 23/36](#))**
- 5/02 . with invariable factor of coupling ([H01P 5/12](#) takes precedence {choke joints [H01P 1/04](#), [H01P 1/06](#)})
- 5/022 . . {Transitions between lines of the same kind and shape, but with different dimensions}
- 5/024 . . . {between hollow waveguides}
- 5/026 . . . {between coaxial lines}
- 5/028 . . . {between strip lines}
- 5/04 . with variable factor of coupling
- 5/08 . for linking dissimilar lines or devices ([H01P 1/16](#), [H01P 5/04](#) take precedence; linking lines of the same kind but with different dimensions [H01P 5/02](#))
- 5/082 . . {Transitions between hollow waveguides of different shape, e.g. between a rectangular and a circular waveguide}
- 5/085 . . {Coaxial-line/strip-line transitions}
- 5/087 . . {Transitions to a dielectric waveguide}

- 5/10 . . for coupling balanced with unbalanced lines or devices
- 5/1007 . . . {Microstrip transitions to Slotline or finline}
- 5/1015 . . . {Coplanar line transitions to Slotline or finline}
- 5/1022 . . . {Transitions to dielectric waveguide}
- 5/103 . . . Hollow-waveguide/coaxial-line transitions
- 5/107 . . . Hollow-waveguide/strip-line transitions
- 5/12 . Coupling devices having more than two ports ([H01P 5/04](#) takes precedence)
- 5/16 . . Conjugate devices, i.e. devices having at least one port decoupled from one other port
- 5/18 . . . consisting of two coupled guides, e.g. directional couplers
- 5/181 . . . . {the guides being hollow waveguides}
- 5/182 . . . . . {the waveguides being arranged in parallel}
- 5/183 . . . . {at least one of the guides being a coaxial line}
- 5/184 . . . . {the guides being strip lines or microstrips}
- 5/185 . . . . . {Edge coupled lines}
- 5/186 . . . . . {Lange couplers}
- 5/187 . . . . . {Broadside coupled lines}
- 5/188 . . . . {the guides being dielectric waveguides}
- 5/19 . . . of the junction type
- 5/20 . . . . Magic-T junctions
- 5/22 . . . . Hybrid ring junctions
- 5/222 . . . . . {180° rat race hybrid rings}
- 5/225 . . . . . {180° reversed phase hybrid rings}
- 5/227 . . . . . {90° branch line couplers}

**7/00**

**Resonators of the waveguide type** ({variable impedance transformers [H01P 5/04](#)}; structurally associated with transit-time tubes and interacting with the discharge therein [H01J 23/18](#); {generators of electronic oscillations using resonators of this type [H03B 5/18](#), [H03B 7/14](#), [H03B 9/14](#); electronic amplifiers using resonators of this type [H03F 3/54](#)}; microwave heating devices [H05B 6/64](#))

- 7/005 . . {Helical resonators; Spiral resonators}
- 7/02 . Lecher resonators
- 7/04 . Coaxial resonators
- 7/06 . Cavity resonators
- 7/065 . . {integrated in a substrate}
- 7/08 . Strip line resonators
- 7/082 . . {Microstripline resonators ([H01P 7/088](#) takes precedence)}
- 7/084 . . {Triplate line resonators ([H01P 7/088](#) takes precedence)}
- 7/086 . . {Coplanar waveguide resonators ([H01P 7/088](#) takes precedence)}
- 7/088 . . {Tunable resonators}
- 7/10 . Dielectric resonators
- 7/105 . . {Multimode resonators}

**9/00**

**Delay lines of the waveguide type** (structurally associated with transit-time tubes and interacting with the discharge therein [H01J 23/24](#))

- 9/003 . . {Delay equalizers}
- 9/006 . . {Meander lines}
- 9/02 . Helical lines
- 9/04 . Interdigital lines

- 11/00 Apparatus or processes specially adapted for manufacturing waveguides or resonators, lines, or other devices of the waveguide type (manufacture of coaxial cables [H01B 13/00](#))**
- 11/001 . {Manufacturing waveguides or transmission lines of the waveguide type}
  - 11/002 . . {Manufacturing hollow waveguides}
  - 11/003 . . {Manufacturing lines with conductors on a substrate, e.g. strip lines, slot lines}
  - 11/005 . . {Manufacturing coaxial lines}
  - 11/006 . . {Manufacturing dielectric waveguides}
  - 11/007 . {Manufacturing frequency-selective devices ([resonators H01P 11/008](#))}
  - 11/008 . {Manufacturing resonators}