

# CPC COOPERATIVE PATENT CLASSIFICATION

## G PHYSICS (NOTES omitted)

### INSTRUMENTS

## G02 OPTICS (NOTE omitted)

## 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

### WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

Subject matter covered by these groups is classified in the following CPC groups:

[G02F 1/13357](#) covered by [G02F 1/1336](#) and subgroups

2. 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.

1/00	<p><b>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</b> (thermometers using change of colour or translucency <a href="#">G01K 11/12</a>; using changes in fluorescence <a href="#">G01K 11/32</a>; light guide devices <a href="#">G02B 6/00</a>; optical devices or arrangements using movable or deformable elements for controlling light independent of the light source <a href="#">G02B 26/00</a>; control of light in general <a href="#">G05D 25/00</a>; visible signalling systems <a href="#">G08B 5/00</a>; indicating arrangements for variable information by selection or combination of individual elements <a href="#">G09F 9/00</a>; control arrangements or circuits for visual indicators other than cathode-ray tubes <a href="#">G09G 3/00</a>; control of light sources <a href="#">H01S 3/10</a>, <a href="#">H05B 33/08</a>, <a href="#">H05B 35/00</a> – <a href="#">H05B 47/00</a> {; photochromic filters <a href="#">G02B 5/23</a>; optical logic elements <a href="#">G02F 3/00</a>))</p> <p><b>NOTE</b></p> <p>This group <u>covers</u> only :</p> <ul style="list-style-type: none"><li>• 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;</li><li>• 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;</li></ul>	<ul style="list-style-type: none"><li>• control of light by electromagnetic waves, e.g. radio waves, or by electrons or other elementary particles.</li></ul>
	<p>1/0009</p> <ul style="list-style-type: none"><li>• {Materials therefor}</li></ul> <p><b>NOTE</b></p> <p><a href="#">G02F 1/0009</a> and subgroups contain mostly non-patent literature</p>	
	<p>1/0018</p> <ul style="list-style-type: none"><li>• . {Electro-optical materials}</li></ul>	
	<p>1/0027</p> <ul style="list-style-type: none"><li>• . . {with ferro-electric properties (domain inversion in ferro-electric materials <a href="#">G02F 1/3558</a>; ferro-electric materials in general <a href="#">H01G 7/02</a>)}</li></ul>	
	<p>1/0036</p> <ul style="list-style-type: none"><li>• . {Magneto-optical materials (magnetic materials in general <a href="#">H01F</a>)}</li></ul>	
	<p>1/0045</p> <ul style="list-style-type: none"><li>• . {Liquid crystals as far as the physical properties are concerned (chemical composition and properties of liquid crystals <a href="#">C09K 19/00</a>)}</li></ul>	
	<p>1/0054</p> <ul style="list-style-type: none"><li>• . {Structure, phase transitions, NMR, ESR, Moessbauer spectra}</li></ul>	
	<p>1/0063</p> <ul style="list-style-type: none"><li>• . {Optical properties, e.g. absorption, reflection, non-linear effects, birefringence (non linear optics in general <a href="#">G02F 1/35</a>)}</li></ul>	
	<p>1/0072</p> <ul style="list-style-type: none"><li>• . {Mechanical, acoustic, electro-elastic, magneto-elastic properties}</li></ul>	
	<p>1/0081</p> <ul style="list-style-type: none"><li>• . {Electric or magnetic properties}</li></ul>	
	<p>1/009</p> <ul style="list-style-type: none"><li>• . {Thermal properties (thermometers using change of colour or translucency <a href="#">G01K 11/12</a>; radiation pyrometry <a href="#">G01J 5/00</a>)}</li></ul>	

