

CPC COOPERATIVE PATENT CLASSIFICATION

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

LIGHTING; HEATING

F21 LIGHTING (electric aspects or elements, [see section H](#), e.g. electric light sources [H01J](#), [H01K](#), [H05B](#))
(NOTE omitted)

F21S NON-PORTABLE LIGHTING DEVICES; SYSTEMS THEREOF; VEHICLE LIGHTING DEVICES SPECIALLY ADAPTED FOR VEHICLE EXTERIORS

NOTES

- This subclass covers:
 - devices or systems intended for fixed installation or for use at a permanent location, e.g. free-standing floor- or table-lamps.
 - aspects related to the optical, mechanical, thermal or electrical arrangement of elements in vehicle illuminating devices specially adapted for vehicle exterior, e.g. headlamps.
 - aspects related to the optical, mechanical, thermal or electrical arrangement of elements in vehicle light signalling devices specially adapted for vehicle exterior, e.g. brake lamps or direction indicator lights.
- This subclass does not cover:
 - devices or systems specially adapted for transportation, which are covered by subclass [F21L](#).
 - aspects related to the vehicles in which lighting devices are arranged, e.g. the arrangement or operation of lighting devices on vehicles, which are covered by [B60Q](#).
 - control of vehicle lighting devices in relation to the vehicle as a whole, e.g. for levelling, swivelling or aiming. Such arrangements are covered by group [B60Q 1/06](#), even if the movement of the lighting device occurs inside the lamp housing.
- Non-electric lighting devices or systems are classified in groups [F21S 11/00](#) - [F21S 15/00](#) only if a special adaptation related to the use of a non-electric light source is of interest.
- In this subclass, it is desirable to add the indexing codes of subclasses [F21W](#) and [F21Y](#).

Electric lighting

		4/26	. . . of rope form, e.g. LED lighting ropes, or of tubular form
2/00	Systems of lighting devices, not provided for in main groups F21S 4/00 - F21S 10/00 or F21S 19/00, e.g. of modular construction	4/28	. . rigid, e.g. LED bars
	<u>WARNING</u>	6/00	Lighting devices intended to be free-standing (F21S 9/00 , F21S 10/00 , { F21S 13/12 } take precedence {lighting devices specially adapted to be transported from place to place, e.g. lighting devices carried on wheeled supports F21L ; details of supports for lighting devices F21V 21/00 })
	Group F21S 2/00 is impacted by reclassification into groups F21K 9/00 , F21K 9/20 , F21K 9/23 , F21K 9/232 , F21K 9/233 , F21K 9/235 , F21K 9/237 , F21K 9/238 , F21K 9/27 , F21K 9/272 , F21K 9/275 , F21K 9/278 , F21K 9/60 , F21K 9/61 , F21K 9/62 , F21K 9/64 , F21K 9/65 , F21K 9/66 , F21K 9/68 , F21K 9/69 and F21K 9/90 .	6/001	. {being candle-shaped (with varying lighting effect of simulating flames F21S 10/04 ; string of light sources F21S 4/00)}
	All groups listed in this Warning should be considered in order to perform a complete search.	6/002	. {Table lamps, e.g. for ambient lighting}
		6/003	. . {for task lighting, e.g. for reading or desk work, e.g. angle poise lamps}
2/005	. {of modular construction}	6/004	. {with a lamp housing in direct contact with the floor or ground}
4/00	Lighting devices or systems using a string or strip of light sources	6/005	. {with a lamp housing maintained at a distance from the floor or ground via a support, e.g. standing lamp for ambient lighting}
4/10	. with light sources attached to loose electric cables, e.g. Christmas tree lights	6/006	. . {for direct lighting only, e.g. task lighting}
4/15	. . the cables forming a grid, net or web structure	6/007	. . {for indirect lighting only, e.g. torchiere with reflector bowl directed towards ceiling}
4/20	. with light sources held by or within elongate supports	6/008	. . {with a combination of direct and indirect lighting}
4/22	. . flexible or deformable, e.g. into a curved shape		
4/24	. . . of ribbon or tape form, e.g. LED tapes		

