

**CPC****COOPERATIVE PATENT CLASSIFICATION****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 27/22](#); 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.

**G03H 1/00**

**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**

- G03H 1/0005 . { Adaptation of holography to specific applications ( holographic optical element [G02B 5/32](#); holographic scanner [G02B 26/106](#); recognition using holographic mask [G06K 9/76](#); holographic memories [G11B 7/0065](#), [G11C 13/042](#) ) }
- G03H 1/0011 .. { for security or authentication ( holograms on information-bearing cards [B42D 15/10D](#); testing papers with holograms [G07D 7/0013](#) ) }
- G03H 2001/0016 ... Covert holograms or holobjects requiring additional knowledge to be perceived, e.g. holobject reconstructed only under IR illumination ( micro-holograms [G03H 2230/10](#) )
- G03H 2001/0022 .... Deciphering being performed with numerical or optical key, e.g. with the optical scrambler used during recording ( optical element in object beam [G03H 1/041](#) )
- G03H 2001/0027 ... Being copy-protected against fraudulent replication, e.g. by layering a filter rejecting laser lines
- G03H 2001/0033 .. in hologrammetry for measuring or analysing
- G03H 2001/0038 ... analogue or digital holobjects ( holographic interferometry [G01B 9/021](#); investigating particles [G01N 15/0227](#) )
- G03H 2001/0044 ... holographic fringes deformations; holographic sensors ( holographic rain sensor in vehicles [B60S 1/084](#) )
- G03H 2001/005 .. in microscopy, e.g. digital holographic microscope [DHM] ( microscopes [G02B 21/00](#); digital holography [G03H 1/0866](#) )
- G03H 2001/0055 .. in advertising or decorative art
- G03H 2001/0061 .. in haptic applications when the observer interacts with the holobject
- G03H 2001/0066 .. 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 [G06K 9/76](#) )
- G03H 2001/0072 . . for wavefront conjugation wherein the hologram generates a wavefront conjugating a predetermined object, e.g. null testing, positioning, comparative holography
- G03H 2001/0077 . . for optical manipulation, e.g. holographic optical tweezers [HOT]
- G03H 2001/0083 . . for restoring distorted objects, e.g. restoring objects through scattering media
- G03H 2001/0088 . . for video-holography, i.e. integrating hologram acquisition, transmission and display
- G03H 2001/0094 . . for patterning or machining using the holobject as input light distribution ( [microlithography G03F 7/70283](#) )
- G03H 1/02 . Details { of features involved during the holographic process; Replication of holograms without interference recording }
- G03H 2001/0204 . . Object characteristics ( [corresponding details, see subgroups of G03H 2210/00](#) )
- G03H 2001/0208 . . Individual components other than the hologram
- G03H 2001/0212 . . . Light sources or light beam properties ( [G03H 1/06](#), [G03H 1/24](#) take precedence; [corresponding details, see subgroups of G03H 2222/00](#) )
- G03H 2001/0216 . . . Optical components ( [G03H 2001/0224](#), [G03H 1/0256](#) take precedence; [corresponding details, see subgroups of G03H 2223/00](#) )
- G03H 2001/022 . . . Writing means other than actinic light wave ( [corresponding details, see subgroups of G03H 2224/00](#) )
- G03H 2001/0224 . . . Active addressable light modulator, i.e. Spatial Light Modulator [SLM] ( [corresponding details, see subgroups of G03H 2225/00](#) )
- G03H 2001/0228 . . . Electro-optic or electronic components relating to digital holography ( [G03H 2001/0224](#) takes precedence; [corresponding details, see subgroups of G03H 2226/00](#) )
- G03H 2001/0232 . . . Mechanical components or mechanical aspects not otherwise provided for ( [corresponding details, see subgroups of G03H 2227/00](#) )
- G03H 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](#) ) }
- G03H 1/024 . . { Hologram nature or properties }
- G03H 1/0244 . . . { Surface relief holograms ( [replicating hologram without interference recording G03H 1/0276](#) ) }
- G03H 1/0248 . . . { Volume holograms }
- G03H 1/0252 . . { Laminate comprising a hologram layer }
- G03H 1/0256 . . . { having specific functional layer }
- G03H 2001/026 . . Recording materials or recording processes ( [G03H 2226/11](#) takes precedence; [corresponding details, see subgroups of G03H 2260/00](#) )
- G03H 2001/0264 . . . Organic recording material
- G03H 2001/0268 . . . Inorganic recording material, e.g. photorefractive crystal [PRC]
- G03H 1/0272 . . { Substrate bearing the hologram }
- G03H 1/0276 . . { Replicating a master hologram without interference recording ( [surface relief holograms G03H 1/0244](#) ) }
- G03H 1/028 . . . { by embossing }
- G03H 2001/0284 . . . by moulding
- G03H 2001/0288 . . . by electroforming
- G03H 2001/0292 . . . by masking

