CPC COOPERATIVE PATENT CLASSIFICATION

G PHYSICS
(NOTES omitted)

INSTRUMENTS

G02 OPTICS (making optical elements or apparatus B24B, B29D 11/00, C03, or other appropriate subclasses or classes; materials per se, see the relevant places, e.g. C03B, C03C)
(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 (optical transfer means between sensing member and indicating or recording part in connection with measuring G01D 5/26; devices in which mathematical operations are carried out with optical elements G06E 3/00, {G06E 3/001}; electrical signal transmission systems using optical means to convert the input signal G08C 19/36; information-recording by electric or magnetic means and reproducing by sensing optical properties G11B 11/00; static stores using optical elements G11C 13/04; transmission systems employing electromagnetic waves other than radio waves, e.g. light, infra-red radiation, H04B 10/00; optical multiplex systems H04J 14/00; pictorial communication, e.g. television H04N)

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 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 (thermometers using change of colour or translucency G01K 11/12; using changes in fluorescence G01K 11/32; light guide devices G02B 6/00; optical devices or arrangements using movable or deformable elements for controlling light independent of the light source G02B 26/00; control of light in general G05D 25/00; visible signalling systems G08B 5/00; indicating arrangements for variable information by selection or combination of individual elements G09F 9/00; control arrangements or circuits for visual indicators other than cathode-ray tubes G09G 3/00; control of light sources H01S 3/10, H05B 33/08, H05B 35/00 - H05B 43/00; {photochromic filters G02B 5/23; optical logic elements G02F 3/001})

NOTE
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.

1/0009 {Materials therefor}

NOTE
G02F 1/0009 and subgroups contain mostly non-patent literature

1/0018 {Electro-optical materials}
WARNING

Group G02F 1/01 is impacted by reclassification into groups G02F 1/165, G02F 1/166, G02F 1/1673, and G02F 1/169. All groups listed in this Warning should be considered in order to perform a complete search.

1/0128 . . . [based on electro-mechanical, magneto-mechanical, clasto-optic effects]
1/0131 . . . [based on elasto-optic, i.e. photoelastic effect, e.g. mechanically induced birefringence (acousto-optic devices G02F 1/11)]
1/0134 . . . [in optical waveguides]
1/0136 . . . [for the control of polarisation, e.g. state of polarisation [ SOP] control, polarisation scrambling, TE-TM mode conversion or separation (G02F 1/0353 takes precedence)]
2001/0139 . . . [Polarisation scrambling; Depolarisers]
2001/0142 . . . [TE-TM mode conversion]
2001/0144 . . . [TE-TM mode separation]
1/0147 . . . [based on thermo-optic effects (G02F 1/132 takes precedence); tenebrescent compositions C09K 9/00; radiation pyrometry G01J 5/00; thermometers using change of colour or translucency G01K 11/12)]
1/015 . . . based on semiconductor elements with at least one potential jump barrier, e.g. PN, PIN junction (G02F 1/03 takes precedence)
2001/0151 . . . [modulating the refractive index]
2001/0152 . . . [by free carrier effects (Plasma)]
2001/0153 . . . [by electro-refraction (Kramers-Kronig relation)]
2001/0154 . . . [by electro-optic effects (LEO=Pockels, QEO=Kerr)]
2001/0155 . . . [modulating the optical absorption]
2001/0156 . . . [by free carrier absorption]
2001/0157 . . . [by electro-absorption effects (FK, Stark, QCSE)]
2001/0158 . . . [with blue-shift of the absorption band]
2001/0159 . . . [with red-shift of the absorption band]
1/017 . . . Structures with periodic or quasi periodic potential variation, e.g. superlattices, quantum wells
1/01708 . . . [in an optical waveguide structure]
1/01716 . . . [Optically controlled superlattice or quantum well devices]
1/01725 . . . [with a non-rectangular quantum well structure, e.g. coupled, graded, stepped quantum wells]
2001/01733 . . . [Coupled or double quantum wells]
2001/01741 . . . [Asymmetrically coupled or double quantum wells]
2001/0175 . . . [with a spatially varied well profile, e.g. graded, stepped quantum wells]
2001/01758 . . . [with an asymmetric well profile, e.g. asymmetrically stepped quantum wells]
2001/01766 . . . [Strained superlattice or quantum well devices]
2001/01775 . . . [involving an intersubband transition in one well, e.g. e1>e2]
2001/01783 . . . [Quantum wire]
2001/01791 . . . [Quantum box or dot]
1/025 . . . in an optical waveguide structure (G02F 1/017, G02F 2/2257) take precedence)
1/03 . . . based on ceramics or electro-optical crystals, e.g. exhibiting Pockels effect or Kerr effect (G02F 1/061 takes precedence)
1/0305 . . . [Constructional arrangements (G02F 1/0327 - G02F 1/05 take precedence)
1/0311 . . . [Structural association of optical elements, e.g. lenses, polarizers, phase plates, with the crystal]