- 8/00 Lighting devices intended for fixed installation** ([F21S 9/00](#), [F21S 10/00](#) take precedence; using a string or strip of light sources [F21S 4/00](#))
- 8/003 . {Searchlights, i.e. outdoor lighting device producing powerful beam of parallel rays, e.g. for military or attraction purposes ([searchlights mounted on a vehicle B60Q 1/24](#))}
- 8/006 . {Solar simulators, e.g. for testing photovoltaic panels}
- 8/02 . of recess-mounted type, e.g. downlighters ([specially adapted for vehicle exteriors F21S 41/00-F21S 45/00](#))
- 8/022 . . {intended to be recessed in a floor or like ground surface, e.g. pavement or false floor}
- 8/024 . . {intended to be recessed in a wall or like vertical structure, e.g. building facade}
- 8/026 . . {intended to be recessed in a ceiling or like overhead structure, e.g. suspended ceiling}
- 8/028 . . {being retractable, i.e. having two fixed positions, one recessed, e.g. in a wall, floor or ceiling, and one extended when in use}
- 8/03 . {of surface-mounted type ([F21S 8/02](#), [F21S 8/04](#) take precedence; details of wall or floor bases [F21V 21/02](#))}
- 8/031 . . {the device consisting essentially only of a light source holder with an exposed light source, e.g. a fluorescent tube}
- 8/032 . . {the surface being a floor or like ground surface, e.g. pavement}
- 8/033 . . {the surface being a wall or like vertical structure, e.g. building facade}
- 8/035 . . . {by means of plugging into a wall outlet, e.g. night light}
- 8/036 . . . {by means of a rigid support, e.g. bracket or arm}
- 8/037 . . . {for mounting in a corner, i.e. between adjacent walls or wall and ceiling}
- 8/038 . . {intended to be mounted on a light track ([suspended from a light track F21S 8/066](#); details of supporting elements displaceable along a guiding element [F21V 21/34](#))}
- 8/04 . intended only for mounting on a ceiling or the like overhead structures ([F21S 8/02](#) takes precedence; details of ceiling bases [F21V 21/03](#))}
- 8/043 . . {mounted by means of a rigid support, e.g. bracket or arm}
- 8/046 . . {having multiple lighting devices, e.g. connected to a common ceiling base}
- 8/06 . . by suspension
- 8/061 . . . {with a non-rigid pendant, i.e. a cable, wire or chain}
- 8/063 . . . {with a rigid pendant, i.e. a pipe or rod}
- 8/065 . . . {multi-branched, e.g. a chandelier}
- 8/066 . . . {from a light track ([details of supporting elements displaceable along a guiding element F21V 21/34](#))}
- 8/068 . . . {from a stretched wire}
- 8/08 . with a standard ([F21S 6/00](#) takes precedence)}
- 8/081 . . {of low-built type, e.g. landscape light}
- 8/083 . . . {of bollard type, i.e. with lighting fixture integrated into the standard or mounted on top of it and having substantially the same diameter}
- 8/085 . . {of high-built type, e.g. street light}
- 8/086 . . . {with lighting device attached sideways of the standard, e.g. for roads and highways}
- 8/088 . . . {with lighting device mounted on top of the standard, e.g. for pedestrian zones}
- 9/00 Lighting devices with a built-in power supply; Systems employing lighting devices with a built-in power supply**
- 9/02 . the power supply being a battery or accumulator
- 9/022 . . {Emergency lighting devices}
- 9/024 . . . {using a supplementary light source for emergency lighting}
- 9/026 . . {rechargeable by using wind power, e.g. using wind turbines}
- 9/028 . . {rechargeable by using hydropower, e.g. using water powered turbines}
- 9/03 . . rechargeable by exposure to light
- 9/032 . . . {the solar unit being separate from the lighting unit}
- 9/035 . . . {the solar unit being integrated within the support for the lighting unit, e.g. within or on a pole}
- 9/037 . . . {the solar unit and the lighting unit being located within or on the same housing}
- 9/04 . the power supply being a generator
- 9/043 . . {driven by wind power, e.g. by wind turbines}
- 9/046 . . {driven by hydropower, e.g. by water powered turbines}
- 10/00 Lighting devices or systems producing a varying lighting effect**
- 10/002 . {using liquids, e.g. water ([F21W 2121/02](#) takes precedence)}
- 10/005 . {using light guides ([light guides specially adapted for lighting devices G02B 6/0001](#))}
- 10/007 . {using rotating transparent or colored disks, e.g. gobo wheels}
- 10/02 . changing colors ([F21S 10/002 - F21S 10/007](#), [F21S 10/04](#) take precedence)}
- 10/023 . . {by selectively switching fixed light sources}
- 10/026 . . {by movement of parts, e.g. by movement of reflectors or light sources ([F21S 10/007](#) takes precedence)}
- 10/04 . simulating flames
- 10/043 . . {by selectively switching fixed light sources}
- 10/046 . . {by movement of parts, e.g. by movement of reflectors or light sources}
- 10/06 . flashing, e.g. with rotating reflector or light source ([signalling lighting devices mounted on vehicles B60Q 1/26](#))}
- 10/063 . . {for providing a rotating light effect}
- 10/066 . . . {by selectively switching fixed light sources}
- Non-electric lighting**
- 11/00 Non-electric lighting devices or systems using daylight** ([roofs with sky-light opening E04D 13/03](#); [sun blinds for windows with means for redirecting light onto ceiling of a room E06B 9/00](#); [hybrid lighting devices combining artificial and natural light F21S 19/00](#); [solar heat collectors F24S](#); [solar cells or solar cell modules H01L 31/00](#))
- 11/002 . {characterised by the means for collecting or concentrating the sunlight, e.g. parabolic reflectors or Fresnel lenses}