G03H 2001/0296	...	Formation of the master hologram
G03H 1/04	.	Processes or apparatus for producing holograms ( <a href="#">G03H 1/26</a> takes precedence )
G03H 1/0402	..	{ <a href="#">Recording geometries or arrangements</a> ( <a href="#">G03H 1/0443</a> , <a href="#">G03H 1/0476</a> , <a href="#">G03H 1/16</a> take precedence ) }
G03H 1/0404	...	{ <a href="#">In-line recording arrangement</a> }
G03H 1/0406	...	{ <a href="#">Image plane or focused image holograms, i.e. an image of the object or holobject is formed on, in or across the recording plane</a> }
G03H 1/0408	...	{ <a href="#">Total internal reflection [TIR] holograms, e.g. edge lit or substrate mode holograms</a> }
G03H 1/041	...	{ <a href="#">Optical element in the object space affecting the object beam, not otherwise provided for</a> }
G03H 2001/0413	...	for recording transmission holograms
G03H 2001/0415	...	for recording reflection holograms
G03H 2001/0417	....	for recording single beam Lippmann hologram wherein the object is illuminated by reference beam passing through the recording material
G03H 2001/0419	...	for recording combined transmission and reflection holograms
G03H 2001/0421	...	Parallax aspect
G03H 2001/0423	....	<a href="#">Restricted parallax, e.g. horizontal parallax only holograms [HPO]</a>
G03H 2001/0426	....	<a href="#">Extended parallax, e.g. panoramic or 360deg. holograms</a>
G03H 2001/0428	...	<a href="#">Image holography, i.e. an image of the object or holobject is recorded ( <a href="#">G03H 1/0406</a> takes precedence; <a href="#">holographic microscope G03H 2001/005</a> )</a>
G03H 2001/043	...	Non planar recording surface, e.g. curved surface
G03H 2001/0432	...	Constrained record wherein, during exposure, the recording means undergoes constraints substantially differing from those expected at reconstruction
G03H 2001/0434	...	In situ recording when the hologram is recorded within the device used for reconstruction
G03H 2001/0436	...	Holographic camera ( <a href="#">portable device G03H 2227/02</a> )
G03H 2001/0439	...	for recording Holographic Optical Element [HOE] ( <a href="#">HOE per se G02B 5/32</a> )
G03H 2001/0441	...	Formation of interference pattern, not otherwise provided for
G03H 1/0443	..	{ <a href="#">Digital holography, i.e. recording holograms with digital recording means ( holobject computation G03H 1/0866 )</a> }
G03H 2001/0445	...	Off-axis recording arrangement ( <a href="#">G03H 2001/0456</a> takes precedence )
G03H 2001/0447	...	In-line recording arrangement
G03H 2001/045	...	Fourier or lensless Fourier arrangement
G03H 2001/0452	...	arranged to record an image of the object ( <a href="#">holographic microscope G03H 2001/005</a> )
G03H 2001/0454	...	Arrangement for recovering hologram complex amplitude
G03H 2001/0456	....	<a href="#">Spatial heterodyne, i.e. filtering a Fourier transform of the off-axis record</a>
G03H 2001/0458	....	<a href="#">Temporal or spatial phase shifting, e.g. parallel phase shifting method</a>
G03H 2001/046	...	Synthetic aperture
G03H 2001/0463	...	Frequency heterodyne, i.e. one beam is frequency shifted
G03H 1/0465	..	{ <a href="#">Particular recording light; Beam shape or geometry</a> ( <a href="#">G03H 1/06</a> takes precedence ) }
G03H 2001/0467	...	Gated recording using pulsed or low coherence light source, e.g. light in flight, first arriving light