1/0316 . . . [Electrodes]

1/0322 . . . [Arrangements comprising two or more independently controlled crystals]

1/0327 . . . [Operation of the cell; Circuit arrangements (G02F 1/05 takes precedence)]

1/0333 . . . [addressed by a beam of charged particles, e.g. directed to an adjacent layer exhibiting secondary emission or bombardment-induced conductivity effect (G02F 1/05 takes precedence; electrography, electrophotography G03G; screens for cathode ray tubes acting as light valves H01J 29/12)]

1/0338 . . . [structurally associated with a photoconductive layer or having photo-refractive properties (G02F 1/05 takes precedence)]

1/0344 . . . [controlled by a high-frequency electromagnetic wave component in an electric waveguide (G02F 1/035, G02F 1/05, G02F 1/2255, G02F 1/3134 take precedence)]

1/035 . . . in an optical waveguide structure

1/0353 . . . [involving an electro-optic TE-TM mode conversion]

1/0356 . . . [controlled by a high-frequency electromagnetic wave component in an electric waveguide structure]

1/05 . . . with ferro-electric properties (G02F 1/035, G02F 1/05, G02F 1/3558; ferro-electric digital stores G11C 11/22)]

1/0508 . . . [specially adapted for gating or modulating in optical waveguides]

1/0516 . . . [Operation of the cell; Circuit arrangements]

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 G03G; screens for cathode-ray tubes acting as light valves H01J 29/12)]

1/0533 . . . [structurally associated with a photoconductive layer]

1/0541 . . . [using photo-refractive effects (holography G03H; electro-optical digital static stores using an interference pattern G11C 13/044)]

1/055 . . . the active material being a ceramic (G02F 1/035 takes precedence)

1/0551 . . . [Constructional details]

1/0553 . . . [specially adapted for gating or modulating in optical waveguides]

1/0555 . . . [Operation of the cell; Circuit arrangements]

1/0556 . . . [specially adapted for a particular application]

1/0558 . . . [structurally associated with a photoconductive layer or exhibiting photo-refractive properties]

1/061 . . . based on electro-optical organic material (G02F 1/07, G02F 1/13 take precedence)

1/065 . . . in an optical waveguide structure

1/07 . . . based on electro-optical liquids exhibiting Kerr effect

1/073 . . . [specially adapted for gating or modulating in optical waveguides]

1/076 . . . [Operation of the cell; Circuit arrangements]

1/09 . . . based on magneto-optical elements, e.g. exhibiting Faraday effect

1/091 . . . [based on magneto-optical elements, e.g. exhibiting Faraday effect]

1/092 . . . [Operation of the cell; Circuit arrangements]

1/093 . . . [used as non-reciprocal devices, e.g. optical isolators, circulators (G02F 1/0955 takes precedence)]

2001/094 . . . [Based on magnetophoretic effect]

1/095 . . . in an optical waveguide structure

1/0955 . . . [used as non-reciprocal devices, e.g. optical isolators, circulators]

