IHMA
PATENT NEWSLETTER

Limited circulation patent news bulletin for the Holography Industry

APRIL 2023 – 81 PATENTS

Published and granted patents

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- Some patents can be indexed in several categories.
- Some old patents are sometimes introduced in the databases if they have not been included in the previous update.
- The full patent information is in the tables at the end of this document (See TABLES WITH REFERENCES).
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P36254

SECURITY & OPTICAL EFFECTS' COLUMN
BANKNOTE – RELIEF – MICROLENS

WO202351948 **GIESECKE & DEVRIENT CURRENCY TECHNOLOGY**

Inventor(s): HUYNH THANH-HAO | FUHSE CHRISTIAN

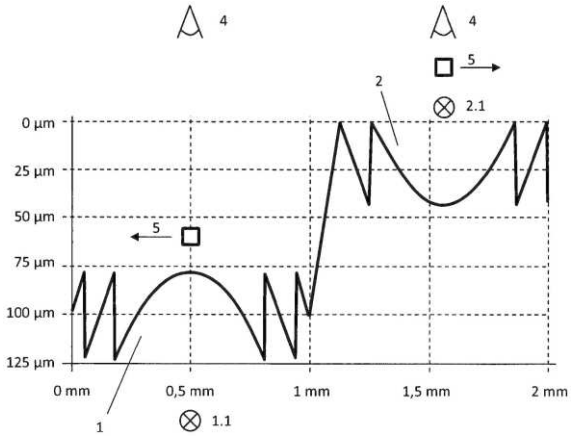
Application Nber / Date: WOEP2022/025440 2022-09-22

Priority Nber / Date / Country: DE102021004910 2021-09-29

DISPLAY ELEMENT HAVING AN IMAGE FLOATING ABOVE AND BELOW THE SUBSTRATE

The invention relates to a display element having a substrate with an upper side and a lower side, a multiplicity of optical elements being arranged in a surface region of the upper side. [0003] 2. According to the invention, some of the optical elements are arranged in a first grid and another part of the optical elements are arranged in a second grid, the first grid adjoining the second grid. The optical elements of the first grid consist of a first type of optical elements and the optical elements of the second grid consist of a second type of optical elements, the first type of optical elements being different from the second type of optical elements.

ÉLÉMENT DE PRÉSENTATION COMPRENANT UNE IMAGE FLOTTANT AU-DESSUS ET AU-DESSOUS DU SUBSTRAT



Élément de présentation comprenant un substrat présentant une pluralité d'éléments optiques. Les éléments optiques (p.ex. miroir convexe 2 en forme de miroir de Fresnel concave, pourvu d'un point focal 2.1) d'une première grille constitués d'un premier type d'éléments optiques et les éléments optiques (p.ex. renversés vers les miroirs convexes 2 ou miroir convexe 1 réfléchi de 180° autour de l'axe transversal en forme de miroir de Fresnel convexe ou d'une lentille de Fresnel convexe, avec un point focal 1.1) d'une deuxième grille constituée d'un deuxième type d'éléments optiques, le premier type d'éléments optiques étant différent du deuxième type d'éléments optiques. Lors du basculement de l'élément de présentation, les taches lumineuses 5 des surfaces de miroir concave et convexe se déplacent de manière synchrone en sens inverse dans la direction des flèches de manière à ce qu'un observateur 4 observe un effet de battement particulièrement dynamique.

CLAIM 1. Display element having a substrate with an upper side and a lower side, a multiplicity of optical elements being arranged in a surface region of the upper side, characterized in that In that a part of the optical elements are arranged in a first grid and another part of the optical elements are arranged in a second grid, wherein the first grid adjoins the second grid, wherein the optical elements of the first grid consist of a first type of optical elements and the optical elements of the second grid consist of a second type of optical elements, wherein the first type of optical elements is different from the second type of optical elements.

Equivalent: DE102021004910 A1

Status: Pending

Research Report:

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2022/025440

A. CLASSIFICATION OF SUBJECT MATTER
B42D 25/324(2014.01)i; ***B42D 25/351***(2014.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B42D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2012048847 A1 (GIESECKE & DEVRIENT GMBH [DE]; FUHSE CHRISTIAN [DE] ET AL.) 19 April 2012 (2012-04-19) cited in the application page 3, line 12 - line 19 page 4, line 5 - line 13 page 4, line 28 - page 6, line 22 page 9, line 4 - line 17	1-14

PATENT REFERENCE – See the table at the end of this document

P36246 **CARD – LABEL**

WO202354570
Priority Date: **30/09/2021**

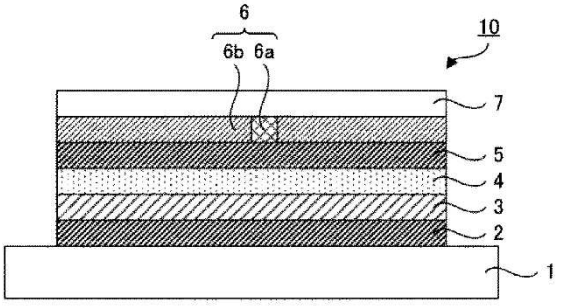
DAI NIPPON PRINTING

HOLOGRAPHIC LAMINATE

The present disclosure provides a holographic laminate comprising a volume hologram layer, and a metal layer arranged on one side of the volume hologram layer and having a patterned light-transmitting section and a light-reflecting section.

STRATIFIÉ HOLOGRAPHIQUE

La présente invention concerne un stratifié holographique comprenant une couche d'hologramme volumique, et une couche métallique disposée sur un côté de la couche d'hologramme volumique et ayant une partie d'émission de lumière à motifs et une partie de réflexion de lumière.



CLAIM 1. A hologram laminate comprising: a volume hologram layer; and a metal layer disposed on one surface of the volume hologram layer and including a patterned light transmission portion and a patterned light reflection portion.

P36263 **BANKNOTE**

PL2021438968
Priority Date: **17/09/2021**

POLSKA WYTWÓRNIA PAPIERÓW WARTOSCIOWYCH SPÓLKA AKCYJNA

DATA CARRIER CONTAINING A TRANSMISSION DIFFRACTION ELEMENT AND METHOD FOR ITS MANUFACTURE

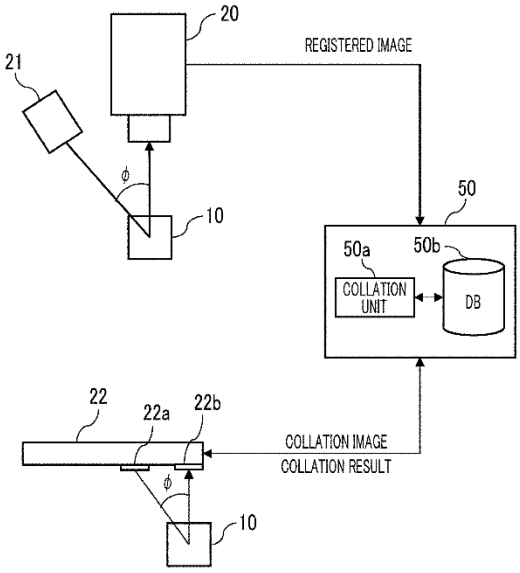
A data carrier, in particular a data carrier for documents with security elements, in particular valuable documents with security elements, comprising a transmission diffractive element (102), preferably comprising personal data and/or markings individualizing the data carrier, which transmission diffractive element (102), when illuminated by collimated light, provides an image projection observable on a surface located on the opposite side of the carrier to the source of collimated light illuminating the carrier containing said transmissive diffractive element (102), and which data carrier comprises a carrier substrate comprising a stack, preferably permanently interconnected, most preferably laminated, at least three layers, including at least two transparent layers, preferably transparent film layers, of which at least one transparent layer is a laser-markable transparent layer, and, preferably, one or more non-transparent layer (101) with a transparent window, the medium being transparent at least in part of its surface, forming a transparent area of the surface of the data medium which, in the presence of a non-transparent layer (101), is defined by an area of a transparent window or windows present in the non-transparent layer (101) overlapping at least partly with the area a surface of a data carrier provided with a transmissive diffractive element (102) providing a transmissive diffractive effect, the transmissive diffractive element (102) having the form of a pattern consisting of laser-modified areas in said at least one laser-markable layer, and wherein the transmissive diffractive element (102) is a computer generated tactile imperceptible binary holographic structure formed of first and second regions having extremely different light ray transmission characteristics, the first being preferably a substantially light ray transmissive region and the second preferably being a substantially light opaque region, and which holographic structure ensures the observation of the image encoded in the holographic binary structure in the transmission image, and its thickness does not exceed the thickness of the carrier.

P36291

EP4156119 **FUJIFILM BUSINESS INNOVATION**
Priority Date: **24/09/2021**

COLLATION DEVICE, PROGRAM, AND COLLATION METHOD

A collation device includes a light source unit; a camera unit that receives light emitted from the light source unit and reflected in a collation area of an object to acquire a photographed image of the collation area; a display unit; and a processor configured to, by executing a program: display a guide of a bright spot portion of the light source unit on the photographed image on the display unit so that an angle formed by the light source unit, the camera unit, and the collation area of the object is a predetermined angle.



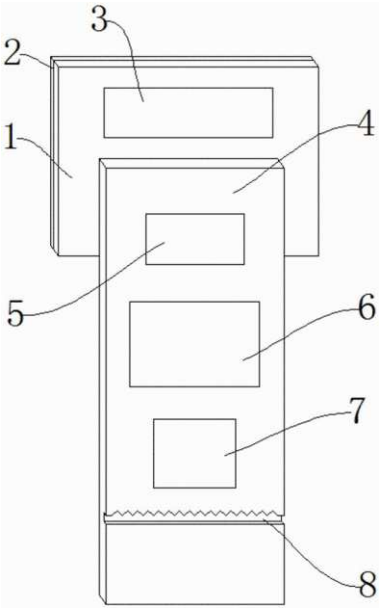
CLAIM 1. A collation device comprising: a light source unit; a camera unit that receives light emitted from the light source unit and reflected in a collation area of an object to acquire a photographed image of the collation area; a display unit; and a processor configured to, by executing a program: display a guide of a bright spot portion of the light source unit on the photographed image on the display unit so that an angle formed by the light source unit, the camera unit, and the collation area of the object is a predetermined angle.

P36296 **PRINTING – LABEL – INFRARED**

CN218886741U **PEOPLE S PRINTING PLANT OF GUANGZHOU**
Priority Date: **27/09/2022**

ARTWORK ANTI-COUNTERFEIT LABEL

The utility model discloses an artwork anti-counterfeit label, including carrying the pad, be provided with the adhesive layer on carrying the lateral wall that fills up, be provided with the mark district on carrying another lateral wall that fills up, the below in mark district is provided with the label carrier, be provided with holographic false proof mark on the lateral wall of label carrier, holographic false proof mark's below spraying has infrared anti-fake printing ink, infrared anti-fake printing ink's below spraying has anti-fake two-dimensional code, anti-fake two-dimensional code's below is provided with anti-fake irregular indent. Has the advantages that: the utility model discloses a design in label carrier, holographic false proof mark, infrared anti-fake printing ink coating district, anti-fake two-dimensional code and the irregular indent of anti-fake can make work of art antifalsification label have multiple anti-fake mark.



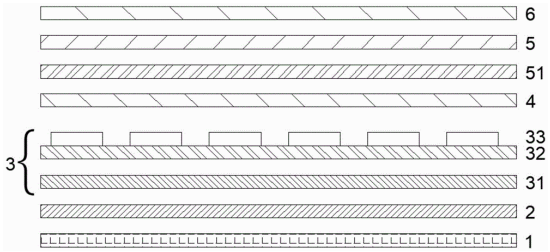
CLAIM 1. An artwork anti-counterfeit label is characterized in that: including carrying pad (1), be provided with adhesive layer (2) on carrying the lateral wall of pad (1), be provided with mark district (3) on carrying another lateral wall of pad (1), the below of mark district (3) is provided with label carrier (4), be provided with holographic anti-fake label (5) on the lateral wall of label carrier (4), the below spraying of holographic anti-fake label (5) has infrared anti-fake printing ink (6), the below spraying of infrared anti-fake printing ink (6) has anti-fake two-dimensional code (7), the below of anti-fake two-dimensional code (7) is provided with anti-fake irregular indent (8).

P36305 **PRINTING – BRAND PROTECTION – LUMINESCENCE**

CN218768663U **HUIZHOU SHANGSHI HUA TECHNOLOGY**
Priority Date: **07/12/2022**

HOLOGRAPHIC ULTRAVIOLET ANTI-COUNTERFEITING PLASTIC BAG

The utility model discloses a holographic ultraviolet ray plastic bag that guards against falsification, include: the base film layer, coat in printing layer on the base film layer, set up in holographic layer on the printing layer, print in fluorescent printing layer on the holographic layer, laminate the tectorial membrane layer on fluorescent printing layer through the glue film, and laminate in heat-seal layer on the tectorial membrane layer. The utility model discloses a set up holographic picture layer and fluorescence printing layer to play dual anti-fake effect, provide the fluorescence that customization holographic pattern was anti-fake and was shown under the ultraviolet lamp simultaneously and prevent falsification, improve packaging material's anti-fake effect, and improve the preparation degree of difficulty, avoid being imitated by other people.



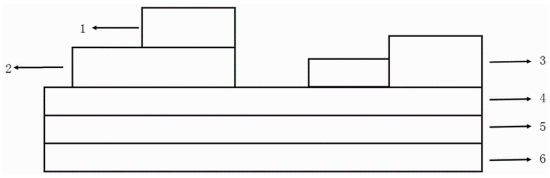
CLAIM 1. A holographic ultraviolet anti-counterfeiting plastic bag is characterized by comprising: the base film layer, coat in printing layer on the base film layer, set up in holographic layer on the printing layer, print in fluorescent printing layer on the holographic layer, laminate the tectorial membrane layer on fluorescent printing layer through the glue film, and laminate in heat-seal layer on the tectorial membrane layer.

P36306 **LABEL**

CN218768536U **ZHONGSHAN GUOAN TORCH TECHNOLOGY DEVELOPMENT**
Priority Date: **12/10/2022**

LABEL WITH MICROPOROUS MEMBRANE STRUCTURE

The utility model discloses a label with nuclear microporous membrane structure, include: a carrier layer; the pressure-sensitive adhesive layer is arranged on the surface of the carrier layer; the base film layer is arranged on the surface of the pressure-sensitive adhesive layer; the identification code layer is arranged in a partial region of the base film layer; a core microporous membrane layer disposed at a partial region of the base membrane layer; a holographic scratch layer disposed at a partial area of the identification code layer. Through set up identification code layer and nuclear micropore layer and with holographic scrapable layer cover the dual anti-fake effect has been realized on the identification code layer in the basement rete, use holographic scrapable layer to cover the identification code layer, replace ordinary scraping and scrape the china ink, reach and make the product apparent abundanter, also can reach ordinary scraping simultaneously and scrape the technological effect that the china ink hidden the identification code.



CLAIM 1. A label with a microporous membrane structure, comprising: a carrier layer (6); a pressure sensitive adhesive layer (5), the pressure sensitive adhesive layer (5) being arranged on the surface of the carrier layer (6); the base film layer (4), the base film layer (4) is arranged on the surface of the pressure-sensitive adhesive layer (5); the identification code layer (2) is arranged in a partial region of the base film layer (4); a nuclear microporous membrane layer (3), wherein the nuclear microporous membrane layer (3) is arranged on a partial region of the base membrane layer (4); a holographic scratch-off layer (1), wherein the holographic scratch-off layer (1) is arranged in a partial area of the identification code layer (2).

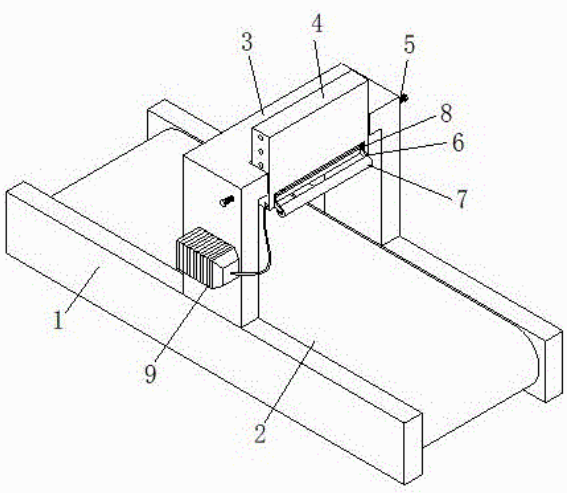
P36309 **LABEL**

CN218704539U
Priority Date: **29/07/2022**

LYVANSHENGDE BEIJING SECURITY & ANTI COUNTERFEITING TECHNOLOGY

LASER HOLOGRAM ANTIFALSIFICATION LABEL PRESSING DEVICE

The utility model relates to an antifalsification label pressfitting technical field just discloses a laser hologram antifalsification label compression fittings, including the support frame, the inside of support frame is provided with the conveyer belt, and the top fixed mounting of support frame has the mount. The utility model discloses in, the operation of control air heater, the pressfitting roller pastes tightly under the effect of extension spring and carries out the pressfitting to the label at the label surface, the hot-blast inside that gets into the connecting pipe through flexible hose that produces of air heater, hot-blast can flow to both sides in getting into a movable section of thick bamboo inside at the connecting pipe, hot-blast inside that gets into the extension frame through a movable section of thick bamboo, can drive the angle that extends the frame when a movable section of thick bamboo rotates and adjust, it follows a movable section of thick bamboo and rotates to the suitable angle in to extend the frame, hot-blast air-guide duct through extending the frame bottom blows to the label surface in order to heat the label, the extrusion of label after the heating is in order to realize the effect of pressfitting, thereby carry out the viscidity of appropriate heating in order to ensure the label to the label when winter temperature is lower.



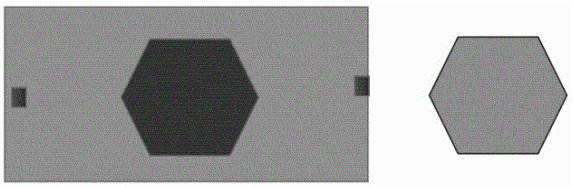
CLAIM 1. The utility model provides a laser hologram antifalsification label compression fittings, includes support frame (1), the inside of support frame (1) is provided with conveyer belt (2), and the top fixed mounting of support frame (1) has mount (3), its characterized in that: the mounting groove has been seted up at the top of mount (3), there is regulating plate (4) inside of mounting groove through slide rail movable mounting, the bottom of regulating plate (4) is seted up flutedly, the inside symmetry movable mounting of recess has two movable section of thick bamboo (6), movable mounting has pressfitting roller (7) between two movable section of thick bamboo (6), the outer wall fixed mounting of mount (3) has air heater (9), fixed mounting has connecting pipe (10) between two movable section of thick bamboo (6), the outer wall of connecting pipe (10) is provided with has elastic flexible pipe (11), connecting pipe (10) are through elastic flexible pipe (11) and air heater (9) interconnect, fixed mounting has extension frame (12) between two movable section of thick bamboo (6), the bottom of extension frame (12) is provided with guide duct (13).

P36320

CN115946466 **SHANTOU JIAXIN PACKING MAT**
Priority Date: **08/02/2023**

PRODUCTION PROCESS OF MULTICOLOR MULTI-PATTERN ACCURATE-REGISTRATION HOLOGRAPHIC POSITIONING ALUMITE GOLD STAMPING FILM

The invention discloses a production process of a multicolor multi-pattern precise registration holographic positioning alumite gold stamping film, which changes the traditional three-time hot stamping (wherein two-time hot stamping is overlapping hot stamping) into one-time hot stamping, reduces the use of a gold stamping process and an alumite gold stamping film, saves the cost, improves the production efficiency, adopts an imported plate splicing machine to realize high plate splicing precision, ensures precise registration of an intaglio film printing machine, adopts a positioning registration mould pressing mode for a mould pressing process, can meet the customer requirements, customizes the high-precision multicolor multi-pattern alumite gold stamping film, and avoids the hot stamping defects of infirm hot stamping, blurred holographic patterns, residual hot stamping fine strips and the like after the second overlapping hot stamping process.



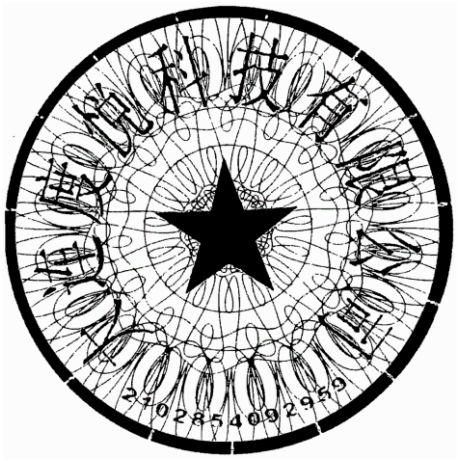
CLAIM 1. The production process of the multicolor multi-pattern precise registration holographic positioning alumite gold stamping film is characterized by comprising the following steps of: the production steps are as follows: s1, manufacturing a holographic positioning nickel plate; s2, coating a release layer on the BOPET film in a full-page manner; s3, partially coating an anilox roller on the release layer by adopting a 1 st color layer, and stretching and positioning at a fixed length to coat the 1 st color layer; s4, partially coating an anilox roller on the release layer by adopting the 2 nd color layer, and stretching and positioning at a fixed length to coat the 2 nd color layer; s5, partially coating an anilox roller on the release layer by adopting a 3 rd color layer, and stretching and positioning at a fixed length to coat the 3 rd color layer; s6, rolling and sticking the holographic positioning nickel plate prepared in the step S1 on a holographic positioning sleeve position molding press; s7, positioning, nesting and molding the coating film prepared in the S5 on a holographic positioning nesting molding press; s8, aluminizing the holographic positioning sleeve laser film prepared in the step S7 on a vacuum aluminizing machine; and S9, coating the holographic positioning sleeve laser aluminizer prepared in the step S8 on a positioning stretching coating machine in a full-page manner to form a back glue layer.

