

**CPC****COOPERATIVE PATENT CLASSIFICATION****F21V****DETAILS OF LIGHTING DEVICES, OF GENERAL APPLICATION****NOTES**

1. Groups [F21V 1/00-F21V 14/00](#) cover aspects related to light emission or distribution. Groups [F21V 15/00-F21V 31/00](#) cover aspects not related to light emission or distribution.
2. Details of non-electric lighting devices or systems are classified in groups [F21V 35/00-F21V 37/00](#) only if a special adaptation related to the use of a non-electric light source is of interest.
3. In this subclass, it is desirable to add the indexing codes of subclasses [F21W](#) and [F21Y](#)

**WARNING**

The following IPC groups are not used in the CPC system. Subject matter covered by these groups is classified in the following CPC groups:

[F21V 8/00](#) covered by [G02B 6/00](#)

**{Aspects related to light emission or distribution}****F21V 1/00****Shades for light sources {i.e. lampshades for table, floor, wall or ceiling lamps}**

- F21V 1/02 . Frames
- F21V 1/04 . . rigid ([F21V 1/08](#) takes precedence)
- F21V 1/06 . . foldable or collapsible
- F21V 1/08 . . adjustable
- F21V 1/10 . Rotating shades
- F21V 1/12 . Composite shades {i.e. shades being made of distinct parts}
- F21V 1/14 . Covers for frames; Frameless shades
- F21V 1/143 . . {The cover being attached to a supporting lampshade frame}
- F21V 1/146 . . {Frameless shades}
- F21V 1/16 . . characterised by the material
- F21V 1/18 . . . the material being paper
- F21V 1/20 . . . the material being glass
- F21V 1/22 . . . the material being plastics
- F21V 1/24 . . . the material being metal
- F21V 1/26 . Manufacturing shades

**F21V 3/00**

**Globes; Bowls; Cover glasses** (with refracting properties [F21V 5/00](#); with reflecting properties [F21V 7/00](#); characterised by cooling arrangements [F21V 29/506](#))

- F21V 3/02 . characterised by the shape
- F21V 3/023 . . {Chinese lanterns; Balloons}
- F21V 3/026 . . . {being inflatable}
- F21V 3/04 . characterised by the material; characterised by surface treatments or coatings
- F21V 3/0409 . . {characterised by the material}
- F21V 3/0418 . . . {the material being glass}
- F21V 3/0427 . . . . {the material diffusing light, e.g. translucent glass}
- F21V 3/0436 . . . {the material being plastics}
- F21V 3/0445 . . . . {the material diffusing light, e.g. translucent plastics}
- F21V 3/0454 . . . {comprising air or water bubbles, e.g. foamed materials}
- F21V 3/0463 . . . {comprising fluorescent or light-storing materials}
- F21V 3/0472 . . {Coatings}
- F21V 3/0481 . . . {provided with fluorescent or light-storing materials}
- F21V 3/049 . . {Patterns or structured surfaces for diffusing light, e.g. frosted surfaces}

**F21V 5/00****Refractors for light sources** (characterised by cooling arrangements  
[F21V 29/504](#))

- F21V 5/002 . {using micro-optical elements for redirecting or diffusing light}
- F21V 5/003 . . {using holograms}
- F21V 5/004 . . {using micro-lenses}
- F21V 5/005 . . {using micro-prisms}
- F21V 5/006 . {applied to portable lighting devices}
- F21V 5/007 . {Array of lenses or refractors for a cluster of light sources, e.g. for arrangement of multiple light sources in one plane ([combination of two or more refractors F21V 5/008](#))}
- F21V 5/008 . {Combination of two or more successive refractors along an optical axis}
- F21V 5/02 . of prismatic shape ([F21V 5/04 takes precedence](#))
- F21V 5/04 . of lens shape
- F21V 5/041 . . {Ball lenses}
- F21V 5/043 . . {the lens having cylindrical faces, e.g. rod lenses, toric lenses}
- F21V 5/045 . . {the lens having discontinuous faces, e.g. Fresnel lenses}
- F21V 5/046 . . {the lens having a rotationally symmetrical shape about an axis for transmitting light in a direction mainly perpendicular to this axis, e.g. ring or annular lens with light source disposed inside the ring}
- F21V 5/048 . . {the lens being a simple lens adapted to cooperate with a point-like source for emitting mainly in one direction and having an axis coincident with the main light transmission direction, e.g. convergent or divergent lenses, plano-concave or plano-convex lenses}
- F21V 5/06 . Hanging lustres for chandeliers
- F21V 5/08 . producing an asymmetric light distribution

**F21V 7/00****Reflectors for light sources** (characterised by cooling arrangements  
[F21V 29/505](#))

- F21V 7/0008 . {providing for indirect lighting}
- F21V 7/0016 . . {on lighting devices that also provide for direct lighting, e.g. by means of independent light sources, by splitting of the light beam, by switching between both lighting modes}
- F21V 7/0025 . {Combination of two or more reflectors for a single light source (array of reflectors for a cluster of light sources [F21V 7/0083](#))}
- F21V 7/0033 . . {with successive reflections from one reflector to the next or following}
- F21V 7/0041 . . . {for avoiding direct view of the light source or to prevent dazzling}
- F21V 7/005 . {with an elongated shape to cooperate with linear light sources}
- F21V 7/0058 . {adapted to cooperate with light sources of shapes different from point-like or linear, e.g. circular light sources}
- F21V 7/0066 . {specially adapted to co operate with point like light sources; specially adapted to co operate with light sources the shape of which is unspecified ([F21V 7/16](#) to [F21V 7/22](#) take precedence)}
- F21V 7/0075 . {for portable lighting devices}
- F21V 7/0083 . {Array of reflectors for a cluster of light sources, e.g. arrangement of multiple light sources in one plane (combination of two or more reflectors [F21V 7/0025](#))}
- F21V 7/0091 . {using total internal reflection}
- F21V 7/04 . Optical design ([F21V 7/22](#) takes precedence)
- F21V 7/041 . . {with conical or pyramidal surface}
- F21V 7/043 . . {with cylindrical surface}
- F21V 7/045 . . {with spherical surface}
- F21V 7/046 . . {with involute curvature}
- F21V 7/048 . . {with facets structure}
- F21V 7/05 . . plane
- F21V 7/06 . . with parabolic curvature
- F21V 7/07 . . with hyperbolic curvature
- F21V 7/08 . . with elliptical curvature
- F21V 7/09 . . with a combination of different curvatures
- F21V 7/10 . Construction ([F21V 7/22](#) takes precedence)
- F21V 7/16 . . with provision for adjusting the curvature
- F21V 7/18 . . with provision for folding or collapsing
- F21V 7/22 . characterised by the material; characterised by surface treatments or coatings
  