1/11 . . . based on acousto-optical elements, e.g. using variable diffraction by sound or like mechanical waves ([elasto-optic effect without wave propagation G02F 1/0131;] acousto-optical deflection G02F 1/33)]

1/125 . . . in an optical waveguide structure

1/13 . . . based on liquid crystals, e.g. single liquid crystal display cells (liquid crystal materials C09K 19/00)

1/1303 . . . [Apparatus specially adapted to the manufacture of LCDs]

1/1306 . . . [Details (not used, see sub-groups)]

1/1309 . . . [Repairing; Testing (testing of optical apparatus G01M 11/00; electronic testing of displays or display drivers, e.g. of LCDs, G01G 3/006)]

1/1313 . . . [specially adapted for a particular application]

2001/1316 . . . [Cleaning methods or materials for cleaning part of liquid crystal cell components during the manufacturing process]

1/132 . . . [Thermal activation of liquid crystals exhibiting a thermo-optic effect (thermometers using change of colour or translucency of liquid crystals G01K 11/165; thermally addressed liquid crystal elements in a matrix G09G 3/3603)]

1/1323 . . . [Arrangements for providing a switchable viewing angle]

1/1326 . . . [Liquid crystal optical waveguides or liquid crystal cells specially adapted for gating or modulating between 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 G09G 3/18 and G09G 3/36)]

1/13306 . . . [Circuit arrangements or driving methods for the control of single liquid crystal cells (G02F 1/132, G02F 1/13382 take precedence)]

2001/13312 . . . [Circuits comprising a photodetector not for feedback]
0201/1333 . . . . . {Constructional arrangements; 
[Manufacturing methods] (G02F 1/135, 
G02F 1/136 take precedence)}

2001/133302 . . . . . {rigid substrate, e.g. inorganic}

1/133305 . . . . . {Flexible substrates, e.g. plastics, organic film}

1/133308 . . . . . {LCD panel immediate support structure, 
e.g. front and back frame or bezel}

2001/133311 . . . . . {Environmental protection, e.g. dust, 
humidity}

2001/133314 . . . . . {Back frame}

2001/133317 . . . . . {Intermediate frame, e.g. between 
backlight housing and front frame}

2001/13332 . . . . . {Front frame}

2001/133322 . . . . . {Mechanical guiding and alignment of 
LCD panel support components}

2001/133325 . . . . . {Method of assembling (G02F 2201/465 
takes precedence)}

2001/133328 . . . . . {Segmented frame}

2001/133331 . . . . . {Cover glass}

2001/133334 . . . . . {Electromagnetic shield}

2001/133337 . . . . . {Ion-diffusion preventing or absorbing 
layer}

1/13334 . . . . . {Plasma addressed liquid crystal cells 
[PALC] (plasma panels H01J 17/49)}

2001/133342 . . . . . {for double side displays}

1/133345 . . . . . {Insulating layers (G02F 1/1335, 
G02F 1/137, G02F 1/135, G02F 1/136 
take precedence)}

1/133348 . . . . . {Charged-particles, e.g. electron-beam, 
adressed liquid crystals cells (screen 
cathode ray tubes acting as light 
valves H01J 29/12; electrography, 
electrophotography G03G)}

1/133351 . . . . . {Manufacturing of individual cells out of a 
plurality of cells, e.g. by dicing}

2001/133354 . . . . . {Arrangements for aligning or assembling 
the substrates}

2001/133357 . . . . . {Planarisation layer}

1/13336 . . . . . {Combining plural substrates to produce 
large-area displays, e.g. tiled displays}

1/133362 . . . . . {Optically addressed liquid crystal cells 
(G02F 1/135 takes precedence)}

1/133365 . . . . . {Cells in which the active layer 
comprises a liquid crystalline polymer 
(liquid crystalline polymers in general 
C09K 19/38)}

2001/133368 . . . . . {cell having two substrates with different 
characteristic, e.g. thickness or material}