P36323 **SEAL**

CN115934978 **LÜ ZHONGYAN**
Priority Date: **06/10/2021**

DOUBLE-SIDE SEAL DATABASE AND DATA GENERATION METHOD

The invention discloses a double-side seal database and a data generation method, which form a double-side seal holographic stamp laminated graph generation method by accurately superposing a main seal stamp graph and a secondary seal stamp graph, form the double-side seal database containing the double-side seal holographic stamp laminated graph, solve the problem of information defect existing on a manually obtained double-side seal laminated graph, ensure that whether the double-side seal laminated graph needing to be authenticated is complete or not, can accurately compare and authenticate, and provide favorable conditions for the smooth anti-counterfeiting work of a seal.



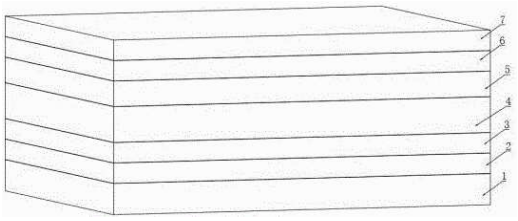
CLAIM 1. A double-side seal database and a data generation method are characterized in that the database contains a double-side seal holographic seal laminated graph.

P36325

CN115926672 **SHANTOU HENGSHUN PACKAGING MAT**
Priority Date: **13/03/2023**

HOLOGRAPHIC ANTI-COUNTERFEITING FILM DOUBLE-COLOR LAYER AND MANUFACTURING PROCESS THEREOF

The invention relates to the technical field of anti-counterfeiting films, in particular to a holographic anti-counterfeiting film double-color layer and a manufacturing process thereof, wherein the holographic anti-counterfeiting film double-color layer comprises a base film, a stripping layer, a connecting layer, an information layer, a protective layer, an aluminum-plated layer and an adhesive layer which are arranged from top to bottom in sequence, the inner bottom surface of the information layer is connected with a coloring layer, and an auxiliary part is arranged inside the connecting layer and used for improving the anti-counterfeiting effect; when the anti-counterfeiting film is used, people wash the anti-counterfeiting film through the acidic solution or the strong alkaline solution to damage the protective layer on the anti-counterfeiting film, the acidic solution or the strong alkaline solution reacts with aluminum hydroxide in the dissolving part in the dissolving layer to cause the dissolving part to dissolve, and after the dissolving part dissolves, the connecting part is not supported by the dissolving part and falls onto the upper coloring layer to cover information on the coloring layer, so that the anti-counterfeiting effect of the anti-counterfeiting film is further improved.

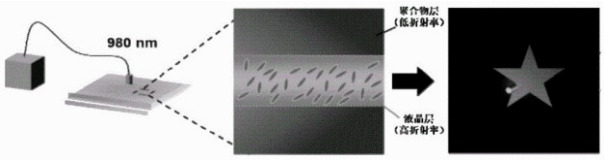


CLAIM 1. The holographic anti-counterfeiting film bichromatic layer is characterized by comprising a base film (7), a stripping layer (6), a connecting layer (5), an information layer (4), a protective layer (3), an aluminum coated layer (2) and an adhesive layer (1) which are sequentially arranged from top to bottom, wherein a coloring layer (8) is connected to the inner bottom surface of the information layer (4), and an auxiliary part is arranged inside the connecting layer (5) and used for improving an anti-counterfeiting effect; the auxiliary part comprises a groove (9) formed in the bottom surface of the connecting layer (5) and close to the middle of the connecting layer and a dissolving layer connected to the bottom surface of the groove (9), the dissolving layer comprises a dissolving part (10) and a connecting part (11), and the connecting part (11) is located in the middle of the dissolving layer.

P36330 **INFRARED – LIQUID CRYSTALS**

CN115894778 **HUAZHONG UNIVERSITY OF SCIENCE & TECHNOLOGY**
Priority Date: **05/12/2022**

HOLOGRAPHIC POLYMER COMPOSITE MATERIAL, PREPARATION METHOD AND APPLICATION THEREOF



The invention discloses a holographic high-molecular composite material for triple image storage, which is prepared by up-conversion nanoparticles, liquid crystal and a photopolymerization monomer through coherent laser polymerization induced phase separation; the composite material specifically comprises 3-15 wt% of photochromic compound, 2-15 wt% of up-conversion nano particles, 9-45 wt% of liquid crystal and 30-74 wt% of photopolymerization monomer; also comprises a photoinitiator accounting for 0.1 to 5 percent of the total weight; at the same spatial position of the composite material, not only can a high-brightness holographic image and a color-changing image be presented under sunlight, but also an up-conversion luminescence image can be presented under the excitation of a punctiform near-infrared laser light source; the area of the up-conversion luminescence image is 2-225 times of the spot area of the point-like near-infrared laser. The invention also discloses a corresponding preparation method and application. The method can be used in the field of high-end anti-counterfeiting, and solves the technical problems that in the prior art, single image anti-counterfeiting is difficult to ensure safety, and the size of an up-conversion image is too small to be recognized by naked eyes.

CLAIM 1. A holographic polymer composite material for triple image storage is characterized in that, the composite material is prepared by up-conversion nano particles, liquid crystal and a photopolymerization monomer through coherent laser polymerization induced phase separation; at the same spatial position of the composite material, not only can a high-brightness holographic image and a color-changing image be presented under sunlight, but also an up-conversion luminescence image can be presented under the excitation of a punctiform near-infrared laser light source; the area of the up-conversion luminescence image is 2-225 times of the area of the spot-shaped near-infrared laser spot.

P36336 **PRINTING – LABEL**

CN115874490 **FUJIAN TAIXIN SPECIAL PAPER**
Priority Date: **30/12/2022**

MULTILAYER ANTI-COUNTERFEITING MEDIUM FRAME PAPER AND PREPARATION METHOD THEREOF

The invention discloses a multi-layer anti-counterfeiting medium frame paper and a preparation method thereof, relating to the technical field of anti-counterfeiting, and comprising a base paper layer, a glue layer, an ink identification layer, a holographic storage layer, a medium layer and a color printing layer, wherein the glue layer is obtained by coating an adhesive force organic silicon modified polyurethane adhesive and plays a role in adhesion; the ink layer uses magnetic optically variable ink as a printing identification point; the holographic storage layer overprints holographic patterns by taking marks in the ink identification layer as positioning points to form a holographic storage layer; the medium layer protects the holographic storage layer through a compact molecular structure, and meanwhile, holographic patterns are more colorful; the color printing layer is used for printing color ink on the surface of the frame paper through anti-counterfeiting ink; and finally, spraying color printing ink to form a color printing layer on the transfer coating, thereby obtaining the multilayer anti-counterfeiting medium frame paper.

CLAIM 1. A multi-layer anti-counterfeiting medium frame paper comprises a base paper layer and a glue layer, an ink identification layer, a holographic storage layer, a medium layer and a color printing layer sequentially arranged on the outer surface of the base paper layer from inside to outside, wherein the base paper layer is made of fiber materials and plays a supporting role after being folded; the ink layer uses magnetic optically variable ink as a printing identification point; the holographic storage layer overprints holographic patterns by taking marks in the ink identification layer as positioning points to form a holographic storage layer; the medium layer protects the holographic storage layer through a compact molecular structure, and meanwhile, holographic patterns are more colorful; the color printing layer is used for printing color ink on the surface of the frame paper through anti-counterfeiting ink; the ink identification layer, the holographic storage layer and the medium layer are all located on the transfer coating, the transfer coating is attached to the base layer through the glue layer to obtain the anti-counterfeiting label, the transfer coating is separated from the base layer and then is attached to the base paper layer through the glue layer, finally, the color printing ink is sprayed on the transfer coating to form the color printing layer, the multi-layer anti-counterfeiting medium frame paper is obtained, and the base layer is the PET transfer film.

PATENT REFERENCE – See the table at the end of this document

P36254

PATENT OF THE MONTH

BANKNOTE – RELIEF – MICROLENS

WO202351948

Priority Date: **29/09/2021**

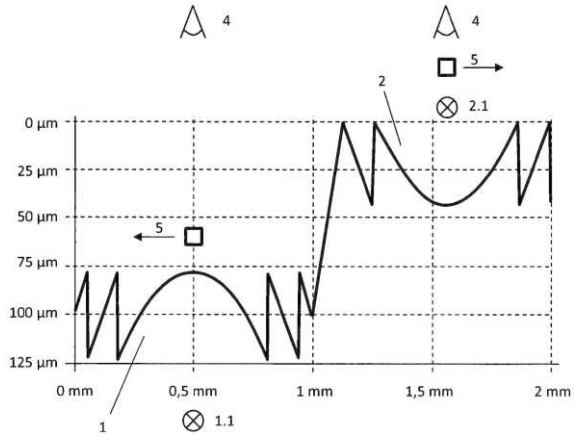
GIESECKE & DEVRIENT CURRENCY TECHNOLOGY

DISPLAY ELEMENT HAVING AN IMAGE FLOATING ABOVE AND BELOW THE SUBSTRATE

The invention relates to a display element having a substrate with an upper side and a lower side, a multiplicity of optical elements being arranged in a surface region of the upper side. [0003] 2. According to the invention, some of the optical elements are arranged in a first grid and another part of the optical elements are arranged in a second grid, the first grid adjoining the second grid. The optical elements of the first grid consist of a first type of optical elements and the optical elements of the second grid consist of a second type of optical elements, the first type of optical elements being different from the second type of optical elements.

ÉLÉMENT DE PRÉSENTATION COMPRENANT UNE IMAGE FLOTTANT AU-DESSUS ET AU-DESSOUS DU SUBSTRAT

Élément de présentation comprenant un substrat présentant une pluralité d'éléments optiques. Les éléments optiques (p.ex. miroir convexe 2 en forme de miroir de Fresnel concave, pourvu d'un point focal 2.1) d'une première grille constitués d'un premier type d'éléments optiques et les éléments optiques (p.ex. renversés vers les miroirs convexes 2 ou miroir convexe 1 réfléchi de 180° autour de l'axe transversal en forme de miroir de Fresnel convexe ou d'une lentille de Fresnel convexe, avec un point focal 1.1) d'une deuxième grille constituée d'un deuxième type d'éléments optiques, le premier type d'éléments optiques étant différent du deuxième type d'éléments optiques. Lors du basculement de l'élément de présentation, les taches lumineuses 5 des surfaces de miroir concave et convexe se déplacent de manière synchrone en sens inverse dans la direction des flèches de manière à ce qu'un observateur 4 observe un effet de battement particulièrement dynamique.



CLAIM 1. Display element having a substrate with an upper side and a lower side, a multiplicity of optical elements being arranged in a surface region of the upper side, characterized in that In that a part of the optical elements are arranged in a first grid and another part of the optical elements are arranged in a second grid, wherein the first grid adjoins the second grid, wherein the optical elements of the first grid consist of a first type of optical elements and the optical elements of the second grid consist of a second type of optical elements, wherein the first type of optical elements is different from the second type of optical elements.

P36262 **PRINTING – PASSPORT – RELIEF – LUMINESCENCE**

RU2791765 **GOZNAK**
Priority Date: **11/04/2022**

MULTI-LAYER STRUCTURE FOR PROTECTING IDENTIFICATION DOCUMENTS AND IDENTIFICATION DOCUMENT

FIELD: identification document protection.
SUBSTANCE: group of inventions relates to a multilayer structure for protecting identification documents and to identification document in form of a passport book containing such a multilayer structure. The multilayer structure includes a removable base film, on one of the sides of which are successively applied: a separating layer, a relief-receiving layer with a diffractive protective element, a demetallized layer of aluminium or copper or nickel with local opaque zones, a reflective layer of zinc sulphide or indium oxide - tin, a printing ink layer and an adhesive layer for fixing the structure on the protected document, while the thickness of the adhesive layer is from 0.2 to 12 microns, the thickness of the relief-receiving layer with a diffractive element is from 0.1 to 10 microns.
EFFECT: inventions improve the reliability of document authenticity identification by increasing the brightness of the imaginary image being restored, as well as increasing the speed of document processing.

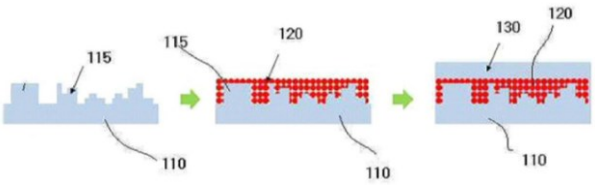
CLAIM 1. A multi-layer identity document protection structure including a fixed-base film, one side of which is successively applied: The separation layer, the diffraction layer with a diffraction protective element, a demetallized layer of aluminum or copper or nickel with local opaque zones, a reflection layer of zinc sulfide or India-tin oxide, a polygraphic paint layer and an adhesive layer to secure the structure on a protected document, with the thickness of adhesives The ionic layer is between 0.2 and 12 μ m and the thickness of the relief layer with the diffraction element is between 0.1 and 10 um.

P36269

KR20230048487 **KOREA UNIVERSITY INDUSTRIAL & ACADEMIC COLLABORATION FOUNDATION**
Priority Date: **30/03/2023**

METHOD FOR MANUFACTURING STRUCTURE FOR AUTHENTICITY DETERMINATION

In a method of manufacturing a true determination structure, a mold having a concavo-convex pattern formed thereon is prepared, and then a diffraction pattern for true determination including nanoparticles is formed on the concavo-convex pattern. Then, a protective layer made of the same material as the mold is formed on the diffraction pattern. As a result, deformation, counterfeiting, or modulation of the authenticity judgment structure can become difficult.



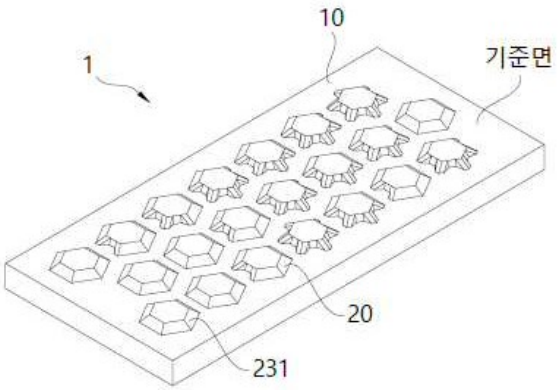
CLAIM 1. A method of manufacturing a semiconductor device, comprising: preparing a mold having a concavo-convex pattern formed thereon; forming a diffraction pattern for authenticity determination including nanoparticles on the concavo-convex pattern; and forming a protective layer made of the same material as the mold on the diffraction pattern, Wherein the diffraction pattern is defined through a Fast Fourier Transform (FFT), implements a diffraction image according to a selected wavelength for the diffraction pattern in performing inverse transformation through a program based on the Fast Fourier Transform, And when the laser is transmitted, a size of a diffraction image implemented according to a selected wavelength for the diffraction pattern varies based on a different refractive index difference according to a wavelength of the laser between the included nanoparticles and a material forming the protective layer, thereby improving performance of counterfeiting through various wavelengths including the selected wavelength.

P36271 **RELIEF**

KR102514746 **KOREA SECURITY PRINTING & MINTING**
Priority Date: **11/10/2022**

MULTI-DIRECTION HIDDEN IMAGE BODY HAVING MULTIPLE HIDDEN IMAGE ACCORDING TO OBSERVATION DIRECTION OF USER

A multidirectional latent image body in which a plurality of different latent images appear according to a viewing direction of a user is provided. the multidirectional latent image body includes: a latent image main body forming a reference plane; and a plurality of latent image protrusions formed on the latent image main body, Wherein the latent projection comprises: an upper surface having a polygonal shape and formed alongside the reference surface; a visible surface extending from each side of the upper surface toward the reference surface, A first visible surface forming a first angle with the reference plane and a second visible surface forming a second angle greater than the first angle with the reference plane, wherein at least one of the latent projections includes both the first visible surface and the second visible surface, The latent image includes a first mode in which the first visible surface is background and the second visible surface is pattern; and a second mode in which the first visible surface is pattern and the second visible surface is background, and adjacent latent images have different modes.



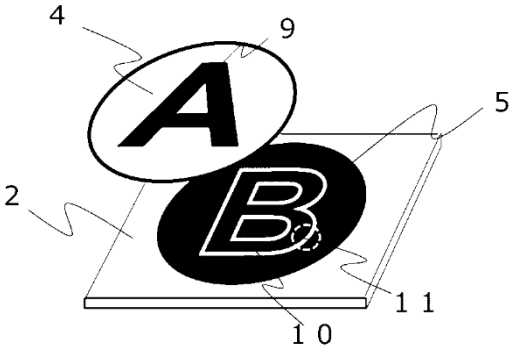
CLAIM 1. A multidirectional latent image body in which a plurality of different latent images appear according to a viewing direction of a user, the multidirectional latent image body comprising: a latent image main body forming a reference plane; and a plurality of latent images formed on the latent image main body, wherein the latent images comprise: an upper surface having a polygonal shape and formed side by side with the reference plane; And a visible surface extending from each side of the upper surface toward the reference surface, wherein the visible surface includes a first visible surface forming a first angle with the reference surface and a second visible surface forming a second angle larger than the first angle with the reference surface, and at least one of the latent projections includes both the first visible surface and the second visible surface, Wherein the latent image includes a first mode in which the first visible surface is background and the second visible surface is pattern; and a second mode in which the first visible surface is pattern and the second visible surface is background, wherein adjacent latent images have different modes, A first viewing angle between 55 degrees and 70 degrees and a second viewing angle between 5 degrees and 15 degrees greater than the first viewing angle, wherein the second visible surface of one of two adjacent latent images has the first viewing angle and the other of the second visible surface has the second viewing angle.

P36278 **PRINTING – BANKNOTE – CARD – LUMINESCENCE**

JP2023042045 **NATIONAL PRINTING BUREAU**
Priority Date: **14/09/2021**

ANTI-COUNTERFEITING PRINTED MATERIAL

TOPIC: To provide an anti-counterfeiting printed material capable of expressing gray scales in excess of 75% with respect to a visible image formed from a photoluminescent ink, the printed material exhibiting a high image change effect even when high-quality paper is used as a substrate, and also exhibiting high resistance to counterfeiting. INVENTION: The present invention provides a printed image having a color different from that of a base material on at least a portion of the base material, wherein the printed image includes a second image having light-dark flip-flop properties and formed at an area ratio of 20% or greater using an ink that is the same color as or transparent to that of the base material, and A first image formed from a photoluminescent ink having a color different from that of a base material is superimposed on a second image; the second image includes a background portion and an image portion having second significance information; and the first image has first significance information formed in a gray-scale expression region where a difference between a maximum area ratio and a minimum area ratio in the image exceeds 75%.



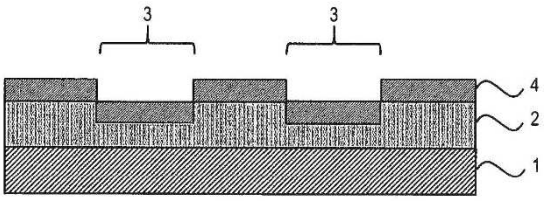
CLAIM 1. A printed image having a color different from that of a base material on at least a portion of the base material, wherein the printed image includes a second image having light-dark flip-flop properties and formed at an area ratio of 20% or greater using an ink that is the same color as or transparent to that of the base material; The device according to claim 1, wherein a first image formed by a photoluminescent ink having a color different from that of the base material is superimposed on the second image, the second image includes a background portion and an image portion having second significant information, and the first image includes: Has first significant information formed in a gray-scale expression region in which a difference between a maximum area ratio and a minimum area ratio in an image exceeds 75%, the first significant information being visually recognized by a difference in streak area ratios of a first image of the photoluminescent ink under diffuse reflected light; Under specularly reflected light, the first significant information disappears and is visually recognized due to differences in optical properties of the respective inks, and the second significant information is visually recognized.

P36284 **PRINTING – INK – BANKNOTE – RELIEF**

EP4163121 **GIESECKE & DEVRIENT CURRENCY TECHNOLOGY**
Priority Date: **05/10/2021**

PIGMENT AND PREPARATION THEREOF

The invention relates to a method for producing pigments of defined shape and size, comprising a) the provision of a carrier substrate (1); b) the coating of the carrier substrate (1) with an embossing lacquer (2) which cures by means of UV radiation and can be removed with aqueous solution after UV curing; C) the embossing technique of introducing defined structures into the embossing lacquer (2) which are determinative for the defined shape and the defined size of the pigments to be produced; d) the UV curing of the embossing lacquer (2); e) coating the embossing lacquer (2) with a pigment material layer (4, 6, 7); f) treating the layer structure obtained with aqueous solution in order to detach the embossing lacquer (2) in this way and to remove the pigment material layer (4, 6, 7); and g) recovering the pigments obtainable from the pigment material layer (4, 6, 7), optionally wherein a mechanical Stress is applied to the pigment material layer (4, 6, 7).



CLAIM 1. Method for producing pigments of defined shape and defined size, comprising a) the provision of a carrier substrate (1); b) the coating of the carrier substrate (1) with an embossing lacquer (2) which cures by means of UV radiation and can be removed with aqueous solution after UV curing; C) the embossing technique of introducing defined structures into the embossing lacquer (2) which are determinative for the defined shape and the defined size of the pigments to be produced; d) the UV curing of the embossing lacquer (2); e) coating the embossing lacquer (2) with a pigment material layer (4, 6, 7); f) treating the layer structure obtained with aqueous solution in order to detach the embossing lacquer (2) in this way and to remove the pigment material layer (4, 6, 7); and g) recovering the pigments obtainable from the pigment material layer (4, 6, 7), optionally wherein a mechanical Stress is applied to the pigment material layer (4, 6, 7).