<p>11/005 . . {with tracking means for following the position of the sun}</p> <p>11/007 . {characterised by the means for transmitting light into the interior of a building}</p> <p>13/00 Non-electric lighting devices or systems employing a point-like light source; Non-electric lighting devices or systems employing a light source of unspecified shape</p> <p>13/02 . Devices intended to be fixed, e.g. ceiling lamp, wall lamp</p> <p>13/04 . . with a pendant</p> <p>13/06 . . . multi-branched, e.g. chandelier</p> <p>13/08 . . with suspension from a stretched wire</p> <p>13/10 . . with a standard, e.g. street lamp</p> <p>13/12 . Devices intended to be free-standing, e.g. table lamp, floor lamp</p> <p>13/14 . Lighting systems</p> <p>15/00 Non-electric lighting devices or systems employing light sources not covered by main groups F21S 11/00, F21S 13/00 or F21S 19/00</p> <hr/> <p>2017/00 Details solely applicable to the devices covered by groups F21S 13/00 and F21S 15/00</p> <p>2017/02 . Fastening and lifting of the lamp-glass</p> <p>19/00 Lighting devices or systems employing combinations of electric and non-electric light sources; Replacing or exchanging electric light sources with non-electric light sources or vice versa</p> <p>19/005 . {Combining sunlight and electric light sources for indoor illumination}</p>	<p>41/141 . . . Light emitting diodes [LED]</p> <p>WARNING</p> <p>Group F21S 41/141 is impacted by reclassification into groups F21S 41/151 and F21S 41/153.</p> <p>Groups F21S 41/141, F21S 41/151 and F21S 41/153 should be considered in order to perform a complete search.</p> <p>41/143 the main emission direction of the LED being parallel to the optical axis of the illuminating device</p> <p>WARNING</p> <p>Group F21S 41/143 is impacted by reclassification into groups F21S 41/145, F21S 41/151 and F21S 41/153.</p> <p>All groups listed in this Warning should be considered in order to perform a complete search.</p> <p>41/145 the main emission direction of the LED being opposite to the main emission direction of the illuminating device</p> <p>WARNING</p> <p>Group F21S 41/145 is incomplete pending reclassification of documents from group F21S 41/143.</p> <p>Groups F21S 41/143 and F21S 41/145 should be considered in order to perform a complete search.</p> <p>41/147 the main emission direction of the LED being angled to the optical axis of the illuminating device</p> <p>WARNING</p> <p>Group F21S 41/147 is impacted by reclassification into groups F21S 41/148, F21S 41/151 and F21S 41/153.</p> <p>All groups listed in this Warning should be considered in order to perform a complete search.</p> <p>41/148 the main emission direction of the LED being perpendicular to the optical axis</p> <p>WARNING</p> <p>Group F21S 41/148 is incomplete pending reclassification of documents from group F21S 41/147.</p> <p>Groups F21S 41/147 and F21S 41/148 should be considered in order to perform a complete search.</p> <p>41/151 arranged in one or more lines</p> <p>WARNING</p> <p>Group F21S 41/151 is incomplete pending reclassification of documents from groups F21S 41/141, F21S 41/143 and F21S 41/147.</p> <p>All groups should be considered in order to perform a complete search.</p>
<p>Vehicle lighting devices specially adapted for vehicle exteriors</p> <p>41/00 Illuminating devices specially adapted for vehicle exteriors, e.g. headlamps (reversing lights F21S 43/00)</p> <p>WARNING</p> <p>Group F21S 41/00 is incomplete pending reclassification of documents from group F21S 43/00.</p> <p>Groups F21S 43/00 and F21S 41/00 should be considered in order to perform a complete search.</p> <p>41/10 . characterised by the light source</p> <p>41/12 . . characterised by the type of emitted light</p> <p>41/125 . . . Coloured light</p> <p>41/13 . . . Ultraviolet light; Infrared light</p> <p>41/135 . . . Polarised</p> <p>41/14 . . characterised by the type of light source</p> <p>WARNING</p> <p>Group F21S 41/14 is impacted by reclassification into groups F21S 41/16 and F21S 41/176.</p> <p>Groups F21S 41/14, F21S 41/16 and F21S 41/176 should be considered in order to perform a complete search.</p>	