G03H 2001/0469	...	Object light being reflected by the object
G03H 2001/0471	...	Object light being transmitted through the object, e.g. illumination through living cells
G03H 2001/0473	...	Particular illumination angle between object or reference beams and hologram
G03H 1/0476	..	{ <b>Holographic printer ( <a href="#">G03H 1/268</a> takes precedence )</b> }
G03H 2001/0478	...	Serial printer i.e. point oriented processing
G03H 2001/048	...	Parallel printer, i.e. a fringe pattern is reproduced
G03H 2001/0482	...	Interference based printer
G03H 2001/0484	...	Arranged to produce three-dimensional fringe pattern
G03H 1/0486	..	{ <b>Improving or monitoring the quality of the record, e.g. by compensating distortions, aberrations</b> }
G03H 2001/0489	...	by using phase stabilized beam
G03H 2001/0491	...	by monitoring the hologram formation, e.g. via a feed-back loop
G03H 1/0493	..	{ <b>Special holograms not otherwise provided for, e.g. conoscopic, referenceless holography</b> }
G03H 2001/0495	...	Polarisation preserving holography where amplitude, phase and polarisation state of the original objet wavefront are recorded
G03H 2001/0497	...	Dot matrix holograms
G03H 1/06	..	using incoherent light
G03H 1/08	..	Synthesising holograms, { <b>i.e. holograms synthesized from objects or objects from holograms</b> } ( <b>using electric digital computers <a href="#">G06F</a> ; <a href="#">G06T</a></b> )
G03H 1/0808	...	{ <b>Methods of numerical synthesis, e.g. coherent ray tracing [CRT], diffraction specific</b> }
G03H 2001/0816	....	Iterative algorithms
G03H 2001/0825	....	Numerical processing in hologram space, e.g. combination of the CGH [computer generated hologram] with a numerical optical element
G03H 2001/0833	....	Look up table
G03H 1/0841	...	{ <b>Encoding method mapping the synthesized field into a restricted set of values representative of the modulator parameters, e.g. detour phase coding</b> }
G03H 2001/085	....	Kinoform, i.e. phase only encoding wherein the computed field is processed into a distribution of phase differences
G03H 2001/0858	....	Cell encoding wherein each computed values is represented by at least two pixels of the modulator, e.g. detour phase coding
G03H 1/0866	...	{ <b>Digital holographic imaging, i.e. synthesizing holobjects from holograms</b> }
G03H 2001/0875	....	Solving phase ambiguity, e.g. phase unwrapping
G03H 2001/0883	....	Reconstruction aspect, e.g. numerical focusing
G03H 1/0891	...	{ <b>Processes or apparatus adapted to convert digital holographic data into a hologram ( <a href="#">G03H 1/2294</a> takes precedence )</b> }
G03H 1/10	..	using modulated reference beam
G03H 1/12	...	Spatial modulation, e.g. ghost imaging
G03H 1/14	...	Temporal modulation, e.g. extending depth of field or phase compensation for object motion
G03H 1/16	..	using Fourier transform ( { <a href="#">G03H 1/10</a> }, <a href="#">G03H 1/12</a> , <a href="#">G03H 1/14</a> take precedence; analogue computers <a href="#">G06G</a> , e.g. <a href="#">G06G 7/19</a> )
G03H 1/18	..	Particular processing of hologram record carriers, e.g. for obtaining blazed holograms { ( <b>photographic processing in general <a href="#">G03C</a> , <a href="#">G03D</a></b> ) }