1/01	<ul style="list-style-type: none"> <li>for the control of the intensity, phase, polarisation or colour (<a href="#">G02F 1/29</a>, <a href="#">G02F 1/35</a> take precedence)</li> </ul> <p><b>WARNING</b></p> <p>Group <a href="#">G02F 1/01</a> is impacted by reclassification into groups <a href="#">G02F 1/165</a>, <a href="#">G02F 1/166</a>, <a href="#">G02F 1/1673</a>, and <a href="#">G02F 1/169</a>.</p> <p>All groups listed in this Warning should be considered in order to perform a complete search.</p>	2001/0151	<ul style="list-style-type: none"> <li>{modulating the refractive index}</li> </ul>
		2001/0152	<ul style="list-style-type: none"> <li>{by free carrier effects (Plasma)}</li> </ul>
		2001/0153	<ul style="list-style-type: none"> <li>{by electro-refraction (Kramers-Kronig relation)}</li> </ul>
		2001/0154	<ul style="list-style-type: none"> <li>{by electro-optic effects (LEO=Pockels, QEO=Kerr)}</li> </ul>
		2001/0155	<ul style="list-style-type: none"> <li>{modulating the optical absorption}</li> </ul>
		2001/0156	<ul style="list-style-type: none"> <li>{by free carrier absorption}</li> </ul>
		2001/0157	<ul style="list-style-type: none"> <li>{by electro-absorption effects (FK, Stark, QCSE)}</li> </ul>
		2001/0158	<ul style="list-style-type: none"> <li>{with blue-shift of the absorption band}</li> </ul>
		2001/0159	<ul style="list-style-type: none"> <li>{with red-shift of the absorption band}</li> </ul>
1/0102	<ul style="list-style-type: none"> <li>{Constructional details (<a href="#">G02F 1/1306</a>, <a href="#">G02F 1/133</a> take precedence)}</li> </ul>	1/017	<ul style="list-style-type: none"> <li>Structures with periodic or quasi periodic potential variation, e.g. superlattices, quantum wells</li> </ul>
1/0105	<ul style="list-style-type: none"> <li>{Illumination devices (for liquid crystal cells <a href="#">G02F1/13357</a>; for display devices for electronic time pieces <a href="#">G04G 9/0041</a>)}</li> </ul>	1/01708	<ul style="list-style-type: none"> <li>{in an optical waveguide structure}</li> </ul>
1/0107	<ul style="list-style-type: none"> <li>{Gaskets, spacers, sealing of the cell; Filling and closing of the cell (for liquid crystal cells <a href="#">G02F 1/1339</a>, <a href="#">G02F 1/1341</a>; for electrochromic or electrolytic cells <a href="#">G02F 1/161</a>)}</li> </ul>	1/01716	<ul style="list-style-type: none"> <li>{Optically controlled superlattice or quantum well devices}</li> </ul>
1/011	<ul style="list-style-type: none"> <li>{in optical waveguides (<a href="#">G02F 1/0134</a>, <a href="#">G02F 1/01708</a>, <a href="#">G02F 1/025</a>, <a href="#">G02F 1/035</a>, <a href="#">G02F 1/0508</a>, <a href="#">G02F 1/0553</a>, <a href="#">G02F 1/065</a>, <a href="#">G02F 1/073</a>, <a href="#">G02F 1/095</a>, <a href="#">G02F 1/125</a>, <a href="#">G02F 1/1326</a>, <a href="#">G02F 1/225</a> take precedence; optical waveguides in general <a href="#">G02B 6/00</a>)}</li> </ul>	1/01725	<ul style="list-style-type: none"> <li>{with a non-rectangular quantum well structure, e.g. coupled, graded, stepped quantum wells}</li> </ul>
2001/0113	<ul style="list-style-type: none"> <li>{made of glass, e.g. silica-based optical waveguides}</li> </ul>	2001/01733	<ul style="list-style-type: none"> <li>{Coupled or double quantum wells}</li> </ul>
1/0115	<ul style="list-style-type: none"> <li>{in optical fibres}</li> </ul>	2001/01741	<ul style="list-style-type: none"> <li>{Asymmetrically coupled or double quantum wells}</li> </ul>
1/0118	<ul style="list-style-type: none"> <li>{by controlling the evanescent coupling of light from a fibre into an active, e.g. electro-optic, overlay}</li> </ul>	2001/0175	<ul style="list-style-type: none"> <li>{with a spatially varied well profile, e.g. graded, stepped quantum wells}</li> </ul>
1/0121	<ul style="list-style-type: none"> <li>{Operation of the device; Circuit arrangements not otherwise provided for (<a href="#">G02F 1/0327</a>, <a href="#">G02F 1/0516</a>, <a href="#">G02F 1/076</a>, <a href="#">G02F 1/092</a>, <a href="#">G02F 1/113</a>, <a href="#">G02F 1/13306</a>, <a href="#">G02F 1/163</a> take precedence)}</li> </ul>	2001/01758	<ul style="list-style-type: none"> <li>{with an asymmetric well profile, e.g. asymmetrically stepped quantum wells}</li> </ul>
1/0123	<ul style="list-style-type: none"> <li>{Circuits for the control or stabilisation of the bias voltage, e.g. automatic bias control [ABC] feedback loops}</li> </ul>	2001/01766	<ul style="list-style-type: none"> <li>{Strained superlattice or quantum well devices}</li> </ul>
1/0126	<ul style="list-style-type: none"> <li>{by another light beam, i.e. opto-optical modulation (<a href="#">G02F 1/01716</a>, <a href="#">G02F 1/0338</a>, <a href="#">G02F 1/0533</a>, <a href="#">G02F 1/0541</a>, <a href="#">G02F 1/0558</a>, <a href="#">G02F 1/135</a>, <a href="#">G02F 1/293</a> take precedence)}</li> </ul>	2001/01775	<ul style="list-style-type: none"> <li>{involving an intersubband transition in one well, e.g. e1-&gt;e2}</li> </ul>
1/0128	<ul style="list-style-type: none"> <li>{based on electro-mechanical, magneto-mechanical, elasto-optic effects}</li> </ul>	2001/01783	<ul style="list-style-type: none"> <li>{Quantum wire}</li> </ul>
1/0131	<ul style="list-style-type: none"> <li>{based on elasto-optic, i.e. photoelastic effect, e.g. mechanically induced birefringence (acousto-optic devices <a href="#">G02F 1/11</a>)}</li> </ul>	2001/01791	<ul style="list-style-type: none"> <li>{Quantum box or dot}</li> </ul>
1/0134	<ul style="list-style-type: none"> <li>{in optical waveguides}</li> </ul>	1/025	<ul style="list-style-type: none"> <li>in an optical waveguide structure (<a href="#">G02F 1/017</a>, <a href="#">G02F 1/2257</a> take precedence)</li> </ul>
1/0136	<ul style="list-style-type: none"> <li>{for the control of polarisation, e.g. state of polarisation [SOP] control, polarisation scrambling, TE-TM mode conversion or separation (<a href="#">G02F 1/0353</a> takes precedence)}</li> </ul>	1/03	<ul style="list-style-type: none"> <li>based on ceramics or electro-optical crystals, e.g. exhibiting Pockels effect or Kerr effect (<a href="#">G02F 1/061</a> takes precedence)</li> </ul>
2001/0139	<ul style="list-style-type: none"> <li>{Polarisation scrambling; Depolarisers}</li> </ul>	1/0305	<ul style="list-style-type: none"> <li>{Constructional arrangements (<a href="#">G02F 1/0327</a> - <a href="#">G02F 1/05</a> take precedence)}</li> </ul>
2001/0142	<ul style="list-style-type: none"> <li>{TE-TM mode conversion}</li> </ul>	1/0311	<ul style="list-style-type: none"> <li>{Structural association of optical elements, e.g. lenses, polarizers, phase plates, with the crystal}</li> </ul>
2001/0144	<ul style="list-style-type: none"> <li>{TE-TM mode separation}</li> </ul>	1/0316	<ul style="list-style-type: none"> <li>{Electrodes}</li> </ul>
1/0147	<ul style="list-style-type: none"> <li>{based on thermo-optic effects (<a href="#">G02F 1/132</a> takes precedence; tenebrescent compositions <a href="#">C09K 9/00</a>; radiation pyrometry <a href="#">G01J 5/00</a>; thermometers using change of colour or translucency <a href="#">G01K 11/12</a>)}</li> </ul>	1/0322	<ul style="list-style-type: none"> <li>{Arrangements comprising two or more independently controlled crystals}</li> </ul>
1/015	<ul style="list-style-type: none"> <li>based on semiconductor elements with at least one potential jump barrier, e.g. PN, PIN junction (<a href="#">G02F 1/03</a> takes precedence)</li> </ul>	1/0327	<ul style="list-style-type: none"> <li>{Operation of the cell; Circuit arrangements (<a href="#">G02F 1/05</a> takes precedence)}</li> </ul>
		1/0333	<ul style="list-style-type: none"> <li>{addressed by a beam of charged particles, e.g. directed to an adjacent layer exhibiting secondary emission or bombardment-induced conductivity effect (<a href="#">G02F 1/05</a> takes precedence; electrography, electrophotography <a href="#">G03G</a>; screens for cathode ray tubes acting as light valves <a href="#">H01J 29/12</a>)}</li> </ul>
		1/0338	<ul style="list-style-type: none"> <li>{structurally associated with a photoconductive layer or having photo-refractive properties (<a href="#">G02F 1/05</a> takes precedence)}</li> </ul>
		1/0344	<ul style="list-style-type: none"> <li>{controlled by a high-frequency electromagnetic wave component in an electric waveguide (<a href="#">G02F 1/0356</a>, <a href="#">G02F 1/05</a>, <a href="#">G02F 1/2255</a>, <a href="#">G02F 1/3134</a> take precedence)}</li> </ul>
		1/035	<ul style="list-style-type: none"> <li>in an optical waveguide structure</li> </ul>