1/133371 . . . . . {Cells with varying thickness of the liquid 
crystal layer}

2001/133374 . . . . . {for displaying permanent signs or marks}

1/133377 . . . . . {Cells with plural compartments or having 
plurality of liquid crystal microcells 
partitioned by walls, e.g. one microcell per 
pixel}

1/13338 . . . . . {Input devices, e.g. touch-panels 
specially adapted as input devices to 
computers G06F 3/03; touch-panels per 
G06K 1/16; keyboard switches per se 
H01H 13/70}

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}

1/133385 . . . . . {with cooling means, e.g. fans}

2001/133388 . . . . . {Constructional means, e.g. fans}

2001/133391 . . . . . {Constructional difference between the 
display region and the peripheral region}

2001/133394 . . . . . {Piezoelectric element associated with the cell}

2001/133397 . . . . . {for suppressing after-image or image-
sticking}

1/1334 . . . . . {based on polymer dispersed liquid crystals, 
e.g. microencapsulated liquid crystals 
(compositions C09K 19/544)}

1/13342 . . . . . {Holographic polymer dispersed liquid 
crystals}

2001/13345 . . . . . {Network or three-dimensional gel}

2001/13347 . . . . . {Reverse mode, i.e. clear in the off-state 
and scattering in the on-state}

1/1335 . . . . . {Structural association of cells with optical 
devices, e.g. polarisers or reflectors}

1/133502 . . . . . {Antiglare, refractive index matching 
layers}

1/133504 . . . . . {Diffusing, scattering, diffracting 
accounts associated to illuminating 
device (G02F 1/13606)}

2001/133507 . . . . . {Luminance enhancement films}

1/133509 . . . . . {Filters, e.g. light shielding masks 
(optical filters G02B 5/20)}

1/133512 . . . . . {Light shielding layers, e.g. black 
matrix (G02F 1/1362/09 takes 
take precedence)}

1/133514 . . . . . {Colour filters (luminescent elements 
G02F 1/13617)}

1/133516 . . . . . {Methods of making thereof, 
e.g. printing, electro-deposition, 
photolithography (photomechanical 
production of textured or patterned 
surfaces G03F)}

2001/133519 . . . . . {overcoating}

2001/133521 . . . . . {Interference filters}

1/133524 . . . . . {Light-guides, e.g. fibre-optic bundles, 
louvered or jalousie light-guides}

1/133526 . . . . . {Lenses, e.g. micro lenses. Fresnel lenses 
(lenses in general G02B 3/00)}

1/133528 . . . . . {Polarisers (polarisers per se 
G02B 5/30)}

2001/133531 . . . . . {Special arrangement of polariser or 
analyser axes}

1/133533 . . . . . {Colour selective polarisers 
(G02F 1/1347 takes precedence)}

1/133536 . . . . . {Reflective polarizers (G02F 1/13362 
takes precedence)}

2001/133538 . . . . . {with a spatial distribution of the 
polarisation direction}

2001/133541 . . . . . {Circular polarisers}

2001/133543 . . . . . {Cholesteric polarisers}

2001/133545 . . . . . {Dielectric stack polarisers}

2001/133548 . . . . . {Wire-grid polarisers}

2001/13355 . . . . . {Polarising beam splitters [PBS]}

2001/13356 . . . . . {Cholesteric liquid crystals (G02F 
1/135 takes precedence)}
Partial View of Liquid Crystals (LC) Inside a Display Element