- F21V 9/00** **Light filters** (coloured shades [F21V 1/00](#); characterised by cooling arrangements [F21V 29/502](#)); **Selection of luminescent materials for light screens**
- F21V 9/02 . for simulating daylight ([F21V 9/04](#), [F21V 9/06](#), [F21V 9/16](#) take precedence)
- F21V 9/04 . for filtering out infra-red radiation (using liquid-filled chambers [F21V 9/12](#))
- F21V 9/06 . for filtering out ultra-violet radiation ([F21V 9/16](#) takes precedence)
- F21V 9/08 . for producing coloured light, e.g. monochromatic; for reducing intensity of light ([F21V 9/16](#) takes precedence)
- F21V 9/083 . . {for portable lighting devices}
- F21V 9/10 . . with provision for variation of the colour or intensity ([F21V 9/12](#) takes precedence)

F21V 9/12	<ul style="list-style-type: none"> <li>with liquid-filled chambers</li> </ul>
F21V 9/14	<ul style="list-style-type: none"> <li>for producing polarised light</li> </ul>
F21V 9/16	<ul style="list-style-type: none"> <li>Selection of luminescent materials for screens</li> </ul>
<b>F21V 11/00</b>	<b>Screens not covered by groups <a href="#">F21V 1/00</a>, <a href="#">F21V 3/00</a>, <a href="#">F21V 7/00</a> or <a href="#">F21V 9/00</a> (characterised by cooling arrangements <a href="#">F21V 29/502</a>)</b>
F21V 11/02	<ul style="list-style-type: none"> <li>using parallel laminae or strips, e.g. of Venetian-blind type (<a href="#">F21V 11/06</a> takes precedence)</li> </ul>
F21V 11/04	<ul style="list-style-type: none"> <li>adjustable</li> </ul>
F21V 11/06	<ul style="list-style-type: none"> <li>using crossed laminae or strips, {e.g. <a href="#">grid-shaped louvers</a>}; using lattices or honeycombs</li> </ul>
F21V 11/065	<ul style="list-style-type: none"> <li>{<a href="#">adjustable</a>}</li> </ul>
F21V 11/08	<ul style="list-style-type: none"> <li>using diaphragms containing one or more apertures</li> </ul>
F21V 11/10	<ul style="list-style-type: none"> <li>of iris type</li> </ul>
F21V 11/12	<ul style="list-style-type: none"> <li>of slot type</li> </ul>
F21V 11/14	<ul style="list-style-type: none"> <li>with many small apertures</li> </ul>
F21V 11/16	<ul style="list-style-type: none"> <li>using sheets without apertures, {i.e. <a href="#">masks for shielding light</a>,} e.g. fixed (<a href="#">F21V 11/02</a>, <a href="#">F21V 11/06</a> take precedence; {for vehicle head lamps <a href="#">F21S 48/145</a>})</li> </ul>
F21V 11/18	<ul style="list-style-type: none"> <li>movable, e.g. flaps, slides</li> </ul>
F21V 11/183	<ul style="list-style-type: none"> <li>{<a href="#">pivotable</a>}</li> </ul>
F21V 11/186	<ul style="list-style-type: none"> <li>{<a href="#">slidable</a>}</li> </ul>
<b>F21V 13/00</b>	<b>Producing particular characteristics or distribution of the light emitted by means of a combination of elements specified in two or more of main groups <a href="#">F21V 1/00</a> <a href="#">F21V 11/00</a> (by means of a combination of two or more elements covered by a single one of main groups <a href="#">F21V 1/00</a> <a href="#">F21V 11/00</a>, see the relevant group; changing the characteristics or distribution of the light emitted by adjustment of parts <a href="#">F21V 14/00</a>)</b>
F21V 13/02	<ul style="list-style-type: none"> <li>Combinations of only two kinds of elements</li> </ul>
F21V 13/04	<ul style="list-style-type: none"> <li>the elements being reflectors and refractors {(for vehicle rear lights <a href="#">F21S 48/24</a>)}</li> </ul>
F21V 13/045	<ul style="list-style-type: none"> <li>{for portable lighting devices}</li> </ul>
F21V 13/06	<ul style="list-style-type: none"> <li>a reflector being rotatable</li> </ul>
F21V 13/08	<ul style="list-style-type: none"> <li>the elements being reflectors and filters</li> </ul>
F21V 13/10	<ul style="list-style-type: none"> <li>the elements being reflectors and screens</li> </ul>
F21V 13/12	<ul style="list-style-type: none"> <li>Combinations of only three kinds of elements</li> </ul>
F21V 13/14	<ul style="list-style-type: none"> <li>the elements being reflectors, refractors, and filters</li> </ul>
<b>F21V 14/00</b>	<b>Changing the characteristics or distribution of the light emitted by adjustment of parts {or by interposition of elements with electrically controlled variable light transmissivity} (reflectors with provision for adjusting the curvature <a href="#">F21V 7/16</a>; light filters with provision for variation of colour or intensity <a href="#">F21V 9/10</a>; screens using iris-type diaphragms <a href="#">F21V 11/10</a>; adjustable mountings for lighting devices <a href="#">F21V 21/14</a>)</b>
F21V 14/003	<ul style="list-style-type: none"> <li>{by interposition of elements with electrically controlled variable light transmissivity, e.g. liquid crystal elements or electrochromic devices (liquid crystal elements <a href="#">G02F 1/13</a>)}</li> </ul>

