SECTION G — PHYSICS

G02 OPTICS

Note(s) [4]

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

- "optical" applies not only to visible light but also to ultra-violet or infra-red radiations.

G02B **OPTICAL ELEMENTS, SYSTEMS, OR APPARATUS** (G02F takes precedence; optical elements specially adapted for use in lighting devices or systems thereof F21V 1/00-F21V 13/00; measuring-instruments, see the relevant subclass of class G01, e.g. optical rangefinders G01C; testing of optical elements, systems, or apparatus G01M 11/00; spectacles G02C; apparatus or arrangements for taking photographs or for projecting or viewing them G03B; sound lenses G10K 11/30; electron and ion "optics" H01J; X-ray "optics" H01J, H05G 1/00; optical elements structurally combined with electric discharge tubes H01J 5/16, H01J 29/89, H01J 37/22; microwave "optics" H01Q; combination of optical elements with television receivers H04N 5/72; optical systems or arrangements in colour television systems H04N 9/00; heating arrangements specially adapted for transparent or reflecting areas H05B 3/84) **[1, 7]**

Note(s) [7]

1. Attention is drawn to the Notes following the titles of class B81 and subclass B81B relating to "microstructural devices" and "microstructural systems".

Subclass index

1/00 **Optical elements characterised by the material of which they are made** (compositions of optical glasses C03C 3/00)**; Optical coatings for optical elements [1, 2006.01]**

1/02 • made of crystals, e.g. rock-salt, semiconductors (G02B 1/08 takes precedence) **[1, 2006.01]**

1/04 • made of organic materials, e.g. plastics (G02B 1/08 takes precedence) **[1, 2006.01]**

1/06 • made of fluids in transparent cells **[1, 2006.01]**

1/08 • made of polarising materials **[1, 2006.01]**

1/10 • Optical coatings produced by application to, or surface treatment of, optical elements (G02B 1/08 takes precedence) **[1, 2006.01, 2015.01]**

1/11 • • Anti-reflection coatings **[6, 2006.01, 2015.01]**

1/111 • • • using layers comprising organic materials **[2015.01]**

1/113 • • • using inorganic layer materials only **[2015.01]**

1/115 • • • • Multilayers **[2015.01]**

1/116 • • • • • including electrically conducting layers **[2015.01]**

Note(s) [2015.01]

When electrically conducting layers also exhibit an anti-static effect, classification is also made in group G02B 1/16.

1/118 • • • having sub-optical wavelength surface structures designed to provide an enhanced transmittance, e.g. moth-eye structures **[2015.01]**

1/12 • • by surface treatment, e.g. by irradiation **[1, 2006.01]**

1/14 • • Protective coatings, e.g. hard coatings **[2015.01]**

1/16 • • having an anti-static effect, e.g. electrically conducting coatings **[2015.01]**

1/18 • • Coatings for keeping optical surfaces clean, e.g. hydrophobic or photo-catalytic films (G02B 1/16 takes precedence) **[2015.01]**

3/00 Simple or compound lenses (artificial eyes A61F 2/14; spectacle lenses or contact lenses for the eyes G02C; watch or clock glasses G04B 39/00) **[1, 2006.01]**

3/02 • with non-spherical faces (G02B 3/10 takes precedence) **[1, 2006.01]**

3/04 • • with continuous faces that are rotationally symmetrical but deviate from a true sphere **[1, 2006.01]**

3/06 • • with cylindrical or toric faces **[1, 2006.01]**

3/08 • • with discontinuous faces, e.g. Fresnel lens **[1, 2006.01]**

3/10 • Bifocal lenses; Multifocal lenses **[1, 2006.01]**

3/12 • Fluid-filled or evacuated lenses **[1, 2006.01]**

3/14 • • of variable focal length **[1, 2006.01]**

5/00 Optical elements other than lenses (light guides G02B 6/00; optical logic elements G02F 3/00) **[1, 4, 2006.01]**

5/02 • Diffusing elements; Afocal elements **[1, 2006.01]**

5/04 • Prisms **[1, 2006.01]**

5/06 • • Fluid-filled or evacuated prisms **[1, 2006.01]**

5/08 • Mirrors **[1, 2006.01]**

5/09 • • Multifaceted or polygonal mirrors **[6, 2006.01]**

5/10 • • with curved faces **[1, 2006.01]**

5/12 • Reflex reflectors **[1, 2006.01]**

5/122 • • cube corner, trihedral or triple reflector type **[2, 2006.01]**

5/124 • • • plural reflecting elements forming part of a unitary plate or sheet **[2, 2006.01]**

5/126 • • including curved refracting surface **[2, 2006.01]**

5/128 • • • transparent spheres being embedded in matrix **[2, 2006.01]**

5/13 • • • plural curved refracting elements forming part of a unitary body **[2, 2006.01]**

5/132 • • • with individual reflector mounting means **[2, 2006.01]**

5/134 • • • • including a threaded mounting member **[2, 2006.01]**

5/136 • • plural reflecting elements forming part of a unitary body (G02B 5/124 takes precedence) **[2, 2006.01]**

5/18 • Diffracting gratings **[1, 2006.01]**

5/20 • Filters (polarising elements G02B 5/30; filters specially adapted for photographic purposes G03B 11/00) **[1, 2006.01]**

5/22 • • Absorbing filters **[1, 2006.01]**

5/23 • • • Photochromic filters **[2, 2006.01]**

5/24 • • • Liquid filters (G02B 5/23 takes precedence) **[1, 2, 2006.01]**

5/26 • • Reflecting filters (G02B 5/28 takes precedence) **[1, 2006.01]**

5/28 • • Interference filters **[1, 2006.01]**

5/30 • Polarising elements (light-modulating devices G02F 1/00) **[1, 2006.01]**

5/32 • Holograms used as optical elements (processes or apparatus for producing holograms G03H) **[2, 2006.01]**

6/00 Light guides; Structural details of arrangements comprising light guides and other optical elements, e.g. couplings [4, 6, 2006.01]