G03H 1/181	...	{ Pre-exposure processing, e.g. hypersensitisation }
G03H 1/182	...	{ Post-exposure processing, e.g. latensification }
G03H 2001/183	....	Erasing the holographic information
G03H 2001/184	.....	Partially erasing
G03H 2001/185	...	Applying a curing step
G03H 2001/186	...	Swelling or shrinking the holographic record or compensation thereof e.g. for controlling the reconstructed wavelength ( <a href="#">G03H 2001/0033</a> , <a href="#">G03H 2250/44</a> take precedence )
G03H 2001/187	...	Trimming process i.e. macroscopically patterning the hologram ( <a href="#">shape of hologram G03H 1/0236</a> )
G03H 2001/188	....	Demetallisation, i.e. removing the enhancing metallic layer ( <a href="#">enhancement layer G03H 2250/36</a> )
G03H 1/20	..	Copying holograms by holographic { i.e. optical } means
G03H 1/202	...	{ Contact copy when the reconstruction beam for the master H1 also serves as reference beam for the copy H2 }
G03H 2001/205	...	Subdivided copy, e.g. scanning transfer
G03H 2001/207	...	with modification of the nature of the hologram, e.g. changing from volume to surface relief or from reflection to transmission
G03H 1/22	.	Processes or apparatus for obtaining an optical image from holograms ( <a href="#">G03H 1/26</a> to <a href="#">G03H 1/34</a> take precedence )
G03H 1/2202	..	{ Reconstruction geometries or arrangements }
G03H 1/2205	...	{ using downstream optical component }
G03H 2001/2207	....	Spatial filter, e.g. for suppressing higher diffraction orders
G03H 2001/221	....	Element having optical power, e.g. field lens
G03H 2001/2213	....	Diffusing screen revealing the real holobject, e.g. container filed with gel to reveal the 3D holobject
G03H 2001/2215	.....	Plane screen
G03H 2001/2218	.....	being perpendicular to optical axis
G03H 2001/2221	.....	Screen having complex surface, e.g. a structured object
G03H 2001/2223	...	Particular relationship between light source, hologram and observer
G03H 2001/2226	....	Edge lit holograms ( <a href="#">TIR recording G03H 1/0408</a> )
G03H 2001/2228	....	adapted for reflection and transmission reconstruction
G03H 2001/2231	....	Reflection reconstruction
G03H 2001/2234	....	Transmission reconstruction
G03H 2001/2236	...	Details of the viewing window
G03H 2001/2239	....	Enlarging the viewing window
G03H 2001/2242	....	Multiple viewing windows
G03H 2001/2244	...	Means for detecting or recording the holobject
G03H 2001/2247	....	for testing the hologram or holobject
G03H 1/2249	..	{ Holobject properties }
G03H 2001/2252	...	Location of the holobject
G03H 2001/2255	....	Holobject out of Fourier or hologram planes
G03H 2001/2257	....	Straddling the hologram
G03H 2001/226	....	Virtual or real

G03H 2001/2263	...	Multicoloured holobject
G03H 2001/2265	....	Achromatic holobject
G03H 2001/2268	....	Rainbow hologram
G03H 2001/2271	....	RGB holobject
G03H 2001/2273	...	Pseudo-dynamic holobject, e.g. due to angle multiplexing and viewer motion
G03H 2001/2276	...	Polarisation dependent holobject ( <a href="#">G03H 2001/0495</a> takes precedence )
G03H 2001/2278	...	Orthoscopic or pseudoscopic
G03H 2001/2281	...	Particular depth of field
G03H 2001/2284	...	Superimposing the holobject with other visual information
G03H 1/2286	..	{ Particular reconstruction light ( <a href="#">G03H 1/24</a> takes precedence ); Beam properties }
G03H 2001/2289	...	when reconstruction wavelength differs from recording wavelength
G03H 2001/2292	...	Using scanning means
G03H 1/2294	..	{ Addressing the hologram to an active spatial light modulator }
G03H 2001/2297	...	using frame sequential, e.g. for reducing speckle noise
G03H 1/24	..	using white light { e.g. rainbow holograms }
G03H 1/26	.	Processes or apparatus specially adapted to produce multiple { sub- } holograms or to obtain images from them, e.g. multicolour technique
G03H 2001/2605	..	Arrangement of the sub-holograms, e.g. partial overlapping
G03H 2001/261	...	in optical contact
G03H 2001/2615	....	in physical contact, i.e. layered holograms
G03H 2001/262	...	not in optical contact ( <a href="#">G03H 1/30</a> takes precedence )
G03H 2001/2625	..	Nature of the sub-holograms
G03H 2001/263	...	Made of different recording materials
G03H 2001/2635	...	Mixed volume and surface relief holograms
G03H 2001/264	...	One hologram being a HOE
G03H 1/2645	..	{ Multiplexing processes, e.g. aperture, shift, or wavefront multiplexing }
G03H 1/265	...	{ Angle multiplexing; Multichannel holograms ( <a href="#">G03H 1/268</a> takes precedence ) }
G03H 2001/2655	...	Time multiplexing, i.e. consecutive records wherein the period between records is pertinent per se
G03H 2001/266	...	Wavelength multiplexing
G03H 2001/2665	...	Coherence multiplexing wherein different holobjects are perceived under coherent or incoherent illumination
G03H 2001/267	...	Polarisation multiplexing
G03H 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 G03H 1/12</a> )
G03H 1/268	..	{ Holographic stereogram }
G03H 2001/2685	...	One step recording process
G03H 2001/269	...	Two and more than two steps recording process
G03H 2001/2695	...	Dedicated printer ( <a href="#">holographic printers G03H 1/0476</a> )
G03H 1/28	..	superimposed holograms only
G03H 1/30	..	discrete holograms only