- F21V 14/006 . {by means of optical elements, e.g. films, filters or screens, being rolled up around a roller}
- F21V 14/02 . by movement of light sources {(in vehicle head lamps [F21S 48/1742](#))}
- F21V 14/025 . . {in portable lighting devices}
- F21V 14/04 . by movement of reflectors {(in vehicle head lamps [F21S 48/1757](#))}
- F21V 14/045 . . {in portable lighting devices}
- F21V 14/06 . by movement of refractors {(in vehicle head lamps [F21S 48/1721](#))}
- F21V 14/065 . . {in portable lighting devices}
- F21V 14/08 . by movement of the screens {or filters}
- F21V 14/085 . . {in portable lighting devices}

#### **{Aspects not related to light emission or distribution, e.g. fittings}**

**F21V 15/00** **Protecting lighting devices from damage** (protection from thermal damage [F21V 29/00](#); gas-tight or water-tight arrangements [F21V 31/00](#))

- F21V 15/005 . {Measures against vandalism, stealing or tampering ([F21V 15/02](#), [F21V 15/04](#) take precedence)}
- F21V 15/01 . Housings, e.g. material or assembling of housing parts ([F21V 15/02](#) takes precedence { housings forming signs or letters [G09F 13/04](#)})

#### **WARNING**

Not complete, see [F21V 15/00](#)

- F21V 15/012 . . {Housings with variable shape or dimensions, e.g. by means of elastically deformable materials or by movement of parts forming telescopic extensions of the housing body}
- F21V 15/013 . . {the housing being an extrusion}
- F21V 15/015 . . Devices for covering joints between adjacent lighting devices; End coverings

#### **WARNING**

Not complete, see [F21V 15/00](#)

- F21V 15/02 . Cages
- F21V 15/04 . Resilient mountings, e.g. shock absorbers (in general [F16F 15/04](#) {shock absorbing devices of vehicle headlamp housings [B60Q 1/0491](#)})

**F21V 17/00** **Fastening of component parts of lighting devices, e.g. shades, globes, refractors, reflectors, filters, screens, grids or protective cages** (of light sources or light holders [F21V 19/00](#); gas-tight or water-tight arrangements [F21V 31/00](#); {for vehicle rear lights [F21S 48/20](#); for vehicle head lights [F21S 48/10](#)})

- F21V 17/002 . {with provision for interchangeability, i.e. component parts being especially adapted to be replaced by another part with the same or a different function ([F21V 17/10](#) takes precedence)}
- F21V 17/005 . {with keying means, i.e. for enabling the assembling of component parts in distinctive positions, e.g. for preventing wrong mounting}

- F21V 17/007 . {with provision for shipment or storage}
- F21V 17/02 . with provision for adjustment ([F21V 17/04](#), [F21V 17/06](#), {[F21V 17/08](#)} take precedence)
- F21V 17/04 . the fastening being onto or by the light source
- F21V 17/06 . the fastening being onto or by the lampholder
- F21V 17/08 . onto the supporting or suspending arrangements of the lighting device, e.g. power cords, standards

### **WARNING**

Not complete, see [F21V 17/00](#)

- F21V 17/10 . characterised by specific fastening means or way of fastening ([F21V 17/02](#) to [F21V 17/08](#) take precedence)
- F21V 17/101 . . {permanently, e.g. welding, gluing or riveting}
- F21V 17/102 . . {using gravity or suction}
- F21V 17/104 . . {using feather joints, e.g. tongues and grooves, with or without friction}
- F21V 17/105 . . {using magnets}
- F21V 17/107 . . {using hinge joints}
- F21V 17/108 . . {using hook and loop-type fasteners}
- F21V 17/12 . . by screwing
- F21V 17/14 . . Bayonet-type fastening
- F21V 17/16 . . by deformation of parts; Snap action mounting
- F21V 17/162 . . . {the parts being subjected to traction or compression, e.g. coil springs}
- F21V 17/164 . . . {the parts being subjected to bending, e.g. snap joints}
- F21V 17/166 . . . {the parts being subjected to torsion, e.g. spiral springs}
- F21V 17/168 . . . {the parts being resilient rings acting substantially isotropically, e.g. split rings}
- F21V 17/18 . . Latch-type fastening, e.g. with rotary action
- F21V 17/20 . . by toggle-action levers

### **F21V 19/00** **Fastening of light sources or lamp holders** (fastening electric light source solely by the coupling device [H01R 33/00](#); {special means for attaching candle to candle holder [F21V 35/003](#)})

- F21V 19/0005 . {of sources having contact pins, wires or blades, e.g. pinch sealed lamp ([F21V 19/001](#) takes precedence)}
- F21V 19/001 . {the light sources being semiconductor devices, e.g. LEDs}
- F21V 19/0015 . . {Fastening arrangements intended to retain light sources}
- F21V 19/002 . . . {the fastening means engaging the encapsulation or the packaging of the semiconductor device}
- F21V 19/0025 . . . {the fastening means engaging the conductors of the light source, i.e. providing simultaneous fastening of the light sources and their electric connections}
- F21V 19/003 . . {Fastening of light source holders, e.g. of circuit boards or substrates holding light sources}
- F21V 19/0035 . . . {the fastening means being capable of simultaneously attaching of an other part, e.g. a housing portion or an optical component}

