

# CPC COOPERATIVE PATENT CLASSIFICATION

## G PHYSICS (NOTES omitted)

### INSTRUMENTS

## G03 PHOTOGRAPHY; CINEMATOGRAPHY; ANALOGOUS TECHNIQUES USING WAVES OTHER THAN OPTICAL WAVES; ELECTROGRAPHY; HOLOGRAPHY (NOTE omitted)

**G03H HOLOGRAPHIC PROCESSES OR APPARATUS** (holograms, e.g. point holograms, used as ordinary optical elements [G02B 5/32](#); producing stereoscopic or other three-dimensional effects [G02B 30/00](#); diffraction-grating systems [G02B 27/44](#); systems using moiré fringes [G02B 27/60](#); optical logic elements [G02F 3/00](#); stereo-photography [G03B 35/00](#); photosensitive materials or processes for photographic purposes [G03C](#); {stereo-photographic or similar processes [G03C 9/00](#)}; apparatus for processing exposed photographic materials [G03D](#); analogue computers performing mathematical operations with the aid of optical elements [G06E 3/00](#); authentication by radiation, of concealed information carried by holograms or diffraction gratings [G06K 19/16](#); holographic storage [G11B 7/0065](#), [G11C 13/04](#); {stereoscopic or other three dimensional effects in television systems [H04N 13/00](#)})

#### NOTE

This subclass covers means for producing a record of the phase and amplitude information of a wave-front, which information can be used to reconstruct the original wave-front, or means to reconstruct the original wave-front from a record containing the phase and amplitude information of the wave-front.

#### WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

|                  |   |                  |   |
|------------------|---|------------------|---|
| <b>1/00</b>      | <b>Holographic processes or apparatus using light, infra-red or ultra-violet waves for obtaining holograms or for obtaining an image from them; Details peculiar thereto</b>  | <b>2001/0044</b> | . . . {holographic fringes deformations; holographic sensors (holographic rain sensor in vehicles <a href="#">B60S 1/084</a> )}   |
| <b>1/0005</b>    | . {Adaptation of holography to specific applications (holographic optical element <a href="#">G02B 5/32</a> ; holographic scanner <a href="#">G02B 26/106</a> ; recognition using holographic mask <a href="#">G06V 10/88</a> ; holographic memories <a href="#">G11B 7/0065</a> , <a href="#">G11C 13/042</a> )} | <b>2001/005</b>  | . {in microscopy, e.g. digital holographic microscope [DHM] (microscopes <a href="#">G02B 21/00</a> ; digital holography <a href="#">G03H 1/0866</a> )}   |
| <b>1/0011</b>    | . . {for security or authentication (holograms on information-bearing cards <a href="#">B42D 25/328</a> ; testing papers with holograms <a href="#">G07D 7/0032</a> )}  | <b>2001/0055</b> | . {in advertising or decorative art}  |
| <b>2001/0016</b> | . . . {Covert holograms or holobjects requiring additional knowledge to be perceived, e.g. holobject reconstructed only under IR illumination (microholograms <a href="#">G03H 2230/10</a> )}   | <b>2001/0061</b> | . {in haptic applications when the observer interacts with the holobject}   |
| <b>2001/0022</b> | . . . . {Deciphering being performed with numerical or optical key, e.g. with the optical scrambler used during recording (optical element in object beam <a href="#">G03H 1/041</a> )}   | <b>2001/0066</b> | . {for wavefront matching wherein the hologram is arranged to convert a predetermined wavefront into a comprehensive wave, e.g. associative memory (recognition using holographic masks <a href="#">G06V 10/88</a> )} |
| <b>2001/0027</b> | . . . {Being copy-protected against fraudulent replication, e.g. by layering a filter rejecting laser lines}  | <b>2001/0072</b> | . {for wavefront conjugation wherein the hologram generates a wavefront conjugating a predetermined object, e.g. null testing, positioning, comparative holography}   |
| <b>2001/0033</b> | . . {in hologrammetry for measuring or analysing}   | <b>2001/0077</b> | . {for optical manipulation, e.g. holographic optical tweezers [HOT]}   |
| <b>2001/0038</b> | . . . {analogue or digital holobjects (holographic interferometry <a href="#">G01B 9/021</a> ; investigating particles <a href="#">G01N 15/0227</a> )}  | <b>2001/0083</b> | . {for restoring distorted objects, e.g. restoring objects through scattering media}  |
|                  |   | <b>2001/0088</b> | . {for video-holography, i.e. integrating hologram acquisition, transmission and display}   |
|                  |   | <b>2001/0094</b> | . {for patterning or machining using the holobject as input light distribution (microlithography <a href="#">G03F 7/70283</a> )}  |