- G03H 2001/303 . . . Interleaved sub-holograms, e.g. three RGB sub-holograms having interleaved pixels for reconstructing coloured holobject
- G03H 2001/306 . . . Tiled identical sub-holograms
- G03H 1/32 . Systems for obtaining speckle elimination
- G03H 1/34 . Systems for reducing the space-spatial bandwidth product
- G03H 3/00** **Holographic processes or apparatus using ultrasonic, sonic or infrasonic waves for obtaining holograms; Processes or apparatus for obtaining an optical image from them ( G03H 1/22 takes precedence; { acoustic non-destructive testing using holographic methods G01N 29/0663; seismology using acoustic vibrations G01V 1/00; non-holographic methods for visualizing acoustic waves G10K 15/00 } )**
- G03H 5/00** **Holographic processes or apparatus using particles or using waves other than those covered by groups G03H 1/00 or G03H 3/00 for obtaining holograms; Processes or apparatus for obtaining an optical image from them ( G03H 1/22 takes precedence; construction of electron microscopes H01J 37/26; { investigating or analysing materials by the use of microwaves G01N 22/00, by the use of particles wave or X-rays G01N 23/00, G21K 7/00 } )**
- G03H 2210/00** **Object characteristics ( not used, see subgroups )**
  - G03H 2210/10 . Modulation characteristics, e.g. amplitude, phase, polarisation
  - G03H 2210/11 . . Amplitude modulating object
  - G03H 2210/12 . . Phase modulating object, e.g. living cell
  - G03H 2210/13 . . Coloured object
  - G03H 2210/20 . 2D object
  - G03H 2210/22 . . 2D SLM object wherein the object beam is formed of the light modulated by the SLM ( SLM per se G03H 2001/0224 )
  - G03H 2210/30 . 3D object
  - G03H 2210/32 . . 3D+2D, i.e. composition of 3D and 2D sub-objects, e.g. scene in front of planar background
  - G03H 2210/33 . . 3D/2D, i.e. the object is formed of stratified 2D planes, e.g. tomographic data
  - G03H 2210/36 . . Occluded features resolved due to parallax selectivity
  - G03H 2210/40 . Synthetic representation, i.e. digital or optical object decomposition
  - G03H 2210/42 . . from real object, e.g. using 3D scanner
  - G03H 2210/44 . . Digital representation
  - G03H 2210/441 . . . Numerical processing applied to the object data other than numerical propagation ( synthesizing propagation G03H 1/0808 )
  - G03H 2210/45 . . Representation of the decomposed object
  - G03H 2210/452 . . . into points
  - G03H 2210/454 . . . into planes
  - G03H 2210/46 . . for subsequent optical processing ( G03H 1/268 takes precedence )
  - G03H 2210/50 . Nature of the object

- G03H 2210/52 . . . Alphanumeric
- G03H 2210/53 . . . Coded object not directly interpretable, e.g. encrypted object, barcode
- G03H 2210/54 . . . For individualisation of product
- G03H 2210/55 . . . Having particular size, e.g. irresolvable by the eye
- G03H 2210/56 . . . Multiple objects, e.g. each in different environment
- G03H 2210/562 . . . . . Holographic object, i.e. a combination of an object and holobject ( [G03H 1/20 takes precedence](#) )
  