- F21V 19/004 . . . {by deformation of parts or snap action mountings, e.g. using clips}
- F21V 19/0045 . . . {by tongue and groove connections, e.g. dovetail interlocking means fixed by sliding}
- F21V 19/005 . . . {by permanent fixing means, e.g. gluing, riveting or embedding in a potting compound}
- F21V 19/0055 . . . {by screwing}
- F21V 19/006 . {of point-like light sources, e.g. incandescent or halogen lamps, with screw-threaded or bayonet base (of sources having contact pins, wires or blades [F21V 19/0005](#); of LEDs or sources mounted on printed-circuit board [F21V 19/001](#))}
- F21V 19/0065 . . {at least one conductive element acting as a support means, e.g. spring-mounted contact plate in a bayonet base}
- F21V 19/007 . . {the support means engaging the vessel of the source}
- F21V 19/0075 . {of tubular light sources, e.g. ring-shaped fluorescent light sources}
- F21V 19/008 . . {of straight tubular light sources, e.g. straight fluorescent tubes, soffit lamps}
- F21V 19/0085 . . . {at least one conductive element acting as a support means, e.g. resilient contact blades, piston-like contact}
- F21V 19/009 . . . {the support means engaging the vessel of the source}
- F21V 19/0095 . . {of U-shaped tubular light sources, e.g. compact fluorescent tubes}
- F21V 19/02 . with provision for adjustment, e.g. for focusing
- F21V 19/04 . with provision for changing light source, e.g. turret {(auxiliary devices for cleaning, placing, or removing incandescent lamps [H01K 3/32](#), fluorescent lamps [H01J 9/006](#))}
- F21V 19/042 . . {the light source being a semiconductor, e.g. an LED}
- F21V 19/045 . . {the light source being a semiconductor mounted on a holder, e.g. a circuit board}
- F21V 19/047 . . {by using spare light sources comprised in or attached to the lighting device and being intended to replace a defect light source by manual mounting}
- F21V 19/06 . Attaching mantles or other incandescent bodies to lamp parts

**F21V 21/00**

**Supporting, suspending, or attaching arrangements for lighting devices** ([F21V 17/00](#), [F21V 19/00](#) take precedence; arrangement of signalling or lighting devices, the mounting or supporting thereof or circuits therefor, for vehicles in general [B60Q](#), stands for supporting apparatus or articles in general [F16M 11/00](#));

**Hand grips**

- F21V 21/002 . making direct electrical contact, e.g. by piercing ([F21V 21/35](#) takes precedence)
- F21V 21/005 . for several lighting devices in an end-to-end arrangement, i.e. light tracks

**WARNING**

Not complete, see [F21V 21/00](#)

- F21V 21/008 . Suspending from a cable or suspension line

**WARNING**

Not complete, see [F21V 21/00](#)

- F21V 21/02 . Wall, ceiling, or floor bases; Fixing pendants or arms to the bases ([F21V 21/08](#) takes precedence; bases for movable standing lamps [F21V 21/06](#))



- F21V 21/025 . . {Elongated bases having a U-shaped cross section}
- F21V 21/03 . . Ceiling bases, e.g. ceiling roses ([F21V 21/04](#) takes precedence)
- F21V 21/04 . . Recessed bases
- F21V 21/041 . . . {Mounting arrangements specially adapted for false ceiling panels or partition walls made of plates ([F21V 21/047](#) takes precedence)}
- F21V 21/042 . . . . {using clamping means, e.g. for clamping with panel or wall}
- F21V 21/043 . . . . . {actuated by screwing}
- F21V 21/044 . . . . . {with elastically deformable elements, e.g. spring tongues}
- F21V 21/045 . . . . . {being tensioned by translation of parts, e.g. by pushing or pulling}
- F21V 21/046 . . . . . {being tensioned by rotation of parts}
- F21V 21/047 . . . {Mounting arrangements with fastening means engaging the inner surface of a hole in a ceiling or wall, e.g. for solid walls or for blind holes}
- F21V 21/048 . . . {Mounting arrangements for fastening lighting devices to false ceiling frameworks}
- F21V 21/049 . . . {Mounting arrangements for attaching lighting devices to the ceiling, the lighting devices being recessed in a false or stretched ceiling}
- F21V 21/06 . Bases for movable standing lamps; Fixing standards to the bases ([F21V 21/08](#) takes precedence)
- F21V 21/08 . Devices for easy attachment to any desired place, e.g. clip, clamp, magnet
- F21V 21/0808 . . {Adhesive means}
- F21V 21/0816 . . {Strap fasteners, e.g. fasteners with a buckle}
- F21V 21/0824 . . {Ground spikes}
- F21V 21/0832 . . {Hook and loop-type fasteners}
- F21V 21/084 . . Head fittings (for medical purposes [A61B 1/06](#) {hats or helmets with lamps [A42B 3/044](#)})
- F21V 21/088 . . Clips; Clamps
- F21V 21/0885 . . . {for portable lighting devices}
- F21V 21/092 . . Suction devices
- F21V 21/0925 . . . {for portable lighting devices}
- F21V 21/096 . . Magnetic devices
- F21V 21/0965 . . . {for portable lighting devices}
- F21V 21/10 . Pendants, arms, or standards; Fixing lighting devices to pendants, arms, or standards (adjustable mounting [F21V 21/14](#); construction of posts not peculiar to use with lighting devices [E04H 12/00](#))
- F21V 21/104 . . Pendants

**WARNING**

Not complete, see [F21V 21/10](#)