6/02 • Optical fibre with cladding (mechanical structures for providing tensile strength and external protection G02B 6/44) **[4, 2006.01]**

6/024 • • with polarisation-maintaining properties **[2006.01]**

6/028 • • with core or cladding having graded refractive index **[2006.01]**

6/032 • • with non-solid core or cladding **[2006.01]**

6/036 • • core or cladding comprising multiple layers **[2006.01]**

6/04 • formed by bundles of fibres (G02B 6/24 takes precedence) **[4, 2006.01]**

6/06 • • the relative position of the fibres being the same at both ends, e.g. for transporting images **[4, 2006.01]**

6/08 • • • with fibre bundle in form of plate **[4, 2006.01]**

6/10 • of the optical waveguide type (G02B 6/02, G02B 6/24 take precedence; devices or arrangements for the control of light by electric, magnetic, electro-magnetic or acoustic means G02F 1/00; transferring the modulation of modulated light G02F 2/00; optical logic elements G02F 3/00; optical analogue/digital converters G02F 7/00; stores using opto-electronic devices G11C 11/42; electric waveguides H01P; transmission of information by optical means H04B 10/00; multiplex systems H04J 14/00) **[4, 2006.01]**

6/12 • • of the integrated circuit kind (production or processing of single crystals C30B; electric integrated circuits H01L 27/00) **[4, 2006.01]**

6/122 • • • Basic optical elements, e.g. light-guiding paths **[6, 2006.01]**

6/124 • • • • Geodesic lenses or integrated gratings **[6, 2006.01]**

6/125 • • • • Bends, branchings or intersections **[6, 2006.01]**

6/126 • • • using polarisation effects **[6, 2006.01]**

6/13 • • • Integrated optical circuits characterised by the manufacturing method **[6, 2006.01]**

6/132 • • • • by deposition of thin films **[6, 2006.01]**

6/134 • • • • by substitution by dopant atoms **[6, 2006.01]**

6/136 • • • • by etching **[6, 2006.01]**

6/138 • • • • by using polymerisation **[6, 2006.01]**

6/14 • • Mode converters **[4, 2006.01]**

6/24 • Coupling light guides (for electric waveguides H01P 1/00) **[4, 5, 2006.01]**

6/245 • • Removing protective coverings of light guides before coupling **[5, 2006.01]**

6/25 • • Preparing the ends of light guides for coupling, e.g. cutting **[5, 2006.01]**

6/255 • • Splicing of light guides, e.g. by fusion or bonding **[5, 2006.01]**

6/26 • • Optical coupling means (G02B 6/36, G02B 6/42 take precedence) **[4, 2006.01]**

6/27 • • • with polarisation selective and adjusting means (polarisation elements in general G02B 5/30; polarisation systems in general G02B 27/28; optical polarisation multiplex systems H04J 14/06) **[6, 2006.01]**

6/28 • • • having data bus means, i.e. plural waveguides interconnected and providing an inherently bidirectional system by mixing and splitting signals **[4, 2006.01]**

6/287 • • • • Structuring of light guides to shape optical elements with heat application (G02B 6/255 takes precedence) **[6, 2006.01]**

6/293 • • • • with wavelength selective means (for optical elements in use, see the relevant subgroups of this subclass; optical wavelength-division multiplexing systems H04J 14/02) **[6, 2006.01]**

6/30 • • • for use between fibre and thin-film device **[4, 2006.01]**

6/32 • • • having lens focusing means **[4, 2006.01]**

6/34 • • • utilising prism or grating **[4, 2006.01]**

6/35 • • • having switching means (optical switching in general G02B 26/08; by changing the optical properties of the medium G02F 1/00) **[6, 2006.01]**

6/36 • • Mechanical coupling means (G02B 6/255, G02B 6/42 take precedence) **[4, 5, 2006.01]**

6/38 • • • having fibre to fibre mating means **[4, 2006.01]**

6/40 • • • having fibre bundle mating means **[4, 2006.01]**

6/42 • • Coupling light guides with opto-electronic elements **[4, 2006.01]**

6/43 • • • Arrangements comprising a plurality of opto-electronic elements and associated optical interconnections (light-emissive or light-sensitive semiconductor devices H01L 27/00, H01L 31/00, H01L 33/00; semiconductor lasers monolithically integrated with other components H01S 5/026) **[6, 2006.01]**

6/44 • Mechanical structures for providing tensile strength and external protection for fibres, e.g. optical transmission cables (cables incorporating electric conductors and optical fibres H01B 11/22) **[4, 2006.01]**

6/46 • Processes or apparatus adapted for installing optical fibres or optical cables (installation of cables containing electric conductors and optical fibres H02G) **[6, 2006.01]**

6/48 • • Overhead installation **[6, 2006.01]**

6/50 • • Underground or underwater installation; Installation through tubing, conduits or ducts **[6, 2006.01]**

6/52 • • • using fluid, e.g. air **[6, 2006.01]**

6/54 • • • using mechanical means, e.g. pulling or pushing devices **[6, 2006.01]**

7/00 Mountings, adjusting means, or light-tight connections, for optical elements [1, 2006.01, 2021.01]

*7/02 • for lenses **[1, 2006.01, 2021.01]***

*7/04 • • with mechanism for focusing or varying magnification **[1, 2, 2006.01, 2021.01]***

*7/06 • • • Focusing binocular pairs **[1, 2006.01, 2021.01]***

*7/08 • • • adapted to co-operate with a remote control mechanism **[1, 2006.01, 2021.01]***

*7/09 • • • adapted for automatic focusing or varying magnification (automatic generation of focusing signals G02B 7/28) **[5, 2006.01, 2021.01]***

*7/10 • • • by relative axial movement of several lenses, e.g. of varifocal objective lens **[1, 2006.01, 2021.01]***

*7/105 • • • • with movable lens means specially adapted for focusing at close distances **[4, 2006.01, 2021.01]***