- 41/153 arranged in a matrix
 - WARNING**
 - Group [F21S 41/153](#) is incomplete pending reclassification of documents from groups [F21S 41/141](#), [F21S 41/143](#) and [F21S 41/147](#).
 - All groups listed in this Warning should be considered in order to perform a complete search.
- 41/155 Surface emitters, e.g. organic light emitting diodes [OLED]
- 41/16 Laser light sources
 - WARNING**
 - Group [F21S 41/16](#) is incomplete pending reclassification of documents from group [F21S 41/14](#).
 - Groups [F21S 41/14](#) and [F21S 41/16](#) should be considered in order to perform a complete search.
- 41/162 Incandescent light sources, e.g. filament or halogen lamps
- 41/164 having two or more filaments
- 41/166 characterised by the shape of the filament
- 41/168 having a filament arranged transversally to the optical axis of the illuminating device
- 41/17 Discharge light sources
 - WARNING**
 - Group [F21S 41/17](#) is impacted by reclassification into group [F21S 41/172](#).
 - Groups [F21S 41/17](#) and [F21S 41/172](#) should be considered in order to perform a complete search.
- 41/172 High-intensity discharge light sources
 - WARNING**
 - Group [F21S 41/172](#) is incomplete pending reclassification of documents from group [F21S 41/17](#).
 - Groups [F21S 41/17](#) and [F21S 41/172](#) should be considered in order to perform a complete search.
- 41/173 Fluorescent light sources
- 41/176 Light sources where the light is generated by photoluminescent material spaced from a primary light generating element
 - WARNING**
 - Group [F21S 41/176](#) is incomplete pending reclassification of documents from group [F21S 41/14](#).
 - Groups [F21S 41/14](#) and [F21S 41/176](#) should be considered in order to perform a complete search.
- 41/18 {Combination of light sources of different types or shapes}
- 41/19 Attachment of light sources or lamp holders (achieving variable light distribution by movable light sources [F21S 41/657](#))
- 41/192 {Details of lamp holders, terminals or connectors}
- 41/194 {Bayonet attachments}
- 41/196 {Wire spring attachments}
- 41/198 {Snap-fit attachments}
- 41/20 characterised by refractors, transparent cover plates, light guides or filters
- 41/24 Light guides
- 41/25 Projection lenses
- 41/255 Lenses with a front view of circular or truncated circular outline
- 41/26 Elongated lenses
- 41/265 Composite lenses; Lenses with a patch-like shape
- 41/27 Thick lenses
- 41/275 Lens surfaces, e.g. coatings or surface structures
- 41/28 {Cover glass}
- 41/285 {Refractors, transparent cover plates, light guides or filters not provided in groups [F21S 41/24-F21S 41/28](#)}
- 41/29 Attachment thereof (for achieving variable light distribution [F21S 41/63](#))
- 41/295 {specially adapted to projection lenses}
- 41/30 characterised by reflectors
- 41/32 Optical layout thereof
 - WARNING**
 - Group [F21S 41/32](#) is impacted by reclassification into group [F21S 41/33](#). Groups [F21S 41/32](#) and [F21S 41/33](#).
 - Groups [F21S 41/32](#) and [F21S 41/33](#) should be considered in order to perform a complete search.
- 41/321 {the reflector being a surface of revolution or a planar surface, e.g. truncated}
- 41/322 {the reflector using total internal reflection}
- 41/323 {the reflector having two perpendicular cross sections having regular geometrical curves of a distinct nature}
- 41/33 Multi-surface reflectors, e.g. reflectors with facets or reflectors with portions of different curvature
 - WARNING**
 - Group [F21S 41/33](#) is incomplete pending reclassification of documents from group [F21S 41/32](#).
 - Groups [F21S 41/32](#) and [F21S 41/33](#) should be considered in order to perform a complete search.
- 41/331 {the reflector consisting of complete annular areas}
- 41/332 {with continuity at the junction between adjacent areas}
- 41/333 {with discontinuity at the junction between adjacent areas}
- 41/334 {the reflector consisting of patch like sectors}
- 41/335 {with continuity at the junction between adjacent areas}
- 41/336 {with discontinuity at the junction between adjacent areas}