- 1/02 . . . Details {of features involved during the holographic process; Replication of holograms without interference recording}
- 2001/0204 . . . {Object characteristics ([corresponding details, see subgroups of G03H 2210/00](#))}
- 2001/0208 . . . {Individual components other than the hologram}
- 2001/0212 . . . {Light sources or light beam properties ([G03H 1/06](#), [G03H 1/24](#) take precedence; [corresponding details, see subgroups of G03H 2222/00](#))}
- 2001/0216 . . . {Optical components ([G03H 2001/0224](#), [G03H 1/0256](#) take precedence; [corresponding details, see subgroups of G03H 2223/00](#))}
- 2001/022 . . . {Writing means other than actinic light wave ([corresponding details, see subgroups of G03H 2224/00](#))}
- 2001/0224 . . . {Active addressable light modulator, i.e. Spatial Light Modulator [SLM] ([corresponding details, see subgroups of G03H 2225/00](#))}
- 2001/0228 . . . {Electro-optic or electronic components relating to digital holography ([G03H 2001/0224](#) takes precedence; [corresponding details, see subgroups of G03H 2226/00](#))}
- 2001/0232 . . . {Mechanical components or mechanical aspects not otherwise provided for ([corresponding details, see subgroups of G03H 2227/00](#))}
- 1/0236 . . . {Form or shape of the hologram when not registered to the substrate, e.g. trimming the hologram to alphanumeric shape ([substrates bearing a hologram G03H 1/0272](#))}
- 1/024 . . . {Hologram nature or properties}
- 1/0244 . . . {Surface relief holograms ([replicating hologram without interference recording G03H 1/0276](#))}
- 1/0248 . . . {Volume holograms}
- 1/0252 . . . {Laminate comprising a hologram layer}
- 1/0256 . . . {having specific functional layer}
- 2001/026 . . . {Recording materials or recording processes ([G03H 2226/11](#) takes precedence; [corresponding details, see subgroups of G03H 2260/00](#))}
- 2001/0264 . . . {Organic recording material}
- 2001/0268 . . . {Inorganic recording material, e.g. photorefractive crystal [PRC]}
- 1/0272 . . . {Substrate bearing the hologram}
- 1/0276 . . . {Replicating a master hologram without interference recording ([surface relief holograms G03H 1/0244](#))}
- 1/028 . . . {by embossing}
- 2001/0284 . . . {by moulding}
- 2001/0288 . . . {by electroforming}
- 2001/0292 . . . {by masking}
- 2001/0296 . . . {Formation of the master hologram}
- 1/04 . . . Processes or apparatus for producing holograms ([G03H 1/26](#) takes precedence)
- 1/0402 . . . {Recording geometries or arrangements ([G03H 1/0443](#), [G03H 1/0476](#), [G03H 1/16](#) take precedence)}
- 1/0404 . . . {In-line recording arrangement}
- 1/0406 . . . {Image plane or focused image holograms, i.e. an image of the object or hologram is formed on, in or across the recording plane}