*7/12 • • Adjusting pupillary distance of binocular pairs **[1, 2006.01, 2021.01]***

*7/14 • • adapted to interchange lenses **[1, 2006.01, 2021.01]***

*7/16 • • • Rotatable turrets **[1, 2006.01, 2021.01]***

*7/18 • for prisms; for mirrors **[1, 2006.01, 2021.01]***

*7/182 • • for mirrors (optical devices or arrangements using movable or deformable optical elements for controlling the intensity, colour, phase, polarisation or direction of light G02B 26/00) **[5, 2006.01, 2021.01]***

*7/183 • • • specially adapted for very large mirrors, e.g. for astronomy (G02B 7/185, G02B 7/192, G02B 7/198 take precedence) **[6, 2006.01, 2021.01]***

*7/185 • • • with means for adjusting the shape of the mirror surface (mirrors with curved faces G02B 5/10) **[5, 2006.01, 2021.01]***

*7/188 • • • • Membrane mirrors **[5, 2006.01, 2021.01]***

*7/192 • • • with means for minimising internal mirror stresses **[5, 2006.01, 2021.01]***

*7/195 • • • • Fluid-cooled mirrors **[5, 2006.01, 2021.01]***

*7/198 • • • with means for adjusting the mirror relative to its support **[5, 2006.01, 2021.01]***

*7/20 • Light-tight connections for movable optical elements **[1, 2006.01, 2021.01]***

*7/22 • • Extensible connections, e.g. bellows **[1, 2006.01, 2021.01]***

*7/24 • • Pivoted connections **[1, 2006.01, 2021.01]***

*7/28 • Systems for automatic generation of focusing signals (measuring distance per se G01C, G01S; using such signals to control focus of particular apparatus, see the subclasses for the apparatus, e.g. G03B, G03F) **[5, 2006.01, 2021.01]***

*7/30 • • using parallactic triangle with a base line **[5, 2006.01, 2021.01]***

*7/32 • • • using active means, e.g. light emitter **[5, 2006.01, 2021.01]***

*7/34 • • using different areas in a pupil plane **[5, 2006.01, 2021.01]***

*7/36 • • using image sharpness techniques **[5, 2006.01, 2021.01]***

*7/38 • • • measured at different points on the optical axis **[5, 2006.01, 2021.01]***

*7/40 • • using time delay of the reflected waves, e.g. of ultrasonic waves **[5, 2006.01, 2021.01]***

9/00 Optical objectives characterised both by the number of the components and their arrangements according to their sign, i.e. + or – (G02B 13/00, G02B 15/00 take precedence) **[1, 2006.01]**

Note(s)

In this group, a component is deemed to be a simple lens or a compound lens or a divided lens equivalent to a simple or to a compound lens.

9/02 • having one + component only (simple lenses G02B 3/00) **[1, 2006.01]**

9/04 • having two components only **[1, 2006.01]**

9/06 • • two + components **[1, 2006.01]**

9/08 • • • arranged about a stop **[1, 2006.01]**

9/10 • • one + and one – component **[1, 2006.01]**

9/12 • having three components only **[1, 2006.01]**

9/14 • • arranged + – + **[1, 2006.01]**

9/16 • • • all the components being simple **[1, 2006.01]**

9/18 • • • only one component having a compound lens (G02B 9/30 takes precedence) **[1, 2006.01]**

9/20 • • • • the rear component having the compound **[1, 2006.01]**
9/22 • • • • the middle component having the compound **[1, 2006.01]**
9/24 • • • two of the components having compound lenses (G02B 9/30 takes precedence) **[1, 2006.01]**
9/26 • • • • the front and rear components having compound lenses **[1, 2006.01]**
9/28 • • • • the middle and rear components having compound lenses **[1, 2006.01]**
9/30 • • • the middle component being a – compound meniscus having a + lens **[1, 2006.01]**
9/32 • • • • the + lens being a meniscus **[1, 2006.01]**
9/34 • having four components only **[1, 2006.01]**
9/36 • • arranged + — + **[1, 2006.01]**

Note(s)

In this group, the first place priority rule is applied.

9/38 • • • both – components being meniscus **[1, 2006.01]**
9/40 • • • • one – component being compound **[1, 2006.01]**
9/42 • • • • two – components being compound **[1, 2006.01]**
9/44 • • • both – components being biconcave **[1, 2006.01]**
9/46 • • • • one – component being compound **[1, 2006.01]**
9/48 • • • • two – components being compound **[1, 2006.01]**
9/50 • • • both + components being meniscus **[1, 2006.01]**
9/52 • • • the rear + component being compound **[1, 2006.01]**
9/54 • • • the front + component being compound **[1, 2006.01]**
9/56 • • • all components being simple lenses **[1, 2006.01]**
9/58 • • arranged – + + – **[1, 2006.01]**
9/60 • having five components only **[1, 2006.01]**
9/62 • having six components only **[1, 2006.01]**
9/64 • having more than six components **[1, 2006.01]**

11/00 Optical objectives characterised by the total number of simple and compound lenses forming the objective and their arrangement (G02B 9/00 takes precedence; having only one simple lens G02B 3/00) **[1, 2006.01]**

Note(s)

In groups G02B 11/02-G02B 11/34, lenses in broken contact are counted separately. Simple lenses are denoted by L, compound lenses by C, and the front lens is mentioned first.