1/133553 . . . . . . [Reflecting elements (associated to illuminating devices G02F 1/133605)]
1/133555 . . . . . . [Transreflectors]
2001/133557 . . . . . . [Half-mirror]
2001/13356 . . . . . . [Particular location of the optical element]
2001/133562 . . . . . . [on the viewer side]
2001/133565 . . . . . . [inside the LC element, i.e. between the cell substrates]
2001/133567 . . . . . . [on the back side]
1/1336 . . . . . . [Illuminating devices (in general F21V; associated with display devices for electronic watches G04G 9/0041)]
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]
1/133609 . . . . . . [including means for improving the color mixing, e.g. white]
1/133611 . . . . . . [including means for improving the brightness uniformity]
2001/133612 . . . . . . [Electrical details]
2001/133613 . . . . . . [including a particular sequence of light sources]
2001/133614 . . . . . . [the light is generated by photoluminescence, e.g. a phosphor is illuminated by UV or blue light]
1/133615 . . . . . . [Edge-illuminating devices, i.e. illuminating from the side (G02B 6/0001 takes precedence)]
2001/133616 . . . . . . [Front illuminating devices]
1/133617 . . . . . . [Illumination with ultra-violet light; Luminescent elements or materials associated to the cell]
2001/133618 . . . . . . [for ambient light]
1/13362 . . . . . . [providing polarised light, e.g. by converting a polarisation component into another one (optical systems for polarising G02B 27/28)]
1/133621 . . . . . . [providing coloured light (G02F 1/133617; G02F 1/133533 take precedence)]
2001/133622 . . . . . . [colour sequential illumination]
2001/133623 . . . . . . [Inclined coloured light beams]
2001/133624 . . . . . . [having a particular spectral emission]
2001/133625 . . . . . . [Electron stream lamps]
2001/133626 . . . . . . [providing two modes of illumination, e.g. day-night]
2001/133627 . . . . . . [Projection-direct viewing]
2001/133628 . . . . . . [with cooling means]
1/13363 . . . . . . Birefringent elements, e.g. for optical compensation
2001/133631 . . . . . . [with a spatial distribution of the retardation value]
1/133632 . . . . . . [with refractive index ellipsoid inclined relative to the LC-layer surface]
2001/133633 . . . . . . [using mesogenic materials]
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]
2001/133635 . . . . . . [Multifunctional compensators]
1/133636 . . . . . . [with twisted orientation, e.g. comprising helically oriented LC-molecules or a plurality of twisted birefringent sublayers]
2001/133637 . . . . . . [characterized by the wavelength dispersion]
2001/133638 . . . . . . [Waveplates, i.e. plates with a retardation value of lambda/4]
1/1337 . . . . . . [Surface-induced orientation of the liquid crystal molecules, e.g. by alignment layers]
1/133703 . . . . . . [by introducing organic surfactant additives into the liquid crystal material (C99K 19/56 takes precedence)]
1/133707 . . . . . . [Structures for producing distorted electric fields, e.g. bumps, protrusions, recesses, slits in pixel electrodes]
1/133711 . . . . . . [by organic films, e.g. polymeric films]
2001/133715 . . . . . . [by first depositing a monomer]
1/133719 . . . . . . [with coupling agent molecules, e.g. silane]
1/133723 . . . . . . [Polyimide, polyamide-imide]
2001/133726 . . . . . . [made of a mesogenic material]
2001/13373 . . . . . . [Disclusion line; Reverse tilt]
1/133734 . . . . . . [by obliquely evaporated films, e.g. Si or SiO2 films]
2001/133738 . . . . . . [for homogeneous alignment]
2001/133742 . . . . . . [for homeotropic alignment]
2001/133746 . . . . . . [for high pretilt angle, i.e. > 15 degrees]
2001/133749 . . . . . . [for low pretilt angle, i.e. < 15 degrees]
1/133753 . . . . . . [with different alignment orientations or pretilt angles on a same surface, e.g. for grey scale or improved viewing angle]
2001/133757 . . . . . . [with different alignment orientations]
2001/133761 . . . . . . [with different pretilt angles]
2001/133765 . . . . . . [without a surface treatment]
2001/133769 . . . . . . [comprising an active, e.g. switchable alignment layer]
2001/133773 . . . . . . [The alignment material or treatment is different for the two opposite substrates]
2001/133776 . . . . . . [having structures, i.e. unevenness locally influencing the alignment]
1/13378 . . . . . . [by treatment of the surface, e.g. embossing, rubbing, light irradiation (G02F 1/133711; G02F 1/133734; G02E 1/133753 (take precedence)]
1/133784 . . . . . . [by rubbing]
1/133788 . . . . . . [by light irradiation, e.g. linearly polarised light photo-polymerisation]
2001/133792 . . . . . . [by etching]
2001/133796 . . . . . . [having conducting property]
crystal valves H04N 9/3197
{ ( colour projection displays with liquid
the effects of two or more layers or cells
light beam is achieved by the addition of
cells in which the final condition of one
)
Arrangement of liquid crystal layers or
terminals
Conductors connecting electrodes to cell
terminals
[ having complementary transistors ]
[ Pattern using a multi-mask
exposure ]
[ Checking; Testing ]
[ Repairing; Defects ]
[ Line defect ]
[ Switch defect ]
[ Auxiliary line ]
[ formed on a semiconductor substrate,
e.g. silicon ]
{ having a particular photoconducting
structure or material }
interaction or dynamic scattering phase transition, orientation effect, guest-host magneto-optical effect, e.g. field-induced liquid crystal remains transparent based on orientation effects in which the Blue phases { Hybrid alignment cells (G02F 1/1393 takes precedence) }

