

CPC COOPERATIVE PATENT CLASSIFICATION

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

LIGHTING; HEATING

F21 LIGHTING (NOTE omitted)

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

NOTES

1. 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.
2. 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.
3. 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.
4. In this subclass, it is desirable to add the indexing codes of subclasses [F21W](#) and [F21Y](#).

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.

Electric lighting

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

WARNING

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](#).

All groups listed in this Warning should be considered in order to perform a complete search.

2/005 . {of modular construction}

4/00 Lighting devices or systems using a string or strip of light sources

4/10 . with light sources attached to loose electric cables, e.g. Christmas tree lights

4/15 . . the cables forming a grid, net or web structure

4/20 . with light sources held by or within elongate supports

4/22 . . flexible or deformable, e.g. into a curved shape

4/24 . . . of ribbon or tape form, e.g. LED tapes

4/26 . . . of rope form, e.g. LED lighting ropes, or of tubular form

4/28 . . rigid, e.g. LED bars

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](#)})

6/001 . {being candle-shaped (with varying lighting effect of simulating flames [F21S 10/04](#); string of light sources [F21S 4/00](#))}

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}

6/004 . {with a lamp housing in direct contact with the floor or ground}

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}

6/006 . . {for direct lighting only, e.g. task lighting}

- 6/007 . . {for indirect lighting only, e.g. torchiere with reflector bowl directed towards ceiling}
- 6/008 . . {with a combination of direct and indirect lighting}
- 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}
- 11/005 . . {with tracking means for following the position of the sun}
- 11/007 . {characterised by the means for transmitting light into the interior of a building}
- 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
- 13/02 . Devices intended to be fixed, e.g. ceiling lamp, wall lamp
- 13/04 . . with a pendant
- 13/06 . . . multi-branched, e.g. chandelier
- 13/08 . . with suspension from a stretched wire
- 13/10 . . with a standard, e.g. street lamp
- 13/12 . Devices intended to be free-standing, e.g. table lamp, floor lamp
- 13/14 . Lighting systems
- 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](#)

2017/00 Details solely applicable to the devices covered by groups [F21S 13/00](#) and [F21S 15/00](#)

- 2017/02 . Fastening and lifting of the lamp-glass

- 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
- 19/005 . {Combining sunlight and electric light sources for indoor illumination}

Vehicle lighting devices specially adapted for vehicle exteriors

- 41/00** Illuminating devices specially adapted for vehicle exteriors, e.g. headlamps ([reversing lights F21S 43/00](#))

WARNING

Group [F21S 41/00](#) is incomplete pending reclassification of documents from group [F21S 43/00](#).

Groups [F21S 43/00](#) and [F21S 41/00](#) should be considered in order to perform a complete search.

- 41/10 . characterised by the light source
- 41/12 . . characterised by the type of emitted light
- 41/125 . . . Coloured light
- 41/13 . . . Ultraviolet light; Infrared light
- 41/135 . . . Polarised

- 41/14 . . characterised by the type of light source

WARNING

Group [F21S 41/14](#) is impacted by reclassification into groups [F21S 41/16](#) and [F21S 41/176](#).

Groups [F21S 41/14](#), [F21S 41/16](#) and [F21S 41/176](#) should be considered in order to perform a complete search.

- 41/141 . . . Light emitting diodes [LED]

WARNING

Group [F21S 41/141](#) is impacted by reclassification into groups [F21S 41/151](#) and [F21S 41/153](#).

Groups [F21S 41/141](#), [F21S 41/151](#) and [F21S 41/153](#) should be considered in order to perform a complete search.

- 41/143 the main emission direction of the LED being parallel to the optical axis of the illuminating device

WARNING

Group [F21S 41/143](#) is impacted by reclassification into groups [F21S 41/145](#), [F21S 41/151](#) and [F21S 41/153](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 41/145 the main emission direction of the LED being opposite to the main emission direction of the illuminating device

WARNING

Group [F21S 41/145](#) is incomplete pending reclassification of documents from group [F21S 41/143](#).

Groups [F21S 41/143](#) and [F21S 41/145](#) should be considered in order to perform a complete search.

- 41/147 the main emission direction of the LED being angled to the optical axis of the illuminating device

WARNING

Group [F21S 41/147](#) is impacted by reclassification into groups [F21S 41/148](#), [F21S 41/151](#) and [F21S 41/153](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 41/148 the main emission direction of the LED being perpendicular to the optical axis

WARNING

Group [F21S 41/148](#) is incomplete pending reclassification of documents from group [F21S 41/147](#).

Groups [F21S 41/147](#) and [F21S 41/148](#) should be considered in order to perform a complete search.

41/151 arranged in one or more lines

WARNING

Group [F21S 41/151](#) is incomplete pending reclassification of documents from groups [F21S 41/141](#), [F21S 41/143](#) and [F21S 41/147](#).

All groups should be considered in order to perform a complete search.

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.