11/02 • having two lenses only **[1, 2006.01]**
11/04 • • arranged C C **[1, 2006.01]**
11/06 • having three lenses only **[1, 2006.01]**
11/08 • • arranged L L L **[1, 2006.01]**
11/10 • • arranged L C L **[1, 2006.01]**
11/12 • • arranged L L C **[1, 2006.01]**
11/14 • • arranged C L C **[1, 2006.01]**
11/16 • • arranged C C L **[1, 2006.01]**
11/18 • • arranged C C C **[1, 2006.01]**
11/20 • having four lenses only **[1, 2006.01]**
11/22 • • arranged L L L L **[1, 2006.01]**
11/24 • • arranged C L L C **[1, 2006.01]**
11/26 • • arranged L C C L **[1, 2006.01]**
11/28 • • arranged C C C C **[1, 2006.01]**
11/30 • having five lenses only **[1, 2006.01]**
11/32 • having six lenses only **[1, 2006.01]**
11/34 • having more than six lenses **[1, 2006.01]**

13/00 Optical objectives specially designed for the purposes specified below (with variable magnification G02B 15/00) **[1, 2006.01]**

13/02 • Telephoto objectives, i.e. systems of the type + – in which the distance from the front vertex to the image plane is less than the equivalent focal length **[1, 2006.01]**
13/04 • Reversed telephoto objectives **[1, 2006.01]**
13/06 • Panoramic objectives; So-called "sky lenses" **[1, 2006.01]**
13/08 • Anamorphotic objectives **[1, 2006.01]**
13/10 • • involving prisms (G02B 13/12 takes precedence) **[1, 2006.01]**
13/12 • • with variable magnification **[1, 2006.01]**
13/14 • for use with infra-red or ultra-violet radiation (G02B 13/16 takes precedence) **[1, 2006.01]**
13/16 • for use in conjunction with image converters or intensifiers **[1, 2006.01]**
13/18 • with lenses having one or more non-spherical faces, e.g. for reducing geometrical aberration **[1, 2006.01]**
13/20 • Soft-focus objectives (diffusing elements in general G02B 5/02) **[1, 2006.01]**
13/22 • Telecentric objectives or lens systems **[1, 2006.01]**
13/24 • for reproducing or copying at short object distances **[1, 2006.01]**
13/26 • • for reproducing with unit magnification **[3, 2006.01]**

15/00 Optical objectives with means for varying the magnification (anamorphotic objectives G02B 13/08) **[1, 2006.01]**

15/02 • by changing, adding, or subtracting a part of the objective, e.g. convertible objective **[1, 2006.01]**
15/04 • • by changing a part **[1, 2006.01]**
15/06 • • • by changing the front part **[1, 2006.01]**
15/08 • • • by changing the rear part **[1, 2006.01]**
15/10 • • by adding a part, e.g. close-up attachment **[1, 2006.01]**
15/12 • • • by adding telescopic attachments (G02B 15/14 takes precedence) **[1, 2006.01]**
15/14 • by axial movement of one or more lenses or groups of lenses relative to the image plane for continuously varying the equivalent focal length of the objective **[1, 4, 2006.01]**
15/15 • • compensation by means of only one movement or by means of only linearly related movements, e.g. optical compensation **[4, 2006.01]**
15/16 • • with interdependent non-linearly related movements between one lens or lens group, and another lens or lens group (G02B 15/22 takes precedence) **[1, 4, 2006.01]**
15/163 • • • having a first movable lens or lens group and a second movable lens or lens group, both in front of a fixed lens or lens group (G02B 15/177 takes precedence) **[4, 2006.01]**
15/167 • • • • having an additional fixed front lens or group of lenses **[4, 2006.01]**
15/17 • • • • • arranged + — **[4, 2006.01]**
15/173 • • • • • arranged + – + **[4, 2006.01]**
15/177 • • • having a negative front lens or group of lenses **[4, 2006.01]**

15/20 • • • having an additional movable lens or lens group for varying the objective focal length **[4, 2006.01]**

15/22 • • with movable lens means specially adapted for focusing at close distances **[4, 2006.01]**

15/24 • • • having a front fixed lens or lens group and two movable lenses or lens groups in front of a fixed lens or lens group **[4, 2006.01]**

15/26 • • • • arranged + — **[4, 2006.01]**

15/28 • • • • arranged + – + **[4, 2006.01]**

17/00 **Systems with reflecting surfaces, with or without refracting elements** (microscopes G02B 21/00; telescopes, periscopes G02B 23/00; beam shaping not otherwise provided for G02B 27/09; for beam splitting or combining G02B 27/10; for optical projection G02B 27/18) **[1, 6, 2006.01]**

17/02 • Catoptric systems, e.g. image erecting and reversing system **[1, 2006.01]**

17/04 • • using prisms only **[1, 2006.01]**

17/06 • • using mirrors only **[1, 2006.01]**

17/08 • Catadioptric systems **[1, 2006.01]**

19/00 **Condensers** (for microscopes G02B 21/08) **[1, 2006.01]**

21/00 **Microscopes** (eyepieces G02B 25/00; polarising systems G02B 27/28; measuring microscopes G01B 9/04; microtomes G01N 1/06; scanning-probe techniques or apparatus G01Q) **[1, 7, 2006.01]**

21/02 • Objectives **[1, 2006.01]**

21/04 • • involving mirrors **[1, 2006.01]**

21/06 • Means for illuminating specimen **[1, 2006.01]**

21/08 • • Condensers **[1, 2006.01]**

21/10 • • • affording dark-field illumination (G02B 21/14 takes precedence) **[1, 2006.01]**

21/12 • • • affording bright-field illumination (G02B 21/14 takes precedence) **[1, 2006.01]**

21/14 • • • affording illumination for phase-contrast observation **[1, 2006.01]**

21/16 • adapted for ultra-violet illumination **[1, 2006.01]**

21/18 • Arrangements with more than one light-path, e.g. for comparing two specimens **[1, 2006.01]**

21/20 • • Binocular arrangements **[1, 2006.01]**

21/22 • • • Stereoscopic arrangements **[1, 2006.01]**

21/24 • Base structure **[1, 2006.01]**

21/26 • • Stages; Adjusting means therefor **[1, 2006.01]**

21/28 • • with cooling device **[1, 2006.01]**

21/30 • • with heating device **[1, 2006.01]**

21/32 • Micromanipulators structurally combined with microscopes **[1, 2006.01]**