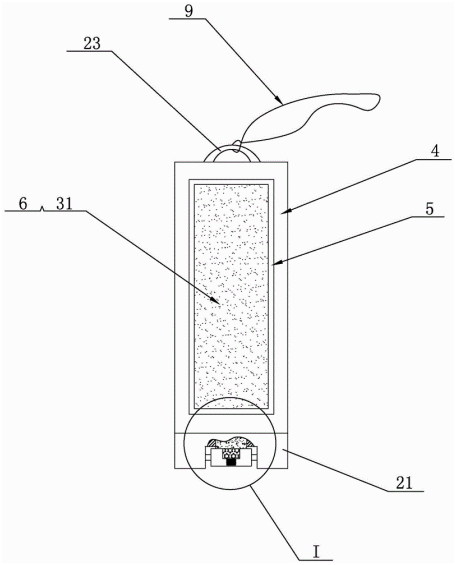
P36303 **LABEL – MAGNETISM**

CN218788245U **WENZHOU HAOGE ANTI COUNTERFEITING TECHNOLOGY**

Priority Date: **06/12/2022**

MAGNETIC ROLLING LIGHT-VARIABLE ANTI-COUNTERFEITING LABEL

The utility model discloses a magnetic rolling light-variable anti-counterfeit label, which comprises a paper base layer, wherein a plastic positioning layer is fixedly arranged on the upper surface of the paper base layer, a kraft paper surface layer is fixedly arranged on the upper surface of the plastic positioning layer, and a transparent protective layer is fixedly arranged on the upper surface of the kraft paper surface layer; a positioning frame is embedded in the storage through hole of the kraft paper surface layer, and a photosensitive color-changing anti-counterfeiting layer is embedded in the positioning frame; a storage groove is formed in the middle of the positioning lug of the plastic positioning layer, a connecting shaft is fixedly arranged in the storage groove, an anti-counterfeiting rotary drum is sleeved on the connecting shaft, a positioning magnet is fixedly arranged in the magnet mounting groove, and the local position of the anti-counterfeiting rotary drum is connected with the positioning magnet; the outer surface of the anti-counterfeiting rotary drum is provided with an anti-counterfeiting image-text engraving layer at a local position. Above-mentioned technical scheme, structural design is reasonable, difficult imitative, anti-fake performance is good, be convenient for distinguish the product true and false and the practicality is good.



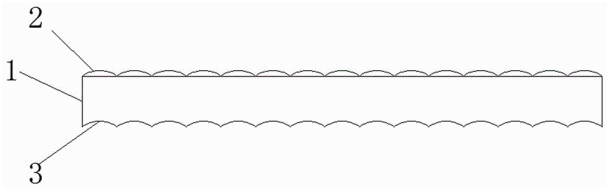
CLAIM 1. The utility model provides a magnetism roll light becomes antifalsification label, includes paper substrate (1), its characterized in that: a plastic positioning layer (2) is fixedly arranged on the upper surface of the paper-based bottom layer (1), a kraft paper surface layer (3) is fixedly arranged on the upper surface of the plastic positioning layer (2), and a transparent protective layer (4) is fixedly arranged on the upper surface of the kraft paper surface layer (3); an article placing through hole (31) is formed in a local position of the kraft paper surface layer (3), a positioning frame (5) is embedded in the article placing through hole (31), and a photosensitive color-changing anti-counterfeiting layer (6) is embedded in the positioning frame (5); a positioning convex block (21) is integrally arranged at one end of the plastic positioning layer (2), an article placing groove (211) is arranged in the middle of the positioning convex block (21), a connecting shaft (22) is fixedly arranged in the article placing groove (211), an anti-counterfeiting rotary drum (7) is sleeved on the connecting shaft (22), a magnet mounting groove (212) is formed in the inner wall surface of the article placing groove (211) and aligned with the local position of the anti-counterfeiting rotary drum, a positioning magnet (8) is fixedly arranged in the magnet mounting groove (212), and the local position of the anti-counterfeiting rotary drum (7) is connected with the positioning magnet (8); an anti-counterfeiting image-text carving layer (71) is arranged at a local position on the outer surface of the anti-counterfeiting rotary drum (7).

P36310 **PRINTING – RELIEF – MICROLENS**

CN218702328U **JIANGSU YUKON PHOTOVOLTAIC MAT**
Priority Date: **28/10/2022**

DYNAMIC ANTI-COUNTERFEITING FILM

The utility model relates to a dynamic anti-counterfeiting film, wherein the upper end surface UV printing array of a PET film is fully distributed with a titanium dioxide UV printing ink coating forming upper lens structure, and the lower end surface array of the PET film is pressed with a pit structure with a font LOGO; the positions of the lens structure and the pit structure on the titanium dioxide UV printing ink coating forming are opposite or staggered up and down, and the longitudinal and transverse axes of the array are parallel or form an included angle. Through UV printing array is covered with on the PET membrane and sets up lens structure on the shaping of titanium white powder UV printing ink coating, the lower terminal surface array impression of PET membrane takes the pit structure of typeface LOGO, and with both sizes, the cross axle setting angle is indulged to position and array, plano-convex lens and concave lens combine to produce light diffraction phenomenon and dislocation, overlap, make the area typeface LOGO or the figure of printing in the pit, the pattern produces the come-up, sink and the dynamic drift effect of distortion, it is higher at the visual anti-fake effect of different angles.



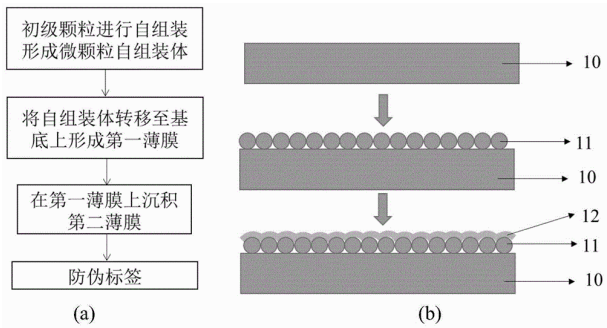
CLAIM 1. A dynamic anti-counterfeiting film comprises a PET film, and is characterized in that: the upper end surface UV printing array of the PET film is fully distributed with a titanium dioxide UV printing ink coating forming upper lens structure, and the lower end surface array of the PET film is embossed with a pit structure with a font LOGO; the positions of the lens structure and the pit structure in the titanium dioxide UV printing ink coating forming are opposite or staggered up and down, and the longitudinal and transverse axes of the array are parallel or form an included angle.

P36313 **LABEL**

CN115985181 **NANJING NANOTECH INSTITUTE**
Priority Date: **15/10/2021**

ANTI-COUNTERFEIT LABEL AND PREPARATION METHOD AND APPLICATION THEREOF

The invention provides an anti-counterfeiting label and a preparation method and application thereof. The optical structure of the first film generating the structural color is randomly generated, so that the anti-counterfeiting label has non-replicability and physical non-clonality, and the optical structure of the first film is disordered, so that the anti-counterfeiting label has different optical images and optical information corresponding to the optical images at different angles.



CLAIM 1. A security label comprising a substrate, a first film for producing a structural color, said first film being disposed on said substrate, said first film comprising microparticles.

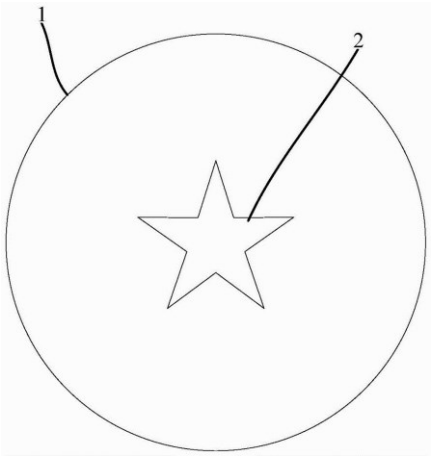
P36321 **COIN – RELIEF**

CN115938210
Priority Date: **29/06/2022**

CHINA BANKNOTE PRINTING & MINT | CHINA BANKNOTE SECURITY PRINTING TECHNOLOGY RESEARCH INSTITUTE

PATTERN OPTICAL ANTI-COUNTERFEITING STRUCTURE AND MANUFACTURING METHOD THEREOF AND COIN AND STAMP

The invention provides a pattern optical anti-counterfeiting structure and a manufacturing method thereof and a coin, which are used for the coin, and the pattern optical anti-counterfeiting structure comprises: the embossment pattern is arranged on the coin and stamp; the relief pattern comprises a planar relief pattern or a three-dimensional relief pattern or a combination of the planar relief pattern and the three-dimensional relief pattern; the outline of the relief pattern comprises characters and/or graphic elements, and a grating microstructure with preset graphics or character elements is filled in the outline of the relief pattern; the grating microstructure enables the relief pattern to present three-dimensional relief patterns with different colors when the relief pattern is viewed from different viewing angles. The pattern optical anti-counterfeiting structure provided by the invention not only can enhance the three-dimensional effect of the embossment and generate richer optical visual effect, but also can combine the plane embossment and the three-dimensional embossment to present unique visual effect.



CLAIM 1. A patterned optical security feature for use with currency stamps, said patterned optical security feature comprising: a relief pattern disposed on the coin stamp; the relief pattern comprises a plane relief pattern or a three-dimensional relief pattern or a combination of the plane relief pattern and the three-dimensional relief pattern; the contour of the relief pattern comprises characters and/or graphic elements, and a grating microstructure with preset graphic elements is filled in the contour of the relief pattern; the grating microstructure enables the relief pattern to present three-dimensional relief patterns with different colors when the relief pattern is viewed from different viewing angles.

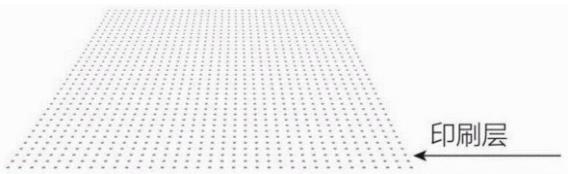
P36331 **PRINTING**

CN115891472
Priority Date: **06/01/2023**

QINGDAO LEIGH MARDON PACKING

BIDIRECTIONAL MICRO-POINT POLARIZATION INVISIBLE ANTI-COUNTERFEITING PRINTING METHOD

The invention discloses a bidirectional micro-point polarization invisible anti-counterfeiting printing method, which comprises the following steps: polarizing the micro points, forming the micro points into a dot matrix, and polarizing partial points in two dimensions according to the effect of hiding the pictures and texts by an algorithm so as to form the pictures and texts of the bidirectional invisible anti-counterfeiting layer; processing the printed dot matrix by special printing ink, and hiding the dot matrix under the structure of the printing ink; and the anti-counterfeiting pattern hidden at the angle is decoded by sticking the grating sheet on the area of the bidirectional invisible anti-counterfeiting layer. The invention has the beneficial effects that: (1) bidirectional: the anti-counterfeiting area is provided with two layers of patterns for anti-counterfeiting, and the patterns are respectively applied to two different angle directions. (2) micro-point: and an ultra-fine dot matrix is printed by an advanced high-precision printer, so that the printing precision is improved. (3) stealth: the dot matrix is hidden under the special ink crystal structure of the surface layer, so that the surface is smooth and flat, the anti-counterfeiting printing image and text are completely hidden, and the printed pattern content cannot be imitated by means of scanning, copying, photographing and the like.



CLAIM 1. The bidirectional micro-point polarization invisible anti-counterfeiting printing method is characterized by comprising the following steps: the method comprises the following steps: polarizing the micro points, forming the micro points into a dot matrix, and polarizing partial points in two dimensions according to the effect of hiding the pictures and texts by an algorithm so as to form the pictures and texts of the bidirectional invisible anti-counterfeiting layer; processing the printed dot matrix by special printing ink, and hiding the dot matrix under the structure of the printing ink; the anti-counterfeiting pattern hidden at the angle is decoded by sticking the grating sheet on the area of the bidirectional invisible anti-counterfeiting layer from one decoding angle, and then the anti-counterfeiting pattern hidden at the angle is decoded by rotating to another decoding angle.

PATENT REFERENCE – See the table at the end of this document

N9307

WO202347145 **LAKATOS, IMRE | ERTL, ZSOLT | PAPP, ZSOLT | KORNIS, TAMÁS**

Priority Date: **23/09/2021**

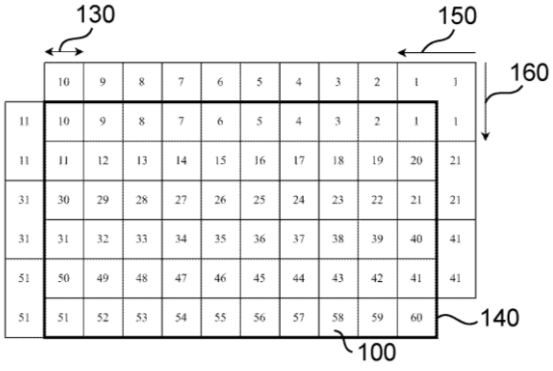
METHOD, COMPUTER PROGRAM PRODUCT AND COMPUTER READABLE MEDIUM FOR CREATING A HOLOGRAM

A method for creating a hologram having an array of hogels (100), by a holographic imaging system having an aperture (120), on a holographic substrate having a predefined hologram area (140), wherein - the method comprises a sequence of exposure steps to sequentially expose each hogel (100) of the array of hogels (100) by the holographic imaging system via projecting light onto the holographic substrate through the aperture (120), wherein the aperture (120) has a projection area on the holographic substrate in each exposure step, The method is characterized in that - each hogel (100) within the hologram area (140) has a hogel surface area that is smaller than the projection area of the aperture (120), and - in each exposure step the aperture (120) of the holographic imaging system is positioned over the hologram area (140) by creating an overlap between the projection area of the aperture (120) and an unexposed portion of the hologram area (140), wherein the overlap corresponds to one hogel (100) of the array of hogels (100). The invention is furthermore a computer program product and a computer readable medium carrying out the above method.

PROCÉDÉ, PRODUIT DE PROGRAMME INFORMATIQUE ET SUPPORT LISIBLE PAR ORDINATEUR POUR CRÉER UN HOLOGRAMME

L'invention concerne un procédé permettant de créer un hologramme ayant un réseau de hogels (100) à l'aide d'un système d'imagerie holographique comportant une ouverture (120) et sur un substrat holographique présentant une zone d'hologramme prédéfinie (140), le procédé comprenant une séquence d'étapes d'exposition servant à exposer de manière successive chaque hogel (100) du réseau de hogels (100) avec le système d'imagerie holographique en projetant de la lumière sur le substrat holographique à travers l'ouverture (120), l'ouverture (120) comportant une zone de projection sur le substrat holographique dans chaque étape d'exposition. Le procédé est caractérisé en ce que chaque hogel (100) se trouvant dans la zone d'hologramme (140) a une superficie de surface de hogel qui est plus petite que la zone de projection de l'ouverture (120), et en ce que dans chaque étape d'exposition, l'ouverture (120) du système d'imagerie holographique est positionnée au-dessus de la zone d'hologramme (140) en créant un chevauchement entre la zone de projection de l'ouverture (120) et une partie non exposée de la zone d'hologramme (140), le chevauchement correspondant à un hogel (100) du réseau de hogels (100). L'invention concerne en outre un produit de programme informatique et un support lisible par ordinateur mettant en œuvre le procédé ci-dessus.

CLAIM 1. A method for creating a hologram having an array of hogels (100), by a holographic imaging system having an aperture (120), on a holographic substrate having a predefined hologram area (140), wherein - the method comprises a sequence of exposure steps to sequentially expose each hogel (100) of the array of hogels (100) by the holographic imaging system via projecting light onto the holographic substrate through the aperture (120), wherein the aperture (120) has a projection area on the holographic substrate in each exposure step, characterized in that - each hogel (100) within the hologram area (140) has a hogel surface area that is smaller than the projection area of the aperture (120), and - in each exposure step the aperture (120) of the holographic imaging system is positioned over the hologram area (140) by creating an overlap between the projection area of the aperture (120) and an unexposed portion of the hologram area (140), wherein the overlap corresponds to one hogel (100) of the array of hogels (100).

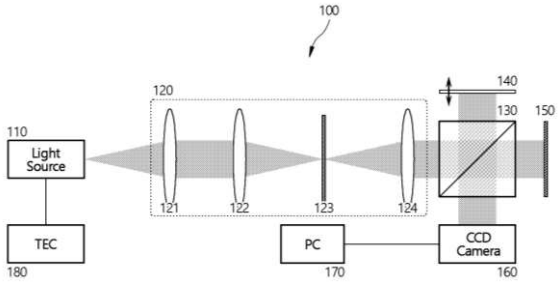


N9313

KR20230039332 **YONSEI UNIVERSITY INDUSTRY ACADEMIC COOPERATION FOUNDATION**
Priority Date: **14/09/2021**

DUAL-WAVELENGTH DIGITAL HOLOGRAPHY APPARATUS AND METHOD USING PHASE TRANSFORMATION BASED ON COMPOSITE WAVELENGTHS ACTING AS A SINGLE LONG WAVELENGTH

The present invention relates to a dual-wavelength digital holography apparatus and method. An object of the present invention is to provide a dual-wavelength digital holography apparatus and a method capable of reducing operation load and processing time while increasing both resolution and observable range by using a phase conversion scheme using a special wavelength combination in which a combined wavelength of two wavelengths can behave like a single wavelength equal to the magnitude of the combined wavelength.



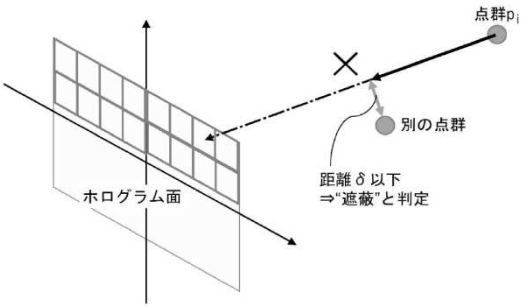
CLAIM 1. A dual-wavelength digital holography apparatus (100) for acquiring a phase difference image of a surface of a sample (150) using light having two wavelengths to calculate a three-dimensional reconstructed image through phase-shift, A light source device comprising: a light source unit (110) which emits used light in the form of a combined light of a first wavelength light and a second wavelength light having different wavelengths; and a thermoelectric cooling unit (180) which is provided in the light source unit (110) to vary the wavelength of the used light by heating or cooling, Wherein a wavelength of the thermoelectric cooling unit (180) is adjusted such that the combined light of the first-wavelength light and the second-wavelength light causes a beat phenomenon to generate a moire pattern, and a phase shift is performed by considering a single-wavelength signal derived from the moiré pattern generated by the first-wavelength light and the second-wavelength light as the combined light of the first-wavelength light and the second-wavelength light.

N9316

JP2023045008 **KDDI**
Priority Date: **21/09/2021**

COMPUTER COMPOSITE HOLOGRAM GENERATION APPARATUS, METHOD, AND PROGRAM

TOPIC: To provide a computer composite hologram generation apparatus, method, and program capable of calculating a continuous parallax hologram at high speed. INVENTION: a 3 D point cloud acquisition unit 10 acquires, for each successive frame, a point cloud of an object model arranged on each frame. The blocking determination unit 30 performs blocking determination on each pixel of the hologram surface from each point of the point cloud. The light wave propagation calculation unit 50 calculates the light wave propagation from each point to the non-blocked pixel of the hologram surface based on the result of the blocking determination. The determination result holding unit 40 holds the result of the occlusion determination for each frame. The neighborhood point search unit 20 searches the determination result holding unit 40 for nearby points in the previous frame for each point. The blocking calculation execution unit 301 performs blocking determination based on a result of the blocking calculation for each pixel of the hologram surface from a point where the neighborhood point cannot be searched. The alternative use execution unit 302 substitutes the occlusion determination result in the previous frame of the nearby point as the occlusion determination result for the point where the nearby point has been searched.



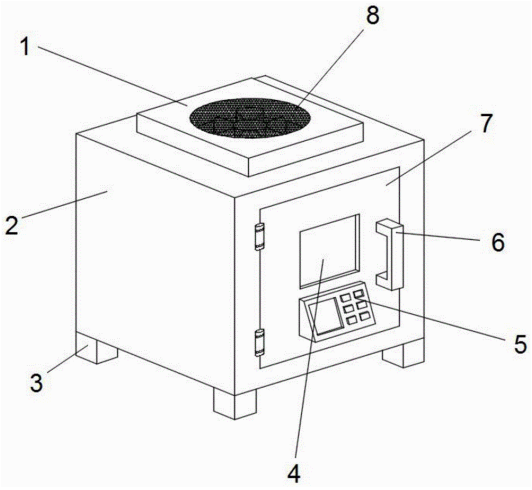
CLAIM 1. A device comprising: a unit configured to acquire a point cloud of an object model arranged in each successive frame; a unit configured to perform a block determination on each pixel position of a hologram surface from each point of the point cloud; A unit configured to calculate a light wave propagation from each point to a non-occluded pixel position of a hologram surface based on a result of the occlusion determination, the unit configured to hold the result of the occlusion determination for each frame; A unit for searching for nearby points in a previous frame at each point, wherein the unit for performing occlusion determination includes: an occlusion calculation execution unit for performing occlusion determination by executing occlusion calculation on each pixel position of the hologram surface from a point where the nearby point cannot be searched; A substitute use execution unit configured to substitute a occlusion determination result in a previous frame of the nearby point as a occlusion determination result for a point at which the nearby point has been searched.

N9332

CN115981112 **CHANGCHUN UNIVERSITY OF SCIENCE & TECHNOLOGY**
Priority Date: **29/01/2023**

PHOTONIC CRYSTAL PREPARATION DEVICE BASED ON HOLOGRAPHIC INTERFERENCE LITHOGRAPHY

The invention provides a photonic crystal preparation device based on holographic interference lithography, and relates to the field of crystal preparation. The photonic crystal preparation device based on holographic interference lithography comprises a main body, wherein a dust removal device is arranged at the center of the upper end face of the main body, the lower end of the dust removal device penetrates through the upper end face of the main body and is communicated to the inside of the main body, a lithography device is arranged at the center of the upper end face of the main body, and a clamping device is arranged at the center of the lower inner wall of the main body at the lower end of the lithography device. Make through controlling first motor and arm and to carry out diversified photoetching to the crystal piece to still can change and add the inside light filter of photoetching head according to the photoetching condition of reality and establish when using, open between photoetching head and the last casing that will be connected with the fixture block through pressing down the pressing block, thereby conveniently change the light filter of inside, directly upwards push up the inside of cooperation joint at the activity hole with the fixture block when closing, thereby can realize quick replacement.