- F21V 21/108
  - . . Arms
  - WARNING**
  - Not complete, see [F21V 21/10](#)
- F21V 21/112
  - . . Fixing lighting devices to pendants ([F21V 21/002 takes precedence](#))
  - WARNING**
  - Not complete, see [F21V 21/10](#)
- F21V 21/116
  - . . Fixing lighting devices to arms or standards ([F21V 21/002 takes precedence](#))
  - WARNING**
  - Not complete, see [F21V 21/10](#)
- F21V 21/12
  - . . capable of being elongated or shortened by the insertion or removal of intermediate pieces
- F21V 21/13
  - . Spring-loaded poles fixed at both ends
  - WARNING**
  - Not complete, see [F21V 21/00](#)
- F21V 21/14
  - . Adjustable mountings
- F21V 21/145
  - . . {for portable lighting devices}
- F21V 21/15
  - . . specially adapted for power operation, e.g. by remote control
  - WARNING**
  - Not complete, see [F21V 21/14](#)
- F21V 21/16
  - . . using wires or cords
- F21V 21/18
  - . . . operated by springs
- F21V 21/20
  - . . . operated by weights
- F21V 21/22
  - . . telescopic
- F21V 21/24
  - . . Lazy-tongs
- F21V 21/26
  - . . Pivoted arms
- F21V 21/28
  - . . . adjustable in more than one plane
- F21V 21/29
  - . . . . employing universal joints
- F21V 21/30
  - . . Pivoted housings or frames
- F21V 21/32
  - . . Flexible tubes
- F21V 21/34
  - . Supporting elements displaceable along a guiding element ({[telescopic mounting of lighting devices F21V 21/22](#)})

- F21V 21/35
  - . . with direct electrical contact between the supporting element and electric conductors running along the guiding element

### **WARNING**

Not complete, see [F21V 21/34](#)

- F21V 21/36
  - . Hoisting or lowering devices, e.g. for maintenance ([F21V 21/14](#) takes precedence)
- F21V 21/38
  - . . with a cable
- F21V 21/40
  - . Hand grips

### **WARNING**

Not complete, see [F21V 21/00](#)

- F21V 21/403
  - . . {for operation or dentist lamps}
- F21V 21/406
  - . . {for portable lighting devices}

## **F21V 23/00**

### **Arrangement of electric circuit elements in or on lighting devices {(characterised by cooling arrangements [F21V 29/508](#))}**

- F21V 23/001
  - . {the elements being electrical wires or cables}
- F21V 23/002
  - . . {Arrangements of cables or conductors inside a lighting device, e.g. means for guiding along parts of the housing or in a pivoting arm}
- F21V 23/003
  - . {the elements being electronics drivers or controllers for operating the light source, e.g. for a LED array}
- F21V 23/004
  - . . {arranged on a substrate, e.g. a printed circuit board}
- F21V 23/005
  - . . . {the substrate is supporting also the light source}
- F21V 23/006
  - . . . {the substrate being distinct from the light source holder}
- F21V 23/007
  - . . {enclosed in a casing}
- F21V 23/008
  - . . . {the casing being outside the housing of the lighting device}
- F21V 23/009
  - . . . {the casing being inside the housing of the lighting device}
- F21V 23/02
  - . the elements being transformers, impedances {or power supply units, e.g. a transformer with a rectifier}
- F21V 23/023
  - . . {Power supplies in a casing ([F21V 23/003](#) takes precedence)}
- F21V 23/026
  - . . {Fastening of transformers or ballasts}
- F21V 23/04
  - . the elements being switches ([safety devices F21V 25/00](#))
- F21V 23/0407
  - . . {for flashing}
- F21V 23/0414
  - . . {specially adapted to be used with portable lighting devices}
- F21V 23/0421
  - . . . {the switch being part of, or disposed on the tail cap portion thereof}
- F21V 23/0428
  - . . . {the switch being part of, or disposed on the lamp head portion thereof}
- F21V 23/0435
  - . . {activated by remote control means}
- F21V 23/0442
  - . . {activated by means of a sensor, e.g. motion or photodetectors}
- F21V 23/045
  - . . . {the sensor receiving a signal from a remote controller}
- F21V 23/0457
  - . . . {the sensor sensing the operating status of the lighting device, e.g. to detect failure of a light source or to provide feedback to the device}

- F21V 23/0464 . . . {the sensor sensing the level of ambient illumination, e.g. dawn or dusk sensors}
- F21V 23/0471 . . . {the sensor detecting the proximity, the presence or the movement of an object or a person}
- F21V 23/0478 . . . . {by means of an image recording device, e.g. a camera}
- F21V 23/0485 . . . {the sensor sensing the physical interaction between a user and certain areas located on the lighting device, e.g. a touch sensor}
- F21V 23/0492 . . . {the sensor detecting a change in orientation, a movement or an acceleration of the lighting device, e.g. a tilt switch}
- F21V 23/06 . the elements being coupling devices, {e.g. connectors}

**F21V 25/00**

**Safety devices structurally associated with lighting devices** (gas- tight or water-tight arrangements [F21V 31/00](#); in general [F16P](#); protective circuit arrangements per se [H02H 7/00](#))

- F21V 25/02 . coming into action when lighting device is disturbed, dismantled, or broken
- F21V 25/04 . . breaking the electric circuit
- F21V 25/06 . . feeding a quenching fluid to the light source
- F21V 25/08 . . cutting the incandescent filament
- F21V 25/10 . coming into action when lighting device is overloaded, e.g. thermal switch
- F21V 25/12 . Flame-proof or explosion-proof arrangements
- F21V 25/125 . . {using intumescent material, i.e. using materials which swells up as a result of heat exposure}

**F21V 27/00**

**Cable-stowing arrangements structurally associated with lighting devices, e.g. reels** (storing lengths of cable in general [B65H](#) {the lighting devices being vehicle headlamps [F21S 48/1109](#); the lighting devices being vehicle lights [F21S 48/212](#)})

- F21V 27/005 . {for portable lighting devices}
- F21V 27/02 . Cable inlets

**WARNING**

Not complete, see [F21V 27/00](#)

**F21V 29/00**

**Protecting lighting devices from thermal damage; Cooling or heating arrangements specially adapted for lighting devices or systems** (lighting fixtures combined with outlets for air-treatment systems [F24F 13/078](#))

**WARNING**

Groups [F21V 29/002](#) - [F21V 29/006](#), [F21V 29/02](#), [F21V 29/20](#), [F21V 29/2212](#), [F21V 29/30](#), [F21V 29/40](#), and [F21V 29/402](#) are no longer used for the classification of documents as of January 15, 2015. The backfile of these groups is being reclassified into groups [F21V 29/002](#) - [F21V 29/89](#).