1/0353	. . . . {involving an electro-optic TE-TM mode conversion}	1/125	. . . . in an optical waveguide structure
1/0356	. . . . {controlled by a high-frequency electromagnetic wave component in an electric waveguide structure}	1/13	. . . . based on liquid crystals, e.g. single liquid crystal display cells
1/05	. . . . with ferro-electric properties ( <a href="#">G02F 1/035</a> , <a href="#">G02F 1/055</a> take precedence)	1/1303	. . . . {Apparatus specially adapted to the manufacture of LCDs}
1/0508	. . . . {specially adapted for gating or modulating in optical waveguides}	1/1306	. . . . {Details}
1/0516	. . . . {Operation of the cell; Circuit arrangements}	1/1309	. . . . {Repairing; Testing (testing of optical apparatus <a href="#">G01M 11/00</a> ; electronic testing of displays or display drivers, e.g. of LCDs, <a href="#">G09G 3/006</a> )}
1/0525	. . . . {addressed by a beam of charged particles, e.g. directed to an adjacent layer exhibiting secondary emission or bombardment-induced conductivity effect (electrography, electrophotography <a href="#">G03G</a> ; screens for cathode-ray tubes acting as light valves <a href="#">H01J 29/12</a> )}	1/1313	. . . . {specially adapted for a particular application}
1/0533	. . . . {structurally associated with a photo-conductive layer}	2001/1316	. . . . {Cleaning methods or materials for cleaning part of liquid crystal cell components during the manufacturing process}
1/0541	. . . . {using photo-refractive effects (holography <a href="#">G03H</a> ; electro-optical digital static stores using an interference pattern <a href="#">G11C 13/044</a> )}	1/132	. . . . {Thermal activation of liquid crystals exhibiting a thermo-optic effect (thermometers using change of colour or translucency of liquid crystals <a href="#">G01K 11/165</a> ; thermally addressed liquid crystal elements in a matrix <a href="#">G09G 3/3603</a> )}
1/055	. . . . the active material being a ceramic ( <a href="#">G02F 1/035</a> takes precedence)	1/1323	. . . . {Arrangements for providing a switchable viewing angle}
1/0551	. . . . {Constructional details}	1/1326	. . . . {Liquid crystal optical waveguides or liquid crystal cells specially adapted for gating or modulating between optical waveguides}
1/0553	. . . . {specially adapted for gating or modulating in optical waveguides}	1/133	. . . . Constructional arrangements; Operation of liquid crystal cells; Circuit arrangements (arrangements or circuits for control of liquid crystal elements in a {segment display or a} matrix, not structurally associated with these elements, {respectively <a href="#">G09G 3/18</a> and } <a href="#">G09G 3/36</a> )}
1/0555	. . . . {Operation of the cell; Circuit arrangements}	1/13306	. . . . {Circuit arrangements or driving methods for the control of single liquid crystal cells ( <a href="#">G02F 1/132</a> , <a href="#">G02F 1/133382</a> take precedence)}
1/0556	. . . . {specially adapted for a particular application}	2001/13312	. . . . {Circuits comprising a photodetector not for feedback}
1/0558	. . . . {structurally associated with a photoconductive layer or exhibiting photo-refractive properties}	1/13318	. . . . {Circuits comprising a photodetector}
1/061	. . . . based on electro-optical organic material ( <a href="#">G02F 1/07</a> , { <a href="#">G02F 1/13</a> } take precedence)	2001/13324	. . . . {Circuits comprising a solar cell}
1/065	. . . . in an optical waveguide structure	1/1333	. . . . Constructional arrangements; {Manufacturing methods} ( <a href="#">G02F 1/135</a> , <a href="#">G02F 1/136</a> take precedence)
1/07	. . . . based on electro-optical liquids exhibiting Kerr effect	2001/133302	. . . . {rigid substrate, e.g. inorganic}
1/073	. . . . {specially adapted for gating or modulating in optical waveguides}	1/133305	. . . . {Flexible substrates, e.g. plastics, organic film}
1/076	. . . . {Operation of the cell; Circuit arrangements}	1/133308	. . . . {LCD panel immediate support structure, e.g. front and back frame or bezel}
1/09	. . . . based on magneto-optical elements, e.g. exhibiting Faraday effect	2001/133311	. . . . {Environmental protection, e.g. dust, humidity}
1/091	. . . . {based on magneto-absorption or magneto-reflection}	2001/133314	. . . . {Back frame}
1/092	. . . . {Operation of the cell; Circuit arrangements}	2001/133317	. . . . {Intermediate frame, e.g. between backlight housing and front frame}
1/093	. . . . {used as non-reciprocal devices, e.g. optical isolators, circulators ( <a href="#">G02F 1/0955</a> takes precedence)}	2001/13332	. . . . {Front frame}
2001/094	. . . . {Based on magnetophoretic effect}	2001/133322	. . . . {Mechanical guiding and alignment of LCD panel support components}
1/095	. . . . in an optical waveguide structure	2001/133325	. . . . {Method of assembling ( <a href="#">G02F 2201/465</a> takes precedence)}
1/0955	. . . . {used as non-reciprocal devices, e.g. optical isolators, circulators}	2001/133328	. . . . {Segmented frame}
1/11	. . . . based on acousto-optical elements, e.g. using variable diffraction by sound or like mechanical waves ({elasto-optic effect without wave propagation <a href="#">G02F 1/0131</a> ; } acousto-optical deflection <a href="#">G02F 1/33</a> )}	2001/133331	. . . . {Cover glass}
1/113	. . . . {Circuit or control arrangements}	2001/133334	. . . . {Electromagnetic shield}
1/116	. . . . {using an optically anisotropic medium, wherein the incident and the diffracted light waves have different polarizations, e.g. acousto-optic tunable filter [AOTF] ( <a href="#">G02F 1/125</a> takes precedence)}	2001/133337	. . . . {Ion-diffusion preventing or absorbing layer}

1/13334 . . . . .	{Plasma addressed liquid crystal cells [PALC] ( <a href="#">plasma panels H01J 17/49</a> )}	1/133504 . . . . .	{Diffusing, scattering, diffracting elements ( <a href="#">associated to illuminating devices G02F 1/133606</a> )}
2001/133342 . . . . .	{for double side displays}	2001/133507 . . . . .	{Luminance enhancement films}
1/133345 . . . . .	{Insulating layers ( <a href="#">G02F 1/1335</a> , <a href="#">G02F 1/1337</a> , <a href="#">G02F 1/135</a> , <a href="#">G02F 1/136</a> take precedence)}	1/133509 . . . . .	{Filters, e.g. light shielding masks ( <a href="#">optical filters G02B 5/20</a> )}
1/133348 . . . . .	{Charged-particles, e.g. electron-beam, addressed liquid crystals cells ( <a href="#">screen for cathode ray tubes acting as light valves H01J 29/12</a> ; <a href="#">electrography, electrophotography G03G</a> )}	1/133512 . . . . .	{Light shielding layers, e.g. black matrix ( <a href="#">G02F 1/136209</a> takes precedence)}
1/133351 . . . . .	{Manufacturing of individual cells out of a plurality of cells, e.g. by dicing}	1/133514 . . . . .	{Colour filters ( <a href="#">luminescent elements G02F 1/133617</a> )}
2001/133354 . . . . .	{Arrangements for aligning or assembling the substrates}	1/133516 . . . . .	{Methods of making thereof, e.g. printing, electro-deposition, photolithography ( <a href="#">photomechanical production of textured or patterned surfaces G03F</a> )}
2001/133357 . . . . .	{Planarisation layer}	2001/133519 . . . . .	{overcoating}
1/13336 . . . . .	{Combining plural substrates to produce large-area displays, e.g. tiled displays}	2001/133521 . . . . .	{Interference filters}
1/133362 . . . . .	{Optically addressed liquid crystal cells ( <a href="#">G02F 1/135</a> takes precedence)}	1/133524 . . . . .	{Light-guides, e.g. fibre-optic bundles, louvered or jalousie light-guides}
1/133365 . . . . .	{Cells in which the active layer comprises a liquid crystalline polymer ( <a href="#">liquid crystalline polymers in general C09K 19/38</a> )}	1/133526 . . . . .	{Lenses, e.g. microlenses, Fresnel lenses ( <a href="#">lenses in general G02B 3/00</a> )}
2001/133368 . . . . .	{cell having two substrates with different characteristic, e.g. hickness or material}	1/133528 . . . . .	{Polarisers ( <a href="#">polarisers per se G02B 5/30</a> )}
1/133371 . . . . .	{Cells with varying thickness of the liquid crystal layer}	2001/133531 . . . . .	{Special arrangement of polariser or analyser axes}
2001/133374 . . . . .	{for displaying permanent signs or marks}	1/133533 . . . . .	{Colour selective polarisers ( <a href="#">G02F 1/1347</a> takes precedence)}
1/133377 . . . . .	{Cells with plural compartments or having plurality of liquid crystal microcells partitioned by walls, e.g. one microcell per pixel}	1/133536 . . . . .	{Reflective polarizers ( <a href="#">G02F 1/13362</a> takes precedence)}
1/13338 . . . . .	{Input devices, e.g. touch-panels ( <a href="#">specially adapted as input devices to computers G06F 3/033</a> ; <a href="#">touch-panels per se G06K 11/06</a> , <a href="#">keyboard switches per se H01H 13/70</a> )}	2001/133538 . . . . .	{with a spatial distribution of the polarisation direction}
1/133382 . . . . .	{Heating or cooling of liquid crystal cells other than for activation, e.g. circuits or arrangements for temperature control, stabilisation or uniform distribution over the cell}	2001/133541 . . . . .	{Circular polarisers}
1/133385 . . . . .	{with cooling means, e.g. fans}	2001/133543 . . . . .	{Cholesteric polarisers}
2001/133388 . . . . .	{Constructional difference between the display region and the peripheral region}	2001/133545 . . . . .	{Dielectric stack polarisers}
2001/133391 . . . . .	{Constructional arrangement for sub-divided displays}	2001/133548 . . . . .	{Wire-grid polarisers}
2001/133394 . . . . .	{Piezoelectric element associated with the cell}	2001/13355 . . . . .	{Polarising beam splitters [PBS]}
2001/133397 . . . . .	{for suppressing after-image or image-sticking}	1/133553 . . . . .	{Reflecting elements ( <a href="#">associated to illuminating devices G02F 1/133605</a> )}
1/1334 . . . . .	based on polymer dispersed liquid crystals, e.g. microencapsulated liquid crystals ( <a href="#">compositions C09K 19/544</a> )}	1/133555 . . . . .	{Transflectors}
1/13342 . . . . .	{Holographic polymer dispersed liquid crystals}	2001/133557 . . . . .	{Half-mirror}
2001/13345 . . . . .	{Network or three-dimensional gel}	2001/13356 . . . . .	{Particular location of the optical element}
2001/13347 . . . . .	{Reverse mode, i.e. clear in the off-state and scattering in the on-state}	2001/133562 . . . . .	{on the viewer side}
1/1335 . . . . .	Structural association of cells with optical devices, e.g. polarisers or reflectors	2001/133565 . . . . .	{inside the LC element, i.e. between the cell substrates}
1/133502 . . . . .	{Antiglare, refractive index matching layers}	2001/133567 . . . . .	{on the back side}
		1/1336 . . . . .	{Illuminating devices ( <a href="#">in general F21V</a> ; <a href="#">associated with display devices for electronic watches G04G 9/0041</a> )}
		2001/133601 . . . . .	{for spatial active dimming}
		1/133602 . . . . .	{Direct backlight}
		1/133603 . . . . .	{with LEDs}
		1/133604 . . . . .	{with lamps}
		1/133605 . . . . .	{including specially adapted reflectors}
		1/133606 . . . . .	{including a specially adapted diffusing, scattering or light controlling members}
		2001/133607 . . . . .	{the light controlling member including light directing or refracting elements, e.g. prisms or lenses}