21/33 • Immersion oils **[6, 2006.01]**

21/34 • Microscope slides, e.g. mounting specimens on microscope slides (preparing specimens for investigation G01N 1/28; means for supporting the objects or the materials to be analysed in electron microscopes H01J 37/20) **[1, 2006.01]**

21/36 • arranged for photographic purposes or projection purposes (G02B 21/18 takes precedence) **[1, 2006.01]**

23/00 **Telescopes, e.g. binoculars** (measuring telescopes G01B 9/06)**; Periscopes; Instruments for viewing the inside of hollow bodies** (diagnostic instruments A61B)**; Viewfinders** (objectives G02B 9/00, G02B 11/00, G02B 15/00, G02B 17/00; eyepieces G02B 25/00)**; Optical aiming or sighting devices** (non-optical aspects of weapon aiming or sighting devices F41G) **[1, 4, 2006.01]**

23/02 • involving prisms or mirrors (G02B 23/14 takes precedence) **[1, 2006.01]**

23/04 • • for the purpose of beam splitting or combining, e.g. fitted with eyepieces for more than one observer (G02B 23/10 takes precedence) **[1, 2006.01]**

23/06 • • having a focusing action, e.g. parabolic mirror **[1, 2006.01]**

23/08 • • Periscopes **[1, 2006.01]**

23/10 • • reflecting into the field of view additional indications, e.g. from collimator (collimators in general G02B 27/30; graticules G02B 27/34) **[1, 2006.01]**

23/12 • with means for image conversion or intensification (objectives for image conversion or intensification G02B 13/16; electrical image converters with optical input and optical output H01J 31/50) **[1, 2006.01]**

23/14 • Viewfinders (for photographic apparatus G03B 13/02) **[1, 2006.01]**

23/16 • Housings; Caps; Mountings; Supports, e.g. with counterweight (cases or receptacles A45C) **[1, 2006.01]**

23/18 • • for binocular arrangements **[1, 2006.01]**

23/20 • • Collapsible housings (G02B 23/18 takes precedence) **[1, 2006.01]**

23/22 • • Underwater equipments, e.g. for submarine periscope **[1, 2006.01]**

23/24 • Instruments for viewing the inside of hollow bodies, e.g. fibrescopes **[4, 2006.01]**

23/26 • • using light guides **[4, 2006.01]**

25/00 **Eyepieces; Magnifying glasses** (simple lenses G02B 3/00) **[1, 2006.01]**

25/02 • with means for illuminating object viewed **[1, 2006.01]**

25/04 • affording a wide-angle view, e.g. through a spy-hole **[1, 2006.01]**

26/00 **Optical devices or arrangements using movable or deformable optical elements for controlling the intensity, colour, phase, polarisation or direction of light, e.g. switching, gating or modulating** (mechanically operable parts of lighting devices for the control of light order F21V; specially adapted for measuring characteristics of light G01J; devices or arrangements, the optical operation of which is modified by changing the optical properties of the medium of the devices or arrangements G02F 1/00; control of light in general G05D 25/00; control of light sources H01S 3/10, H05B 39/00-H05B 47/00) **[4, 2006.01]**

26/02 • for controlling the intensity of light **[4, 2006.01]**

26/04 • • by periodically varying the intensity of light, e.g. using choppers **[4, 2006.01]**

26/06 • for controlling the phase of light (G02B 26/08 takes precedence) **[4, 2006.01]**

26/08 • for controlling the direction of light (in light guides G02B 6/35) **[4, 2006.01]**

26/10 • • Scanning systems (for special applications, see the relevant places, e.g. G03B 27/32, G03F 3/08, G03G 15/04, G09G 3/00, H04N) **[4, 2006.01]**

26/12 • • • using multifaceted mirrors **[6, 2006.01]**

27/00 **Optical systems or apparatus not provided for by any of the groups G02B 1/00-G02B 26/00, G02B 30/00 [1, 2006.01]**

27/01 • Head-up displays **[6, 2006.01]**

27/02 • Viewing or reading apparatus (stereoscopic systems G02B 30/00; of the projection type G03B; slide-changing apparatus G03B) **[1, 2006.01]**

27/04 • • having collapsible parts **[1, 2006.01]**

27/06 • • with moving-picture effect **[1, 2006.01]**

27/08 • • Kaleidoscopes **[1, 2006.01]**

27/09 • Beam shaping, e.g. changing the cross-sectioned area, not otherwise provided for **[6, 2006.01]**

27/10 • Beam splitting or combining systems (mixing and splitting light signals using optical waveguides G02B 6/28; polarising systems G02B 27/28) **[1, 4, 2006.01]**

27/12 • • operating by refraction only **[1, 2006.01]**

27/14 • • operating by reflection only **[1, 2006.01]**

27/16 • • used as aids for focusing **[1, 2006.01]**

27/18 • for optical projection, e.g. combination of mirror and condenser and objective **[1, 2006.01]**

27/20 • • for imaging minute objects, e.g. light-pointer **[1, 2006.01]**

27/28 • for polarising (used in stereoscopes G02B 30/25) **[1, 2006.01]**

27/30 • Collimators **[1, 2006.01]**

27/32 • Fiducial marks or measuring scales within the optical system **[1, 2006.01]**

27/34 • • illuminated **[1, 2006.01]**

27/36 • • adjustable **[1, 2006.01]**

27/40 • Optical focusing aids (beam splitting or combining systems G02B 27/10) **[1, 2006.01]**

27/42 • Diffraction optics (G02B 27/60 takes precedence) **[3, 2006.01]**

27/44 • • Grating systems; Zone plate systems (G02B 27/46 takes precedence; spectrometry G01J) **[3, 2006.01]**

27/46 • • Systems using spatial filters (character recognition G06K 9/00) **[3, 2006.01]**

Note(s) [3]

In this group, the filter may be in any plane, e.g. the image or the Fourier transfer plane.