- 1/0408 . . . {Total internal reflection [TIR] holograms, e.g. edge lit or substrate mode holograms}
- 1/041 . . . {Optical element in the object space affecting the object beam, not otherwise provided for}
- 2001/0413 . . . {for recording transmission holograms}
- 2001/0415 . . . {for recording reflection holograms}
- 2001/0417 . . . {for recording single beam Lippmann hologram wherein the object is illuminated by reference beam passing through the recording material}
- 2001/0419 . . . {for recording combined transmission and reflection holograms}
- 2001/0421 . . . {Parallax aspect}
- 2001/0423 . . . {Restricted parallax, e.g. horizontal parallax only holograms [HPO]}
- 2001/0426 . . . {Extended parallax, e.g. panoramic or 360deg. holograms}
- 2001/0428 . . . {Image holography, i.e. an image of the object or hologram is recorded ([G03H 1/0406](#) takes precedence; [holographic microscope G03H 2001/005](#))}
- 2001/043 . . . {Non planar recording surface, e.g. curved surface}
- 2001/0432 . . . {Constrained record wherein, during exposure, the recording means undergoes constraints substantially differing from those expected at reconstruction}
- 2001/0434 . . . {In situ recording when the hologram is recorded within the device used for reconstruction}
- 2001/0436 . . . {Holographic camera ([portable device G03H 2227/02](#))}
- 2001/0439 . . . {for recording Holographic Optical Element [HOE] ([HOE per se G02B 5/32](#))}
- 2001/0441 . . . {Formation of interference pattern, not otherwise provided for}
- 1/0443 . . . {Digital holography, i.e. recording holograms with digital recording means ([hologram computation G03H 1/0866](#))}
- 2001/0445 . . . {Off-axis recording arrangement ([G03H 2001/0456](#) takes precedence)}
- 2001/0447 . . . {In-line recording arrangement}
- 2001/045 . . . {Fourier or lensless Fourier arrangement}
- 2001/0452 . . . {arranged to record an image of the object ([holographic microscope G03H 2001/005](#))}
- 2001/0454 . . . {Arrangement for recovering hologram complex amplitude}
- 2001/0456 . . . {Spatial heterodyne, i.e. filtering a Fourier transform of the off-axis record}
- 2001/0458 . . . {Temporal or spatial phase shifting, e.g. parallel phase shifting method}
- 2001/046 . . . {Synthetic aperture}
- 2001/0463 . . . {Frequency heterodyne, i.e. one beam is frequency shifted}
- 1/0465 . . . {Particular recording light; Beam shape or geometry ([G03H 1/06](#) takes precedence)}
- 2001/0467 . . . {Gated recording using pulsed or low coherence light source, e.g. light in flight, first arriving light}
- 2001/0469 . . . {Object light being reflected by the object}
- 2001/0471 . . . {Object light being transmitted through the object, e.g. illumination through living cells}
- 2001/0473 . . . {Particular illumination angle between object or reference beams and hologram}