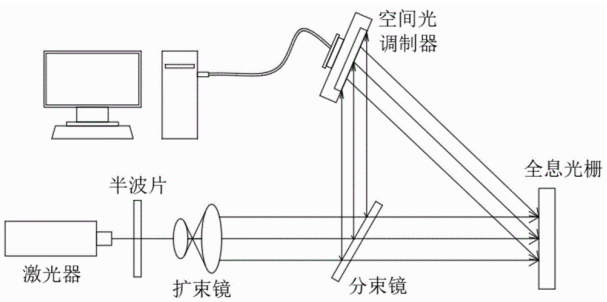
N9340

CN115933208 **LIAOCHENG UNIVERSITY**
Priority Date: **09/12/2022**

METHOD FOR GENERATING ARBITRARY VECTOR BEAM BASED ON HOLOGRAM ENCODING

The invention provides a method for generating any vector beam based on hologram encoding, which comprises the following steps: s1: making a holographic grating, namely recording the phase loaded on the SLM by using a holographic dry plate by using an optical holographic technology, and making vector light to generate the required holographic grating; s2: the holographic grating is used for generating any vector beam, a laser and beam expanding system with the same light path as the holographic grating is used for generating the laser and beam expanding system, the Wollaston branch mirror is introduced to generate two beams of reference light with the same angle, and the two beams of reference light respectively pass through the two reflectors and then irradiate the holographic grating at the same incident angle. The method directly utilizes the optical holographic technology to shoot the holographic grating and combines the angle multiplexing technology in holography to design the vector light generating system, and the method reproduces the light path for generating the vector light through the holographic grating without an SLM (selective laser modulation), thereby avoiding the occurrence of complex polarization states, and having the advantages of simple light path generation, convenient operation, high polarization purity of the generated vector light and the like.

CLAIM 1. A method for generating an arbitrary vector beam based on hologram encoding, comprising the steps of: s1: making a holographic grating, namely recording the phase loaded on the SLM by using a holographic dry plate by using an optical holographic technology, and making vector light to generate the required holographic grating; s2: the holographic grating is used for generating any vector beam, a laser and beam expanding system with the same light path as the holographic grating is used for generating the laser and beam expanding system, the Wollaston branch mirror is introduced to generate two beams of reference light with the same angle, and the two beams of reference light respectively pass through the two reflectors and then irradiate the holographic grating at the same incident angle.



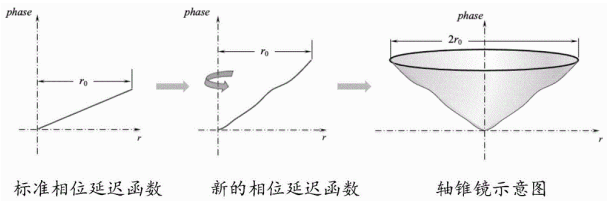
N9342

CN115933177 **HEBEI UNIVERSITY OF TECHNOLOGY**

Priority Date: **24/12/2022**

GAUSS-BESSEL BEAM GENERATION METHOD BASED ON HIGH-ORDER CURVED SURFACE

The invention discloses a method for generating a Gauss-Bessel beam based on a high-order curved surface, which comprises the following steps: step 1, constructing a new phase delay function for an axicon in the propagation process of a light field; step 2, obtaining the light field distribution of the receiving surface by adopting a Fresnel diffraction theory, and establishing a cost function according to the target light intensity distribution; step 3, searching the optimal radial phase delay through a combined feedback optimization algorithm of a genetic algorithm and an unconstrained optimization algorithm so as to minimize an objective function and solve a phase delay function; and 4, writing an axicon hologram according to the optimized parameters, and loading the obtained hologram on the spatial light modulator for experimental verification and processing by using the programmable characteristic of the spatial light modulator. The method can simply and effectively regulate and control the Gaussian beam to obtain the Gaussian-Bessel beam with uniform axial strength, high energy throughput rate and adjustable focal length.



CLAIM 1. A method for generating a Gauss-Bessel beam based on a high-order curved surface is characterized by comprising the following steps: step 1: constructing a new phase delay function for the axicon in the propagation process of the light field; step 2: obtaining the light field distribution of the receiving surface by adopting a Fresnel diffraction theory, and establishing a cost function according to the target light intensity distribution; and step 3: searching for the optimal radial phase delay through a combined feedback optimization algorithm of a genetic algorithm and an unconstrained optimization algorithm to solve a phase delay function by a minimized cost function; and 4, step 4: and writing an axicon hologram according to the optimized parameters, and loading the obtained hologram on the spatial light modulator by utilizing the programmable characteristic of the spatial light modulator for experimental verification and processing.

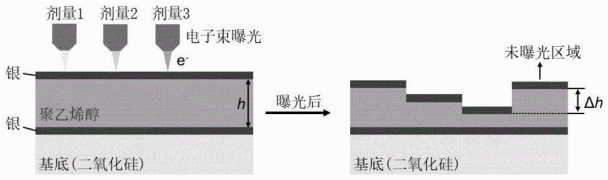
N9346

CN115903429 **WUHAN UNIVERSITY**

Priority Date: **16/11/2022**

DYNAMIC COLOR HOLOGRAPHIC METHOD BASED ON DIRECT PRINTING STRUCTURAL COLOR TECHNOLOGY

The invention discloses a dynamic color holographic method based on a direct printing structural color technology, which utilizes an electron beam exposure direct gray level exposure three-layer film structure to print a stepped three-layer film structure without additional processing steps and can directly generate structural colors with different colors. The three-layer film structure consists of a metal layer, a polyvinyl alcohol layer and a metal layer; the polyvinyl alcohol layer is sensitive to electron beam exposure dose, and is subjected to different degrees of collapse under different exposure doses; the polyvinyl alcohol layer can absorb water molecules in the environment to generate expansion action. By encoding the transmission phase into the direct printing structure, the invention can realize the color printing of the near-field pattern, and can project the colored holographic pattern in the far field, and the pattern color can be dynamically regulated and controlled along with the change of the environmental humidity. The invention can be widely applied to the practical application fields of optical filtering, active optical devices, novel optical display platforms and the like.



CLAIM 1. A dynamic color holographic method based on direct printing structural color technology is characterized in that: the electron beam exposure technology is utilized, the three-layer film structure is subjected to gray level exposure, and the stepped three-layer film structure with different cavity lengths can be directly printed out so as to generate structural colors with different colors; the three-layer film structure consists of a metal layer, a polyvinyl alcohol layer and a metal layer, and is sequentially placed on a silicon dioxide substrate; the polyvinyl alcohol layer in the three-layer film structure is sensitive to electron beam exposure dose and collapses in different degrees along with the increase of the exposure dose; the polyvinyl alcohol layer in the three-layer film structure can absorb water molecules in the environment to perform expansion action or release the water molecules to perform contraction; the color of the printed structural color can change along with the change of the environmental humidity; the metal layer-polyvinyl alcohol layer-metal layer are all micro-nano scale.

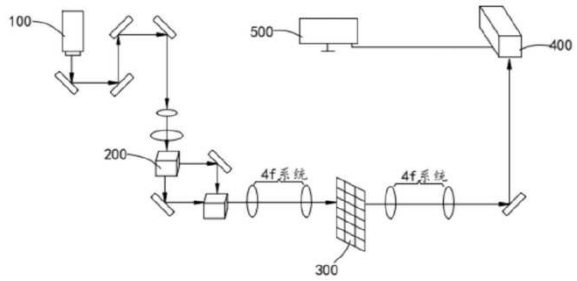
N9354

CN115857304 **WUYI UNIVERSITY**

Priority Date: **23/12/2022**

COMPRESSED ULTRAFAST HOLOGRAPHIC QUANTITATIVE PHASE IMAGING METHOD, SYSTEM, EQUIPMENT AND MEDIUM

The embodiment of the application provides a compressed ultrafast holographic quantitative phase imaging method, a system, equipment and a medium; the method comprises the steps of coding a plurality of interference images of a sample to obtain a coded image; compressing the coded image to obtain a two-dimensional compressed hologram of the sample; obtaining an undecoded interference image by inverse solution of the two-dimensional compressed hologram through a reverse model of the pre-initialization parameter; carrying out iterative multiple times of total variation image denoising processing on an undecoded interference image to obtain a first denoised image; carrying out depth denoising processing on the first denoised image, and reconstructing to obtain a hologram sequence frame; phase reconstruction is carried out on the hologram sequence frame to obtain a phase image of the sample; and a trained depth de-noising device is used and inserted into an image reconstruction frame, the image reconstruction process is accelerated through depth de-noising, and the image reconstruction effect is good.



CLAIM 1. A compressed ultrafast holographic quantitative phase imaging method comprises the following steps: coding the multiple interference images of the sample to obtain a coded image; compressing the coded image to obtain a two-dimensional compressed hologram of the sample; obtaining an undecoded interference image by inverse solution of the two-dimensional compressed hologram through a reverse model of pre-initialization parameters; carrying out iterative multiple times of total variation image denoising processing on the undecoded interference image to obtain a first denoised image; carrying out depth denoising processing on the first denoised image, and reconstructing to obtain a hologram sequence frame; and carrying out phase reconstruction on the hologram sequence frame to obtain a phase image of the sample.

PATENT REFERENCE – See the table at the end of this document

N9352

CN115871359 **DONGTAI XUHAO PRECISION TECHNOLOGY**

Priority Date: **20/12/2022**

METHOD FOR FORMING DIE-PRESSING HOLOGRAPHIC PATTERN

The invention discloses a method for forming a die pressing holographic pattern, which relates to the technical field of computer shell pattern forming and comprises the steps of S1, film printing; s2, processing the workpiece; s3, identifying the shell; and S4, carrying out thermal bonding treatment. The invention adopts the membrane imprinting technology, adds a layer of transparent coating on the surface of a formed product, can design embossing patterns on the inner layer of the coating, inlays the embossing patterns between the notebook computer shell and the upper paint surface to form an attractive and elegant protective layer with good visual effect, in addition, adopts the laser engraving technology to ensure that concave patterns and characters are uniform, fine and natural, have stronger stereoscopic impression and have skin-imitated effect, adopts the thermoplastic resin layer containing hollow glass beads as the intermediate layer to realize the light weight-reducing effect of the thermoplastic composite material plate, the density of the plate can reach 0.9-1.2g/cm < 3 >, the weight-reducing effect of the notebook computer shell is achieved, the use amount of fibers is reduced, and the cost is reduced.

CLAIM 1. A method for forming a molded hologram, comprising the steps of: s1, thin film printing Printing a pattern on a thin film by adopting an IMR (in-mold decoration) process, attaching a membrane to a plastic mold cavity through a membrane feeding machine for extrusion, separating an ink layer with the pattern from the thin film after extrusion, and leaving the ink layer on a computer shell to obtain the computer shell with a decorative pattern on the surface; s2, workpiece treatment By adopting a highlight trimming process, a circle of bright bevel edge is cut at the edge of the computer shell by a high-speed CNC machine, and a coarse and fine knife line is matched, so that the decorative effect is improved by combining refraction, and the effect of highlight brightness processing is achieved; s3, shell identification Identifying the position of the computer shell before printing and detecting the defects of the computer shell; s4, heat bonding treatment The method comprises the steps of coating a transparent medium layer on the surface of a metal, performing thermal bonding treatment on the transparent medium layer for fixing, coloring the coloring layer, and finally performing texture curing on the UV adhesive layer and irradiating ultraviolet rays for texture curing.

PATENT REFERENCE – See the table at the end of this document

P26406
N9304

OVD – PRINTING – BANKNOTE

WO202354365
Priority Date: **29/09/2021**

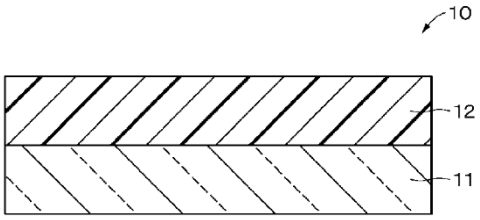
SONY GROUP

HOLOGRAM PHOTOSENSITIVE COMPOSITION, HOLOGRAM RECORDING MEDIUM, HOLOGRAM OPTICAL ELEMENT, OPTICAL APPARATUS, AND OPTICAL COMPONENT

Provided is a hologram photosensitive composition capable of improving light-absorbing efficiency. This hologram photosensitive composition contains a photopolymerizable compound, a photoinitiator, a sensitizing dye, and an alcohol having a valence of 2 or more.

COMPOSITION PHOTOSENSIBLE D'HOLOGRAMME, SUPPORT D'ENREGISTREMENT D'HOLOGRAMME, ÉLÉMENT OPTIQUE D'HOLOGRAMME, APPAREIL OPTIQUE ET COMPOSANT OPTIQUE

L'invention concerne une composition photosensible d'hologramme capable d'améliorer l'efficacité d'absorption de lumière. Cette composition photosensible d'hologramme contient un composé photopolymérisable, un photo-initiateur, un colorant sensibilisateur et un alcool ayant une valence de 2 ou plus.



CLAIM 1. A hologram photosensitive composition comprising: a polymerizable compound; a photopolymerization initiator; a sensitizing dye; and a divalent or higher alcohol.

N9339

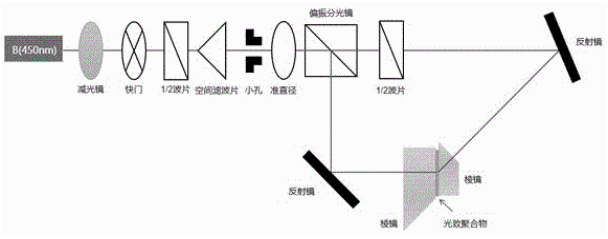
CN115933313
Priority Date: **19/12/2022**

HANGZHOU GUANGLI TECHNOLOGY

PHOTOPOLYMER COMPOSITION AND OPTICAL GRATING

The invention discloses a photopolymer composition and a grating, belonging to the technical field of optical materials. The photopolymer composition comprises a spiro monomer, an acrylate monomer, a film forming agent, a photoinitiator system and an additive, wherein the spiro monomer is introduced into the system through a cation ring-opening polymerization reaction, the ring-opening polymerization can greatly reduce the shrinkage generated in the photocuring process of the acrylate, and a free radical-cation hybrid curing system formed by the cation polymerization of the spiro monomer and the free radical polymerization of the acrylate monomer can obtain a photopolymer material which has high reaction speed, small volume shrinkage and an interpenetrating network structure, can effectively avoid the adverse effect caused by oxygen inhibition polymerization, and can obtain the photopolymer material with extremely low shrinkage and good dimensional stability due to the crosslinking of chemical bonds between a photosensitive part and the film forming agent; and the film-forming agent has cross-linking of chemical bonds among molecules, so that the heat resistance of the photopolymer material can be further improved.

CLAIM 1. A photopolymer composition comprising, in weight fractions: 3.5 to 46.2 percent of spiro monomer; 14 to 69.3 percent of acrylate monomer; 20% -50% of film-forming agent; 0.6 to 10 percent of photoinitiator system; 0.1 to 5 percent of additive; the film forming agent comprises an epoxy monomer, hyperbranched epoxy resin and a curing agent; the photoinitiator system includes a photosensitizer, a co-initiator, and a cationic initiator.

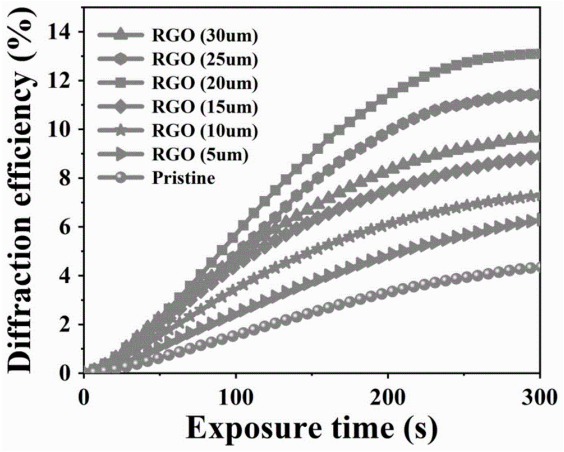


N9351

CN115873158 **FUJIAN NORMAL UNIVERSITY**
Priority Date: **28/10/2022**

TWO-DIMENSIONAL NANO MATERIAL FOR HOLOGRAPHIC STORAGE TECHNOLOGY AND PREPARATION METHOD THEREOF

The invention relates to the technical field of holographic polymer materials, in particular to a two-dimensional nano material for holographic storage technology and a preparation method thereof. The material is prepared from the following raw materials in percentage by mass: RGO solution: MMA: AIBN: PQ) =2:100:1: 1-1.3, and the grain diameter of the RGO nano particles in the RGO solution is 15-30 mu m. The two-dimensional nano material introduces RGO nano particles with specific particle sizes into the PQ/PMMA material, so that the orthogonal polarization diffraction efficiency and the photosensitivity of the performance of the holographic storage material can be greatly improved.



CLAIM 1. The two-dimensional nanomaterial for the holographic storage technology is characterized by being prepared from the following raw materials in percentage by mass: RGO solution: MMA: AIBN: PQ =2:100:1: 1-1.3, and the grain diameter of the RGO nano particles in the RGO solution is 15-30 mu m.

N9357

CN115840347 **HANGZHOU GUANGLI TECHNOLOGY**
Priority Date: **18/09/2021**

PHOTOPOLYMER HOLOGRAPHIC RECORDING MATERIAL CONTAINING MERCAPTO COMPOUND, ACRYLATE COMPOUND AND EPOXY COMPOUND AND GRATING

The invention provides a photopolymer holographic recording material containing a sulfhydryl compound, an acrylate compound and an epoxy compound, which comprises the following components: 10-50 parts by weight of a polymerized monomer; 10-40 parts of a film forming agent; 0.1 to 5 parts by weight of a photoinitiator; 0.5-5 parts by weight of a co-initiator; the polymerization monomer comprises a sulfhydryl compound, an epoxy compound and an acrylate compound. Compared with the prior art, the invention introduces sulfur element into the photopolymer monomer to improve the refractive index of the monomer, effectively improves the refractive index of a bright area by photoinitiating the hybrid polymerization of mercapto-epoxy/mercapto-acrylate, and further improves the refractive index difference between the monomer and the film forming agent, thereby improving the refractive index modulation degree of the photopolymer. Meanwhile, the polymerization reaction is a typical 'click chemistry' reaction and has the advantages of mild reaction conditions, small using amount of a photoinitiator, small volume shrinkage, no oxygen inhibition, excellent thermal performance and mechanical performance and the like.

CLAIM 1. A photopolymer holographic recording material comprising a mercapto compound, an acrylate compound and an epoxy compound, comprising: the polymerization monomer comprises a sulfhydryl compound, an epoxy compound and an acrylate compound; the mass ratio of the sulfhydryl compound, the epoxy compound and the acrylate compound is (1-3): (0.5-2): (1-2).

N9358

CN115838543 **HANGZHOU GUANGLI TECHNOLOGY**

Priority Date: **18/09/2021**

PHOTOPOLYMER COMPOSITION CONTAINING ORGANIC SILICON FILM FORMING AGENT AND GRATING

The present invention provides a photopolymer composition comprising: 10-40 parts by weight of polymerized monomer; 10-40 parts of organosilicon film-forming agent; 0.1 to 5 parts by weight of dye; 0.5-5 parts by weight of a co-initiator; the organosilicon film-forming agent comprises epoxy modified polysiloxane and a curing agent. Compared with the prior art, the polysiloxane structure is introduced into the film forming agent, so that the thermal stability and the service life of the photopolymer material can be effectively improved, the film forming agent is generated by the reaction of epoxy modified polysiloxane and a curing agent, the epoxy modified polysiloxane has lower viscosity and higher solubility and has good compatibility with a high-refraction polymeric monomer, and meanwhile, the introduced epoxy group can also enable the epoxy group to react with the curing agent at normal temperature or lower temperature to form a cross-linked net structure, so that the mechanical property, the cohesiveness and the compatibility of the cross-linked net structure are improved, and the thermal stability and the weather resistance of the photopolymer are further improved.

CLAIM 1. A photopolymer composition comprising: the organosilicon film-forming agent comprises epoxy modified polysiloxane and a curing agent.

PATENT REFERENCE – See the table at the end of this document

N9301

WO202358431 **NTT DOCOMO**

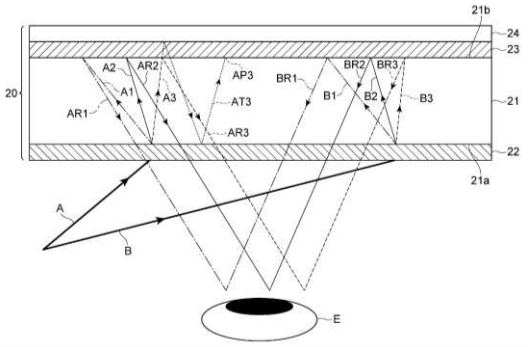
Priority Date: **06/10/2021**

DISPLAY DEVICE

The present invention appropriately prevents an image from looking like overlapping images by a plurality of light rays generated by different reflections being incident on a user's eye from different directions. A display device 1 is mounted on an eye portion of a user, and comprises: a transparent plate 21; an image light emission part that emits image light toward one principal surface 21a of the transparent plate 21; a transmission hologram 22 that is provided on the one principal surface 21a side of the transparent plate 21, duplicates the image light emitted from the image light emission part, and transmits the duplicated light as reproduced light; a reflection hologram 23 that is provided on the other principal surface 21b side of the transparent plate 21, and, on one principal surface thereof, reflects the reproduced light transmitted by the transmission hologram 22 and having passed through the transparent plate 21 toward an eye E of the user; and an absorption layer 24 that is provided on the other principal surface side of the reflection hologram 23, and formed by combining an absorption member for absorbing part of the reproduced light, which has not been reflected by the reflection hologram 23, and a transparent member.

DISPOSITIF D'AFFICHAGE

La présente invention empêche de manière appropriée une image de ressembler à des images se chevauchant par une pluralité de rayons lumineux générés par différentes réflexions qui sont incidentes sur l'œil d'un utilisateur à partir de différentes directions. Un dispositif d'affichage 1 est monté sur une partie de l'œil d'un utilisateur, et comprend : une plaque transparente 21 ; une partie d'émission de lumière d'image qui émet une lumière d'image vers une surface principale 21a de la plaque transparente 21 ; un hologramme de transmission 22 qui est disposé sur le côté de la surface principale 21a de la plaque transparente 21, duplique la lumière d'image émise à partir de la partie d'émission de lumière d'image, et transmet la lumière dupliquée sous la forme d'une lumière reproduite ; un hologramme de réflexion 23 qui est disposé sur l'autre côté de la surface principale 21b de la plaque transparente 21, et, sur une surface principale de celui-ci, réfléchit la lumière reproduite transmise par l'hologramme de transmission 22 et ayant traversé la plaque transparente 21 vers un œil E de l'utilisateur ; et une couche d'absorption 24 qui est disposée sur l'autre côté de la surface principale de l'hologramme de réflexion 23, et formé en combinant un élément d'absorption pour absorber une partie de la lumière reproduite, qui n'a pas été réfléchie par l'hologramme de réflexion 23, et un élément transparent.