- G03H 2210/62 . . . Moving object
  
- G03H 2210/63 . . . Environment affecting the recording, e.g. underwater ( [G03H 2001/0432 takes precedence](#) )
  
- G03H 2222/00** **Light sources or light beam properties ( not used, see subgroups )**
  
- G03H 2222/10 . . . Spectral composition
- G03H 2222/12 . . . Single or narrow bandwidth source e.g. laser, light emitting diode [LED]
- G03H 2222/13 . . . Multi-wavelengths wave with discontinuous wavelength ranges ( [G03H 2222/18 takes precedence](#) )
- G03H 2222/14 . . . Broadband source, e.g. sun light
- G03H 2222/15 . . . Ultra Violet [UV]
- G03H 2222/16 . . . Infra Red [IR]
- G03H 2222/17 . . . White light ( [G03H 1/24 takes precedence](#) )
- G03H 2222/18 . . . . . RGB trichrome light
  
- G03H 2222/20 . . . Coherence of the light source
- G03H 2222/22 . . . Spatial coherence
- G03H 2222/23 . . . Temporal coherence
- G03H 2222/24 . . . Low coherence light normally not allowing valuable record or reconstruction ( [G03H 1/06 takes precedence](#) )
  
- G03H 2222/31 . . . Polarised light
  
- G03H 2222/32 . . . Unpolarised light
  
- G03H 2222/33 . . . Pulsed light beam
  
- G03H 2222/34 . . . Multiple light sources
  
- G03H 2222/35 . . . Transverse intensity distribution of the light beam
  
- G03H 2222/36 . . . Scanning light beam
  
- G03H 2222/40 . . . Particular irradiation beam not otherwise provided for
- G03H 2222/42 . . . Reference beam at recording stage
- G03H 2222/43 . . . Object beam at recording stage
- G03H 2222/44 . . . Beam irradiating the object at recording stage



- G03H 2222/45 . . Interference beam at recording stage, i.e. following combination of object and reference beams
- G03H 2222/46 . . Reconstruction beam at reconstruction stage
- G03H 2222/47 . . Evanescent wave
  
- G03H 2222/50 . Geometrical property of the irradiating beam
- G03H 2222/52 . . Divergent beam
- G03H 2222/53 . . Collimated beam
- G03H 2222/54 . . Convergent beam
- G03H 2222/55 . . Astigmatic beam having different focal planes ( [anamorphic optical element G03H 2223/21](#) )
- G03H 2222/56 . . Conjugated beam
  
- G03H 2223/00** **Optical components ( not used, see subgroups )**
  
- G03H 2223/12 . Amplitude mask, e.g. diaphragm, Louver filter
- G03H 2223/13 . Phase mask
- G03H 2223/14 . Diffuser, e.g. lens array, random phase mask
- G03H 2223/15 . Colour filter, e.g. interferential colour filter
- G03H 2223/16 . Optical waveguide, e.g. optical fibre, rod
- G03H 2223/17 . Element having optical power
- G03H 2223/18 . Prism
- G03H 2223/19 . Micro-optic array e.g. lens array
- G03H 2223/20 . Birefringent optical element, e.g. wave plate
- G03H 2223/21 . Anamorphic optical element e.g. cylindrical ( [astigmatic beam G03H 2222/55](#) )
- G03H 2223/22 . Polariser
- G03H 2223/23 . Diffractive element
- G03H 2223/24 . Reflector; Mirror
- G03H 2223/25 . Index matching material
- G03H 2223/26 . Means providing optical delay e.g. for path length matching
- G03H 2223/50 . Particular location or purpose of optical element ( [downstream optical component G03H 1/2205](#) )
- G03H 2223/52 . . Filtering the object information
- G03H 2223/53 . . Filtering the hologram information, i.e. the fringe pattern

- G03H 2223/54 . . Filtering the holobject information
- G03H 2223/55 . . Arranged at a Fourier plane

**G03H 2224/00 Writing means other than actinic light wave ( not used, see subgroups )**

- G03H 2224/02 . Mechanical means, e.g. diamond tool
- G03H 2224/04 . Particle beam, e.g. e-beam
- G03H 2224/06 . Thermal or photo-thermal means ( [infra red source G03H 2222/16](#) )