- 1/0476 . . {Holographic printer ([G03H 1/268](#) takes precedence)}
- 2001/0478 . . . {Serial printer, i.e. point oriented processing}
- 2001/048 . . . {Parallel printer, i.e. a fringe pattern is reproduced}
- 2001/0482 . . . {Interference based printer}
- 2001/0484 . . . {Arranged to produce three-dimensional fringe pattern}
- 1/0486 . . {Improving or monitoring the quality of the record, e.g. by compensating distortions, aberrations}
- 2001/0489 . . . {by using phase stabilized beam}
- 2001/0491 . . . {by monitoring the hologram formation, e.g. via a feed-back loop}
- 1/0493 . . {Special holograms not otherwise provided for, e.g. conoscopic, referenceless holography}
- 2001/0495 . . . {Polarisation preserving holography where amplitude, phase and polarisation state of the original objet wavefront are recorded}
- 2001/0497 . . . {Dot matrix holograms}
- 1/06 . . using incoherent light
- 1/08 . . Synthesising holograms, {i.e. holograms synthesized from objects or objects from holograms}(using electric digital computers [G06F](#); [G06T](#))
- 1/0808 . . . {Methods of numerical synthesis, e.g. coherent ray tracing [CRT], diffraction specific}
- 2001/0816 . . . . {Iterative algorithms}
- 2001/0825 . . . . {Numerical processing in hologram space, e.g. combination of the CGH [computer generated hologram] with a numerical optical element}
- 2001/0833 . . . . {Look up table}
- 1/0841 . . . {Encoding method mapping the synthesized field into a restricted set of values representative of the modulator parameters, e.g. detour phase coding}
- 2001/085 . . . . {Kinoform, i.e. phase only encoding wherein the computed field is processed into a distribution of phase differences}
- 2001/0858 . . . . {Cell encoding wherein each computed values is represented by at least two pixels of the modulator, e.g. detour phase coding}
- 1/0866 . . . {Digital holographic imaging, i.e. synthesizing holobjects from holograms}
- 2001/0875 . . . . {Solving phase ambiguity, e.g. phase unwrapping}
- 2001/0883 . . . . {Reconstruction aspect, e.g. numerical focusing}
- 1/0891 . . . {Processes or apparatus adapted to convert digital holographic data into a hologram ([G03H 1/2294](#) takes precedence)}
- 1/10 . . using modulated reference beam
- 1/12 . . . Spatial modulation, e.g. ghost imaging
- 1/14 . . . Temporal modulation, e.g. extending depth of field or phase compensation for object motion
- 1/16 . . using Fourier transform ({[G03H 1/10](#)}, [G03H 1/12](#), [G03H 1/14](#) take precedence; analogue computers [G06G](#), e.g. [G06G 7/19](#))
- 1/18 . . Particular processing of hologram record carriers, e.g. for obtaining blazed holograms {(photographic processing in general [G03C](#), [G03D](#))}
- 1/181 . . . {Pre-exposure processing, e.g. hypersensitisation}
- 1/182 . . . {Post-exposure processing, e.g. latensification}
- 2001/183 . . . . {Erasing the holographic information}
- 2001/184 . . . . . {Partially erasing}
- 2001/185 . . . {Applying a curing step}
- 2001/186 . . . {Swelling or shrinking the holographic record or compensation thereof, e.g. for controlling the reconstructed wavelength ([G03H 2001/0033](#), [G03H 2250/44](#) take precedence)}
- 2001/187 . . . {Trimming process, i.e. macroscopically patterning the hologram ([shape of hologram G03H 1/0236](#))}
- 2001/188 . . . . {Demetallisation, i.e. removing the enhancing metallic layer ([enhancement layer G03H 2250/36](#))}
- 1/20 . . Copying holograms by holographic {, i.e. optical} means
- 1/202 . . . {Contact copy when the reconstruction beam for the master H1 also serves as reference beam for the copy H2}
- 2001/205 . . . {Subdivided copy, e.g. scanning transfer}
- 2001/207 . . . {with modification of the nature of the hologram, e.g. changing from volume to surface relief or from reflection to transmission}
- 1/22 . . Processes or apparatus for obtaining an optical image from holograms ([G03H 1/26](#) - [G03H 1/34](#) take precedence)
- 1/2202 . . {Reconstruction geometries or arrangements}
- 1/2205 . . . {using downstream optical component}
- 2001/2207 . . . . {Spatial filter, e.g. for suppressing higher diffraction orders}
- 2001/221 . . . . {Element having optical power, e.g. field lens}
- 2001/2213 . . . . {Diffusing screen revealing the real holobject, e.g. container filed with gel to reveal the 3D holobject}
- 2001/2215 . . . . . {Plane screen}
- 2001/2218 . . . . . {being perpendicular to optical axis}
- 2001/2221 . . . . . {Screen having complex surface, e.g. a structured object}
- 2001/2223 . . . {Particular relationship between light source, hologram and observer}
- 2001/2226 . . . . {Edge lit holograms ([TIR recording G03H 1/0408](#))}
- 2001/2228 . . . . {adapted for reflection and transmission reconstruction}
- 2001/2231 . . . . {Reflection reconstruction}
- 2001/2234 . . . . {Transmission reconstruction}
- 2001/2236 . . . {Details of the viewing window}
- 2001/2239 . . . . {Enlarging the viewing window}
- 2001/2242 . . . . {Multiple viewing windows}
- 2001/2244 . . . {Means for detecting or recording the holobject}
- 2001/2247 . . . . {for testing the hologram or holobject}
- 1/2249 . . {Holobject properties}
- 2001/2252 . . . {Location of the holobject}
- 2001/2255 . . . . {Holobject out of Fourier or hologram planes}
- 2001/2257 . . . . {Straddling the hologram}
- 2001/226 . . . . {Virtual or real}
- 2001/2263 . . . {Multicoloured holobject}