27/48 • Laser speckle optics (speckle suppression in holography G03H 1/32) **[3, 2006.01]**

27/50 • Optics for phase object visualisation (in microscopes G02B 21/14) **[3, 2006.01]**

27/52 • • Phase contrast optics **[3, 2006.01]**

27/54 • • Schlieren-optical systems **[3, 2006.01]**

27/56 • Optics using evanescent waves, i.e. inhomogeneous waves **[3, 2006.01]**

27/58 • Optics for apodization or superresolution; Optical synthetic aperture systems **[3, 2006.01]**

27/60 • Systems using moire fringes (means for converting the output of a sensing member using diffraction gratings G01D 5/38) **[3, 2006.01]**

27/62 • Optical apparatus specially adapted for adjusting optical elements during the assembly of optical systems (adjusting means being part of the system to be assembled G02B 7/00) **[3, 2006.01]**

27/64 • Imaging systems using optical elements for stabilisation of the lateral and angular position of the image (focusing systems G02B 7/04; adjustment of optical system relative to image or object surface G03B 5/00) **[3, 2006.01]**

30/00 Optical systems or apparatus for producing three-dimensional [3D] effects, e.g. stereoscopic images (in microscopes G02B 21/22) **[2020.01]**

30/10 • using integral imaging methods **[2020.01]**

30/20 • by providing first and second parallax images to an observer's left and right eyes **[2020.01]**

30/22 • • of the stereoscopic type **[2020.01]**

30/23 • • • using wavelength separation, e.g. using anaglyph techniques **[2020.01]**

30/24 • • • involving temporal multiplexing, e.g. using sequentially activated left and right shutters **[2020.01]**

30/25 • • • using polarisation techniques **[2020.01]**

30/26 • • of the autostereoscopic type **[2020.01]**

30/27 • • • involving lenticular arrays **[2020.01]**

30/28 • • • • involving active lenticular arrays **[2020.01]**

30/29 • • • • characterised by the geometry of the lenticular array, e.g. slanted arrays, irregular arrays or arrays of varying shape or size **[2020.01]**

30/30 • • • involving parallax barriers **[2020.01]**

30/31 • • • • involving active parallax barriers (involving directional light or back-light sources G02B 30/33) **[2020.01]**

30/32 • • • • characterised by the geometry of the parallax barriers, e.g. staggered barriers, slanted parallax arrays or parallax arrays of varying shape or size **[2020.01]**

30/33 • • • involving directional light or back-light sources **[2020.01]**

30/34 • • Stereoscopes providing a stereoscopic pair of separated images corresponding to parallactically displaced views of the same object, e.g. 3D slide viewers **[2020.01]**

30/35 • • • using reflective optical elements in the optical path between the images and the observer **[2020.01]**

30/36 • • • using refractive optical elements, e.g. prisms, in the optical path between the images and the observer **[2020.01]**

30/37 • • • Collapsible stereoscopes **[2020.01]**

30/40 • giving the observer of a single two-dimensional [2D] image a perception of depth **[2020.01]**

30/50 • the image being built up from image elements distributed over a 3D volume, e.g. voxels **[2020.01]**

30/52 • • the 3D volume being constructed from a stack or sequence of 2D planes, e.g. depth sampling systems **[2020.01]**

30/54 • • the 3D volume being generated by moving a 2D surface, e.g. by vibrating or rotating the 2D surface **[2020.01]**

30/56 • • by projecting aerial or floating images **[2020.01]**

30/60 • involving reflecting prisms and mirrors only **[2020.01]**

G02C SPECTACLES; SUNGLASSES OR GOGGLES INSOFAR AS THEY HAVE THE SAME FEATURES AS SPECTACLES; CONTACT LENSES

Note(s)

This subclass also covers monocles, pince-nez or lorgnettes.

Subclass index

1/00 **Assemblies of lenses with bridges or browbars [1, 2006.01]**

1/02 • Bridge or browbar secured to lenses without the use of rims **[1, 2006.01]**

1/04 • Bridge or browbar secured to, or integral with, partial rims, e.g. with partially-flexible rim for holding the lens **[1, 2006.01]**

1/06 • Bridge or browbar secured to, or integral with, closed rigid rims for the lenses **[1, 2006.01]**

1/08 • • the rims being transversely-split and provided with securing means **[1, 2006.01]**

3/00 **Special supporting arrangement for lens assemblies or monocles [1, 2006.01]**

3/02 • Arrangements for supporting by headgear **[1, 2006.01]**

3/04 • Arrangements for supporting by hand, e.g. lorgnette; Arrangements for supporting by articles **[1, 2006.01]**

5/00 **Constructions of non-optical parts [1, 2006.01]**

5/02 • Bridges; Browbars; Intermediate bars (nose-engaging surfaces G02C 5/12) **[1, 2006.01]**

5/04 • • with adjustable means **[1, 2006.01]**

5/06 • • with resilient means **[1, 2006.01]**

5/08 • • foldable **[1, 2006.01]**

5/10 • • Intermediate bar or bars between bridge and side-members **[1, 2006.01]**

5/12 • Nose-pads; Nose-engaging surfaces of bridges or rims **[1, 2006.01]**

5/14 • Side-members **[1, 2006.01]**

5/16 • • resilient or with resilient parts **[1, 2006.01]**

5/18 • • reinforced **[1, 2006.01]**

5/20 • • adjustable, e.g. telescopic **[1, 2006.01]**

5/22 • Hinges **[1, 2006.01]**

7/00 **Optical parts** (characterised by the material G02B 1/00) **[1, 2006.01]**

7/02 • Lenses; Lens systems **[1, 2006.01]**

7/04 • • Contact lenses for the eyes **[1, 2006.01]**

7/06 • • bifocal; multifocal **[1, 2006.01]**

7/08 • • Auxiliary lenses; Arrangements for varying focal length **[1, 2006.01]**

7/10 • Filters, e.g. for facilitating adaptation of the eyes to the dark; Sunglasses **[1, 2006.01]**

7/12 • Polarisers **[1, 2006.01]**

7/14 • Mirrors; Prisms **[1, 2006.01]**

7/16 • Shades, shields; Obturators, e.g. with pinhole, with slot **[1, 2006.01]**