1/133608 . . . . .	{including particular frames or supporting means}	1/133707 . . . . .	{Structures for producing distorted electric fields, e.g. bumps, protrusions, recesses, slits in pixel electrodes}
1/133609 . . . . .	{including means for improving the color mixing, e.g. white}	1/133711 . . . . .	{by organic films, e.g. polymeric films}
1/133611 . . . . .	{including means for improving the brightness uniformity}	2001/133715 . . . . .	{by first depositing a monomer}
2001/133612 . . . . .	{Electrical details}	1/133719 . . . . .	{with coupling agent molecules, e.g. silane}
2001/133613 . . . . .	{including a particular sequence of light sources}	1/133723 . . . . .	{Polyimide, polyamide-imide}
2001/133614 . . . . .	{the light is generated by photoluminescence, e.g. a phosphor is illuminated by UV or blue light}	2001/133726 . . . . .	{made of a mesogenic material}
1/133615 . . . . .	{Edge-illuminating devices, i.e. illuminating from the side ( <a href="#">G02B 6/0001</a> takes precedence)}	2001/13373 . . . . .	{Disclination line; Reverse tilt}
2001/133616 . . . . .	{Front illuminating devices}	1/133734 . . . . .	{by obliquely evaporated films, e.g. Si or SiO <sub>2</sub> films}
1/133617 . . . . .	{Illumination with ultra-violet light; Luminescent elements or materials associated to the cell}	2001/133738 . . . . .	{for homogeneous alignment}
2001/133618 . . . . .	{for ambient light}	2001/133742 . . . . .	{for homeotropic alignment}
1/13362 . . . . .	{providing polarisation light, e.g. by converting a polarisation component into another one ( <a href="#">optical systems for polarising G02B 27/28</a> )}	2001/133746 . . . . .	{for high pretilt angle, i.e. > 15 degrees}
1/133621 . . . . .	{providing coloured light ( <a href="#">G02F 1/133617</a> , <a href="#">G02F 1/133533</a> take precedence)}	2001/133749 . . . . .	{for low pretilt angle, i.e. < 15 degrees}
2001/133622 . . . . .	{colour sequential illumination}	1/133753 . . . . .	{with different alignment orientations or pretilt angles on a same surface, e.g. for grey scale or improved viewing angle}
2001/133623 . . . . .	{Inclined coloured light beams}	2001/133757 . . . . .	{with different alignment orientations}
2001/133624 . . . . .	{having a particular spectral emission}	2001/133761 . . . . .	{with different pretilt angles}
2001/133625 . . . . .	{Electron stream lamps}	2001/133765 . . . . .	{without a surface treatment}
2001/133626 . . . . .	{providing two modes of illumination, e.g. day-night}	2001/133769 . . . . .	{comprising an active, e.g. switchable alignment layer}
2001/133627 . . . . .	{Projection-direct viewing}	2001/133773 . . . . .	{The alignment material or treatment is different for the two opposite substrates}
2001/133628 . . . . .	{with cooling means}	2001/133776 . . . . .	{having structures, i.e. unevenness locally influencing the alignment}
1/13363 . . . . .	Birefringent elements, e.g. for optical compensation	1/13378 . . . . .	{by treatment of the surface, e.g. embossing, rubbing, light irradiation ( <a href="#">G02F 1/133711</a> , <a href="#">G02F 1/133734</a> , <a href="#">G02F 1/133753</a> take precedence)}
2001/133631 . . . . .	{with a spatial distribution of the retardation value}	1/133784 . . . . .	{by rubbing}
1/133632 . . . . .	{with refractive index ellipsoid inclined relative to the LC-layer surface}	1/133788 . . . . .	{by light irradiation, e.g. linearly polarised light photo-polymerisation}
2001/133633 . . . . .	{using mesogenic materials}	2001/133792 . . . . .	{by etching}
1/133634 . . . . .	{the refractive index Nz perpendicular to the element surface being different from in-plane refractive indices Nx and Ny, e.g. biaxial or with normal optical axis}	2001/133796 . . . . .	{having conducting property}
2001/133635 . . . . .	{Multifunctional compensators}	1/1339 . . . . .	Gaskets; Spacers; Sealing of cells
1/133636 . . . . .	{with twisted orientation, e.g. comprising helically oriented LC-molecules or a plurality of twisted birefringent sublayers}	1/13392 . . . . .	{spacers dispersed on the cell substrate, e.g. spherical particles, microfibres}
2001/133637 . . . . .	{characterized by the wavelength dispersion}	1/13394 . . . . .	{spacers regularly patterned on the cell substrate, e.g. walls, pillars ( <a href="#">G02F 1/133377</a> takes precedence)}
2001/133638 . . . . .	{Waveplates, i.e. plates with a retardation value of $\lambda/2$ }	2001/13396 . . . . .	{Spacers having different sizes}
1/1337 . . . . .	Surface-induced orientation of the liquid crystal molecules, e.g. by alignment layers	2001/13398 . . . . .	{Materials and properties of the spacer}
1/133703 . . . . .	{by introducing organic surfactant additives into the liquid crystal material ( <a href="#">C09K 19/56</a> takes precedence)}	1/1341 . . . . .	Filling or closing of cells
		2001/13415 . . . . .	{Drop filling process}
		1/1343 . . . . .	Electrodes ( <a href="#">reflective electrodes G02F 1/133553</a> )
		1/134309 . . . . .	{characterised by their geometrical arrangement ( <a href="#">G09F 9/302</a> takes precedence)}
		2001/134318 . . . . .	{having a patterned common electrode}
		1/134327 . . . . .	{Segmented, e.g. alpha numeric display}
		1/134336 . . . . .	{Matrix}
		2001/134345 . . . . .	{Subdivided pixels, e.g. grey scale, redundancy}
		2001/134354 . . . . .	{the sub-pixels being capacitively coupled}