Until reclassification is complete, groups [F21V 29/002](#) - [F21V 29/006](#) and [F21V 29/02](#), [F21V 29/20](#), [F21V 29/2212](#), [F21V 29/30](#), [F21V 29/40](#), and [F21V 29/402](#) should be considered in order to perform a complete search.

F21V 29/002  
(Frozen)

- {Cooling arrangements ([F21V 29/02](#) takes precedence)}

#### **WARNING**

Group [F21V 29/002](#) is no longer used for the classification of documents as of January 15, 2015. The backfile of this group is being reclassified into groups [F21V 29/00](#) - [F21V 29/89](#).

Until reclassification is complete, group [F21V 29/002](#) should also be considered in order to perform a complete search.

F21V 29/004  
(Frozen)

- · {Natural cooling, i.e. by natural convection, conduction or radiation}

#### **WARNING**

Group [F21V 29/004](#) is no longer used for the classification of documents as of January 15, 2015. The backfile of this group is being reclassified into groups [F21V 29/00](#) - [F21V 29/89](#).

Until reclassification is complete, group [F21V 29/004](#) should also be considered in order to perform a complete search.

F21V 29/006  
(Frozen)

- · {Cooling devices or systems using condensation or evaporation of a fluid, e.g. heat pipes or two phase cooling systems}

#### **WARNING**

Group [F21V 29/006](#) is no longer used for the classification of documents as of January 15, 2015. The backfile of this group is being reclassified into groups [F21V 29/51](#) and [F21V 29/52](#).

Until reclassification is complete, groups [F21V 29/006](#), [F21V 29/51](#) and [F21V 29/52](#) should also be considered in order to perform a complete search.

F21V 29/02  
(Frozen)

- Cooling by forcing air {or gas} over or around the light source ([cooling arrangements structurally associated with electric {discharge or incandescent} lamps \[H01J 61/52\]\(#\), \[H01K 1/58\]\(#\)](#))

#### **WARNING**

Group [F21V 29/02](#) is no longer used for the classification of documents as of January 15, 2015. The backfile of this group is being reclassified into groups [F21V 29/503](#), and [F21V 29/60](#) - [F21V 29/89](#).

Until reclassification is complete, group [F21V 29/02](#) should also be considered in order to perform a complete search.

F21V 29/10

- Arrangement of heat-generating components to reduce thermal damage, e.g. by distancing heat-generating components from other components to be protected

#### **WARNING**

Group [F21V 29/10](#) is incomplete pending reclassification of documents from groups [F21V 29/002](#), [F21V 29/004](#) and [F21V 29/02](#).

Until reclassification is complete, groups [F21V 29/002](#), [F21V 29/004](#) and [F21V 29/02](#) should also be considered in order to perform a complete search.

F21V 29/15

- Thermal insulation

F21V 29/20  
(Frozen)

- {Cooling devices, cooling systems or arrangements thereof}

**WARNING**

Group [F21V 29/20](#) is no longer used for the classification of documents as of January 15, 2015. The backfile of this group is being reclassified into groups [F21V 29/00](#) - [F21V 29/89](#).

Until reclassification is complete, group [F21V 29/20](#) should also be considered in order to perform a complete search.

F21V 29/2212  
(Frozen)

- • {the fins or blades being planar}

**WARNING**

Group [F21V 29/2212](#) is no longer used for the classification of documents as of January 15, 2015. The backfile of this group is being reclassified into groups [F21V 29/76](#) - [F21V 29/78](#).

Until reclassification is complete, group [F21V 29/2212](#) should also be considered in order to perform a complete search.

F21V 29/30  
(Frozen)

- {Forced cooling using liquids, e.g. water}

**WARNING**

Group [F21V 29/30](#) is no longer used for the classification of documents as of January 15, 2015. The backfile of this group is being reclassified into groups [F21V 29/56](#) - [F21V 29/59](#).

Until reclassification is complete, groups [F21V 29/30](#) should also be considered in order to perform a complete search.

F21V 29/40  
(Frozen)

- {Forced cooling by electrically-powered actuators (fans [F21V29/025](#))}

**WARNING**

Groups [F21V 29/40](#) and [F21V 29/402](#) are no longer used for the classification of documents as of January 15, 2015. The backfile of these groups is being reclassified into groups [F21V 29/51](#) - [F21V 29/677](#).

Until reclassification is complete, groups [F21V 29/40](#) and [F21V 29/402](#) should also be considered in order to perform a complete search.

F21V 29/402  
(Frozen)

- • {Multi-phase cooling systems actuated by pumps}

F21V 29/50

- Cooling arrangements (air-treatment systems dissipating or using the heat of lighting fixtures [F24F 3/056](#))

**WARNING**

Groups [F21V 29/50](#) - [F21V 29/503](#) are incomplete pending reclassification of documents from groups [F21V 29/002](#), [F21V 29/004](#), and [F21V 29/02](#).

F21V 29/50  
(continued)

Until reclassification is complete, groups [F21V 29/002](#), [F21V 29/004](#), and [F21V 29/02](#) should also be considered in order to perform a complete search.