CLAIM 1. A display device to be mounted on an eye portion of a user, the display device comprising: a transparent plate to be disposed such that one main surface faces the eye of the user when the display device is mounted by the user; and a display device to be mounted on the eye portion of the user, the display device comprising: An image light emitting unit configured to emit image light related to an image to be displayed; a transmissive hologram provided between one main surface of the transparent plate and the image light emitting unit, the transmissive hologram being configured to replicate the image light emitted from the image light emitting unit and transmit the image light as reproduction light; A reflection hologram provided such that one main surface faces the other main surface of the transparent plate, the reflection hologram reflecting, on the one main surface, reproduction light transmitted by the transmission hologram and passing through the transparent plate toward the eye of the user; and An absorption layer that is provided on the other main surface side of the reflective hologram and is formed by combining an absorption member and a transparent member, the absorption member being configured to absorb a portion of the regenerated light that has not been reflected on the one main surface side of the reflective hologram.

N9303

WO202354793 **KOREA ELECTRONICS TECHNOLOGY INSTITUTE**

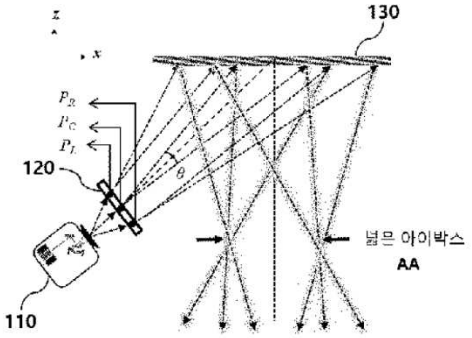
Priority Date: **30/09/2021**

AUGMENTED REALITY DEVICE USING HOLOGRAM LENS AND MANUFACTURING APPARATUS

Provided are an optical structure in which a pupil-permitted region that is observable using an angle-multiplexed hologram lens, which is a holographic optical element, may be extended, and an apparatus for manufacturing the holographic optical element. The apparatus for manufacturing a holographic optical element, according to an embodiment of the present invention, comprises: a light source emitting one or more pixel lights; a splitting unit splitting each of the one or more emitted pixel lights into a reference beam and a signal beam to be emitted in different directions; a first direction adjusting unit which adjusts the direction of the signal beam split by the splitting unit and emitted, and is provided to be rotated up, down, left, and right; a first optical element mounted in the first direction adjusting unit so as to generate divergent light of the signal beam so that parallel light of the incident signal beam can correspond to diffused light of a pixel; a second direction adjusting unit which adjusts the direction of the reference beam split by the splitting unit and emitted, and is provided to be rotated up, down, left, and right; a second optical element mounted in the second direction adjusting unit so as to generate divergent light of the reference beam so that parallel light of the incident reference beam can correspond to the diffused light of the pixel; and a holographic medium in which interference patterns of the divergent light of the signal beam and the divergent light of the reference beam are recorded, wherein the interference pattern of the signal beam with an adjusted incidence direction and the interference pattern of the reference beam with an adjusted focal position are recorded again, and the incidence direction of the signal beam and the focal position of the reference beam are adjusted with respect to the same region. Accordingly, the eye box through which augmented reality content can be observed may be extended, thereby allowing a user to observe content in a wider range.

DISPOSITIF DE RÉALITÉ AUGMENTÉE UTILISANT UNE LENTILLE D'HOLOGRAMME ET APPAREIL DE FABRICATION

L'invention concerne une structure optique dans laquelle une région autorisée par pupille qui est observable à l'aide d'une lentille d'hologramme multiplexé par angle, qui est un élément optique holographique, peut être étendu, et un appareil de fabrication de l'élément optique holographique. L'appareil de fabrication d'un élément optique holographique, selon un mode de réalisation de la présente invention, comprend : une source de lumière émettant une ou plusieurs lumières de pixel ; une unité de division divisant chacune de la ou des lumières de pixel émises en un faisceau de référence et un faisceau de signal à émettre dans différentes directions ; une première unité de réglage de direction qui règle la direction du faisceau de signal divisé par l'unité de division et émise, et qui est prévue pour être mise en rotation vers le haut, vers le bas, vers la gauche et vers la droite ; un premier élément optique monté dans la première unité de réglage de direction de façon à générer une lumière divergente du faisceau de signal de telle sorte qu'une lumière parallèle du faisceau de signal incident peut correspondre à la lumière diffusée d'un pixel ; une seconde unité de réglage de direction qui règle la direction du faisceau de référence divisé par l'unité de division et émise, et est conçue pour être mise en rotation vers le haut, vers le bas, vers la gauche et vers la droite ; un second élément optique monté dans la seconde unité de réglage de direction de façon à générer une lumière divergente du faisceau de référence de telle sorte qu'une lumière parallèle du faisceau de référence incident peut correspondre à la lumière diffusée du pixel ; et un support holographique dans lequel des motifs d'interférence de la lumière divergente du faisceau de signal et de la lumière divergente du faisceau de référence sont enregistrés, le motif d'interférence du faisceau de signal ayant une direction d'incidence ajustée et le motif d'interférence du faisceau de référence ayant une position focale ajustée étant à nouveau enregistrés, et la direction d'incidence du faisceau de signal et la position focale du faisceau de référence étant ajustées par rapport à la même région. Par conséquent, la région oculaire à travers laquelle un contenu de réalité augmentée peut être observé peut être étendue, ce qui permet à un utilisateur d'observer un contenu dans une plage plus large.



AA ... Wide eye box

CLAIM 1. A light source that emits one or more pixel light; A dividing unit configured to divide the emitted one or more pixel lights into a reference beam and a signal beam, respectively, so as to emit light in different directions; A first direction adjusting unit configured to adjust a direction of a signal beam divided and emitted by the dividing unit, the first direction adjusting unit being configured to be rotationally movable up, down, left, and right; A first optical element mounted on the first direction adjusting unit and generating divergent light of the signal beam so that parallel light of the signal beam incident thereon corresponds to divergent light of the pixel; A second direction adjusting unit configured to adjust a direction of a reference beam divided by the dividing unit and emitted, the second direction adjusting unit configured to be capable of rotating up, down, left, and right; A second optical element mounted on the second direction adjusting unit and generating divergent light of the reference beam so that parallel light of the incident reference beam corresponds to diffuse light of the pixel; and And a holographic medium in which interference patterns between divergent light of the signal beam and divergent light of the reference beam are recorded, wherein interference patterns between the signal beam whose light input direction is adjusted and the reference beam whose focus position is adjusted are recorded again for the same area.

N9306

WO202352131 **TRULIFE OPTICS**
Priority Date: **28/09/2021**

HOLOGRAPHIC DEVICE

A holographic device and method of forming a holographic device for a virtual retinal display, the holographic device comprising: a transparent substrate; and a holographic element arranged on said substrate; wherein the holographic element comprises a phase pattern and said phase pattern is a predefined optical coma configured and arranged to diffract light from a light source to form a plurality of images at an image plane of the holographic element. A virtual retinal display comprising a holographic device. An augmented reality system comprising a virtual retinal device and a pair of smart glasses.

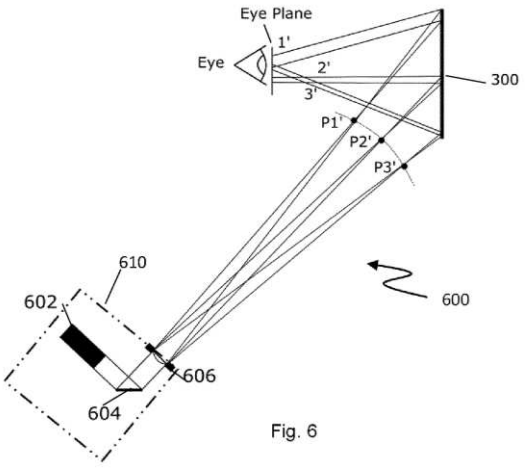


Fig. 6

DISPOSITIF HOLOGRAPHIQUE

L'invention concerne un dispositif holographique et un procédé de formation d'un dispositif holographique pour un affichage rétinien virtuel, le dispositif holographique comprenant : un substrat transparent ; et un élément holographique disposé sur ledit substrat ; l'élément holographique comprenant un motif de phase et ledit motif de phase étant un coma optique prédéfini configuré et conçu pour diffracter la lumière provenant d'une source de lumière pour former une pluralité d'images au niveau d'un plan d'image de l'élément holographique. L'invention concerne également un affichage rétinien virtuel comprenant un dispositif holographique. L'invention concerne également un système de réalité augmentée comprenant un dispositif rétinien virtuel et une paire de lunettes intelligentes.

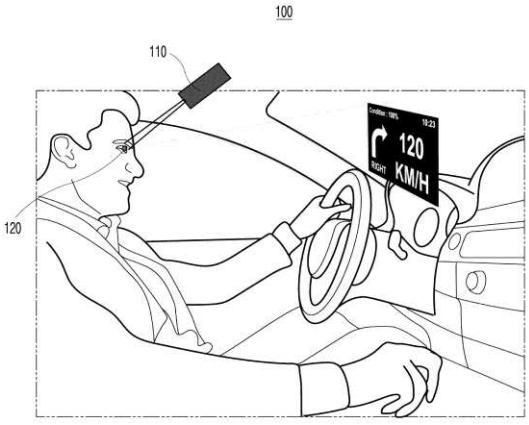
CLAIM 1. A holographic device for a virtual retinal display, the holographic device comprising: a substrate; and a holographic element arranged on said substrate; wherein the holographic element comprises a phase pattern and said phase pattern contains a predefined optical coma configured and arranged to diffract light from a light source to generate an eye box at an eye plane of the holographic element.

N9309

KR20230049391 **KOREA PHOTONICS TECHNOLOGY INSTITUTE**
Priority Date: **06/10/2021**

CONTACT LENS TYPE PROJECTION HOLOGRAPHIC DISPLAY DEVICE AND SYSTEM CAPABLE OF ENSURING DIFFRACTION EFFICIENCY

A contact lens type projection holographic display device and system capable of ensuring diffraction efficiency are provided. According to one embodiment of the present invention, there is provided a system for outputting information necessary for a user as a holographic image in a preset space, the system comprising: a contact lens disposed in front of an eye of the user in a direction in which light is incident; and a processor attached to the contact lens to receive interference fringes from the outside, A wavefront control optical element configured to allow a user to perceive a hologram image, and a holographic display device mounted in the predetermined space and configured to output interference fringes corresponding to the hologram image to a contact lens worn by the user.



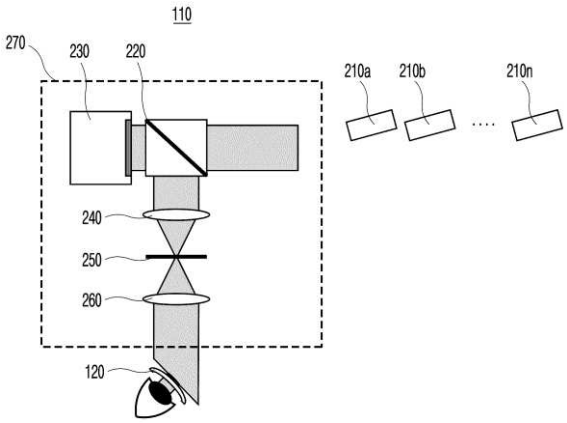
CLAIM 1. A system for outputting information required by a user as a holographic image in a preset space, the system comprising: a contact lens disposed in front of an eye of the user in a direction in which light is incident; a controller attached to the contact lens or inserted into the contact lens to receive an interference fringe from the outside, The projection holographic display system comprising: a wavefront control optical element configured to recognize a hologram image by a user; and a holographic display device mounted in the predetermined space and configured to output interference fringes corresponding to the hologram image by a contact lens worn by the user.

N9310

KR20230049387 **KOREA PHOTONICS TECHNOLOGY INSTITUTE**
Priority Date: **06/10/2021**

CONTACT LENS PROJECTION HOLOGRAPHIC DISPLAY DEVICE AND SYSTEM

A contact lens type projection holographic display device and system are provided. According to one embodiment of the present invention, there is provided a system for outputting information necessary for a user as a hologram image in a preset space, the system comprising: a holographic contact lens mounted on the eyeball of the user and receiving interference fringes from the outside to allow the user to recognize the hologram image; and a holographic contact lens mounted in the preset space, The projection holographic display system includes a holographic display device configured to output interference fringes corresponding to holographic images to a holographic contact lens worn by a user.



CLAIM 1. A system for outputting information required by a user as a hologram image in a predetermined space, the system comprising: a holographic contact lens mounted on an eye of the user and configured to receive an interference fringe from the outside to enable the user to perceive the hologram image; And a holographic display device mounted in the predetermined space and configured to output interference fringes corresponding to holographic images to holographic contact lenses worn by a user.

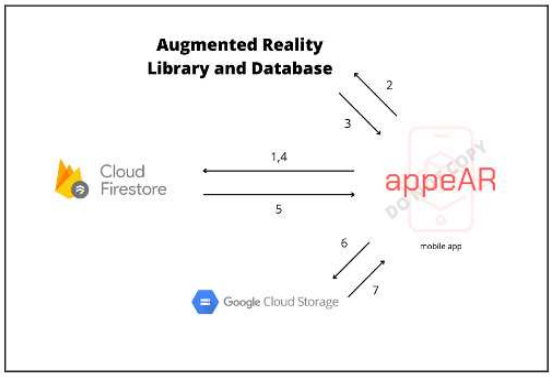
N9317

IN202341014279 **CHAITANYA BHARATI INSTITUTE OF TECHNOLOGY**
Priority Date: **03/03/2023**

AN AUGMENTED REALITY (AR) BASED PROJECTOR WITH HOLOGRAPHIC APPLICATION FOR ENHANCING LEARNING SKILLS OF STUDENTS IN RURAL REGIONS

An educating system consists of the integration of a HOLOGRAPHIC projector to display the 3D content we provide and also a fully dedicated AR application to view the same 3D models/ videos in mobile post the class work. appeAR focuses on improving education standards of rural areas, boosting the comprehension of students. The innovation uses Augmented reality for digital textbooks, the app augments various 3D models, video relevant to the description on the existing textbooks. This enables students to understand the concept better and experience the model practically. Teachers are equipped with the holographic display to explain the concepts, the models and videos for the holographic display are custom built by us. This content will also be used for the AR app, to make sure students can revise later at home. The package of Holographic display and AR app, will make sure students will learn, understand, and apply things practically.

CLAIM 1. A system for enhancing the educating capacities of children especially in rural schools and education institutions the said system comprising of HOLOGRAPHIC projector to display the 3D content we provide and also a fully dedicated AR (Augemented Reality) application to view the same 3D models/ videos in mobile post the class work ; AR app, students will get to know what they are learning in detail as the content provided is visually improved and focuses on detailing the concept within less time and the app augments 3D models, video/audio content, and simulations over textbook content and while reading the information, the student can interact with the content to understand the characteristics, advantages, or other information about a particular topic ; the models and animated videos used are custom-tailored by us to cover the general syllabus of any subject and since target customer base is rural areas, the app is built to perform its functions efficiently with limited network and hardware support and further the said system works on dynamic content loading, which removes the additional memory usage by the app like storing the content locally and further, the models are compressed and stored into minimal size, which can be downloaded with less network bandwidth. Videos are streamed directly from the server like a live embed with quality control

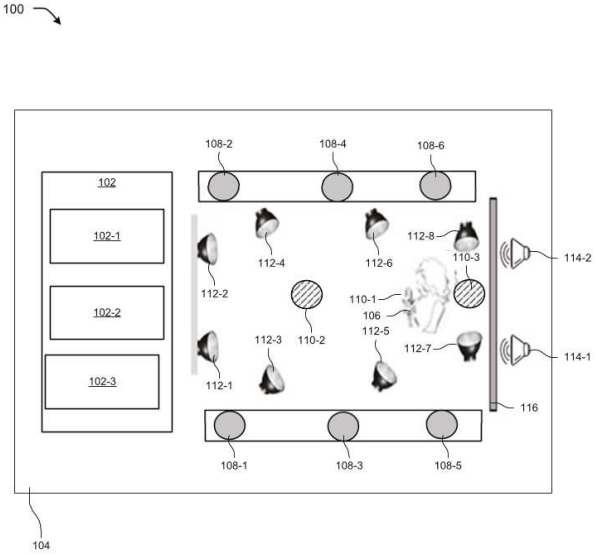


N9318

IN202321011493 **GHOSE ANIRVAN**
Priority Date: **20/02/2023**

A SYSTEM TO PRODUCE, TRANSMIT, AND PLAYBACK LIVE AND ARCHIVED HOLOGRAPHIC VIDEO

A system 100 and method to produce, transmit, and playback holographic video of a live and archived performance from a first place 104 to one or more second places 602 include a master audio-video unit 102, one or more camera 108, at least one microphone 110, and a plurality of light illuminating source 112. The master audio-video unit 102 performs to convert video and audio data into three-dimensional video and immersive sound, and after synchronizing both obtain final holographic video output to transmit using at least one broadcasting channel or storing after encryption. Further, after receiving data at one or more second places 602, decrypt and separate the holographic video in moving video to display on a compatible holographic screen 614 and immersive sound to compatible speakers 610, and after mixing special effects, create scenario as good as a live performance of the event.



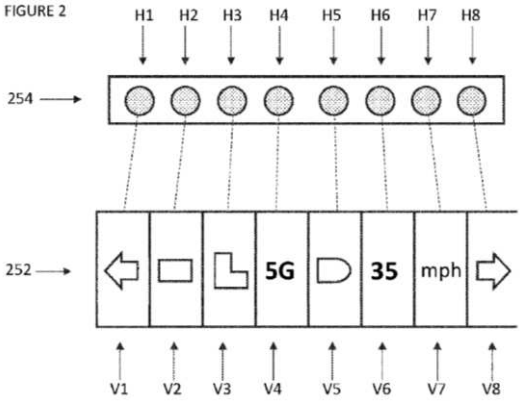
CLAIM 1. A system (100) to produce, transmit and playback holographic video, the system (100) comprising: a master audio-video unit (102) configured with one or more sub-units; and a first place (104) to shoot a live show of an artist (106), comprising one or more camera (108), wherein each camera (108) configured to capture live image of objects in field of view and send it to the master audio-video unit (102), at least one microphone (110) to receive three-dimensional sound field signals and send to the master audio-video unit (102) for converting into immersive audio, and a plurality of light illuminating source (112), wherein the master audio-video unit (102) perform to: receive image data from one or more camera (108) configured at the first place (104) to convert image data into three-dimensional motion image data; receive sound data from at least one microphone (110) configured at the first place (104) to convert into immersive sound data; synchronize three dimensional motion image data with immersive sound data; mix one or more special effects and programming to the synchronized motion image data and immersive sound data to generate final holographic video output; encrypt the holographic video to secure, and store; transmit the holographic video to one or more second places (602) using at least one broadcasting channel; receive the holographic video at the one or more second places (602) for reproduction; and separate the holographic video into the immersive sound data and video data after decryption to respective video channels for display on a compatible screen (614) and to the sound channels to reflect holographic view as the live show at the one or more second places (602).

N9319

GB2611405 **ENVISICS**
Priority Date: **29/07/2022**

HOLOGRAM WAVEGUIDING

A projection system comprising a display device, a hologram engine and a waveguide and an associated hologram replication method are disclosed. The SLM is arranged to display a hologram of an image and spatially modulate light to form a holographic wavefront. The engine computes the hologram. The hologram is arranged to angularly distribute light within the holographic wavefront in accordance with spatial position within the image such that continuous angular ranges of the holographic wavefront 254 respectively correspond with adjacent regions of the image 252. The waveguide includes parallel reflective surfaces arranged to waveguide the holographic wavefront therebetween. The first surface is partially reflective-transmissive forming a plurality of emission zones (Fig. 4) for the wavefront. The hologram engine is arranged to modify the hologram to at least partially compensate for decreasing emission intensity from each successive output zone of the waveguide, The intensity attenuation offset may include modifying the intensity of at least a section of the target image before hologram calculation or applying a gain or loss factor. An iterative phase retrieval algorithm may be applied as well as a point cloud method. Viewer tracking may be employed.



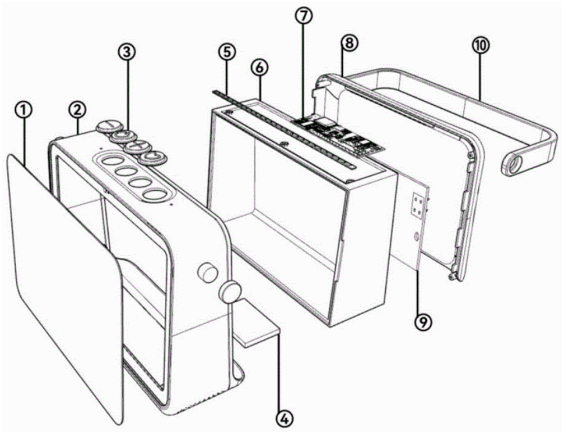
CLAIM 1. A projection system comprising:
a display device arranged to display a hologram of an image and spatially modulate light in accordance with the hologram to form a holographic light field;
a hologram engine arranged to calculate the hologram, wherein the hologram is arranged to angularly distribute light within the holographic light field in accordance with spatial position within the image such that continuous angular ranges of the holographic light field respectively correspond with continuous regions of the image;
a waveguide comprising a pair of parallel reflective surfaces arranged to waveguide the holographic light field therebetween, wherein a first surface of the pair of parallel reflective surfaces is partially reflective-transmissive so as to form an output comprising a plurality of emission zones for the holographic light field,
wherein the hologram engine is arranged to modify the hologram to at least partially compensate for a decrease in intensity of the emission from each successive emission zone of the waveguide caused by the partial reflection-transmissions at the first surface during waveguiding.