1/134363 . . . . .	{for applying an electric field parallel to the substrate, i.e. in-plane switching [IPS]}	1/1362 . . . . .	Active matrix addressed cells {(G02F 1/134336, G02F 1/134363 take precedence)}
2001/134372 . . . . .	{for fringe field switching [FFS] where the common electrode is not patterned, e.g. planar}	1/136204 . . . . .	{Arrangements to prevent high voltage or static electricity failures}
2001/134381 . . . . .	{Hybrid switching mode, i.e. for applying an electric field both parallel and orthogonal to the substrates}	1/136209 . . . . .	{Light shielding layers, e.g. black matrix, incorporated in the active matrix substrate, e.g. structurally associated with the switching element}
1/13439 . . . . .	{characterised by their electrical, optical, physical properties; materials therefor; method of making}	1/136213 . . . . .	{Storage capacitors associated with the pixel electrode}
1/1345 . . . . .	Conductors connecting electrodes to cell terminals	2001/136218 . . . . .	{Shield electrode}
1/13452 . . . . .	{Conductors connecting driver circuitry and terminals of panels (H01L 21/00 takes precedence; electrical details inside the cell G02F 1/133;)}	2001/136222 . . . . .	{Color filter incorporated in the active matrix substrate}
1/13454 . . . . .	{Drivers integrated on the active matrix substrate (G02F 1/136277 takes precedence)}	1/136227 . . . . .	{Through-hole connection of the pixel electrode to the active element through an insulation layer}
2001/13456 . . . . .	{cell terminals on one side of the display only}	2001/136231 . . . . .	{for reducing the number of lithographic steps}
1/13458 . . . . .	{Terminal pads}	2001/136236 . . . . .	{using a gray or half tone lithographic process}
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	1/13624 . . . . .	{having more than one switching element per pixel}
1/13471 . . . . .	{in which all the liquid crystal cells or layers remain transparent, e.g. FLC, ECB, DAP, HAN, TN, STN, SBE-LC cells (G02F 1/13475 takes precedence)}	2001/136245 . . . . .	{having complementary transistors}
1/13473 . . . . .	{for wavelength filtering or for colour display without the use of colour mosaic filters}	2001/13625 . . . . .	{Patterning using a multi-mask exposure}
1/13475 . . . . .	{in which at least one liquid crystal cell or layer is doped with a pleochroic dye, e.g. GH-LC cell (G02F 1/13476 takes precedence)}	2001/136254 . . . . .	{Checking; Testing}
1/13476 . . . . .	{in which at least one liquid crystal cell or layer assumes a scattering state}	1/136259 . . . . .	{Repairing; Defects}
2001/13478 . . . . .	{based on selective reflection}	2001/136263 . . . . .	{Line defect}
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 {(G02F 1/133348 takes precedence)}	2001/136268 . . . . .	{Switch defect}
2001/1351 . . . . .	{light-absorbing or blocking layer}	2001/136272 . . . . .	{Auxiliary line}
2001/1352 . . . . .	{light-reflecting layer}	1/136277 . . . . .	{formed on a semiconductor substrate, e.g. silicon}
1/1354 . . . . .	{having a particular photoconducting structure or material}	2001/136281 . . . . .	{having a transmissive semiconductor substrate}
2001/1355 . . . . .	{material or manufacturing process thereof}	1/136286 . . . . .	{Wiring, e.g. gate line, drain line}
2001/1357 . . . . .	{electrode structure}	2001/13629 . . . . .	{Multi-layer wirings}
1/1358 . . . . .	{the supplementary layer being a ferro-electric layer}	2001/136295 . . . . .	{Materials; Compositions; Methods of manufacturing}
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)	1/1365 . . . . .	in which the switching element is a two-electrode device {(G02F 1/136277 takes precedence)}
2001/13606 . . . . .	{having means for reducing parasitic capacitance}	1/1368 . . . . .	in which the switching element is a three-electrode device {(G02F 1/136277 takes precedence)}
2001/13613 . . . . .	{the semiconductor element is formed on a first substrate and thereafter transferred to the final cell substrate}	2001/13685 . . . . .	{Top gate}
		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
		2001/13706 . . . . .	{the LC having positive dielectric anisotropy}
		2001/13712 . . . . .	{the LC having negative dielectric anisotropy}
		1/13718 . . . . .	{based on a change of the texture state of a cholesteric liquid crystal}
		1/13725 . . . . .	{based on guest-host interaction (G02F 1/13762, G02F 1/13737, take precedence)}
		1/13731 . . . . .	{based on a field-induced phase transition (G02F 1/13781 takes precedence)}
		1/13737 . . . . .	{in liquid crystals doped with a pleochroic dye}

- 1/13743 . . . . {based on electrohydrodynamic instabilities or domain formation in liquid crystals}
- 1/1375 . . . . {using dynamic scattering}
- 2001/13756 . . . . {the liquid crystal selectively assuming a light-scattering state ([G02F 1/1334](#), [G02F 1/13718](#) take precedence)}
- 1/13762 . . . . {containing luminescent or electroluminescent additives (luminescent materials in general [C09K 11/00](#); compositions of liquid crystals comprising additives [C09K 19/52](#) - [C09K 19/603](#); electroluminescent light sources [H05B 33/00](#))}
- 1/13768 . . . . {based on magneto-optical effects}
- 2001/13775 . . . . {Polymer stabilized liquid crystal layers}
- 1/13781 . . . . {using smectic liquid crystals ([G02F 1/141](#) takes precedence)}
- 2001/13787 . . . . {Hybrid alignment cells ([G02F 1/1393](#) takes precedence)}
- 2001/13793 . . . . {Blue phases}
- 1/139 . . . . based on orientation effects in which the liquid crystal remains transparent
- 1/1391 . . . . {Bistable or multi-stable liquid crystal cells ([G02F 1/141](#) takes precedence)}
- 1/1392 . . . . {using a field-induced sign-reversal of the dielectric anisotropy}
- 1/1393 . . . . {the birefringence of the liquid crystal being electrically controlled, e.g. ECB-, DAP-, HAN-, PI-LC cells ([G02F 1/1396](#), [G02F 1/141](#) take precedence)}
- 1/1395 . . . . {Optically compensated birefringence [OCB]- cells or PI- cells}
- 1/1396 . . . . {the liquid crystal being selectively controlled between a twisted state and a non-twisted state, e.g. TN-LC cell ([G02F 1/141](#) takes precedence)}
- 1/1397 . . . . {the twist being substantially higher than 90°, e.g. STN-, SBE-, OMI-LC cells}
- 2001/1398 . . . . {the twist being below 90°C}
- 1/141 . . . . using ferroelectric liquid crystals
- 2001/1412 . . . . {Antiferroelectric liquid crystals}
- 2001/1414 . . . . {Deformed helix ferroelectric [DHL]}
- 1/1416 . . . . {Details of the smectic layer structure, e.g. bookshelf, chevron, C1 and C2}
- 1/1418 . . . . {using smectic liquid crystals, e.g. based on the electroclinic effect}
- 1/15 . . . . based on an electrochromic effect
- WARNING**
- Group [G02F 1/15](#) is impacted by reclassification into groups [G02F 1/1514](#) and [G02F 1/1516](#).
- All groups listed in this Warning should be considered in order to perform a complete search.
- 2001/1502 . . . {complementary cell}
- 2001/15025 . . . {having an inorganic electrochromic layer and a second solid organic electrochromic layer}
- 1/1503 . . . caused by oxidation-reduction reactions in organic liquid solutions, e.g. viologen solutions
- 1/1506 . . . caused by electrodeposition, e.g. electrolytic deposition of an inorganic material on or close to an electrode
- 1/1508 . . . {using a solid electrolyte}
- 1/1514 . . . characterised by the electrochromic material, e.g. by the electrodeposited material
- WARNING**
- Group [G02F 1/1514](#) is incomplete pending reclassification of documents from group [G02F 1/15](#).
- Groups [G02F 1/15](#) and [G02F 1/1514](#) should be considered in order to perform a complete search.
- 2001/15145 . . . {the electrochromic layer comprises a mixture of anodic and cathodic compounds}
- 1/1516 . . . comprising organic material
- WARNING**
- Group [G02F 1/1516](#) is incomplete pending reclassification of documents from group [G02F 1/15](#).
- Groups [G02F 1/15](#) and [G02F 1/1516](#) should be considered in order to perform a complete search.
- 1/15165 . . . {Polymers}
- 2001/1517 . . . {Cyano complex compounds, e.g. Prussian blue}
- 2001/1518 . . . {Ferrocene compounds}
- 1/1523 . . . comprising inorganic material
- WARNING**
- Group [G02F 1/1523](#) is impacted by reclassification into group [G02F 1/1524](#).
- Groups [G02F 1/1523](#) and [G02F 1/1524](#) should be considered in order to perform a complete search.
- 1/1524 . . . Transition metal compounds
- WARNING**
- Group [G02F 1/1524](#) is incomplete pending reclassification of documents from group [G02F 1/1523](#).
- Groups [G02F 1/1523](#) and [G02F 1/1524](#) should be considered in order to perform a complete search.
- 1/15245 . . . {based on iridium oxide or hydroxide}
- 1/1525 . . . {characterised by a particular ion transporting layer, e.g. electrolyte}
- 1/153 . . . Constructional details
- 1/1533 . . . {structural features not otherwise provided for}
- 2001/1536 . . . {additional, e.g. protective, layer inside the cell}
- 1/155 . . . Electrodes
- 2001/1552 . . . {Inner electrode, e.g. the electrochromic layer being sandwiched between the inner electrode and the support substrate---- this group, now to be changed, should already been created by implementation of a previous DOC14 (prior to the one referred to above)----}

