

**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 25/328](#); 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 <a href="#">G06K 9/76</a> )}
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 <a href="#">G03F 7/70283</a> )}
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 <a href="#">G03H 2210/00</a> )}
G03H 2001/0208	..	{Individual components other than the hologram}
G03H 2001/0212	...	{Light sources or light beam properties ( <a href="#">G03H 1/06</a> , <a href="#">G03H 1/24</a> take precedence; corresponding details, see subgroups of <a href="#">G03H 2222/00</a> )}
G03H 2001/0216	...	{Optical components ( <a href="#">G03H 2001/0224</a> , <a href="#">G03H 1/0256</a> take precedence; corresponding details, see subgroups of <a href="#">G03H 2223/00</a> )}
G03H 2001/022	...	{Writing means other than actinic light wave (corresponding details, see subgroups of <a href="#">G03H 2224/00</a> )}
G03H 2001/0224	...	{Active addressable light modulator, i.e. Spatial Light Modulator [SLM] (corresponding details, see subgroups of <a href="#">G03H 2225/00</a> )}
G03H 2001/0228	...	{Electro-optic or electronic components relating to digital holography ( <a href="#">G03H 2001/0224</a> takes precedence; corresponding details, see subgroups of <a href="#">G03H 2226/00</a> )}
G03H 2001/0232	...	{Mechanical components or mechanical aspects not otherwise provided for (corresponding details, see subgroups of <a href="#">G03H 2227/00</a> )}
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 <a href="#">G03H 1/0272</a> )}
G03H 1/024	..	{Hologram nature or properties}
G03H 1/0244	...	{Surface relief holograms (replicating hologram without interference recording <a href="#">G03H 1/0276</a> )}
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 ( <a href="#">G03H 2226/11</a> takes precedence; corresponding details, see subgroups of <a href="#">G03H 2260/00</a> )}
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 ( <a href="#">surface relief holograms G03H 1/0244</a> )}
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 takes precedence</a> )
G03H 1/0402	..	{Recording geometries or arrangements ( <a href="#">G03H 1/0443</a> , <a href="#">G03H 1/0476</a> , <a href="#">G03H 1/16 take precedence</a> )}
G03H 1/0404	...	{In-line recording arrangement}
G03H 1/0406	...	{Image plane or focused image holograms, i.e. an image of the object or holobject is formed on, in or across the recording plane}
G03H 1/0408	...	{Total internal reflection [TIR] holograms, e.g. edge lit or substrate mode holograms}
G03H 1/041	...	{Optical element in the object space affecting the object beam, not otherwise provided for}
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	....	{Restricted parallax, e.g. horizontal parallax only holograms [HPO]}
G03H 2001/0426	....	{Extended parallax, e.g. panoramic or 360deg. holograms}
G03H 2001/0428	...	{Image holography, i.e. an image of the object or holobject is recorded ( <a href="#">G03H 1/0406 takes precedence</a> ; <a href="#">holographic microscope G03H 2001/005</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	..	{Digital holography, i.e. recording holograms with digital recording means ( <a href="#">holobject computation G03H 1/0866</a> )}
G03H 2001/0445	...	{Off-axis recording arrangement ( <a href="#">G03H 2001/0456 takes precedence</a> )}
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	....	{Spatial heterodyne, i.e. filtering a Fourier transform of the off-axis record}
G03H 2001/0458	....	{Temporal or spatial phase shifting, e.g. parallel phase shifting method}
G03H 2001/046	...	{Synthetic aperture}
G03H 2001/0463	...	{Frequency heterodyne, i.e. one beam is frequency shifted}
G03H 1/0465	..	{Particular recording light; Beam shape or geometry ( <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	..	{Holographic printer ( <a href="#">G03H 1/268</a> takes precedence)}
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	..	{Improving or monitoring the quality of the record, e.g. by compensating distortions, aberrations}
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	..	{Special holograms not otherwise provided for, e.g. conoscopic, referenceless holography}
G03H 2001/0495	...	{Polarisation preserving holography where amplitude, phase and polarisation state of the original object wavefront are recorded}
G03H 2001/0497	...	{Dot matrix holograms}
G03H 1/06	..	using incoherent light
G03H 1/08	..	Synthesising holograms, { i.e. holograms synthesized from objects or objects from holograms} ( <a href="#">using electric digital computers G06F; G06T</a> )
G03H 1/0808	...	{Methods of numerical synthesis, e.g. coherent ray tracing [CRT], diffraction specific}
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	...	{Encoding method mapping the synthesized field into a restricted set of values representative of the modulator parameters, e.g. detour phase coding}
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	...	{Digital holographic imaging, i.e. synthesizing holobjects from holograms}
G03H 2001/0875	....	{Solving phase ambiguity, e.g. phase unwrapping}

G03H 2001/0883	....	{Reconstruction aspect, e.g. numerical focusing}
G03H 1/0891	...	{Processes or apparatus adapted to convert digital holographic data into a hologram ( <a href="#">G03H 1/2294</a> takes precedence)}
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 {(photographic processing in general <a href="#">G03C</a> , <a href="#">G03D</a> )}
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 (shape of hologram <a href="#">G03H 1/0236</a> )}
G03H 2001/188	....	{Demetallisation, i.e. removing the enhancing metallic layer (enhancement layer <a href="#">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 filled 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 (TIR recording <a href="#">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 holograms 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 hologram}
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
<b>G03H 3/00</b>		<b>Holographic processes or apparatus using ultrasonic, sonic or infrasonic waves for obtaining holograms; Processes or apparatus for obtaining an optical image from them (<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>})</b>
<b>G03H 5/00</b>		<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 (<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>})</b>
<b>G03H 2210/00</b>		<b>Object characteristics (<a href="#">not used, see subgroups</a>)</b>
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 ( <a href="#">SLM per se G03H 2001/0224</a> )
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 . . . Alphanumerical
- 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

<b>G03H 2230/00</b>	<b>Form or shape of the hologram when not registered to the substrate (not used, see subgroups)</b>
G03H 2230/10	. Micro-hologram not registered to the substrate
<b>G03H 2240/00</b>	<b>Hologram nature or properties (not used, see subgroups)</b>
G03H 2240/10	. Physical parameter modulated by the hologram ( <a href="#">G03H 2001/0224 takes precedence</a> )
G03H 2240/11	.. Phase only modulation ( <a href="#">G03H 1/0244 takes precedence</a> )
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 ( <a href="#">G03H 1/0244 takes precedence</a> )
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 ( <a href="#">G03H 2240/52 takes precedence</a> )
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
<b>G03H 2250/00</b>	<b>Laminate comprising a hologram layer (not used, see subgroups)</b>
G03H 2250/10	. arranged to be transferred onto a carrier body ( <a href="#">adhesive layer G03H 2250/35</a> )
G03H 2250/12	. Special arrangement of layers
G03H 2250/14	. Forming layer onto which a surface relief hologram is formed ( <a href="#">G03H 2270/52 takes precedence</a> )
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 ([G03H 2260/33 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