|           |  |          |  |
|-----------|--|----------|--|
| 2001/2265 | . . . . {Achromatic holobject}   | 1/34     | . Systems for reducing the space-spatial bandwidth product   |
| 2001/2268 | . . . . {Rainbow hologram}   |          |  |
| 2001/2271 | . . . . {RGB holobject}  |          |  |
| 2001/2273 | . . . {Pseudo-dynamic holobject, e.g. due to angle multiplexing and viewer motion}   | 3/00     | <b>Holographic processes or apparatus using ultrasonic, sonic or infrasonic waves for obtaining holograms; Processes or apparatus for obtaining an optical image from them</b> ( <a href="#">G03H 1/22</a> takes precedence; {acoustic non-destructive testing using holographic methods <a href="#">G01N 29/0663</a> ; seismology using acoustic vibrations <a href="#">G01V 1/00</a> ; non-holographic methods for visualizing acoustic waves <a href="#">G10K 15/00</a> })  |
| 2001/2276 | . . . {Polarisation dependent holobject ( <a href="#">G03H 2001/0495</a> takes precedence)}  |          |  |
| 2001/2278 | . . . {Orthoscopic or pseudoscopic}  |          |  |
| 2001/2281 | . . . {Particular depth of field}  |          |  |
| 2001/2284 | . . . {Superimposing the holobject with other visual information}  |          |  |
| 1/2286    | . . {Particular reconstruction light ( <a href="#">G03H 1/24</a> takes precedence); Beam properties}   | 5/00     | <b>Holographic processes or apparatus using particles or using waves other than those covered by groups <a href="#">G03H 1/00</a> or <a href="#">G03H 3/00</a> for obtaining holograms; Processes or apparatus for obtaining an optical image from them</b> ( <a href="#">G03H 1/22</a> takes precedence; construction of electron microscopes <a href="#">H01J 37/26</a> ; {investigating or analysing materials by the use of microwaves <a href="#">G01N 22/00</a> , by the use of particles wave or X-rays <a href="#">G01N 23/00</a> , <a href="#">G21K 7/00</a> }) |
| 2001/2289 | . . . {when reconstruction wavelength differs from recording wavelength}   |          |  |
| 2001/2292 | . . . {Using scanning means}   |          |  |
| 1/2294    | . . {Addressing the hologram to an active spatial light modulator}   |          |  |
| 2001/2297 | . . . {using frame sequential, e.g. for reducing speckle noise}  |          |  |
| 1/24      | . . using white light {, e.g. rainbow holograms}   | 2210/00  | <b>Object characteristics</b>  |
| 1/26      | . Processes or apparatus specially adapted to produce multiple {sub-} holograms or to obtain images from them, e.g. multicolour technique  | 2210/10  | . Modulation characteristics, e.g. amplitude, phase, polarisation  |
| 2001/2605 | . . {Arrangement of the sub-holograms, e.g. partial overlapping}   | 2210/11  | . . Amplitude modulating object  |
| 2001/261  | . . . {in optical contact}   | 2210/12  | . . Phase modulating object, e.g. living cell  |
| 2001/2615 | . . . . {in physical contact, i.e. layered holograms}  | 2210/13  | . . Coloured object  |
| 2001/262  | . . . {not in optical contact ( <a href="#">G03H 1/30</a> takes precedence)}   | 2210/20  | . 2D object  |