- 2001/1555 . . . . . {Counter electrode}
- 2001/1557 . . . . . {Side by side arrangements of working and counter electrodes}
- 1/157 . . . . . Structural association of cells with optical devices, e.g. reflectors or illuminating devices
- 1/161 . . . . . Gaskets; Spacers; Sealing of cells; Filling or closing of cells
- 1/163 . . . . . Operation of electrochromic cells, e.g. electrodeposition cells; Circuit arrangements therefor
- 2001/1635 . . . . . {the pixel comprises active switching elements, e.g. TFT}
- 2001/164 . . . . . {the electrolyte is made of polymers}
- 1/165 . . . . . based on translational movement of particles in a fluid under the influence of an applied field

**WARNING**

Group [G02F 1/165](#) is incomplete pending reclassification of documents from groups [G02F 1/01](#), [G02F 1/17](#), and [G02F 1/19](#).

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

- 1/166 . . . . . characterised by the electro-optical or magneto-optical effect

**WARNING**

Group [G02F 1/166](#) is incomplete pending reclassification of documents from group [G02F 1/01](#), [G02F 1/17](#), and [G02F 1/19](#).

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

- 1/167 . . . . . by electrophoresis

**WARNING**

Group [G02F 1/167](#) is impacted by reclassification into groups [G02F 1/1675](#), [G02F 1/16753](#), [G02F 1/16755](#), [G02F 1/16756](#), [G02F 1/16757](#), [G02F 1/1677](#), [G02F 1/1679](#), and [G02F 1/1685](#).

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

- 1/1671 . . . . . involving dry toners
- 1/1673 . . . . . by magnetophoresis

**WARNING**

Group [G02F 1/1673](#) is incomplete pending reclassification of documents from group [G02F 1/01](#), [G02F 1/17](#), and [G02F 1/19](#).

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

- 1/1675 . . . . . Constructional details

**WARNING**

Group [G02F 1/1675](#) is incomplete pending reclassification of documents from group [G02F 1/167](#), [G02F 1/17](#), and [G02F 1/19](#).

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

- 1/16753 . . . . . Structures for supporting or mounting cells, e.g. frames or bezels

**WARNING**

Group [G02F 1/16753](#) is incomplete pending reclassification of documents from group [G02F 1/167](#), [G02F 1/17](#), and [G02F 1/19](#).

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

- 1/16755 . . . . . Substrates

**WARNING**

Group [G02F 1/16755](#) is incomplete pending reclassification of documents from group [G02F 1/167](#), [G02F 1/17](#), and [G02F 1/19](#).

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

- 1/16756 . . . . . Insulating layers

**WARNING**

Group [G02F 1/16756](#) is incomplete pending reclassification of documents from group [G02F 1/167](#), [G02F 1/17](#), and [G02F 1/19](#).

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

- 1/16757 . . . . . Microcapsules

**WARNING**

Group [G02F 1/16757](#) is incomplete pending reclassification of documents from group [G02F 1/167](#), [G02F 1/17](#), and [G02F 1/19](#).

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

- 1/1676 . . . . . Electrodes

**WARNING**

Group [G02F 1/1676](#) is impacted by reclassification into groups [G02F 1/16761](#), [G02F 1/16762](#), and [G02F 1/16766](#).

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



- 1/16761 . . . . Side-by-side arrangement of working electrodes and counter-electrodes

**WARNING**

Group [G02F 1/16761](#) is incomplete pending reclassification of documents from group [G02F 1/1676](#).

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

- 1/16762 . . . . having three or more electrodes per pixel

**WARNING**

Group [G02F 1/16762](#) is incomplete pending reclassification of documents from group [G02F 1/1676](#).

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

- 1/16766 . . . . for active matrices

**WARNING**

Group [G02F 1/16766](#) is incomplete pending reclassification of documents from group [G02F 1/1676](#).

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

- 1/1677 . . . . Structural association of cells with optical devices, e.g. reflectors or illuminating devices

**WARNING**

Group [G02F 1/1677](#) is incomplete pending reclassification of documents from group [G02F 1/167](#), [G02F 1/17](#), and [G02F 1/19](#).

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

- 2001/1678 . . . . {characterised by the composition or particle type}

- 1/1679 . . . . Gaskets; Spacers; Sealing of cells; Filling or closing of cells

**WARNING**

Group [G02F 1/1679](#) is incomplete pending reclassification of documents from group [G02F 1/167](#), [G02F 1/17](#), and [G02F 1/19](#).

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

- 1/1681 . . . . having two or more microcells partitioned by walls, e.g. of microcup type

- 1/1685 . . . . Operation of cells; Circuit arrangements affecting the entire cell

**WARNING**

Group [G02F 1/1685](#) is incomplete pending reclassification of documents from group [G02F 1/167](#), [G02F 1/17](#), and [G02F 1/19](#).

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

- 1/169 . . . . based on orientable non-spherical particles having a common optical characteristic, e.g. suspended particles of reflective metal flakes

**WARNING**

Group [G02F 1/169](#) is incomplete pending reclassification of documents from groups [G02F 1/17](#) and [G02F 1/19](#).

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

- 1/17 . . . . based on variable-absorption elements not provided for in groups [G02F 1/015](#) - [G02F 1/169](#)

**WARNING**

Group [G02F 1/17](#) is impacted by reclassification into group [G02F 1/165](#), [G02F 1/166](#), [G02F 1/1673](#), [G02F 1/1675](#), [G02F 1/16753](#), [G02F 1/16755](#), [G02F 1/16756](#), [G02F 1/16757](#), [G02F 1/1677](#), [G02F 1/1679](#), [G02F 1/1685](#), [G02F 1/169](#).

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

- 1/172 . . . . {based on a suspension of orientable dipolar particles, e.g. suspended particles displays}

- 1/174 . . . . {based on absorption band-shift, e.g. Stark - or Franz-Keldysh effect ([G02F 1/015](#), [G02F 1/178](#) take precedence)}

- 1/176 . . . . {using acid- based indicators}

- 1/178 . . . . {based on pressure effects ([G02F 1/195](#) takes precedence)}

- 1/19 . . . . based on variable-reflection or variable-refraction elements not provided for in groups [G02F 1/015](#) - [G02F 1/169](#)

**WARNING**

Group [G02F 1/19](#) is impacted by reclassification into group [G02F 1/165](#), [G02F 1/166](#), [G02F 1/1673](#), [G02F 1/1675](#), [G02F 1/16753](#), [G02F 1/16755](#), [G02F 1/16756](#), [G02F 1/16757](#), [G02F 1/1677](#), [G02F 1/1679](#), [G02F 1/1685](#), [G02F 1/169](#).