- F21V 29/502 . . characterised by the adaption for cooling of specific components
- F21V 29/503 . . . of light sources (cooling arrangements structurally associated with gas-discharge or vapour-discharge lamps [H01J 61/52](#); cooling arrangements structurally associated with electric incandescent lamps [H01K 1/58](#); cooling arrangements structurally associated with light-emitting diodes [H01L 33/64](#))
- F21V 29/504 . . . of refractors
- F21V 29/505 . . . of reflectors
- F21V 29/506 . . . of globes, bowls or cover glasses
- F21V 29/507 . . . of means for protecting lighting devices from damage, e.g. housings
- F21V 29/508 . . . of electrical circuits
- F21V 29/51 . . using condensation or evaporation of a fluid, e.g. heat pipes

#### **WARNING**

Groups [F21V 29/51](#) - [F21V 29/52](#) are incomplete pending reclassification of documents from groups [F21V 29/006](#), [F21V 29/40](#), and [F21V 29/402](#).

Until reclassification is complete, groups [F21V 29/006](#), [F21V 29/40](#) and [F21V 29/402](#) should also be considered in order to perform a complete search.

- F21V 29/52 . . . electrically powered, e.g. refrigeration systems
- F21V 29/54 . . using thermoelectric means, e.g. Peltier elements

#### **WARNING**

Group [F21V 29/54](#) is incomplete pending reclassification of documents from groups [F21V 29/40](#) and [F21V 29/402](#).

Until reclassification is complete, groups [F21V 29/40](#) and [F21V 29/402](#) should also be considered in order to perform a complete search.

- F21V 29/56 . . using liquid coolants ([F21V 29/51](#) takes precedence)

#### **WARNING**

Groups [F21V 29/56](#) - [F21V 29/59](#) are incomplete pending reclassification of documents from groups [F21V 29/30](#), [F21V 29/40](#) and [F21V 29/402](#)

Until reclassification is complete, groups [F21V 29/30](#), [F21V 29/40](#) and [F21V 29/402](#) should also be considered in order to perform a complete search.

- F21V 29/57 . . . characterised by control arrangements
- F21V 29/58 . . . characterised by the coolants
- F21V 29/59 . . . {with forced flow of the coolant}
- F21V 29/60 . . characterised by the use of a forced flow of gas, e.g. air

#### **WARNING**

F21V 29/60  
(continued)

Groups [F21V 29/60](#) - [F21V 29/677](#) are incomplete pending reclassification of documents from groups [F21V 29/02](#), [F21V 29/40](#) and [F21V 29/402](#)

Until reclassification is complete, groups [F21V 29/02](#), [F21V 29/40](#) and [F21V 29/402](#) should also be considered in order to perform a complete search.

- F21V 29/61 . . . characterised by control arrangements
- F21V 29/63 . . . using electrically-powered vibrating means; using ionic wind
- F21V 29/65 . . . the gas flowing in a closed circuit
- F21V 29/67 . . . characterised by the arrangement of fans
- F21V 29/673 . . . . {the fans being used for intake}
- F21V 29/677 . . . . {the fans being used for discharging}
- F21V 29/70 . . characterised by passive heat-dissipating elements, e.g. heat-sinks

**WARNING**

Groups [F21V 29/70](#) - [F21V 29/83](#) are incomplete pending reclassification of documents from group [F21V 29/02](#).

Until reclassification is complete, group [F21V 29/02](#) should be considered in order to perform a complete search.

- F21V 29/71 . . . using a combination of separate elements interconnected by heat-conducting means, e.g. with heat pipes or thermally conductive bars between separate heat-sink elements
- F21V 29/713 . . . . {in direct thermal and mechanical contact of each other to form a single system}
- F21V 29/717 . . . . {using split or remote units thermally interconnected, e.g. by thermally conductive bars or heat pipes}
- F21V 29/73 . . . the elements being adjustable with respect to each other, e.g. hinged
- F21V 29/74 . . . with fins or blades
- F21V 29/745 . . . . {the fins or blades being planar and inclined with respect to the joining surface from which the fins or blades extend}
- F21V 29/75 . . . . with fins or blades having different shapes, thicknesses or spacing
- F21V 29/76 . . . . with essentially identical parallel planar fins or blades, e.g. with comb-like cross-section

**WARNING**

Groups [F21V 29/76](#) - [F21V 29/767](#) are incomplete pending reclassification of documents from group [F21V 29/2212](#).

Until reclassification is complete, group [F21V 29/2212](#) should also be considered in order to perform a complete search.

- F21V 29/763 . . . . . {the planes containing the fins or blades having the direction of the light emitting axis}
- F21V 29/767 . . . . . {the planes containing the fins or blades having directions perpendicular to the light emitting axis}



- F21V 29/77 . . . . with essentially identical diverging planar fins or blades, e.g. with fan-like or star-like cross-section

### **WARNING**

Groups [F21V 29/77](#) - [F21V 29/777](#) are incomplete pending reclassification of documents from group [F21V 29/2212](#).

Until reclassification is complete, group [F21V 29/2212](#) should also be considered in order to perform a complete search.

- F21V 29/773 . . . . {the planes containing the fins or blades having the direction of the light emitting axis}

- F21V 29/777 . . . . {the planes containing the fins or blades having directions perpendicular to the light emitting axis}

- F21V 29/78 . . . . with helically or spirally arranged fins or blades

### **WARNING**

Group [F21V 29/78](#) is incomplete pending reclassification of documents from group [F21V 29/2212](#).

Until reclassification is complete, group [F21V 29/2212](#) should also be considered in order to perform a complete search.

- F21V 29/80 . . . with pins or wires

- F21V 29/81 . . . . with pins or wires having different shapes, lengths or spacing

- F21V 29/83 . . . the elements having apertures, ducts or channels, e.g. heat radiation holes

- F21V 29/85 . characterised by the material ([liquid coolants F21V 29/56](#))

### **WARNING**

Groups [F21V 29/85](#) - [F21V 29/89](#) are incomplete pending reclassification of documents from group [F21V 29/02](#).

Until reclassification is complete, group [F21V 29/02](#) should also be considered in order to perform a complete search.