N9321

CN218886528U **CHINA CABLE NETWORK**
Priority Date: **08/12/2022**

HOLOGRAPHIC NAKED EYE 3D VIRTUAL SERVICE DEVICE

The utility model relates to a virtual service device of holographic bore hole 3D, including preceding shell, inner frame and back shell, form inside die cavity after preceding shell links to each other with the back shell, place in the inner frame in the inside die cavity, the display is installed to the front side of preceding shell, be provided with holographic component on the inner frame. The utility model discloses a holographic bore hole 3D virtual service device can provide online 3D personage interactive, carries out the dialogue, and functional command is mutual.



CLAIM 1. The utility model provides a holographic bore hole 3D virtual service device, its characterized in that includes preceding shell, inner frame and back shell, preceding shell and back shell form inside die cavity after linking to each other, place in the inner frame in the inside die cavity, the display is installed to the front side of preceding shell, be provided with holographic component on the inner frame.

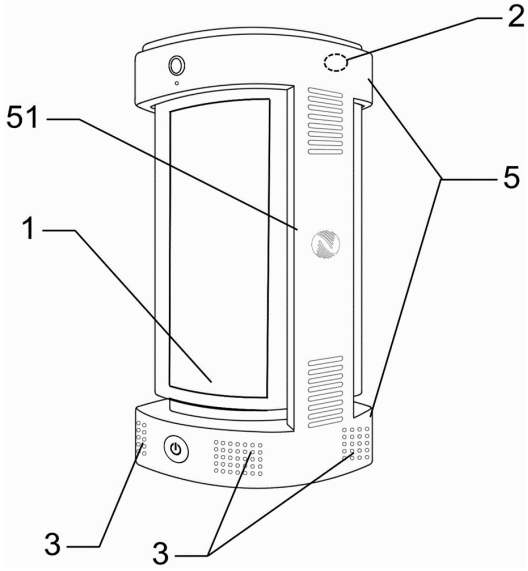
N9322

CN218868346U **CHINA RADIO & TELEVISION LIAONING NETWORK**

Priority Date: **12/08/2022**

VISUAL HOLOGRAPHIC INTELLIGENT SOUND BOX

The utility model discloses a visual holographic intelligent sound box, wherein a display screen (1) is arranged on the front side of the intelligent sound box, and a projection lens (2) is arranged on the top end of the intelligent sound box; the intelligent sound box is provided with a tubular shell, the display screen (1) is located on the inner side of the tubular shell, a transparent cover is arranged on the tubular shell corresponding to the position of the display screen (1), so that the display screen (1) can be observed, and the horizontal section of the display screen (1) is arc-shaped. The utility model discloses a visual holographic intelligent sound box, the accessible display screen with throw the screen and realize the broadcast of video, picture, and throw the stability of screen strong.



CLAIM 1. A visual holographic intelligent sound box is characterized in that, the front side of the intelligent sound box is provided with a display screen (1), and the top end of the intelligent sound box is provided with a projection lens (2); the intelligent sound box is provided with a tubular shell, the display screen (1) is positioned on the inner side of the tubular shell, a transparent cover is arranged on the tubular shell corresponding to the position of the display screen (1) so that the display screen (1) can be observed, the horizontal section of the display screen (1) is arc-shaped; the projection lens (2) is connected with the shell of the intelligent sound box through a balance mechanism (4), the balance mechanism (4) comprises a connecting rod (41), a rotating piece (42) and a gravity rod (43), one end of the connecting rod (41) is connected with the intelligent sound box shell, the other end of the connecting rod is connected with the rotating piece (42), and the rotating piece (42) can rotate relative to the connecting rod (41) by taking the axis of the connecting rod (41) as a rotating shaft; a horizontal rotating shaft (421) is further arranged on the rotating piece (42), and the middle part of the gravity rod (43) is sleeved on the horizontal rotating shaft (421), so that the gravity rod can rotate by taking the horizontal rotating shaft (421) as an axis; one end of the gravity rod (43) is provided with a counterweight (431), and the other end of the gravity rod is connected with the projection lens (2); the rotating piece (42) is sleeved on the connecting rod (41), and a bearing is arranged between the rotating piece (42) and the connecting rod (41), so that the rotating piece (42) can rotate relative to the connecting rod (41) by taking the axis of the connecting rod (41) as a rotating shaft; balance mechanism (4) still include stop device (44), stop device (44) one end is connected with intelligent audio amplifier shell, and the other end is the annular, sets up all sides in gravity pole (43).

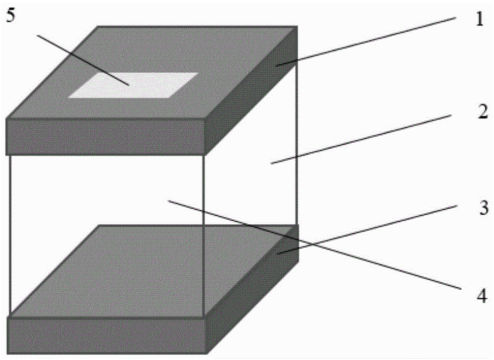
N9323

CN218866694U **SINO SINGAPORE INTERNATIONAL JOINT RESEARCH INSTITUTE**

Priority Date: **20/10/2022**

INTERACTIVE HOLOGRAPHIC PROJECTION SHOWCASE OF INTELLIGENCE

The utility model provides an intelligent interactive holographic projection system, an intelligent interactive holographic projection showcase, which comprises a top cover, a cabinet body, a base, a projector, a gesture induction control device, a voice control device, a virtual network system and an automatic switch system, wherein the top cover and the base are respectively arranged at the top and the bottom of the cabinet body; the cabinet body is formed by enclosing common glass and projection glass; the projection port of the projector faces the cabinet body; the gesture sensing control device is used for enabling a user to control the content projected by the projector through gestures; the voice control device is used for enabling a user to control the contents projected by the projector through voice control; the virtual network system is used for interacting with an external network; the automatic switching system is used for controlling the opening and closing of the projector. The system integrates multiple functions including holographic display, intelligent interaction, infrared isolation, ultraviolet isolation, safety, explosion prevention and the like.



CLAIM 1. An intelligent interactive holographic projection showcase, which is characterized by comprising a top cover (1), a showcase body, a base (3), a projector (5), a gesture induction control device, a sound control device, a virtual network system and an automatic switch system, the top cover (1) and the base (3) are respectively arranged at the top and the bottom of the cabinet body; the cabinet body is formed by enclosing common glass (2) and projection glass (4); the projection port of the projector (5) faces the cabinet body; the gesture sensing control device is used for enabling a user to control the contents projected by the projector (5) through gestures; the voice control device is used for enabling a user to control the contents projected by the projector (5) through voice control; the virtual network system is used for interacting with an external network; the automatic switching system is used for controlling the opening and closing of the projector (5).

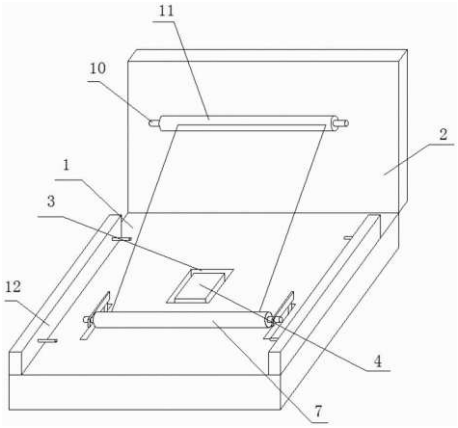
N9324

CN218825129U **SHANGHAI MENGYUN HOLOGRAPHIC TECHNOLOGY**

Priority Date: **10/11/2021**

VEHICLE-MOUNTED HOLOGRAPHIC SCREEN PROJECTION DEVICE BASED ON CLOUD BIM PLATFORM

The utility model provides an on-vehicle holographic screen projection arrangement based on cloud BIM platform, which comprises a mounting bas, top one side of mount pad articulates there is the background board, the top slidable mounting of mount pad has two slide shafts that the symmetry set up, and the equal fixed mounting in top of two slide shafts has the mounting panel. The utility model discloses compare traditional on-vehicle holographic screen projection arrangement based on cloud BIM platform, accomodate and expand the process and need not fold holographic screen, avoid holographic screen the situation that the fold appears, prolonged the life of holographic screen, expand and accomodate holographic screen the step few, holographic screen's result of use is good.



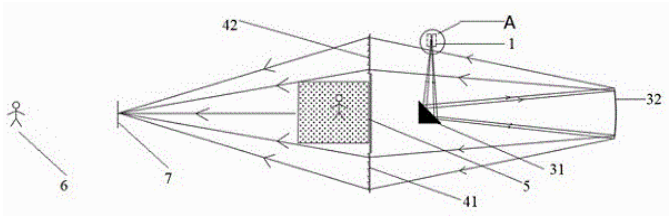
CLAIM 1. The vehicle-mounted holographic screen projection device based on the cloud BIM platform comprises a mounting seat (1) and is characterized in that a background plate (2) is hinged to one side of the top of the mounting seat (1), two sliding shafts (5) which are symmetrically arranged are slidably mounted on the top of the mounting seat (1), mounting plates are fixedly mounted at the tops of the two sliding shafts (5), first hinge pins (6) are movably mounted on the two mounting plates, the same first transverse shaft (7) is fixedly mounted at one end, close to each other, of the two first hinge pins (6), two clamp hoops (9) which are symmetrically arranged are fixedly mounted on one side of the background plate (2), second hinge pins (10) can be movably clamped in a separated mode on the two clamp hoops (9), the same second transverse shaft (11) is fixedly mounted at one end, close to each other, of the two second hinge pins (10), the same holographic screen (8) is fixedly mounted on the second transverse shaft (11) and the first transverse shaft (7), a clamping assembly is arranged at the top of the mounting seat (1), the clamping assembly, the two first hinge pins (6) and the two second hinge pins (10) and the movable clamp the same pin (18), and two limit hoops (18) can be clamped separately from the movable clamp the mounting seat.

N9325

CN218767784U **SHENZHEN ORANGE DIGITAL TECHNOLOGY**
Priority Date: **27/12/2022**

HOLOGRAPHIC PROJECTION EQUIPMENT

The utility model belongs to the technical field of projection, in particular to a holographic projection device which is used for a stage; the holographic projection device includes: a projection device for emitting a light beam; the reflecting device comprises a first reflecting mirror and a second reflecting mirror; the first reflector is positioned on a light emitting path of a light beam emitted by the projection equipment and used for reflecting the received light beam; the second reflector is positioned on the light-emitting path of the light beam reflected by the first reflector and used for reflecting the received light beam; the light beams reflected by the first reflector and the second reflector do not intersect; and the Fresnel lens is connected with the stage background wall, is arranged on the light emergent path of the second reflecting mirror and is used for refracting the received light beam and focusing the light beam on the stage for imaging. The light beam emitted by the projection equipment is reflected to the Fresnel lens through the reflecting device and focused and imaged through the Fresnel lens, medium-free projection is achieved, three-dimensional impression is achieved, and then the impression is improved for stage performance.



CLAIM 1. A holographic projection device for use in a stage; characterized in that the holographic projection device comprises: a projection device (1) for emitting a light beam; a reflection device comprising a first mirror (31), a second mirror (32); the first reflector (31) is positioned on an outgoing light path of a light beam emitted by the projection equipment (1) and used for reflecting the received light beam; the second reflector (32) is positioned on the light-emitting path of the light beam reflected by the first reflector (31) and used for reflecting the received light beam; the light beams reflected by the first reflector (31) and the second reflector (32) do not intersect; and the Fresnel lens (4) is connected with the stage background wall (5), is arranged on the light emergent path of the second reflecting mirror (32), and is used for refracting the received light beam and focusing the light beam on the stage image.

N9326

CN218729213U **BANK OF CHINA**
Priority Date: **30/09/2022**

PORTABLE HOLOGRAPHIC INTERACTIVE TELLER MACHINE AND HOLOGRAPHIC INTERACTIVE SYSTEM

The application discloses a portable holographic interactive teller machine and a holographic interactive system, which can be used in the field of holographic technology or the field of finance. A teller machine comprising: the system comprises a holographic projection module, a data acquisition module and an interaction module; the interactive module is respectively connected with the holographic projection module and the data acquisition module; the data acquisition module is used for acquiring user operation information and sending the user operation information to the interaction module; the interaction module is used for sending interaction data corresponding to the user operation information to the server; receiving an interaction result returned by the server; the holographic projection module is used for projecting the interaction result on the interaction interface. The application provides a portable holographic interactive teller machine passes through interactive holographic projection technique, realizes man-machine interaction, and the help customer is handled relevant business, reduces the direct contact of customer and physical equipment, reduces teller machine physical equipment quantity and volume, reaches the effect that the customer contactless, the teller machine of going out are portable to reduce customer contact risk and use the maintenance cost with equipment.

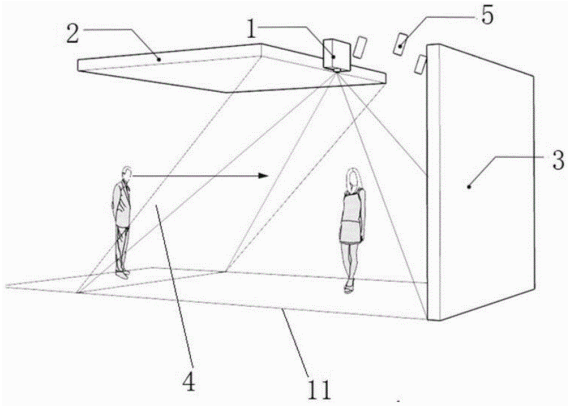
CLAIM 1. A portable holographic interactive teller machine comprising: the system comprises a holographic projection module, a data acquisition module and an interaction module; the interactive module is respectively connected with the holographic projection module and the data acquisition module; the data acquisition module is used for acquiring user operation information and sending the user operation information to the interaction module; the interaction module is used for sending interaction data corresponding to the user operation information to a server; receiving an interaction result returned by the server; the holographic projection module is used for projecting the interaction result on an interaction interface.

N9327

CN218728626U **SHANGHAI EPEAN DISPLAY ORIGINALITY**

Priority Date: **04/11/2022**

IMMERSIVE HOLOGRAPHIC DISPLAY SYSTEM



The utility model provides an immersive holographic display system includes projecting apparatus, first display screen, second display screen and holographic membrane, holographic membrane set up in first display screen and between the plane of projection of projecting apparatus, first display screen the plane of projection with holographic membrane is "Z" font and arranges, holographic membrane be used for with the picture that first display screen shows is imaged, first display screen with the projecting apparatus throws plane of projection parallel arrangement, the second display screen with first display screen is perpendicular, and this immersive holographic display system shows the picture formation of image that first display screen shows in the space through the reflection of holographic membrane, and the linkage picture background is constituteed in the projection of second display screen and projecting apparatus, and the formation of image of setback holographic membrane increases the stereovision of formation for the picture is more three-dimensional.

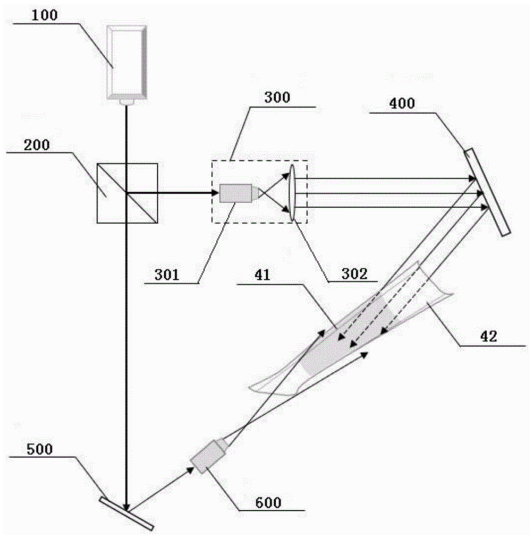
CLAIM 1. An immersive holographic display system, comprising: the holographic display screen comprises a projector, a first display screen, a second display screen and a holographic film; the holographic film set up in first display screen and between the plane of projection of projecting apparatus, first display screen the plane of projection with holographic film is "Z" font and arranges, holographic film be used for with the picture that first display screen shows is imaged, first display screen with the projecting apparatus is thrown plane of projection parallel arrangement, the second display screen with first display screen is perpendicular.

N9328

CN218728595U **ARTIZAN PHOTONIC CRYSTAL SHANDONG**

Priority Date: **05/09/2022**

EXPOSURE SYSTEM OF HOLOGRAPHIC DISPLAY FILM FOR AUTOMOBILE A-COLUMN DISPLAY SYSTEM



The utility model discloses an exposure system that is used for car A post display system's holographic display membrane, include: a laser for emitting laser light; the beam splitting prism is used for splitting laser emitted by the laser into a first laser beam and a second laser beam; the beam expanding device is used for expanding the first laser beam to obtain parallel light; the first reflector is used for reflecting parallel light obtained after beam expansion of the beam expander to the holographic display film; and the second reflector is used for reflecting the second laser beam to the second spatial light filter, and the second laser beam obtains divergent light after passing through the second spatial light filter and irradiates the holographic display film. The utility model discloses a holographic display film that exposure system obtained after the exposure can be with most light intensity diffraction to the driver, can obtain the holographic display film in the big visual field of large tracts of land.

CLAIM 1. An exposure system for a holographic display film for an a-pillar display system of an automobile, comprising: a laser for emitting laser light; the beam splitting prism is used for splitting laser emitted by the laser into a first laser beam and a second laser beam; the beam expanding device is used for expanding the first laser beam to obtain parallel light; the first reflector is used for reflecting parallel light obtained after beam expansion of the beam expander to the holographic display film; and the second reflector is used for reflecting the second laser beam to the second spatial light filter, and the second laser beam passes through the second spatial light filter to obtain divergent light and irradiates the holographic display film.

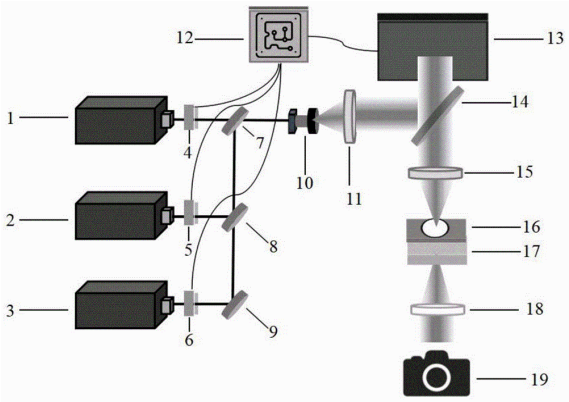
N9331

CN115981126 **BEIHANG UNIVERSITY OF AERONAUTICS & ASTRONAUTICS**

Priority Date: **09/01/2023**

LARGE-VISUAL-ANGLE COLOR HOLOGRAPHIC 3D DISPLAY SYSTEM BASED ON LIQUID CRYSTAL GRATING

The invention provides a large-visual-angle color holographic 3D display system based on a liquid crystal grating. The red light source, the green light source, the blue light source and the three shutters are used for generating red light, green light and blue light which are emitted according to time sequence. The half-transmitting half-reflecting mirror I, the half-transmitting half-reflecting mirror II and the reflecting mirror are used for coinciding optical axes of red light, green light and blue light. The signal controller is used for controlling the on-off states of the three shutters, generating holograms of three color channels of the 3D object, namely red, green and blue, on which blazed gratings are superposed simultaneously, and loading the holograms onto the spatial light modulator according to time sequence. The liquid crystal grating is positioned on the back focal plane of the lens II and on the front focal plane of the lens III, and the holographic diffraction light fields of the red, green and blue color channels generate second-order diffraction in different liquid crystal layer areas of the liquid crystal grating to generate second-order diffraction images with completely consistent intervals. After passing through the lens III, the CCD receives a color holographic reproduction image with a large visual angle.



CLAIM 1. A large-visual-angle color holographic 3D display system based on a liquid crystal grating is characterized by comprising a red light source, a green light source, a blue light source, a shutter I, a shutter II, a shutter III, a semi-transparent semi-reflective mirror I, a semi-transparent semi-reflective mirror II, a reflecting mirror, a signal controller, a beam expander, a lens I, a spatial light modulator, a semi-transparent semi-reflective mirror III, a lens II, a diaphragm, a liquid crystal grating and a lens III; the red light source, the green light source, the blue light source and the three shutters are used for generating red light, green light and blue light which are emitted according to time sequence, the semi-transparent semi-reflective mirror I, the semi-transparent semi-reflective mirror II and the reflector are used for overlapping optical axes of the red light, the green light and the blue light, and the red light, the green light and the blue light which are overlapped by the optical axes are reflected to the spatial light modulator by the semi-transparent semi-reflective mirror III after being collimated and expanded by the beam expander and the lens I; the signal controller is used for controlling the on-off states of the three shutters, generating holograms of three color channels of a 3D object, namely red, green and blue, and overlapping blazed gratings at the same time, loading the holograms onto the spatial light modulator according to a time sequence, wherein the loading sequence of the holograms of the three color channels of the red, green and blue is consistent with the emitting sequence of the red light, the green light and the blue light, holographic diffraction light fields of the three color channels of the red, green and blue modulated by the spatial light modulator are incident to different liquid crystal layer regions of the liquid crystal grating after passing through a lens II and a diaphragm, the liquid crystal grating is positioned on a rear focal plane of the lens II and is positioned on a front focal plane of the lens III, and voltages are applied to the liquid crystal grating to control diffraction images to generate second-order diffraction, the holographic diffraction light fields of the three color channels of the red, green and blue generate second-order diffraction images with completely consistent intervals, and after passing through the lens III, the holographic CCD receives a color reproduction image with a large visual angle.