{ using smectic liquid crystals (G02F 1/141 takes precedence) }

{ Polymer stabilized liquid crystal layers }

{ based on magneto-optical effects }

{ Hybrid alignment cells (G02F 1/1393 takes precedence) }

{ Blue phases }

{ based on orientation effects in which the liquid crystal remains transparent }

{ Bistable or multi-stable liquid crystal cells (G02F 1/141 takes precedence) }

{ using a field-induced sign-reversal of the dielectric anisotropy } 

{ the birefringence of the liquid crystal being electrically controlled, e.g. ECB-, DAP-, HAN-, PI-LC cells (G02F 1/1396, G02F 1/141 takes precedence) }

{ Optically compensated birefringence [OCB]- cells or PI- cells }
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.

**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.

**Electrodes**

- 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)----

- Counter electrode

- Side by side arrangements of working and counter electrodes

**Structural association of cells with optical devices, e.g. reflectors or illuminating devices**

- Gaskets; Spacers; Sealing of cells; Filling or closing of cells

**Operation of electrochromic cells, e.g. electrodeposition cells; Circuit arrangements therefor**

- [the pixel comprises active switching elements, e.g. TFT]

- [the electrolyte is made of polymers]

**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.
1/16755 . . .  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]
2001/217 . . . [Multi mode interference type]
1/218 . . . [using semi-conducting materials]
1/225 . . . in an optical waveguide structure
1/2252 . . . [in optical fibres]
1/2255 . . . [controlled by a high-frequency electromagnetic component in an electric waveguide structure]
1/2257 . . . [the optical waveguides being made of semiconducting material]
1/23 . . . for the control of the colour (G02F 1/03 - G02F 1/21 take precedence)
1/25 . . . as to hue or predominant wavelength
1/29 . . . for the control of the position or the direction of light beams, i.e. deflection (optical coupling means G02B 6/26; optical-mechanical scanning in general G02B 26/10); static stores with electric or magnetic read-in and optical read-out G11C; lasers provided with means to change the location from which, or the direction in which, laser radiation is emitted H01S 3/101]
2001/291 . . . [Two-dimensional analog deflection]
1/292 . . . [by controlled diffraction or phased-array beam steering (controlled diffraction for optical switching G02F 1/311)]
1/293 . . . [by another light beam, i.e. opto-optical deflection]
2001/294 . . . [Variable focal length device]
1/295 . . . [Analog deflection from or] in an optical waveguide structure
1/2955 . . . [by controlled diffraction or phased-array beam steering (controlled diffraction for optical waveguide switching G02F 1/313)]
1/31 . . . Digital deflection, [i.e. optical switching] (G02F 1/33 takes precedence)
2001/311 . . . [Cascade arrangement of plural switches]
1/313 . . . in an optical waveguide structure
1/3131 . . . [in optical fibres]
1/3132 . . . [of directional coupler type (all-optical modulation, gating or switching using a non-linear directional coupler G02F 1/3521)]
1/3133 . . . [the optical waveguides being made of semiconducting materials]
1/3134 . . . [controlled by a high-frequency electromagnetic wave component in an electric waveguide structure]
2001/3135 . . . . . . [vertical structure]
1/3136 . . . [of interferometric switch type]
1/3137 . . . [with intersecting or branching waveguides, e.g. X-switches and Y-junctions]
1/3138 . . . [the optical waveguides being made of semiconducting materials]