- F21V 29/86 . . {Ceramics or glass}

- F21V 29/87 . . Organic material, e.g. filled polymer composites; Thermo-conductive additives or coatings therefor

- F21V 29/89 . . Metals

- F21V 29/90 . Heating arrangements

### **F21V 31/00 Gas-tight or water-tight arrangements**

- F21V 31/005 . {Sealing arrangements therefor}

- F21V 31/03 . with provision for venting ({for vehicle head lights [F21S 48/335](#); for vehicle rear lights [F21S 48/337](#)})

- F21V 31/04 . Provision of filling media ([safety devices F21V 25/00](#); cooling arrangements [F21V 29/50](#))

**F21V 33/00****Structural combinations of lighting devices with other articles, not otherwise provided for**

- F21V 33/0004 . {Personal or domestic articles}
- F21V 33/0008 . . {Clothing or clothing accessories, e.g. scarfs, gloves or belts}
- F21V 33/0012 . . {Furniture ([hospital beds F21V 33/0072](#))}
- F21V 33/0016 . . . {Furnishing for windows and doors ([sunshades F21V 33/006](#))}
- F21V 33/002 . . . {Racks for compact discs or the like}
- F21V 33/0024 . . {Household or table equipment}
- F21V 33/0028 . . . {Decorative household equipment, e.g. plant holders or food dummies}
- F21V 33/0032 . . . . {Paintings, pictures or photographs; Frames therefor}
- F21V 33/0036 . . . {Table-ware or table equipment, e.g. dishes, cutlery or trays}
- F21V 33/004 . . {Sanitary equipment, e.g. mirrors, showers, toilet seats or paper dispensers}
- F21V 33/0044 . . {Household appliances, e.g. washing machines or vacuum cleaners}
- F21V 33/0048 . . {Office articles, e.g. bookmarks, desk lamps with drawers, stands for books or music scores}
- F21V 33/0052 . . {Audio or video equipment, e.g. televisions, telephones, cameras or computers; Remote control devices therefor}
- F21V 33/0056 . . . {Audio equipment, e.g. music instruments, radios or speakers}
- F21V 33/006 . {General building constructions or finishing work for buildings, e.g. roofs, gutters, stairs or floors; Garden equipment; Sunshades or parasols}
- F21V 33/0064 . {Health, life-saving or fire-fighting equipment}
- F21V 33/0068 . . {Medical equipment}
- F21V 33/0072 . . . {Hospital beds}
- F21V 33/0076 . . {Safety or security signalisation, e.g. smoke or burglar alarms, earthquake detectors; Self-defence devices}
- F21V 33/008 . {Leisure, hobby or sport articles, e.g. toys, games or first-aid kits; Hand tools; Toolboxes}
- F21V 33/0084 . . {Hand tools; Toolboxes}
- F21V 33/0088 . {Ventilating systems ([lighting fixtures combined with outlets for air treatment systems F24F 13/078](#))}
- F21V 33/0092 . . {with heating or cooling devices}
- F21V 33/0096 . . {Fans, e.g. ceiling fans ([forced cooling of lighting devices characterised by the arrangement of fans F21V 29/67](#))}

**F21V 35/00****Candle holders**

- F21V 35/003 . {Special means for attaching the candle to the candle holder}
- F21V 35/006 . {Drop catchers; Shade holders}

**F21V 36/00****Arrangements of mantles or other incandescent bodies on burners ([attaching to lamp parts F21V 19/06](#))**

- F21V 36/02 . in ceiling lamps

**F21V 37/00****Details of lighting devices employing combustion as light source, not otherwise provided for; Night lamps; Votive lamps**

- F21V 37/0004 . {using liquid fuel}
- F21V 37/0008 . . {Fuel containers}
- F21V 37/0012 . . . {Filling or level checking}
- F21V 37/0016 . . . {Fastening of the container to other parts of the lamp}
- F21V 37/002 . . {Wicks}
- F21V 37/0025 . . . {vegetal ([F21V 37/0033](#) takes precedence)}
- F21V 37/0029 . . . {mineral ([F21V 37/0033](#) takes precedence)}
- F21V 37/0033 . . . {combination of vegetal and mineral}
- F21V 37/0037 . . . {Cleaning devices}
- F21V 37/0041 . . {Fuel supply}
- F21V 37/0045 . . . {using hydrostatic pressure or weights}
- F21V 37/005 . . . {using air or gas pressure}
- F21V 37/0054 . . . {Controlling means, e.g. floaters}
- F21V 37/0058 . . {Reflectors, cover glasses, chimneys; Smoke-removing devices; Preheaters}
- F21V 37/0062 . . . {Reflectors}
- F21V 37/0066 . . . {Chimneys}
- F21V 37/007 . . . {Globs}
- F21V 37/0075 . . {Fastening or safety devices for reflectors, cover glasses or chimneys}
- F21V 37/0079 . . . {Fastening of chimneys ([F21V 37/0087](#) takes precedence)}
- F21V 37/0083 . . . {Fastening of cover glasses ([F21V 37/0087](#) takes precedence)}
- F21V 37/0087 . . . {Devices for lifting chimneys or cover glasses}
- F21V 37/0091 . . . {Protections against shocks}
- F21V 37/0095 . {Night lamps; Votive lamps}
- F21V 37/02 . Special adaptation for protection against draughts {(for lanterns [F21L 19/006](#)); Draft controllers}

**F21V 99/00****Subject matter not provided for in other groups of this subclass****F21V 2200/00****Use of light guides, e.g. fibre optic devices, in lighting devices or systems**

- F21V 2200/10 . of light guides of the optical fibres type
- F21V 2200/13 . . the light being emitted at the end of the guide
- F21V 2200/15 . . the light being emitted along at least a portion of the outer surface of the guide
- F21V 2200/17 . . characterised by the admission of light into the guide
- F21V 2200/20 . of light guides of a generally planar shape
- F21V 2200/30 . of light guides doped with fluorescent agents
- F21V 2200/40 . of hollow light guides