**G03H 2225/00 Active addressable light modulator ( not used, see subgroups )**

- G03H 2225/10 . Shape or geometry
- G03H 2225/11 . . 1D SLM
- G03H 2225/12 . . 2D SLM
- G03H 2225/13 . . 3D SLM
- G03H 2225/20 . Nature, e.g. e-beam addressed
- G03H 2225/21 . . Acousto-optic SLM [AO-SLM]
- G03H 2225/22 . . Electrically addressed SLM [EA-SLM]
- G03H 2225/23 . . Grating based SLM
- G03H 2225/24 . . Having movable pixels, e.g. micro-electromechanical systems [MEMS]
- G03H 2225/25 . . Optically addressed SLM [OA-SLM]
- G03H 2225/30 . Modulation
- G03H 2225/31 . . Amplitude only
- G03H 2225/32 . . Phase only
- G03H 2225/33 . . Complex modulation
- G03H 2225/34 . . . Amplitude and phase coupled modulation
- G03H 2225/35 . . Colour modulation
- G03H 2225/36 . . Polarisation
- G03H 2225/52 . Reflective modulator
- G03H 2225/55 . Having optical element registered to each pixel
- G03H 2225/60 . Multiple SLMs
- G03H 2225/61 . . for multicolour processing

**G03H 2226/00 Electro-optic or electronic components relating to digital holography ( not used, see subgroups )**

- G03H 2226/02 . Computing or processing means, e.g. digital signal processor [DSP]
- G03H 2226/04 . Transmission or communication means, e.g. internet protocol

- G03H 2226/05 . Means for tracking the observer
- G03H 2226/11 . Electro-optic recording means, e.g. CCD, pyroelectric sensors
- G03H 2226/13 . . Multiple recording means
- G03H 2227/00** **Mechanical components or mechanical aspects not otherwise provided for ( not used, see subgroups )**
- G03H 2227/02 . Handheld portable device, e.g. holographic camera, mobile holographic display
- G03H 2227/03 . Means for moving one component ( [G03H 1/0476](#), [G03H 2001/2695](#) take precedence )
- G03H 2227/04 . Production line for mass production
- G03H 2227/05 . Support holding the holographic record
- G03H 2227/06 . . Support including light source
- G03H 2230/00** **Form or shape of the hologram when not registered to the substrate ( not used, see subgroups )**
- G03H 2230/10 . Micro-hologram not registered to the substrate
- G03H 2240/00** **Hologram nature or properties ( not used, see subgroups )**
- G03H 2240/10 . Physical parameter modulated by the hologram ( [G03H 2001/0224](#) takes precedence )
- G03H 2240/11 . . Phase only modulation ( [G03H 1/0244](#) takes precedence )
- G03H 2240/12 . . Amplitude only modulation
- G03H 2240/13 . . Amplitude and phase complex modulation
- G03H 2240/15 . . Polarisation modulation
- G03H 2240/20 . Details of physical variations exhibited in the hologram
- G03H 2240/21 . . Optical density variations
- G03H 2240/22 . . . Chromatic variations e.g. photochromic or electrochromic
- G03H 2240/23 . . Optical length variations, e.g. bleached silver halide ( [G03H 1/0244](#) takes precedence )
- G03H 2240/24 . . . Index variations only
- G03H 2240/25 . . Magnetic variations
- G03H 2240/26 . . Structural variations, e.g. structure variations due to photoanchoring or conformation variations due to photo-isomerisation
- G03H 2240/40 . . Dynamic of the variations
- G03H 2240/41 . . . Binary
- G03H 2240/42 . . . Discrete level
- G03H 2240/43 . . . Continuous
- G03H 2240/50 . Parameters or numerical values associated with holography, e.g. peel strength

- G03H 2240/51 . . Intensity, power or luminance ( [G03H 2240/52](#) takes precedence )
- G03H 2240/52 . . Exposure parameters e.g. time, intensity
- G03H 2240/53 . . Diffraction efficiency [DE]
- G03H 2240/54 . . Refractive index
- G03H 2240/55 . . Thickness
- G03H 2240/56 . . Resolution
- G03H 2240/61 . . SLM related parameters, e.g. pixel size
- G03H 2240/62 . . Sampling aspect applied to sensor or display