1/315 . . . [based on the use of controlled internal reflection]
1/33 . . . Acousto-optical deflection devices [(circuit or control arrangements therefor G02F 1/113)]
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 (optical bistable devices G02F 3/02; lasers using stimulated Brillouin or Raman effect H01S 3/30)
1/3501 . . . [Constructional arrangements of non-linear optical devices, e.g. shape of non-linear crystals (constructional arrangements of electro-optic devices G02F 1/305)]
2001/3503 . . . . . . [Structural association of optical elements, e.g. lenses, with the nonlinear optical device]
2001/3505 . . . [Coatings; Housings; Supports]
2001/3507 . . . [Arrangements comprising two or more nonlinear optical devices]
2001/3509 . . . [Shape, e.g. shape of end face]
1/3511 . . . [Self-focusing or self-trapping of light; Light-induced birefringence; Induced optical Kerr-effect (photorefractive effects of electro-optic crystals G02F 1/0338, G02F 1/0341, of ceramics G02F 1/0538; opto-optical modulation G02F 1/0126; opto-optical deflection G02F 1/293)]
1/3513 . . . [Soliton propagation]
1/3515 . . . [All-optical modulation, gating, switching, e.g. control of a light beam by another light beam (G02F 1/353, G02F 1/37, G02F 1/39 take precedence)]
G02F

1/3517 . . . [using an interferometer]
1/3519 . . . . [of Sagnac type, i.e. nonlinear optical loop mirror [NOLM]]
1/3521 . . . [using a directional coupler]
1/3523 . . . [Non-linear absorption changing by light, e.g. bleaching (laser Q-switching using bleachable media H01S 3/113)]
1/3525 . . . [Optical damage]
1/3526 . . . [using two-photon emission or absorption processes (Raman effect H01S 3/30)]
2001/3528 . . . [for producing a supercontinuum]
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 G02F 1/37; optical parametric generation or amplification G02F 1/39; transferring the modulation of modulated light G02F 2/004; optical pumping of a laser by another laser H01S 3/094; nonlinear optical devices inside a laser cavity H01S 3/108)]
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]
1/3534 . . . [Three-wave interaction, e.g. sum-difference frequency generation (G02F 1/3532 takes precedence)]
1/3536 . . . [Four-wave interaction]
1/3538 . . . . [for optical phase conjugation (H01S 3/10076 takes precedence)]
2001/354 . . . [Third or higher harmonic generation]
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]
1/3544 . . . [Particular phase matching techniques]
2001/3546 . . . [Active phase matching, e.g. by electro- or thermo-optic tuning]
2001/3548 . . . [Quasi-phase-matching [QPM], e.g. using a periodic domain inverted structure]
1/355 . . . . characterised by the materials used
1/3551 . . . [Crystals]
1/3553 . . . . [having the formula MTiOYO4, where M=K, Rb, Tl, NH4 or Cs and Y=P or As, e.g. KTP]
1/3555 . . . [Glasses]
1/3556 . . . [Semiconductor materials, e.g. quantum wells]
1/3558 . . . . [Poled materials, e.g. with periodic poling; Fabrication of domain inverted structures, e.g. for quasi-phase-matching [QPM]]
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 (G02F 1/377, [G02F 1/395] take precedence)
1/37 . . . . for second-harmonic generation ([G02F 1/3532 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] (G02F 1/383 takes precedence))
1/383 . . . . . . of the optical fibre type
1/39 . . . . . . for parametric generation or amplification of light, infra-red or ultra-violet waves ((G02F 1/3532 takes precedence; ) electrical parametric amplifiers H03F 7/00)
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]