- 41/337 {the reflector having a structured surface, e.g. with facets or corrugations}
- 41/338 {the reflector having surface portions added to its general concavity}
- 41/36 . . . Combinations of two or more separate reflectors
- WARNING**
- Group [F21S 41/36](#) is impacted by reclassification into group [F21S 41/365](#).
- Groups [F21S 41/36](#) and [F21S 41/365](#) should be considered in order to perform a complete search.
- 41/365 successively reflecting the light
- WARNING**
- Group [F21S 41/365](#) is incomplete pending reclassification of documents from group [F21S 41/36](#).
- Groups [F21S 41/36](#) and [F21S 41/365](#) should be considered in order to perform a complete search.
- 41/37 . . characterised by their material, surface treatment or coatings
- 41/39 . . Attachment thereof (achieving variable light distribution by movable reflectors [F21S 41/675](#))
- 41/395 . . . {specially adapted to extension reflectors}
- 41/40 . . characterised by screens, non-reflecting members, light-shielding members or fixed shades
- 41/43 . . characterised by the shape thereof
- 41/435 . . . {Hoods or cap-shaped}
- 41/47 . . Attachment thereof (achieving variable light distribution by movable screens [F21S 41/683](#))
- 41/50 . . characterised by aesthetic components not otherwise provided for, e.g. decorative trim, partition walls or covers
- 41/55 . . Attachment thereof
- 41/60 . . characterised by a variable light distribution
- 41/62 . . for adaptation between right-hand and left-hand traffic
- 41/63 . . by acting on refractors, filters or transparent cover plates
- 41/635 . . . {by moving refractors, filters or transparent cover plates}
- 41/64 . . . by changing their light transmissivity, e.g. by liquid crystal or electrochromic devices
- 41/645 {by electro-optic means, e.g. liquid crystal or electrochromic devices}
- 41/65 . . by acting on light sources
- 41/657 . . . by moving light sources
- 41/663 . . . by switching light sources (by switching incandescent light sources [F21S 41/162](#))
- 41/67 . . by acting on reflectors
- 41/675 . . . by moving reflectors
- 41/68 . . by acting on screens
- 41/683 . . . by moving screens
- 41/686 Blades, i.e. screens moving in a vertical plane
- 41/689 Flaps, i.e. screens pivoting around one of their edges
- 41/692 Shields, i.e. screens not creating an image meant to be projected
- 41/695 Screens rotating around a vertical axis (rotating flaps [F21S 41/689](#))
- 41/698 Shaft-shaped screens rotating along its longitudinal axis
- 43/00 Signalling devices specially adapted for vehicle exteriors, e.g. brake lamps, direction indicator lights or reversing lights**
- WARNING**
- Group [F21S 43/00](#) is impacted by reclassification into groups [F21S 41/00](#) and [F21W 2104/00](#).
- Groups [F21S 43/00](#), [F21S 41/00](#) and [F21W 2104/00](#) should be considered in order to perform a complete search.
- 43/10 . . characterised by the light source
- 43/13 . . characterised by the type of light source
- WARNING**
- Group [F21S 43/13](#) is impacted by reclassification into group [F21S 43/16](#).
- Groups [F21S 43/13](#) and [F21S 43/16](#) should be considered in order to perform a complete search.
- 43/14 . . . Light emitting diodes [LED]
- 43/145 Surface emitters, e.g. organic light emitting diodes [OLED]
- 43/15 . . . Strips of light sources
- 43/16 . . . Light sources where the light is generated by photoluminescent material spaced from a primary light generating element
- WARNING**
- Group [F21S 43/16](#) is incomplete pending reclassification of documents from group [F21S 43/13](#).
- Groups [F21S 43/13](#) and [F21S 43/16](#) should be considered in order to perform a complete search.
- 43/19 . . Attachment of light sources or lamp holders
- 43/195 . . . {Details of lamp holders, terminals or connectors}
- 43/20 . . characterised by refractors, transparent cover plates, light guides or filters
- 43/235 . . Light guides
- 43/236 . . . characterised by the shape of the light guide
- 43/237 rod-shaped
- 43/239 plate-shaped
- 43/241 of complex shape
- 43/242 . . . characterised by the emission area
- 43/243 emitting light from one or more of its extremities
- 43/245 emitting light from one or more of its major surfaces
- 43/247 . . . with a single light source being coupled into the light guide
- 43/249 . . . with two or more light sources being coupled into the light guide
- 43/251 . . . the light guides being used to transmit light from remote light sources
- 43/255 . . {Filters}