9/00 **Attaching auxiliary optical parts [1, 2006.01]**

9/02 • by hinging **[1, 2006.01]**

9/04 • by fitting over or clamping on **[1, 2006.01]**

11/00 **Non-optical adjuncts; Attachment thereof** (G02C 7/16 takes precedence) **[1, 2006.01]**

11/02 • Ornaments, e.g. exchangeable **[1, 2006.01]**

11/04 • Illuminating means **[1, 2006.01]**

11/06 • Hearing aids (construction of hearing aids H04R 25/00) **[1, 2006.01]**

11/08 • Anti-misting means, e.g. ventilating, heating; Wipers (H05B 3/84 takes precedence) **[1, 5, 2006.01]**

13/00 **Assembling; Repairing; Cleaning** (disinfection or sterilisation of contact lenses A61L 12/00) **[1, 2006.01]**

G02F DEVICES OR ARRANGEMENTS, THE OPTICAL OPERATION OF WHICH IS MODIFIED BY CHANGING THE OPTICAL PROPERTIES OF THE MEDIUM OF THE DEVICES OR ARRANGEMENTS FOR THE CONTROL OF THE INTENSITY, COLOUR, PHASE, POLARISATION OR DIRECTION OF LIGHT, e.g. SWITCHING, GATING, MODULATING OR DEMODULATING; TECHNIQUES OR PROCEDURES FOR THE OPERATION THEREOF; FREQUENCY-CHANGING; NON-LINEAR OPTICS; OPTICAL LOGIC ELEMENTS; OPTICAL ANALOGUE/DIGITAL CONVERTERS [2, 4]

1/00 **Devices or arrangements for the control of the intensity, colour, phase, polarisation or direction of light arriving from an independent light source, e.g. switching, gating or modulating; Non-linear optics [1, 2, 4, 2006.01]**

Note(s) [2]

This group covers only:

- devices or arrangements, e.g. cells, the optical operation of which is modified by changing the optical properties of the medium of the devices or arrangements by the influence or control of physical parameters, e.g. electric fields, electric current, magnetic fields, sound or mechanical vibrations, stress or thermal effects;
- devices or arrangements in which the electric or magnetic field component of the light beams influences the optical properties of the medium, i.e. non-linear optics;
- control of light by electromagnetic waves, e.g. radio waves, or by electrons or other elementary particles.

1/01 • for the control of the intensity, phase, polarisation or colour (G02F 1/29, G02F 1/35 take precedence) **[2, 7, 2006.01]**

1/015 • • based on semiconductor elements with at least one potential jump barrier, e.g. PN, PIN junction (G02F 1/03 takes precedence) **[3, 2006.01]**

1/017 • • • Structures with periodic or quasi periodic potential variation, e.g. superlattices, quantum wells **[7, 2006.01]**

1/025 • • • in an optical waveguide structure (G02F 1/017 takes precedence) **[5, 7, 2006.01]**

1/03 • • based on ceramics or electro-optical crystals, e.g. exhibiting Pockels or Kerr effect (G02F 1/061 takes precedence) **[2, 4, 7, 2006.01]**

1/035 • • • in an optical waveguide structure **[5, 2006.01]**

1/05 • • • with ferro-electric properties (G02F 1/035, G02F 1/055 take precedence) **[2, 5, 2006.01]**

1/055 • • • the active material being a ceramic (G02F 1/035 takes precedence) **[4, 5, 2006.01]**

1/061 • • based on electro-optical organic material (G02F 1/07 takes precedence) **[7, 2006.01]**

1/065 • • • in an optical waveguide structure **[7, 2006.01]**

1/07 • • based on electro-optical liquids exhibiting Kerr effect **[2, 2006.01]**

1/09 • • based on magneto-optical elements, e.g. exhibiting Faraday effect **[2, 2006.01]**

1/095 • • • in an optical waveguide structure **[5, 2006.01]**

1/11 • • based on acousto-optical elements, e.g. using variable diffraction by sound or like mechanical waves (acousto-optical deflection G02F 1/33) **[2, 2006.01]**

1/125 • • • in an optical waveguide structure **[5, 2006.01]**

1/13 • • based on liquid crystals, e.g. single liquid crystal display cells **[2, 2006.01]**

1/133 • • • Constructional arrangements; Operation of liquid crystal cells; Circuit arrangements (arrangements or circuits for control of liquid crystal elements in a matrix, not structurally associated with these elements G09G 3/36) **[3, 7, 2006.01]**

1/1333 • • • • Constructional arrangements (G02F 1/135, G02F 1/136 take precedence) **[5, 2006.01]**

1/1334 • • • • • based on polymer-dispersed liquid crystals, e.g. microencapsulated liquid crystals **[7, 2006.01]**

1/1335 • • • • • Structural association of cells with optical devices, e.g. polarisers or reflectors **[5, 2006.01]**

1/13357• • • • • • Illuminating devices **[7, 2006.01]**

1/13363• • • • • • Birefringent elements, e.g. for optical compensation **[7, 2006.01]**

1/1337 • • • • • Surface-induced orientation of the liquid crystal molecules, e.g. by alignment layers **[5, 2006.01]**

1/1339 • • • • • Gaskets; Spacers; Sealing of cells **[5, 2006.01]**

1/1341 • • • • • Filling or closing of cells **[5, 2006.01]**

1/1343 • • • • • Electrodes **[5, 2006.01]**

1/1345 • • • • • Conductors connecting electrodes to cell terminals **[5, 2006.01]**

1/1347 • • • • • Arrangement of liquid crystal layers or cells in which the final condition of one light beam is achieved by the addition of the effects of two or more layers or cells **[5, 2006.01]**

1/135 • • • • Liquid crystal cells structurally associated with a photoconducting or a ferro-electric layer, the properties of which can be optically or electrically varied **[3, 2006.01]**