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

- 1/195 . . . . {by using frustrated reflection (digital reflection using controlled total internal reflection [G02F 1/315](#))}

- 1/21 . . . . by interference

- 2001/211 . . . . {Sagnac type}

- 2001/212 . . . . {Mach-Zehnder type}

- 2001/213 . . . . {Fabry-Perot type}

- 2001/215 . . . . {Michelson type}

1/216	. . . {using liquid crystals, e.g. liquid crystal Fabry-Perot filters}	2001/3507	. . . {Arrangements comprising two or more nonlinear optical devices}
2001/217	. . . {Multi mode interference type}	2001/3509	. . . {Shape, e.g. shape of end face}
1/218	. . . {using semi-conducting materials}	1/3511	. . {Self-focusing or self-trapping of light; Light-induced birefringence; Induced optical Kerr-effect (photorefractive effects of electro-optic crystals <a href="#">G02F 1/0338</a> , <a href="#">G02F 1/0541</a> , of ceramics <a href="#">G02F 1/0558</a> ; opto-optical modulation <a href="#">G02F 1/0126</a> ; opto-optical deflection <a href="#">G02F 1/293</a> )}
1/225	. . . in an optical waveguide structure	1/3513	. . . {Soliton propagation}
1/2252	. . . . {in optical fibres}	1/3515	. . {All-optical modulation, gating, switching, e.g. control of a light beam by another light beam ( <a href="#">G02F 1/353</a> , <a href="#">G02F 1/37</a> , <a href="#">G02F 1/39</a> take precedence)}
1/2255	. . . . {controlled by a high-frequency electromagnetic component in an electric waveguide structure}	1/3517	. . . {using an interferometer}
1/2257	. . . . {the optical waveguides being made of semiconducting material}	1/3519	. . . . {of Sagnac type, i.e. nonlinear optical loop mirror [NOLM]}
1/23	. . for the control of the colour ( <a href="#">G02F 1/03</a> - <a href="#">G02F 1/21</a> take precedence)	1/3521	. . . {using a directional coupler}
1/25	. . . as to hue or predominant wavelength	1/3523	. . {Non-linear absorption changing by light, e.g. bleaching (laser Q-switching using bleachable media <a href="#">H01S 3/113</a> )}
1/29	. for the control of the position or the direction of light beams, i.e. deflection	1/3525	. . {Optical damage}
2001/291	. . {Two-dimensional analog deflection}	1/3526	. . {using two-photon emission or absorption processes (Raman effect <a href="#">H01S 3/30</a> )}
1/292	. . {by controlled diffraction or phased-array beam steering (controlled diffraction for optical switching <a href="#">G02F 1/31</a> )}	2001/3528	. . {for producing a supercontinuum}
1/293	. . {by another light beam, i.e. opto-optical deflection}	1/353	. . {Frequency conversion, i.e. wherein a light beam with frequency components different from those of the incident light beams is generated (second harmonic generation <a href="#">G02F 1/37</a> ; optical parametric generation or amplification <a href="#">G02F 1/39</a> ; transferring the modulation of modulated light <a href="#">G02F 2/004</a> ; optical pumping of a laser by another laser <a href="#">H01S 3/094</a> ; nonlinear optical devices inside a laser cavity <a href="#">H01S 3/108</a> )}
2001/294	. . {Variable focal length device}	1/3532	. . . {Arrangements of plural nonlinear devices for generating multi-colour light beams, e.g. arrangements of SHG, SFG, OPO devices for generating RGB light beams}
1/295	. . {Analog deflection from or} in an optical waveguide structure]	1/3534	. . . {Three-wave interaction, e.g. sum-difference frequency generation ( <a href="#">G02F 1/3532</a> takes precedence)}
1/2955	. . . {by controlled diffraction or phased-array beam steering (controlled diffraction for optical waveguide switching <a href="#">G02F 1/313</a> )}	1/3536	. . . {Four-wave interaction}
1/31	. . Digital deflection, {i.e. optical switching} ( <a href="#">G02F 1/33</a> takes precedence)	1/3538	. . . . {for optical phase conjugation ( <a href="#">H01S 3/10076</a> takes precedence)}
2001/311	. . . {Cascade arrangement of plural switches}	2001/354	. . . {Third or higher harmonic generation}
1/313	. . . in an optical waveguide structure	2001/3542	. . . {Multi-pass arrangements, i.e. arrangements to pass light a plurality of times through the same element, e.g. by using an enhancement cavity}
1/3131	. . . . {in optical fibres}	1/3544	. . . {Particular phase matching techniques}
1/3132	. . . . {of directional coupler type (all-optical modulation, gating or switching using a non-linear directional coupler <a href="#">G02F 1/3521</a> )}	2001/3546	. . . . {Active phase matching, e.g. by electro- or thermo-optic tuning}
1/3133	. . . . . {the optical waveguides being made of semiconducting materials}	2001/3548	. . . . {Quasi-phase-matching [QPM], e.g. using a periodic domain inverted structure}
1/3134	. . . . . {controlled by a high-frequency electromagnetic wave component in an electric waveguide structure}	1/355	. . characterised by the materials used
2001/3135	. . . . . {vertical structure}	1/3551	. . . {Crystals}
1/3136	. . . . . {of interferometric switch type}	1/3553	. . . . {having the formula MTiOYO <sub>4</sub> , where M=K, Rb, Tl, NH <sub>4</sub> or Cs and Y=P or As, e.g. KTP}
1/3137	. . . . . {with intersecting or branching waveguides, e.g. X-switches and Y-junctions}	1/3555	. . . {Glasses}
1/3138	. . . . . {the optical waveguides being made of semiconducting materials}	1/3556	. . . {Semiconductor materials, e.g. quantum wells}
1/315	. . . based on the use of controlled internal reflection	1/3558	. . . {Poled materials, e.g. with periodic poling; Fabrication of domain inverted structures, e.g. for quasi-phase-matching [QPM]}
1/33	. . Acousto-optical deflection devices {(circuit or control arrangements therefor <a href="#">G02F 1/113</a> )}		
1/332	. . . {comprising a plurality of transducers on the same crystal surface, e.g. multi-channel Bragg cell}		
1/335	. . . having an optical waveguide structure		
1/35	. Non-linear optics		
1/3501	. . {Constructional arrangements of non-linear optical devices, e.g. shape of non-linear crystals (constructional arrangements of electro-optic devices <a href="#">G02F 1/0305</a> )}		
2001/3503	. . . {Structural association of optical elements, e.g. lenses, with the nonlinear optical device}		
2001/3505	. . . {Coatings; Housings; Supports}		

1/361	. . . Organic materials
1/3611	. . . . {containing Nitrogen}
1/3612	. . . . . {Heterocycles having N as heteroatom}
1/3613	. . . . . {containing Sulfur}
1/3614	. . . . . {Heterocycles having S as heteroatom}
1/3615	. . . . . {containing polymers}
1/3616	. . . . . {having the non-linear optical group in the main chain}
1/3617	. . . . . {having the non-linear optical group in a side chain}
1/3618	. . . . {Langmuir Blodgett Films}
1/3619	. . . . {Organometallic compounds}
1/365	. . in an optical waveguide structure ( <a href="#">G02F 1/377</a> , <a href="#">G02F 1/395</a> take precedence)
1/37	. . for second-harmonic generation { ( <a href="#">G02F 1/3532</a> takes precedence) }
2001/372	. . . {means for homogenizing the output beam}
2001/374	. . . {Cerenkov radiation}
1/377	. . . in an optical waveguide structure
1/3775	. . . . {with a periodic structure, e.g. domain inversion, for quasi-phase-matching [QPM] ( <a href="#">G02F 1/383</a> takes precedence) }
1/383	. . . . of the optical fibre type
1/39	. . for parametric generation or amplification of light, infra-red, or ultra-violet waves { (arrangements of plural nonlinear devices for generating multi-colour light beams <a href="#">G02F 1/3532</a> ) }
2001/392	. . . {Parametric amplification}
1/395	. . . {in optical waveguides}
1/397	. . . {Amplification of light by wave mixing involving an interference pattern, e.g. using photorefractive material}
<b>2/00</b>	<b>Demodulating light; Transferring the modulation of modulated light; Frequency-changing of light (<a href="#">G02F 1/35</a> takes precedence)</b>
2/002	. {using optical mixing (homodyne systems <a href="#">H04B 10/63</a> ; heterodyne systems <a href="#">H04B 10/64</a> ) }
2/004	. {Transferring the modulation of modulated light, i.e. transferring the information from one optical carrier of a first wavelength to a second optical carrier of a second wavelength, e.g. all-optical wavelength converter}
2002/006	. . {All-optical wavelength conversion}
2002/008	. . {Opto-electronic wavelength conversion, i.e. involving photo-detection of the first optical carrier}
2/02	. Frequency-changing of light, e.g. by quantum counters
<b>3/00</b>	<b>Optical logic elements; Optical bistable devices</b>
3/02	. Optical bistable devices
3/022	. . {based on electro-, magneto- or acousto-optical elements ( <a href="#">G02F 3/028</a> takes precedence) }
3/024	. . {based on non-linear elements, e.g. non-linear Fabry-Perot cavity ( <a href="#">G02F 3/028</a> takes precedence) }
3/026	. . {based on laser effects}
3/028	. . {based on self electro-optic effect devices [SEED]}