- 43/26 . . {Refractors, transparent cover plates, light guides or filters not provided in groups [F21S 43/235](#) - [F21S 43/255](#)}
- 43/27 . . Attachment thereof
- 43/30 . characterised by reflectors
- 43/31 . . Optical layout thereof
- 43/315 . . . {using total internal reflection}
- 43/33 . . characterised by their material, surface treatment or coatings
- 43/37 . . Attachment thereof
- 43/40 . characterised by the combination of reflectors and refractors
- 43/50 . characterised by aesthetic components not otherwise provided for, e.g. decorative trim, partition walls or covers
- 43/51 . . {Attachment thereof}
- 45/00 Arrangements within vehicle lighting devices specially adapted for vehicle exteriors, for purposes other than emission or distribution of light**
- WARNING**
- Group [F21S 45/00](#) is impacted by reclassification into groups [F21S 45/20](#), [F21S 45/70](#) and [F21W 2104/00](#).
- All groups should be considered in order to perform a complete search.
- 45/10 . Protection of lighting devices ([cooling of lighting devices F21S 45/40](#); [waterproofing of lighting devices F21S 45/50](#))
- 45/20 . Promoting gas flow in lighting devices, e.g. directing flow toward the cover glass for demisting ([ventilation F21S 45/30](#); [forced cooling F21S 45/42](#))
- WARNING**
- Group [F21S 45/20](#) is incomplete pending reclassification of documents from group [F21S 45/00](#).
- Groups [F21S 45/00](#) and [F21S 45/20](#) should be considered in order to perform a complete search.
- 45/30 . Ventilation or drainage of lighting devices
- 45/33 . . specially adapted for headlamps
- 45/37 . . specially adapted for signal lamps
- 45/40 . Cooling of lighting devices
- 45/42 . . Forced cooling
- 45/43 . . . using gas
- WARNING**
- Group [F21S 45/43](#) is impacted by reclassification into group [F21S 45/435](#).
- Groups [F21S 45/43](#) and [F21S 45/435](#) should be considered in order to perform a complete search.
- 45/435 circulating the gas within a closed system
- WARNING**
- Group [F21S 45/435](#) is incomplete pending reclassification of documents from group [F21S 45/43](#).
- Groups [F21S 45/43](#) and [F21S 45/435](#) should be considered in order to perform a complete search.
- 45/46 . . . using liquid
- WARNING**
- Group [F21S 45/46](#) is impacted by reclassification into group [F21S 45/465](#).
- Groups [F21S 45/46](#) and [F21S 45/465](#) should be considered in order to perform a complete search.
- 45/465 from other vehicle cooling systems, e.g. from air-conditioning or engine cooling systems
- WARNING**
- Group [F21S 45/465](#) is incomplete pending reclassification of documents from group [F21S 45/46](#).
- Groups [F21S 45/46](#) and [F21S 45/465](#) should be considered in order to perform a complete search.
- 45/47 . . Passive cooling, e.g. using fins, thermal conductive elements or openings
- WARNING**
- Group [F21S 45/47](#) is impacted by reclassification into group [F21S 45/48](#).
- Groups [F21S 45/47](#) and [F21S 45/48](#) should be considered in order to perform a complete search.
- 45/48 . . . with means for conducting heat from the inside to the outside of the lighting devices, e.g. with fins on the outer surface of the lighting device
- WARNING**
- Group [F21S 45/48](#) is incomplete pending reclassification of documents from group [F21S 45/47](#).
- Groups [F21S 45/47](#) and [F21S 45/48](#) should be considered in order to perform a complete search.
- 45/49 . . Attachment of the cooling means
- 45/50 . Waterproofing
- 45/60 . Heating of lighting devices, e.g. for demisting
- 45/70 . Prevention of harmful light leakage
- WARNING**
- Group [F21S 45/70](#) is incomplete pending reclassification of documents from group [F21S 45/00](#).
- Groups [F21S 45/00](#) and [F21S 45/70](#) should be considered in order to perform a complete search.