1/136 • • • • Liquid crystal cells structurally associated with a semi-conducting layer or substrate, e.g. cells forming part of an integrated circuit (G02F 1/135 takes precedence) **[5, 2006.01]**

1/1362 • • • • • Active matrix addressed cells **[7, 2006.01]**

1/1365 • • • • • • in which the switching element is a two-electrode device **[7, 2006.01]**

1/1368 • • • • • • in which the switching element is a three-electrode device **[7, 2006.01]**

1/137 • • • characterised by the electro-optical or magneto-optical effect, e.g. field-induced phase transition, orientation effect, guest-host interaction or dynamic scattering **[3, 2006.01]**

1/139 • • • • based on orientation effects in which the liquid crystal remains transparent **[6, 2006.01]**

1/141 • • • • • using ferroelectric liquid crystals **[6, 2006.01]**

1/15 • • based on an electrochromic effect **[5, 2006.01, 2019.01]**

1/1503 • • • caused by oxidation-reduction reactions in organic liquid solutions, e.g. viologen solutions **[2019.01]**

1/1506 • • • based on electrodeposition, e.g. electrolytic deposition of an inorganic material on or close to an electrode **[2019.01]**

1/1514 • • • characterised by the electrochromic material, e.g. by the electrodeposited material **[2019.01]**

1/1516 • • • • comprising organic material **[2019.01]**

1/1523 • • • • comprising inorganic material **[2019.01]**

1/1524 • • • • • Transition metal compounds **[2019.01]**

1/153 • • • Constructional details **[5, 2006.01]**

1/155 • • • • Electrodes **[5, 2006.01]**

1/157 • • • • Structural association of cells with optical devices, e.g. reflectors or illuminating devices **[5, 2006.01]**

1/161 • • • • Gaskets; Spacers; Sealing of cells; Filling or closing of cells **[5, 2006.01]**

1/163 • • • Operation of electrochromic cells, e.g. electrodeposition cells; Circuit arrangements therefor **[5, 2006.01]**

1/165 • • based on translational movement of particles in a fluid under the influence of an applied field **[2019.01]**

1/166 • • • characterised by the electro-optical or magneto-optical effect **[2019.01]**

1/167 • • • • by electrophoresis **[5, 2006.01, 2019.01]**

1/1671 • • • • involving dry toners **[2019.01]**
1/1673 • • • • by magnetophoresis **[2019.01]**
1/1675 • • • Constructional details **[2019.01]**
1/16753• • • • Structures for supporting or mounting cells, e.g. frames or bezels **[2019.01]**
1/16755• • • • Substrates **[2019.01]**
1/16756• • • • Insulating layers **[2019.01]**
1/16757• • • • Microcapsules **[2019.01]**
1/1676 • • • • Electrodes **[2019.01]**
1/16761• • • • • Side-by-side arrangement of working electrodes and counter-electrodes **[2019.01]**
1/16762• • • • • having three or more electrodes per pixel **[2019.01]**
1/16766• • • • • for active matrices **[2019.01]**
1/1677 • • • • Structural association of cells with optical devices, e.g. reflectors or illuminating devices **[2019.01]**
1/1679 • • • • Gaskets; Spacers; Sealing of cells; Filling or closing of cells **[2019.01]**
1/1681 • • • • • having two or more microcells partitioned by walls, e.g. of microcup type **[2019.01]**
1/1685 • • • Operation of cells; Circuit arrangements affecting the entire cell **[2019.01]**
1/169 • • based on orientable non-spherical particles having a common optical characteristic, e.g. suspended particles of reflective metal flakes **[2019.01]**
1/17 • • based on variable-absorption elements not provided for in groups G02F 1/015-G02F 1/169 **[2, 5, 2006.01, 2019.01]**
1/19 • • based on variable-reflection or variable-refraction elements not provided for in groups G02F 1/015-G02F 1/169 **[2, 5, 2006.01, 2019.01]**
1/21 • • by interference **[2, 2006.01]**
1/225 • • • in an optical waveguide structure **[5, 2006.01]**
1/23 • • for the control of the colour (G02F 1/03-G02F 1/21 take precedence) **[2, 2006.01]**
1/25 • • • as to hue or predominant wavelength **[2, 2006.01]**
1/29 • for the control of the position or the direction of light beams, i.e. deflection **[4, 2006.01]**
1/295 • • in an optical waveguide structure (G02F 1/313, G02F 1/335 take precedence) **[5, 2006.01]**
1/31 • • Digital deflection devices (G02F 1/33 takes precedence) **[2, 2006.01]**
1/313 • • • in an optical waveguide structure **[5, 2006.01]**
1/315 • • • based on the use of controlled total internal reflection **[3, 2006.01]**
1/33 • • Acousto-optical deflection devices **[2, 2006.01]**
1/335 • • • having an optical waveguide structure **[5, 2006.01]**
1/35 • Non-linear optics **[2, 5, 2006.01]**
1/355 • • characterised by the materials used **[7, 2006.01]**
1/361 • • • Organic materials **[7, 2006.01]**
1/365 • • in an optical waveguide structure (G02F 1/377 takes precedence) **[7, 2006.01]**
1/37 • • for second-harmonic generation **[2, 2006.01]**
1/377 • • • in an optical waveguide structure **[7, 2006.01]**
1/383 • • • • of the optical fibre type **[7, 2006.01]**
1/39 • • for parametric generation or amplification of light, infra-red, or ultra-violet waves **[2, 2006.01]**

2/00 Demodulating light; Transferring the modulation of modulated light; Frequency-changing of light (G02F 1/35 takes precedence) **[1, 2, 2006.01]**

2/02 • Frequency-changing of light, e.g. by quantum counters **[2, 2006.01]**

3/00 Optical logic elements; Optical bistable devices [1, 5, 2006.01]

3/02 • Optical bistable devices **[5, 2006.01]**

7/00 Optical analogue/digital converters [1, 2006.01]

Note(s) [4]

This group covers only converters based in substantial manner on elements which are provided for in group G02F 1/00.