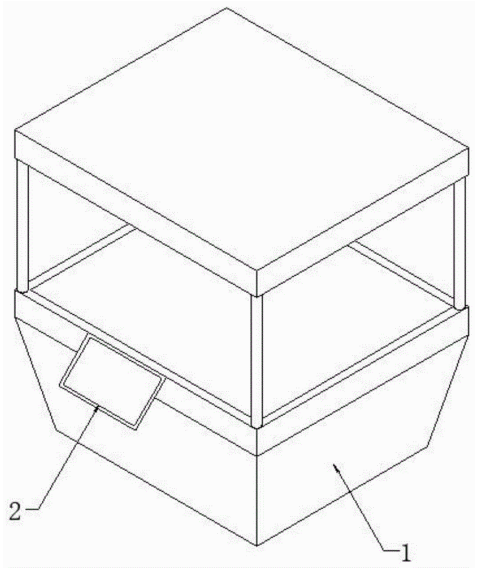
N9333

CN115978383 **SHENYANG JINRAN TECHNOLOGY**

Priority Date: **30/12/2022**

INTELLIGENT HOLOGRAPHIC TABLE

The invention discloses an intelligent holographic table which comprises a holographic table main body and a touch screen main body, wherein a connecting assembly is arranged between the touch screen main body and the holographic table main body and comprises a first connecting block, a rotating shaft, a limiting rod and two control rods, a second connecting block is arranged inside the first connecting block, the rotating shaft is arranged between the first connecting block and the second connecting block, the limiting rod is arranged in an inner cavity of the rotating shaft, the limiting assembly is arranged on the outer wall of the limiting rod, the outer wall of the limiting rod is symmetrically arranged on the limiting blocks, and the two control rods are symmetrically arranged on the outer walls of the two limiting blocks. According to the invention, the installation between the touch screen main body and the holographic table main body is more convenient and faster through the arrangement mode of the connecting component, the installation and use efficiency of the touch screen main body is effectively improved, and the touch screen main body can be conveniently used for rapidly adjusting the use angle according to the use requirement, so that the use convenience of the touch screen main body is effectively improved, and certain practicability is also improved.



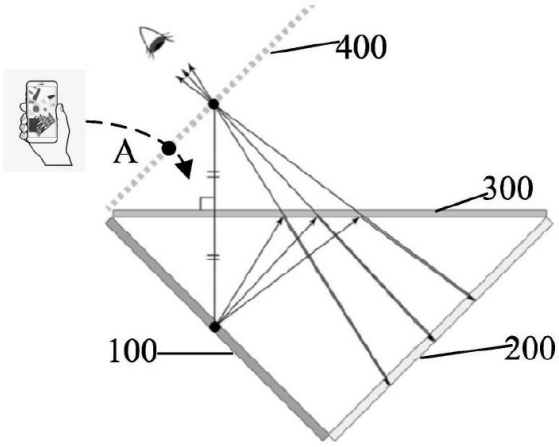
CLAIM 1. The utility model provides a holographic platform of intelligence, includes holographic platform main part (1) and touch-sensitive screen main part (2), its characterized in that, touch-sensitive screen main part (2) set up in the front of holographic platform main part (1), be provided with coupling assembling (3) between touch-sensitive screen main part (2) and the holographic platform main part (1), coupling assembling (3) include: the holographic table comprises a first connecting block (31), wherein the first connecting block (31) is fixedly arranged on the outer wall of the holographic table main body (1), a second connecting block (32) is arranged inside the first connecting block (31), and the first connecting block (31) and the second connecting block (32) are used for fixing a touch screen main body (2) on the holographic table main body (1); a rotation shaft (33), the rotation shaft (33) being disposed between the first connection block (31) and the second connection block (32), the rotation shaft (33) being used for rotation between the first connection block (31) and the second connection block (32); the limiting rod (34) is arranged in the inner cavity of the rotating shaft (33), the limiting component (4) is arranged on the outer wall of the limiting rod (34), and the outer wall of the limiting rod (34) is symmetrically arranged on the limiting block (35); the two control rods (36) are symmetrically arranged on the outer walls of the two limiting blocks (35), and the two control rods (36) are used for pressing the two limiting blocks (35) respectively.

N9334

CN115963972 **PATEO CONNECT TECHNOLOGY SHANGHAI**
Priority Date: **31/05/2021**

METHOD AND DEVICE FOR SHARING VEHICLE-MOUNTED HOLOGRAPHIC PICTURE TO MOBILE TERMINAL AND STORAGE MEDIUM

A method, a device and a storage medium for sharing vehicle-mounted holographic pictures to a mobile terminal are provided, and the method comprises the following steps: establishing communication connection with a mobile terminal; displaying a picture on a holographic imaging interface in a holographic imaging mode; acquiring gesture information of a user; when the gesture information of the user is matched with preset gesture information, the picture is sent to the mobile terminal, and the preset gesture information is preset gesture information. According to the method, the interactive experience between the user and the car machine in the holographic imaging mode is optimized, and the experience of the intelligent car cabin is improved.



CLAIM 1. A method for sharing a holographic picture of a vehicle-mounted system to a mobile terminal is characterized by comprising the following steps: establishing communication connection with a mobile terminal; displaying a picture on a holographic imaging interface in a holographic imaging mode; acquiring gesture information of a user; when the gesture information of the user is matched with preset gesture information, the picture is sent to the mobile terminal, and the preset gesture information is preset gesture information.

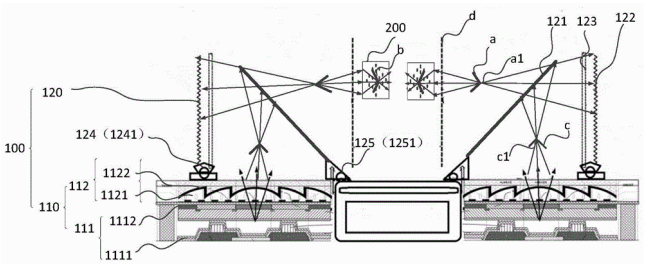
N9335

CN115963633 **BOE TECHNOLOGY GROUP | HEFEI BOE JOINT TECHNOLOGY**
Priority Date: **29/07/2022**

HOLOGRAPHIC LIGHT FIELD DISPLAY SYSTEM

The present disclosure provides a holographic light field display system comprising: the light field display device comprises a plurality of light source modules and a plurality of spatial light modulators, wherein the light source modules are used for projecting a planar 3D coherent array light source; the spatial light modulators are respectively and correspondingly arranged on the projection light paths of the light source modules and used for modulating and positioning the corresponding planar 3D coherent array light sources so as to form a first holographic surface with a first projection depth profile relative to the surface of the virtual screen; the secondary modulator is arranged on the light path of the plurality of spatial light modulators and used for modulating and positioning the first holographic surface with the first projection depth profile to form a second holographic surface with an expected second projection depth profile relative to the surface of the virtual screen, and the surface of the virtual screen is not parallel to the light emergent surface of the light source module. The embodiment of the disclosure provides a holographic light field display system, which can realize real holographic projection by using a light field holographic technology.

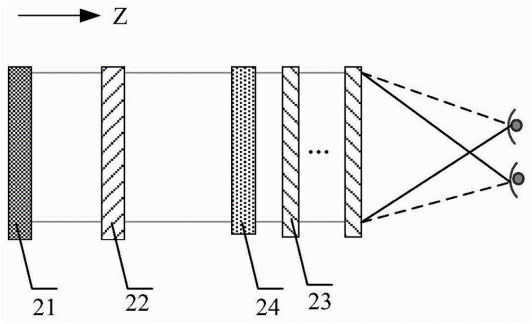
CLAIM 1. A holographic light field display system, comprising: the light field display device comprises a plurality of light source modules and a plurality of spatial light modulators, wherein the light source modules are used for projecting a planar 3D coherent array light source; the spatial light modulators are respectively and correspondingly arranged on the projection light paths of the light source modules and used for modulating and positioning the corresponding planar 3D coherent array light sources to form a first holographic surface with a first projection depth profile relative to the surface of the virtual screen; and the secondary modulator is arranged on the projection light paths of the plurality of spatial light modulators and is used for modulating and positioning the points of the first holographic surface to form a second holographic surface which has an expected second projection depth profile relative to the surface of the virtual screen, and the surface of the virtual screen is not parallel to the light emergent surface of the light source module.



N9336

CN115951570 **TIANMA**
Priority Date: **30/12/2022**

HOLOGRAPHIC DISPLAY SYSTEM, HOLOGRAPHIC DISPLAY METHOD THEREOF AND ELECTRONIC EQUIPMENT



The application provides a holographic display system, a holographic display method and an electronic device thereof, wherein the holographic display system comprises: the backlight module, the spatial light modulator and the liquid crystal grating modules are sequentially arranged in a first direction; the backlight module is used for emitting a backlight beam; the spatial light modulator is used for carrying out phase modulation and amplitude modulation on the backlight beam; the liquid crystal grating modules are sequentially arranged in a first direction; based on the polarization direction of the incident light, the liquid crystal grating module can change the transmission direction of the incident light or keep the transmission direction of the incident light; the light incident side of at least one liquid crystal grating module is provided with a first optical rotation device which can rotate the polarization direction of incident light, so that in a set time period, the propagation direction of the incident light is changed by at least one liquid crystal grating module, and the propagation direction of the incident light is not changed by at least one liquid crystal grating module. The technical scheme of the application can reduce the picture refreshing frequency of the liquid crystal grating module.

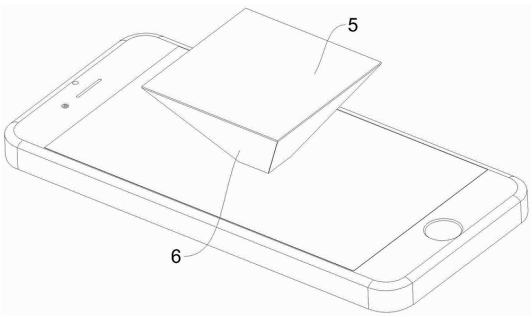
CLAIM 1. A holographic display system, comprising: the backlight module, the spatial light modulator and the liquid crystal grating modules are sequentially arranged in a first direction; the backlight module is used for emitting a backlight beam; the spatial light modulator is used for carrying out phase modulation and amplitude modulation on the backlight light beam; the liquid crystal grating modules are sequentially arranged in the first direction; based on the polarization direction of the incident light, the liquid crystal grating module can change the transmission direction of the incident light or keep the transmission direction of the incident light; the light incident side of at least one liquid crystal grating module is provided with a first optical rotation device, and the first optical rotation device can rotate the polarization direction of incident light, so that in a set time period, the propagation direction of the incident light is changed by at least one liquid crystal grating module, and the propagation direction of the incident light is not changed by at least one liquid crystal grating module.

N9337

CN115938168 **WUHAN BOAO PENGCHENG EDUCATION TECHNOLOGY**
Priority Date: **06/01/2023**

3D HOLOGRAPHIC PROJECTION TEACHING AID SUIT AND COMBINATION

The invention relates to a 3D holographic projection teaching aid set, which comprises an indicating plate body and a transparent plate body, wherein the transparent plate body is made of transparent materials, the indicating plate body comprises a square indicating part and a trapezoid indicating part, the trapezoid indicating part is in an isosceles trapezoid shape, the length of the lower bottom of the trapezoid indicating part is equal to the side length of the square indicating part, the transparent plate body comprises a square cutting part and a trapezoid cutting part, the shape of the square cutting part is matched with that of the square indicating part, and the shape of the trapezoid cutting part is matched with that of the trapezoid indicating part. The invention can achieve the aim of teaching 3D holographic transparency.



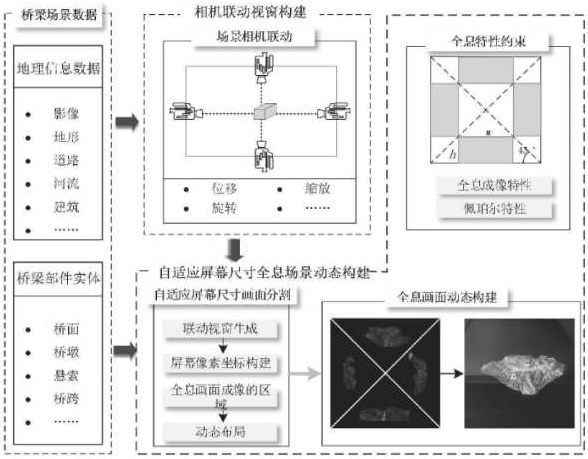
CLAIM 1. The utility model provides a 3D holographic projection teaching aid suit, a serial communication port, including indicator plate body (1) and transparent plate body (2), transparent plate body (2) are made by transparent material, indicator plate body (1) is including square instruction portion (3) and trapezoidal instruction portion (4), trapezoidal instruction portion (4) are isosceles trapezoid, just the length that trapezoidal instruction portion (4) go to the bottom equals the length of side of square instruction portion (3), transparent plate body (2) are including square cutting out portion (5) and trapezoidal cutting out portion (6), the shape of square cutting out portion (5) with the shape of square instruction portion (3) cooperatees, the shape of trapezoidal cutting out portion (6) with the shape of trapezoidal instruction portion (4) cooperatees.

N9338

CN115937482 **SOUTHWEST JIAOTONG UNIVERSITY**
Priority Date: **24/11/2022**

HOLOGRAPHIC SCENE DYNAMIC CONSTRUCTION METHOD AND SYSTEM CAPABLE OF ADAPTING TO SCREEN SIZE

The invention discloses a holographic scene dynamic construction method and system capable of adapting to screen size, belongs to the field of mapping geographic information, and solves the problems that a holographic scene dynamic construction method in the prior art is large in detail loss and low in scene drawing frame rate. The method comprises the steps of obtaining digital twin bridge construction scene data; importing digital twin bridge construction scene data to construct a bridge construction holographic scene, and then dynamically constructing a self-adaptive screen size holographic scene based on the bridge construction holographic scene to obtain the position of a visual window drawing view of the bridge construction holographic scene, so as to obtain the bridge construction holographic scene with the self-adaptive screen size; and optimizing the bridge construction holographic scene during interaction, and drawing the optimized bridge construction holographic scene based on the digital twin bridge construction scene data to obtain the drawn bridge construction holographic scene. The method is used for dynamically constructing the holographic scene.



CLAIM 1. A dynamic construction method of a holographic scene with a self-adaptive screen size is characterized by comprising the following steps: step 1, acquiring digital twin bridge construction scene data; step 2, importing digital twin bridge construction scene data to construct a bridge construction holographic scene, and then carrying out self-adaption screen size holographic scene dynamic construction based on the bridge construction holographic scene to obtain the position of a visual window drawing view of the bridge construction holographic scene, so as to obtain a bridge construction holographic scene with self-adaption screen size; and 3, optimizing the bridge construction holographic scene obtained in the step 2 during interaction, and drawing the optimized bridge construction holographic scene based on the digital twin bridge construction scene data to obtain the drawn bridge construction holographic scene.

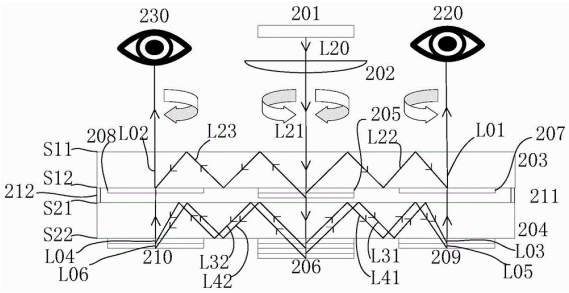
N9341

CN115933187 **CHONGQING UNIVERSITY**

Priority Date: **10/10/2022**

POLARIZER HOLOGRAPHIC COLOR BINOCULAR WAVEGUIDE DISPLAY SYSTEM

The invention provides a polarizer holographic color binocular waveguide display system, which comprises a micro-image source, a collimating lens, a double-layer waveguide, a first in-coupling grating group, a second in-coupling grating group and an out-coupling grating group, wherein the first in-coupling grating group is designed to work in a blue light wave band and comprises two layers of reflective polarizer holographic gratings, wherein liquid crystal molecules in the two layers have opposite rotation directions but same periodicity, so that diffraction of left circularly polarized light and diffraction of right circularly polarized light can be realized. The second in-coupling grating group is designed to work in red and green light wave bands and comprises four layers of reflection type polarizer holographic gratings, the first layer diffracts red right-handed circularly polarized light, the second layer diffracts red left-handed circularly polarized light, the third layer diffracts green right-handed circularly polarized light, and the fourth layer diffracts green left-handed circularly polarized light.



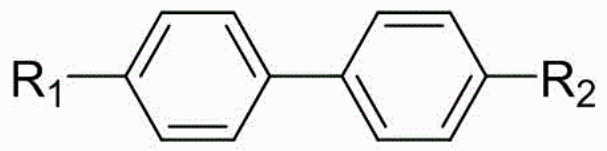
CLAIM 1. A polarizer holographic color binocular waveguide display system, comprising: the micro-image source comprises a micro-image source, a collimating lens, a first layer of waveguide, a second layer of waveguide, a first in-coupling grating group, a second in-coupling grating group, a first left-handed out-coupling grating, a first right-handed out-coupling grating, a second left-handed out-coupling grating group and a second right-handed out-coupling grating group, wherein the first layer of waveguide comprises an upper surface S11 and a lower surface S12, and the second layer of waveguide comprises an upper surface S21 and a lower surface S22; one end of the micro image source is connected with an external power supply, an image is loaded at the light emitting end of the micro image source, divergent light L20 is emitted, and the divergent light is changed into parallel light L21 after passing through the collimating lens; the collimating lens is positioned above the upper surface S11 of the first layer of waveguide, the first in-coupling grating group is closely connected to the center of the lower surface S12 of the first layer of waveguide, the first left-handed out-coupling grating is positioned at the left end of the lower surface S12 of the first layer of waveguide, the first right-handed out-coupling grating is positioned at the right end of the lower surface S12 of the waveguide, the second in-coupling grating group is closely connected to the center of the lower surface S22 of the second layer of waveguide, the second left-handed out-coupling grating group is positioned at the left end of the lower surface S22 of the second layer of waveguide, and the second right-handed out-coupling grating group is positioned at the right end of the lower surface S22 of the second layer of waveguide; wherein the microimage source is used for decomposing into left-handed circularly polarized light and right-handed circularly polarized light; an air layer is arranged between the first waveguide and the second waveguide and used for avoiding crosstalk between the two layers of waveguides; the first in-coupling grating group and the second in-coupling grating group respectively diffract blue light and red and green light wave bands, non-polarized light is decomposed into left-handed circularly polarized light and right-handed circularly polarized light, the left-handed out-coupling grating and the first right-handed out-coupling grating respectively diffract the red left-handed circularly polarized light and the red right-handed circularly polarized light, the second left-handed out-coupling grating group and the second right-handed out-coupling grating group respectively diffract the red left-handed circularly polarized light, the green left-handed circularly polarized light, the red right-handed circularly polarized light and the green right-handed circularly polarized light, and diffracted light is changed into parallel light and is transmitted to human eyes; the collimating lens is positioned below the light-emitting end and above the first layer of waveguide, parallel light vertically enters the first in-coupling grating group, the blue light wave band is diffracted to generate diffracted light, other light wave bands vertically enter the second in-coupling grating group through the grating, the red and green light wave bands are diffracted to generate diffracted light, the diffracted light enters the waveguide and is transmitted in a total reflection mode until the diffracted light is diffracted by the out-coupling grating and output as parallel light, and the parallel light enters human eyes.

N9345

CN115926809 **JOURNEY TECHNOLOGY**
Priority Date: **23/02/2023**

HOLOGRAPHIC POLYMER DISPERSED LIQUID CRYSTAL MATERIAL AND APPLICATION THEREOF

The invention provides a holographic polymer dispersed liquid crystal material and application thereof. The holographic polymer dispersed liquid crystal material comprises a liquid crystal composition, a polymerizable monomer and glue capable of being cured in a visible light wave band; the liquid crystal composition comprises compounds shown in formulas I-III, and the polymerizable monomer comprises at least one compound shown in formula IV. The holographic polymer dispersed liquid crystal material provided by the invention has excellent performance, and the volume holographic grating prepared by the holographic polymer dispersed liquid crystal material has high diffraction efficiency and low haze, can be switched between a holographic state and a transparent state, and can meet the application requirement of volume holographic optical waveguide.



CLAIM 1. The holographic polymer dispersed liquid crystal material is characterized by comprising a liquid crystal composition, a polymerizable monomer and glue curable in a visible light waveband; the liquid crystal composition comprises compounds shown as formulas I-III, and the polymerizable monomer comprises at least one compound shown as formula IV: formula I; formula II; formula III; formula IV; wherein R is 1 ,R 3 Each independently represent ,/> ,/> ,/> A linear or branched C1-C7 alkyl group, a C1-C7 alkoxy group, a C2-C7 chain alkenyl group, a C3-C7 chain alkenyloxy group> ,/> ,/> ,/> At least one hydrogen atom of a straight chain or branched chain C1-C7 alkyl group, a C1-C7 alkoxy group, a C2-C7 chain alkenyl group, a C3-C7 chain alkenyloxy group may be substituted with a fluorine atom; R 2 ,R 4 each independently represents a straight-chain or branched-chain C1-C7 alkyl group, a C1-C7 alkoxy group, a C2-C7 chain alkenyl group, a C3-C7 chain alkenyloxy group, or at least one hydrogen atom of a straight-chain or branched-chain C1-C7 alkyl group, a C1-C7 alkoxy group, a C2-C7 chain alkenyl group, a C3-C7 chain alkenyloxy group may be substituted with a fluorine atom; Sp 1 ,Sp 2 each independently represents a single bond, a C1-C6 linear alkyl group, at least one-CH in the C1-C6 linear alkyl groups 2 -may be substituted by-O-, -COO-or-C = C-; L 1 represents F, cl, straight chain or branched C1-C7 alkyl, C3-C6 cycloalkyl, C1-C7 alkoxy, C2-C7 chain alkenyl, C3-C7 chain alkenyloxy; p represents an integer of 1 to 5, and q represents an integer of 0 to 4.

N9347

CN115903235 **HU DAWEN**
Priority Date: **23/01/2022**

DISPLAY DEVICE FOR DISPLAYING HOLOGRAM AND METHOD THEREOF

Techniques for displaying holograms in a wearable display device are provided. An image source sequentially projects a holographic image in three primary colors into the waveguide, where the image is amplitude and phase modulated in a Spatial Light Modulator (SLM). Depending on the implementation, the image source may be next to an end of the waveguide or optical fiber, where the optical fiber is used to convey the holographic image near the waveguide to be projected into the waveguide.