**G03H 2250/00**      **Laminate comprising a hologram layer** ( not used, see subgroups )

- G03H 2250/10 . arranged to be transferred onto a carrier body ( adhesive layer [G03H 2250/35](#) )
- G03H 2250/12 . Special arrangement of layers
- G03H 2250/14 . Forming layer onto which a surface relief hologram is formed ( [G03H 2270/52](#) takes precedence )
- G03H 2250/32 . Antireflective layer
- G03H 2250/33 . Absorbing layer
- G03H 2250/34 . Colour layer
- G03H 2250/35 . Adhesive layer
- G03H 2250/36 . Conform enhancement layer
- G03H 2250/37 . Enclosing the photosensitive material
- G03H 2250/38 . Liquid crystal
- G03H 2250/39 . Protective layer
- G03H 2250/40 . Printed information overlapped with the hologram
- G03H 2250/41 . Polarisation active layer
- G03H 2250/42 . Reflective layer ( [G03H 2250/36](#) takes precedence )
- G03H 2250/43 . One layer having dispersed particles ( [S02H 260/33](#) takes precedence )
- G03H 2250/44 . Colour tuning layer

**G03H 2260/00**      **Recording materials or recording processes** ( not used, see subgroups )

- G03H 2260/10 . Dichromated gelatine or equivalents
- G03H 2260/12 . Photopolymer

- G03H 2260/14 . Photoresist
- G03H 2260/16 . Silver halide emulsion
- G03H 2260/30 . Details of photosensitive recording material not otherwise provided for
  - G03H 2260/31 . . Ageing or resistance of the material ( [G03H 2250/39 takes precedence](#) )
  - G03H 2260/32 . . Combining different recording materials ( [G03H 2001/2615 takes precedence](#) )
  - G03H 2260/33 . . Having dispersed compound
  - G03H 2260/34 . . Non uniform thickness
  - G03H 2260/35 . . Rewritable material allowing several record and erase cycles
  - G03H 2260/36 . . . Dynamic material where the lifetime of the recorded pattern is quasi instantaneous, the holobject is simultaneously reconstructed
- G03H 2260/50 . Reactivity or recording processes ( [writing means G03H 2001/0212, G03H 2001/022](#) )
  - G03H 2260/51 . . Photoanisotropic reactivity wherein polarized light induces material birefringence, e.g. azo-dye doped polymer
  - G03H 2260/52 . . Photochromic reactivity wherein light induces a reversible transformation between two states having different absorption spectra
  - G03H 2260/53 . . Photoconductor thermoplastic reactivity wherein light is transformed into an electrostatic then into a thickness distribution
  - G03H 2260/54 . . Photorefractive reactivity wherein light induces photo-generation, redistribution and trapping of charges then a modification of refractive index, e.g. photorefractive polymer
  - G03H 2260/61 . . Producing material deformation
  - G03H 2260/62 . . Direct etching
  - G03H 2260/63 . . Indirect etching, e.g. lithography ( [photoresist G03H 2260/14](#) )
- G03H 2270/00 Substrate bearing the hologram ( [not used, see subgroups](#) )**
- G03H 2270/10 . Composition
  - G03H 2270/11 . . Crystal or glass ( [G03H 2270/55 takes precedence](#) )
  - G03H 2270/12 . . Fibrous, e.g. paper, textile
  - G03H 2270/13 . . Metallic
  - G03H 2270/14 . . Plastic
- G03H 2270/20 . Shape
  - G03H 2270/21 . . Curved bearing surface
  - G03H 2270/22 . . Disc shaped
  - G03H 2270/23 . . Ribbon shaped, e.g. holographic foil
  - G03H 2270/24 . . Having particular size, e.g. microscopic
- G03H 2270/30 . Nature
  - G03H 2270/31 . . Flexible
  - G03H 2270/32 . . Transparent
- G03H 2270/52 . Integrated surface relief hologram without forming layer

- G03H 2270/53 . Recording material dispersed into porous substrate
- G03H 2270/54 . Recording material filed in recessed substrate
- G03H 2270/55 . being an optical element, e.g. spectacles