**7/00****Optical analogue/digital converters****NOTE**

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

<b>2201/00</b>	<b>Constructional arrangements not provided for in groups <a href="#">G02F 1/00</a> - <a href="#">G02F 7/00</a></b>
2201/02	. fibre
2201/04	. monomode
2201/05	. multimode
2201/06	. integrated waveguide
2201/063	. . ridge; rib; strip loaded
2201/066	. . channel; buried
2201/07	. buffer layer
2201/08	. light absorbing layer
2201/083	. . infra-red absorbing
2201/086	. . UV absorbing
2201/12	. electrode
2201/121	. . common or background
2201/122	. . having a particular pattern
2201/123	. . pixel
2201/124	. . interdigital
2201/125	. . delta-beta
2201/126	. . push-pull
2201/127	. . travelling wave
2201/128	. . field shaping
2201/14	. asymmetric
2201/15	. periodic
2201/16	. series; tandem
2201/17	. Multi-pass arrangements, i.e. arrangements to pass light a plurality of times through the same element, e.g. by using an enhancement cavity
2201/18	. parallel
2201/20	. delay line
2201/205	. . of fibre type
2201/30	. grating
2201/302	. . grating coupler
2201/305	. . diffraction grating
2201/307	. . Reflective grating, i.e. Bragg grating
2201/34	. reflector
2201/343	. . cholesteric liquid crystal reflector
2201/346	. . distributed (Bragg) reflector
2201/36	. Airflow channels, e.g. constructional arrangements facilitating the flow of air
2201/38	. Anti-reflection arrangements
2201/40	. Arrangements for improving the aperture ratio
2201/42	. Arrangements for providing conduction through an insulating substrate
2201/44	. Arrangements combining different electro-active layers, e.g. electrochromic, liquid crystal or electroluminescent layers
2201/46	. Fixing elements
2201/465	. . Snap -fit
2201/48	. Flattening arrangements
2201/50	. Protective arrangements
2201/501	. . Blocking layers, e.g. against migration of ions
2201/503	. . Arrangements improving the resistance to shock
2201/505	. . Arrangements improving the resistance to acoustic resonance like noise
2201/506	. . Repairing, e.g. with redundant arrangement against defective part

2201/508	. . . Pseudo repairing, e.g. a defective part is brought into a condition in which it does not disturb the functioning of the device	2203/07	. Polarisation dependent
2201/52	. RGB geometrical arrangements	2203/09	. transfective
2201/54	. Arrangements for reducing warping-twist	2203/10	. plasmon
2201/56	. Substrates having a particular shape, e.g. non-rectangular	2203/11	. involving infrared radiation
2201/58	. Arrangements comprising a monitoring photodetector	2203/12	. spatial light modulator
		2203/13	. involving THZ radiation
		2203/15	. involving resonance effects, e.g. resonantly enhanced interaction
		2203/16	. involving spin polarization effects
<b>2202/00</b>	<b>Materials and properties</b>	2203/17	. involving soliton waves
2202/01	. dipole	2203/18	. adaptive optics, e.g. wavefront correction
2202/02	. organic material	2203/19	. linearised modulation; reduction of harmonic distortions
2202/021	. . low molecular weight	2203/20	. Intrinsic phase difference, i.e. optical bias, of an optical modulator; Methods for the pre-set thereof
2202/022	. . polymeric	2203/21	. Thermal instability, i.e. DC drift, of an optical modulator; Arrangements or methods for the reduction thereof
2202/023	. . . curable	2203/22	. diffractive
2202/025	. . . . thermocurable	2203/24	. beam steering
2202/026	. . charge transfer complex	2203/25	. Frequency chirping of an optical modulator; Arrangements or methods for the pre-set or tuning thereof
2202/027	. . Langmuir-Blodgett film	2203/255	. . Negative chirp
2202/028	. . photobleached	2203/26	. Pulse shaping; Apparatus or methods therefor
2202/04	. dye	2203/28	. focussing or defocussing
2202/043	. . pleochroic	2203/30	. Gray scale
2202/046	. . fluorescent	2203/34	. Colour display without the use of colour mosaic filters
2202/06	. dopant	2203/48	. Variable attenuator
2202/07	. poled	2203/50	. Phase-only modulation
2202/08	. glass transition temperature	2203/52	. Optical limiters
2202/09	. inorganic glass	2203/54	. Optical pulse train (comb) synthesizer
2202/10	. semiconductor	2203/56	. Frequency comb synthesizer
2202/101	. . Ga×As and alloy	2203/58	. Multi-wavelength, e.g. operation of the device at a plurality of wavelengths
2202/102	. . In×P and alloy	2203/585	. . Add/drop devices
2202/103	. . a-Si	2203/60	. Temperature independent
2202/104	. . poly-Si	2203/62	. Switchable arrangements whereby the element being usually not switchable
2202/105	. . single crystal Si	2203/64	. Normally black display, i.e. the off state being black
2202/106	. . Cd×Se or Cd×Te and alloys	2203/66	. Normally white display, i.e. the off state being white
2202/107	. . Zn×S or Zn×Se and alloys	2203/68	. Green display, e.g. recycling, reduction of harmful substances
2202/108	. . quantum wells	2203/69	. Arrangements or methods for testing or calibrating a device
2202/12	. photoconductor	2203/70	. Semiconductor optical amplifier [SOA] used in a device covered by <a href="#">G02F</a>
2202/13	. photorefractive		
2202/14	. photochromic	<b>2413/00</b>	<b>Indexing scheme related to <a href="#">G02F 1/13363</a>, i.e. to birefringent elements, e.g. for optical compensation, characterised by the number, position, orientation or value of the compensation plates</b>
2202/16	. conductive	2413/01	. Number of plates being 1
2202/20	. LiNbO <sub>3</sub> , LiTaO <sub>3</sub>	2413/02	. Number of plates being 2
2202/22	. Antistatic materials or arrangements	2413/03	. Number of plates being 3
2202/28	. Adhesive materials or arrangements	2413/04	. Number of plates greater than or equal to 4
2202/30	. Metamaterials	2413/05	. Single plate on one side of the LC cell
2202/32	. Photonic crystals	2413/06	. Two plates on one side of the LC cell
2202/34	. Metal hydrides materials	2413/07	. All plates on one side of the LC cell
2202/36	. Micro- or nanomaterials	2413/08	. with a particular optical axis orientation
2202/38	. Sol-gel materials	2413/09	. with a spatial distribution of the retardation value
2202/40	. Materials having a particular birefringence, retardation		
2202/42	. Materials having a particular dielectric constant		
2202/99	. Test HW		
<b>2203/00</b>	<b>Function characteristic</b>		
2203/01	. transmissive		
2203/02	. reflective		
2203/023	. . total internal reflection		
2203/026	. . attenuated or frustated internal reflection		
2203/03	. scattering		
2203/04	. wavelength independent		
2203/05	. wavelength dependent		
2203/055	. . wavelength filtering		
2203/06	. Polarisation independent		



## G02F

- 2413/10 . with refractive index ellipsoid inclined, or tilted, relative to the LC-layer surface O plate
- 2413/105 . . with varying inclination in thickness direction, e.g. hybrid oriented discotic LC
- 2413/11 . The refractive index  $N_z$  perpendicular to the element surface being different from in-plane refractive indices  $N_x$  and  $N_y$ , e.g. C plate
- 2413/12 . Biaxial compensators
- 2413/13 . Positive birefringence
- 2413/14 . Negative birefringence
- 2413/15 . with twisted orientation, e.g. comprising helically oriented LC-molecules or a plurality of twisted birefringent sublayers