| 2001/2625 | . . {Nature of the sub-holograms}  | 2210/22  | . 2D SLM object wherein the object beam is formed of the light modulated by the SLM ( <a href="#">SLM per se</a> <a href="#">G03H 2001/0224</a> )  |
| 2001/263  | . . . {Made of different recording materials}  | 2210/30  | . 3D object  |
| 2001/2635 | . . . {Mixed volume and surface relief holograms}  | 2210/32  | . . 3D+2D, i.e. composition of 3D and 2D sub-objects, e.g. scene in front of planar background   |
| 2001/264  | . . . {One hologram being a HOE}   | 2210/33  | . . 3D/2D, i.e. the object is formed of stratified 2D planes, e.g. tomographic data  |
| 1/2645    | . . {Multiplexing processes, e.g. aperture, shift, or wavefront multiplexing}  | 2210/36  | . . Occluded features resolved due to parallax selectivity   |
| 1/265     | . . . {Angle multiplexing; Multichannel holograms ( <a href="#">G03H 1/268</a> takes precedence)}  | 2210/40  | . Synthetic representation, i.e. digital or optical object decomposition   |
| 2001/2655 | . . . {Time multiplexing, i.e. consecutive records wherein the period between records is pertinent <i>per se</i> }   | 2210/42  | . . from real object, e.g. using 3D scanner  |
| 2001/266  | . . . {Wavelength multiplexing}  | 2210/44  | . . Digital representation   |
| 2001/2665 | . . . {Coherence multiplexing wherein different holobjects are perceived under coherent or incoherent illumination}  | 2210/441 | . . . Numerical processing applied to the object data other than numerical propagation ( <a href="#">synthesizing propagation</a> <a href="#">G03H 1/0808</a> )  |
| 2001/267  | . . . {Polarisation multiplexing}  | 2210/45  | . . Representation of the decomposed object  |
| 2001/2675 | . . . {Phase code multiplexing, wherein the sub-holograms are multiplexed according to spatial modulation of the reference beam ( <a href="#">reference beam spatial modulation</a> <a href="#">G03H 1/12</a> )} | 2210/452 | . . . into points  |
| 1/268     | . . {Holographic stereogram}   | 2210/454 | . . . into planes  |
| 2001/2685 | . . . {One step recording process}   | 2210/46  | . . for subsequent optical processing ( <a href="#">G03H 1/268</a> takes precedence)   |
| 2001/269  | . . . {Two and more than two steps recording process}  | 2210/50  | . Nature of the object   |
| 2001/2695 | . . . {Dedicated printer ( <a href="#">holographic printers</a> <a href="#">G03H 1/0476</a> )}   | 2210/52  | . . Alphanumerical   |
| 1/28      | . . superimposed holograms only  | 2210/53  | . . Coded object not directly interpretable, e.g. encrypted object, barcode  |
| 1/30      | . . discrete holograms only  | 2210/54  | . . For individualisation of product   |
| 2001/303  | . . . {Interleaved sub-holograms, e.g. three RGB sub-holograms having interleaved pixels for reconstructing coloured holobject}  | 2210/55  | . . Having particular size, e.g. irresolvable by the eye   |
| 2001/306  | . . . {Tiled identical sub-holograms}  | 2210/56  | . . Multiple objects, e.g. each in different environment   |
| 1/32      | . Systems for obtaining speckle elimination  | 2210/562 | . . . Holographic object, i.e. a combination of an object and holobject ( <a href="#">G03H 1/20</a> takes precedence)  |
|           |  | 2210/62  | . Moving object  |