2/00 Demodulating light; Transferring the modulation of modulated light; Frequency-changing of light (G02F 1/35 takes precedence; photoelectric detecting or measuring devices G01J, H01L 40/00, H01L 31/00; demodulating laser arrangements {, e.g. switching, gating} H01S 3/10; demodulation or transference of modulation of modulated electro-magnetic waves in general H03D 9/00)
2002/002 . . . [using optical mixing (homodyne, heterodyne systems H04B 10/142)]
2004/004 . . . . [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 (luminescent materials C09K 11/00)
3/00 Optical logic elements (optical computing G06E) ; electric pulse generators using opto-electronic devices as active elements (H03K 3/42; logic circuits using opto-electronic devices H03K 19/14); Optical bistable devices
3/02 . . . . Optical bistable devices
3/022 . . . . [based on electro-, magneto- or acousto-optical elements (G02F 3/028 takes precedence)]
3/024 . . . . . [based on nonlinear elements, e.g. nonlinear Fabry-Perot cavity (G02F 3/028 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.

2201/00 Constructional arrangements not provided for in groups G02F 1/00 - G02F 7/00
2201/02 . . . fibre

CPC - 2019.02
Arrangements comprising a monitoring photodetector

Examples of materials and properties

- dipole
- organic material
- low molecular weight
- polymeric
- curable
- thermocurable
- charge transfer complex
- Langmuir-Blodgett film
- photobleached
dye
pleochroic
fluorescent
dopant
poled
glass transition temperature
inorganic glass
semiconductor
GaAs and alloy
InP and alloy
a-Si
poly-Si
crystal Si
CdSe or CdTe and alloys
ZnS or ZnSe and alloys
quantum wells
photoconductor
photorefractive
photochromic
conductive
LiNbO₃, LiTaO₃
Antistatic materials or arrangements
Adhesive materials or arrangements
Metamaterials
Photonics crystals
Metal hydrides materials
Micro- or nanomaterials
Sol-gel materials
Materials having a particular birefringence, retardation
Materials having a particular dielectric constant
Test HW
involving soliton waves

adaptive optics, e.g. wavefront correction

linearised modulation; reduction of harmonic distortions

Intrinsic phase difference, i.e. optical bias, of an optical modulator; Methods for the pre-set thereof

Thermal instability, i.e. DC drift, of an optical modulator; Arrangements or methods for the reduction thereof

diffusive

Frequency chirping of an optical modulator; Arrangements or methods for the pre-set or tuning thereof

Negative chirp

Pulse shaping; Apparatus or methods therefor

focussing or defocussing

Gray scale

Colour display without the use of colour mosaic filters

Variable attenuator

Phase-only modulation

Optical limiters

Optical pulse train (comb) synthesizer

Frequency comb synthesizer

Multi-wavelength, e.g. operation of the device at a plurality of wavelengths

Add/drop devices

Temperature independent

Switchable arrangements whereby the element being usually not switchable

Normally black display, i.e. the off state being black

Normally white display, i.e. the off state being white

Green display, e.g. recycling, reduction of harmful substances

Arrangements or methods for testing or calibrating a device

Semiconductor optical amplifier [SOA] used in a device covered by G02F

Indexing scheme related to G02F 1/13363, i.e. to birefringent elements, e.g. for optical compensation, characterised by the number, position, orientation or value of the compensation plates

Number of plates being 1

Number of plates being 2

Number of plates being 3

Number of plates greater than or equal to 4

Single plate on one side of the LC cell

Two plates on one side of the LC cell

All plates on one side of the LC cell

with a particular optical axis orientation

with a spatial distribution of the retardation value

with refractive index ellipsoid inclined, or tilted, relative to the LC-layer surface O plate

with varying inclination in thickness direction, e.g. hybrid oriented discotic LC

The refractive index Nz perpendicular to the element surface being different from in-plane refractive indices Nx an Ny, e.g. C plate

Biaxial compensators

Positive birefringence