- 2210/63 . Environment affecting the recording, e.g. underwater ([G03H 2001/0432 takes precedence](#))
- 2222/00 Light sources or light beam properties**
- 2222/10 . Spectral composition
- 2222/12 . . Single or narrow bandwidth source, e.g. laser, light emitting diode [LED]
- 2222/13 . . Multi-wavelengths wave with discontinuous wavelength ranges ([G03H 2222/18 takes precedence](#))
- 2222/14 . . Broadband source, e.g. sun light
- 2222/15 . . Ultra Violet [UV]
- 2222/16 . . Infra Red [IR]
- 2222/17 . . White light ([G03H 1/24 takes precedence](#))
- 2222/18 . . . RGB trichrome light
- 2222/20 . Coherence of the light source
- 2222/22 . . Spatial coherence
- 2222/23 . . Temporal coherence
- 2222/24 . . Low coherence light normally not allowing valuable record or reconstruction ([G03H 1/06 takes precedence](#))
- 2222/31 . Polarised light
- 2222/32 . Unpolarised light
- 2222/33 . Pulsed light beam
- 2222/34 . Multiple light sources
- 2222/35 . Transverse intensity distribution of the light beam
- 2222/36 . Scanning light beam
- 2222/40 . Particular irradiation beam not otherwise provided for
- 2222/42 . . Reference beam at recording stage
- 2222/43 . . Object beam at recording stage
- 2222/44 . . Beam irradiating the object at recording stage
- 2222/45 . . Interference beam at recording stage, i.e. following combination of object and reference beams
- 2222/46 . . Reconstruction beam at reconstruction stage
- 2222/47 . . Evanescent wave
- 2222/50 . Geometrical property of the irradiating beam
- 2222/52 . . Divergent beam
- 2222/53 . . Collimated beam
- 2222/54 . . Convergent beam
- 2222/55 . . Astigmatic beam having different focal planes ([anamorphic optical element G03H 2223/21](#))
- 2222/56 . . Conjugated beam
- 2223/00 Optical components**
- 2223/12 . Amplitude mask, e.g. diaphragm, Louver filter
- 2223/13 . Phase mask
- 2223/14 . Diffuser, e.g. lens array, random phase mask
- 2223/15 . Colour filter, e.g. interferential colour filter
- 2223/16 . Optical waveguide, e.g. optical fibre, rod
- 2223/17 . Element having optical power
- 2223/18 . Prism
- 2223/19 . Microoptic array, e.g. lens array
- 2223/20 . Birefringent optical element, e.g. wave plate
- 2223/21 . Anamorphic optical element, e.g. cylindrical ([astigmatic beam G03H 2222/55](#))
- 2223/22 . Polariser
- 2223/23 . Diffractive element
- 2223/24 . Reflector; Mirror
- 2223/25 . Index matching material
- 2223/26 . Means providing optical delay, e.g. for path length matching
- 2223/50 . Particular location or purpose of optical element ([downstream optical component G03H 1/2205](#))
- 2223/52 . . Filtering the object information
- 2223/53 . . Filtering the hologram information, i.e. the fringe pattern
- 2223/54 . . Filtering the holobject information
- 2223/55 . . Arranged at a Fourier plane
- 2224/00 Writing means other than actinic light wave**
- 2224/02 . Mechanical means, e.g. diamond tool
- 2224/04 . Particle beam, e.g. e-beam
- 2224/06 . Thermal or photo-thermal means ([infra red source G03H 2222/16](#))
- 2225/00 Active addressable light modulator**
- 2225/10 . Shape or geometry
- 2225/11 . . 1D SLM
- 2225/12 . . 2D SLM
- 2225/13 . . 3D SLM
- 2225/20 . Nature, e.g. e-beam addressed
- 2225/21 . . Acousto-optic SLM [AO-SLM]
- 2225/22 . . Electrically addressed SLM [EA-SLM]
- 2225/23 . . Grating based SLM
- 2225/24 . . Having movable pixels, e.g. microelectromechanical systems [MEMS]
- 2225/25 . . Optically addressed SLM [OA-SLM]
- 2225/30 . Modulation
- 2225/31 . . Amplitude only
- 2225/32 . . Phase only
- 2225/33 . . Complex modulation
- 2225/34 . . . Amplitude and phase coupled modulation
- 2225/35 . . Colour modulation
- 2225/36 . . Polarisation
- 2225/52 . Reflective modulator
- 2225/55 . Having optical element registered to each pixel
- 2225/60 . Multiple SLMs
- 2225/61 . . for multicolour processing
- 2226/00 Electro-optic or electronic components relating to digital holography**
- 2226/02 . Computing or processing means, e.g. digital signal processor [DSP]
- 2226/04 . Transmission or communication means, e.g. internet protocol
- 2226/05 . Means for tracking the observer
- 2226/11 . Electro-optic recording means, e.g. CCD, pyroelectric sensors
- 2226/13 . . Multiple recording means
- 2227/00 Mechanical components or mechanical aspects not otherwise provided for**
- 2227/02 . Handheld portable device, e.g. holographic camera, mobile holographic display
- 2227/03 . Means for moving one component ([G03H 1/0476, G03H 2001/2695 take precedence](#))
- 2227/04 . Production line for mass production
- 2227/05 . Support holding the holographic record
- 2227/06 . . Support including light source
- 2230/00 Form or shape of the hologram when not registered to the substrate**
- 2230/10 . Microhologram not registered to the substrate
- 2240/00 Hologram nature or properties**

**G03H**

- |         |  |         |   |
|---------|--|---------|---|
| 2240/10 | Physical parameter modulated by the hologram<br>(G03H 2001/0224 takes precedence)  | 2260/31 | Ageing or resistance of the material<br>(G03H 2250/39 takes precedence)   |
| 2240/11 | Phase only modulation (G03H 1/0244 takes precedence)   | 2260/32 | Combining different recording materials<br>(G03H 2001/2615 takes precedence)  |
| 2240/12 | Amplitude only modulation  | 2260/33 | Having dispersed compound   |
| 2240/13 | Amplitude and phase complex modulation   | 2260/34 | Non uniform thickness   |
| 2240/15 | Polarisation modulation  | 2260/35 | Rewritable material allowing several record and erase cycles  |
| 2240/20 | Details of physical variations exhibited in the hologram   | 2260/36 | Dynamic material where the lifetime of the recorded pattern is quasi instantaneous, the holobject is simultaneously reconstructed   |
| 2240/21 | Optical density variations   | 2260/50 | Reactivity or recording processes (writing means G03H 2001/0212, G03H 2001/022)   |
| 2240/22 | Chromatic variations, e.g. photochromic or electrochromic  | 2260/51 | Photoanisotropic reactivity wherein polarized light induces material birefringence, e.g. azo-dye doped polymer  |
| 2240/23 | Optical length variations, e.g. bleached silver halide (G03H 1/0244 takes precedence)  | 2260/52 | Photochromic reactivity wherein light induces a reversible transformation between two states having different absorption spectra  |
| 2240/24 | Index variations only  | 2260/53 | Photoconductor thermoplastic reactivity wherein light is transformed into an electrostatic then into a thickness distribution   |
| 2240/25 | Magnetic variations  | 2260/54 | Photorefractive reactivity wherein light induces photo-generation, redistribution and trapping of charges then a modification of refractive index, e.g. photorefractive polymer |
| 2240/26 | Structural variations, e.g. structure variations due to photoanchoring or conformation variations due to photo-isomerisation | 2260/61 | Producing material deformation  |
| 2240/40 | Dynamic of the variations  | 2260/62 | Direct etching  |
| 2240/41 | Binary   | 2260/63 | Indirect etching, e.g. lithography (photoresist G03H 2260/14)   |
| 2240/42 | Discrete level   |         |   |
| 2240/43 | Continuous   |         |   |
| 2240/50 | Parameters or numerical values associated with holography, e.g. peel strength  |         |   |
| 2240/51 | Intensity, power or luminance (G03H 2240/52 takes precedence)  |         |   |
| 2240/52 | Exposure parameters, e.g. time, intensity  |         |   |
| 2240/53 | Diffraction efficiency [DE]  |         |   |
| 2240/54 | Refractive index   |         |   |
| 2240/55 | Thickness  |         |   |
| 2240/56 | Resolution   |         |   |
| 2240/61 | SLM related parameters, e.g. pixel size  |         |   |
| 2240/62 | Sampling aspect applied to sensor or display   |         |   |
| 2250/00 | <b>Laminate comprising a hologram layer</b>  | 2270/00 | <b>Substrate bearing the hologram</b>   |
| 2250/10 | arranged to be transferred onto a carrier body<br>(adhesive layer G03H 2250/35)  | 2270/10 | Composition   |
| 2250/12 | Special arrangement of layers  | 2270/11 | Crystal or glass (G03H 2270/55 takes precedence)  |
| 2250/14 | Forming layer onto which a surface relief hologram is formed (G03H 2270/52 takes precedence)                                 | 2270/12 | Fibrous, e.g. paper, textile  |
| 2250/32 | Antireflective layer   | 2270/13 | Metallic  |
| 2250/33 | Absorbing layer  | 2270/14 | Plastic   |
| 2250/34 | Colour layer   | 2270/20 | Shape   |
| 2250/35 | Adhesive layer   | 2270/21 | Curved bearing surface  |
| 2250/36 | Conform enhancement layer  | 2270/22 | Disc shaped   |
| 2250/37 | Enclosing the photosensitive material  | 2270/23 | Ribbon shaped, e.g. holographic foil  |
| 2250/38 | Liquid crystal   | 2270/24 | Having particular size, e.g. microscopic  |
| 2250/39 | Protective layer   | 2270/30 | Nature  |
| 2250/40 | Printed information overlapped with the hologram   | 2270/31 | Flexible  |
| 2250/41 | Polarisation active layer  | 2270/32 | Transparent   |
| 2250/42 | Reflective layer (G03H 2250/36 takes precedence)   | 2270/52 | Integrated surface relief hologram without forming layer  |
| 2250/43 | One layer having dispersed particles<br>(G03H 2260/33 takes precedence)  | 2270/53 | Recording material dispersed into porous substrate  |
| 2250/44 | Colour tuning layer  | 2270/54 | Recording material filed in recessed substrate  |
|         |  | 2270/55 | being an optical element, e.g. spectacles   |
| 2260/00 | <b>Recording materials or recording processes</b>  |         |   |
| 2260/10 | Dichromated gelatine or equivalents  |         |   |
| 2260/12 | Photopolymer   |         |   |
| 2260/14 | Photoresist  |         |   |
| 2260/16 | Silver halide emulsion   |         |   |
| 2260/30 | Details of photosensitive recording material not otherwise provided for  |         |   |