CLAIM 1. A display device, comprising: a spectacle frame; at least one integrated lens, wherein the integrated lens is framed in the eyeglass frame; a spatial light modulation device to amplitude-modulate and phase-modulate an optical image to generate a modulated image; and at least one holographic mirror that receives the modulated image and projects the modulated image into the integrated lens after rotating it 90 degrees, wherein the holographic mirror is optically coated to selectively allow specific wavelengths to pass or reflect, the hologram produced by the modulated image being visible in the integrated lens by a user wearing the display device.

N9349

CN115891844 **FAW BESTUNE CAR**
Priority Date: **27/04/2022**

VEHICLE-MOUNTED HOLOGRAPHIC PROJECTION NAVIGATION SYSTEM AND AUTOMOBILE

The invention discloses a vehicle-mounted holographic projection navigation system and a vehicle, belonging to the technical field of intelligent control of vehicles. The invention discloses a method for reasonably adjusting a projection angle according to eyeball position information of a driver, and avoids the situation that the driver cannot see the projection.

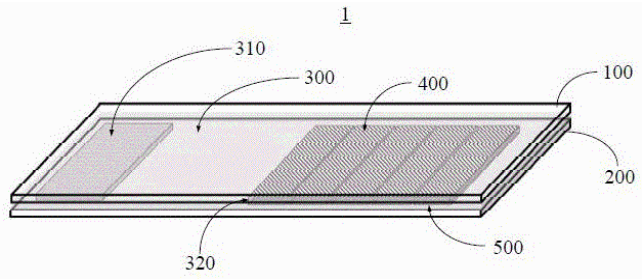
CLAIM 1. The utility model provides a vehicle-mounted holographic projection navigation, its characterized in that, including set up the first road conditions identification module on the windscreen, set up second road conditions identification module, eyeball identification module, the projection module and the pronunciation module of arranging in the panel board top in left and right sides rear-view mirror in the place ahead of driver, first road conditions identification module, second road conditions identification module, eyeball identification module and pronunciation module respectively with projection module electric connection.

N9355

CN115857178 **NANCHANG VIRTUAL REALITY RESEARCH INSTITUTE**
Priority Date: **01/03/2023**

HOLOGRAPHIC OPTICAL WAVEGUIDE LENS AND PREPARATION METHOD THEREOF

The invention discloses a holographic optical waveguide lens and a preparation method thereof, wherein the holographic optical waveguide lens comprises a first lens substrate, a second lens substrate, an in-coupling grating, an out-coupling grating, a first transparent electrode and a second transparent electrode. The first transparent electrode, the coupling grating and the second transparent electrode are integrally divided into a plurality of sub-regions, and the voltage between the first transparent electrode and the second transparent electrode in each sub-region is set according to the electro-optic response curve and the diffraction efficiency of the polymer dispersed liquid crystal holographic grating of the sub-region. The first transparent electrode and the second transparent electrode are arranged on the first lens substrate and the second lens substrate, and the first transparent electrode and the second transparent electrode are used for applying adjustable voltage to the coupling grating between the first lens substrate and the second lens substrate, so that the diffraction efficiency of different areas of the coupling grating is adjusted, and the uniformity of the exit pupil light is improved.



CLAIM 1. A holographic optical waveguide lens, comprising: a first lens substrate comprising a first surface; a second lens substrate comprising a second surface, the second surface being opposite the first surface; the coupling-in grating and the coupling-out grating are arranged between the first lens substrate and the second lens substrate, and both the coupling-in grating and the coupling-out grating are polymer dispersed liquid crystal holographic gratings; the first transparent electrode is formed in a region, corresponding to the coupling grating, of the first surface; and the second transparent electrode is formed in the area, corresponding to the coupling grating, of the second surface; the first transparent electrode, the coupling grating and the second transparent electrode are integrally divided into a plurality of sub-regions, and the voltage between the first transparent electrode and the second transparent electrode in each sub-region is set according to the electro-optic response curve and the diffraction efficiency of the polymer dispersed liquid crystal holographic grating of the sub-region; the thickness of the polymer dispersed liquid crystal holographic body grating is 2um to 10um.

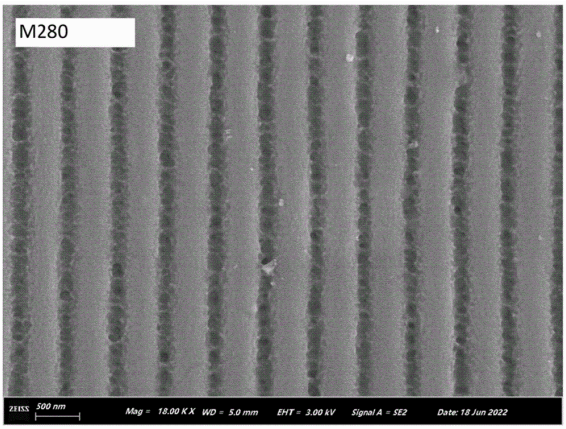
N9356

CN115857066 **NANCHANG VIRTUAL REALITY RESEARCH INSTITUTE**

Priority Date: **21/09/2022**

POLYMER DISPERSED LIQUID CRYSTAL HOLOGRAPHIC BODY GRATING AND PREPARATION METHOD THEREOF

The invention discloses a polymer dispersed liquid crystal holographic grating and a preparation method thereof, wherein the polymer dispersed liquid crystal holographic grating comprises the following raw materials in parts by weight: 0.1-1 part of photosensitizer; 0.1-5 parts of a co-initiator; 30-80 parts of a photopolymerization monomer; 20-60 parts of liquid crystal; the photopolymerization monomer comprises a monofunctional acrylic monomer and a multifunctional ethylenic monomer, and the mass ratio of the monofunctional acrylic monomer to the multifunctional ethylenic monomer is 1:5-2:1. the invention promotes the phase separation of the liquid crystal phase and the polymer phase during photopolymerization by the coordination and proportioning of initiator, polymer, liquid crystal molecules and other aspects, especially the addition of polyfunctional monomer of the flexible chain segment, thereby obtaining the grating with high diffraction efficiency and high refractive index modulation degree.



CLAIM 1. The polymer dispersed liquid crystal holographic body grating is characterized by comprising the following raw materials in parts by weight: 0.1-1 part of photosensitizer; 0.1-5 parts of a co-initiator; 30-80 parts of a photopolymerization monomer; 20-60 parts of liquid crystal; the photopolymerization monomer comprises a monofunctional acrylic monomer and a multifunctional ethylenic monomer, and the mass ratio of the monofunctional acrylic monomer to the multifunctional ethylenic monomer is 1:5-2:1.

PATENT REFERENCE – See the table at the end of this document

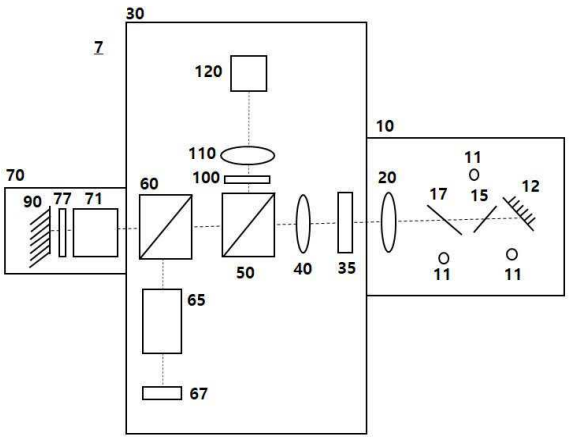
N9312

KR20230040559 **PRINTECH**

Priority Date: **16/09/2021**

INLINE DIGITAL HOLOGRAPHIC MICROSCOPE DEVICE USING POLARIZED CAMERA FOR EXTENDED BEACON HIGH DEFECT INSPECTION AND DEFECT INSPECTION METHOD USING THE SAME

The present invention relates to an inline digital holographic microscope device and method using an extended BGA high-level defect inspection polarization camera, by photographing a BGA hologram having surface roughness using an led light source with small time coherence and a low resolution photographing device, and measuring high-level defect information of a measurement sample through cleaning life of the photographed hologram. In an in-line digital holographic microscope device, light from a light source unit is incident on a linear polarizer, light incident on the linear polarizer is directed to a focus lens, light (beam) passing through the focus lens is transmitted through a non polarized beam splitter and incident on the polarized beam splitter, The reference light, which is the light transmitted through the polarization beamsplitter, is collected by the first objective lens and directed to the reference mirror, the light reflected from the reference mirror passes through the polarization beamsplitter and is transmitted to the unpolarization beamsplitter, The object light reflected and scattered from the sample is reflected by the polarization beamsplitter via the second objective lens and transmitted to a non-polarization beamsplitter, in which the object light and the reference light forming the hologram are reflected and transmitted to a polarization camera via a quarter wave plate and a tube lens, an inline digital holographic microscope device using a polarization camera for inspection of BGA high defect, including an inline digital holographic microscope, including imaging holograms by the polarization camera, wherein a light source unit includes a plurality of LEDs, and optical axes coincide with one mirror and two dichroic mirrors.



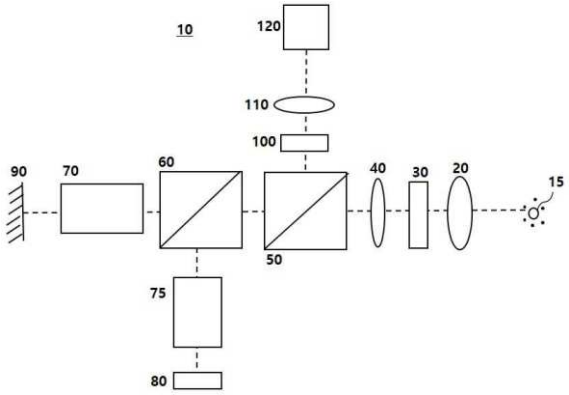
CLAIM 1. Wherein light from a light source section is incident on a linear polarizer, light incident on the linear polarizer is directed to a focus lens, light (beam) passing through the focus lens is transmitted through a non polarized beam splitter and incident on the polarized beam splitter, The reference light, which is the light transmitted through the polarization beamsplitter, is collected by a first objective lens and directed to a reference mirror, the light reflected by the reference mirror passes through the polarization beamsplitter through the first objective lens and is transmitted to a non-polarization beamsplitter, the object light, which is the light reflected by the polarization beamsplitter, is collected by a second objective lens and enters the sample, And reflected from the polarizing beamsplitter and transmitted to the non-polarizing beamsplitter via the second objective lens, in which object light and reference light forming the hologram are reflected and transmitted to the polarizing camera via the quarter wave plate and the tube lens, an inline digital holographic microscope device using a polarization camera for BGA high defect inspection, wherein a light source unit comprises a plurality of LEDs, and an optical axis of the light source unit coincides with one mirror and two dichroic mirrors.

N9314

KR20230039277 **PRINTECH**
Priority Date: **14/09/2021**

IN-LINE DIGITAL HOLOGRAPHIC MICROSCOPE APPARATUS USING POLARIZING CAMERA FOR BALL GRID ARRAY (BGA) HIGH DEFECT AND DEFECT INSPECTION METHOD USING THE SAME

The present invention relates to an in-line digital holographic microscope using a Ball Grid Array (BGA) high-level defect inspection polarizing camera for photographing a BGA hologram having a surface roughness using a light source having a small time coherence and numerically reproducing the same, DHM) apparatus and a defect inspection method using the same. An inline digital holographic microscope device using a polarization camera for BGA high defect inspection includes: an led (light emitting diode) light source; a light source configured to collect light from the led light source and enter a condenser lens and emit the incident light to a focus lens, A linear polarizer; a polarization beamsplitter in which light (beam) passing through the focus lens is incident through a non polarized beam splitter, and splits the incident light into object light and reference light; a light collecting unit collecting transmitted reference light in the polarization beamsplitter, A first objective lens that transmits light to a reference mirror and transmits light reflected from the reference mirror to a polarization beamsplitter; a second objective lens that collects light reflected from the polarization beamsplitter to enter the sample and transmits object light reflected and scattered from the sample to the polarization beamsplitter; An unpolarized beamsplitter into which the object light and the reference light transmitted through the polarized beamsplitter are incident to generate a hologram; and a polarized camera through which the object light and the reference light reflected by the unpolarized beamsplitter are transmitted through a quarter wave plate and a tube lens to image the hologram.



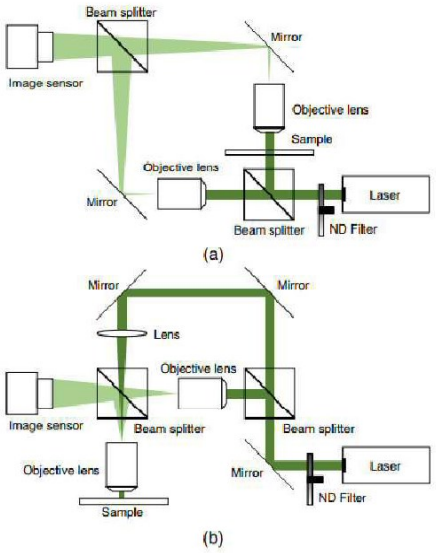
CLAIM 1. An in-line digital holographic microscope device using a polarization camera for BGA high defect inspection, the in-line digital holographic microscope device comprising: an led (light emitting diode) light source; a linear polarizer in which light from the led light source is collected by a condenser lens, and the incident light is emitted to a focus lens; Wherein light (beam) passing through the focus lens is incident through a non polarized beam splitter, and splits the incident light into object light and reference light; a light collecting unit configured to collect the reference light transmitted from the polarization beam splitter and transmit the reference light to a reference mirror, And transmits the object light to the polarization beamsplitter; a second objective lens that collects light reflected from the polarization beamsplitter and enters the sample, and transmits the object light reflected and scattered from the sample to the polarization beamsplitter; a third objective lens that receives the object light and the reference light transmitted through the polarization beamsplitter, an in-line digital holographic microscope device using a polarization camera for inspection of BGA high defect, comprising: an in-line digital holographic microscope including: an unpolarized beamsplitter; and a polarization camera in which object light and reference light reflected from the unpolarized beamsplitter are transmitted through a quarter wave plate and a tube lens to image a hologram.

N9315

KR20230039251 **HOLOLAB**
Priority Date: **14/09/2021**

METHOD FOR IMPROVING DIGITAL HOLOGRAM MICROSCOPY IMAGE QUALITY

The present invention relates to a method for improving digital hologram microscopy image quality in a low-light environment, and more particularly, to a method for improving digital hologram microscopy image quality in a low-light environment using a new fringe restoration algorithm using an angular spectrum matching algorithm for restoring object hologram using a reference hologram. It is not necessary to lower the laser power when recording the reference hologram, and it is possible to record a well-defined high-contrast fringe pattern because there is no highly absorptive object in the laser beam path, and to obtain better object phase reconstruction under very dark conditions which can estimate the object hologram according to the reference hologram even when there is little visible and noisy. In order to realize this estimation, both object hologram reference holograms in the Fourier domain match cumulative distribution functions CDF between real and imaginary parts by using spectral matching algorithms. CDF is an integral function of the probability density function and represents characteristics of the image. Therefore, the object holograms can mimic only the characteristics of the reference hologram while maintaining the phase factor of the 3 D object by satisfying CDFs between holograms, thereby further improving and restoring digital hologram microscopy image quality. The invention is characterized in that it additionally uses ASMs for digital hologram noise removal at very low illumination conditions in digital hologram microscopy in low-light environments. ASMcombines CDFs to provide mimicking of the angular spectrum between two holograms. Since the statistics of the fringe pattern do not change significantly, there is no need to update the reference CDFs captured after DHM construction each time. Thus, it is possible to restore holograms at very low lighting conditions using the reference CDFs at normal lighting conditions. DHMs using ASMs are particularly useful for the study of the fact that it uses high-speed, low-power, low-cost laser light sources and high-speed cameras to perform measurements of low light intensity.

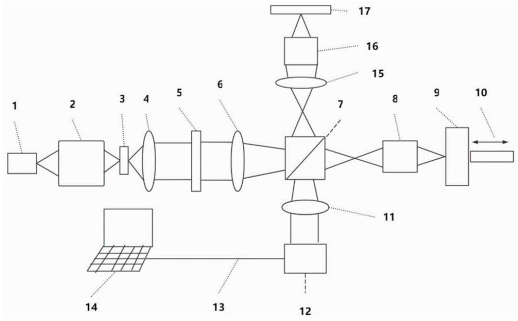


CLAIM 1. A method for reconstructing a digital hologram microscopy image quality system including a reference hologram acquisition unit (100), an object hologram acquisition unit (200), and an object phase reproduction unit (300), estimating the object hologram according to the reference hologram to reconstruct an object phase, Characterized in that an angular spectrum matching unit (ASM) is added between the object hologram acquisition unit and the reference hologram and the acquisition unit to reconstruct a better object phase even under dark conditions.

N9344

CN115930773 **CHINA JILIANG UNIVERSITY**
Priority Date: **13/06/2022**

LIGHT OFF-AXIS DIGITAL HOLOGRAPHIC DETECTION DEVICE



The application provides a little detection device of digital holography based on two steps of subtraction methods of light off-axis, detection device component include 620 nm's LED light source, the collimation that microscope and aperture diaphragm constitute expands beam system, polarization element, first convergent lens, beam splitter prism, plane mirror, micro objective 1, second lens, micro objective 2, light intensity decay piece, objective table, mechanical type micro displacement platform. The method uses a beam splitter prism to split incident light into reference light and object light; the reference light is reflected by the plane reflector, and the object light is reflected by the object placed at the focal point. And the CCD collected data after passing through the convergent lens is transmitted to a computer for calculation to obtain object phase distribution. During calculation, the object hologram and the background hologram are respectively shot to subtract external noise and phase distortion brought by the microscope objective. The device gives consideration to the utilization rate of the CCD field of view, the real-time measurement and the system stability.

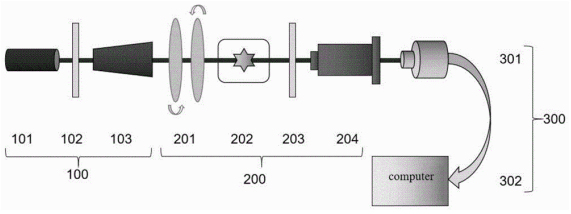
CLAIM 1. According to claim 1, the original light is converged at one point after passing through the non-polarizing beam splitter prism and then diverged to reserve enough space for placing the light intensity attenuation element, and the light path is a telecentric structure, and the focal plane of the lens 6 is the same as the front focal plane of the microscope objective 7, so that the light exiting the microscope objective 7 is parallel light, and the phase distortion after reconstruction is greatly reduced. The first lens and the second lens have the same focal length, are symmetrically arranged and are short-working-distance objective lenses.

N9348

CN115900779 **HEFEI UNIVERSITY OF TECHNOLOGY**
Priority Date: **22/09/2021**

SUPER-RESOLUTION COAXIAL MICRO HOLOGRAPHIC DEVICE

A super-resolution coaxial micro-holographic device comprises an optical gain module, wherein the optical gain module comprises a rotary double-grinding glass module and a grating; the rotating double-grinding glass module and the grating are positioned on the same light path and are sequentially arranged, and a testing station for placing a tested object is arranged between the rotating double-grinding glass module and the grating on the light path; the rotating double-grinding glass module consists of two pieces of ground glass, wherein the central shafts of the two pieces of ground glass are parallel to the light path, the ground glass is arranged on the light path in a rotating mode around the central shafts, and the rotating directions of the two pieces of ground glass are opposite. The optical gain module can realize the omnibearing detection of small-volume objects, and lays a foundation for applying the holographic technology to small-volume object modeling.



CLAIM 1. A super-resolution coaxial micro-holographic device, comprising an optical gain module (200) comprising: rotating the double-grinding glass module (201) and the grating (203); the rotary double-grinding glass module (201) and the grating (203) are positioned on the same light path and are sequentially arranged, and a test station (202) for placing a tested object is arranged between the rotary double-grinding glass module (201) and the grating (203) on the light path; the rotating double-grinding glass module (201) is composed of two pieces of ground glass, wherein the central axes of the two pieces of ground glass are parallel to the light path, the ground glass is arranged on the light path in a rotating mode around the central axes, and the rotating directions of the two pieces of ground glass are opposite.

PATENT REFERENCE – See the table at the end of this document

N9302

WO202355707 **UNIVERSITY OF ARIZONA**

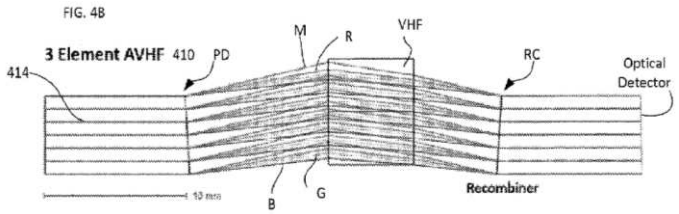
Priority Date: **29/09/2021**

USE OF A DISPERSIVE OPTICAL ELEMENT AS A SPECTRAL RECOMBINER FOR AN ADVANCED VOLUME HOLOGRAM FILTER (AVHF) AND OPTICAL IMAGING SYSTEMS EMPLOYING SUCH FILTER

Addition of a light-recombiner in the form of a diffraction grating to an advanced-volume-hologram filter system (conventionally containing only a pre-disperser diffraction grating and a volume holographic filter VHP configured as a volume Bragg grating, VBG) demonstrated recollimation and spatial overlap of light components at different wavelengths in addition to the spectral bandwidth optimization and signal-to-noise improvement. Here, the wide spectral bandwidth is ensured by the angular Bragg-matching of the pre-disperser with the VBG. The signal-to-noise improvement is obtained by the wavefront selectivity of the VBG. The cancellation of the spectral dispersion is achieved by the light-recombiner. Utilization of a light-recombiner in the form of a diffraction grating as opposed to another dispersive optic such as an optical prism additionally eliminates the potential for spatial chirp that normally reduces the usability of the conventional A VHP system in optical imaging applications.

UTILISATION D'UN ÉLÉMENT OPTIQUE DISPERSIF EN TANT QUE RECOMBINEUR SPECTRAL POUR UN FILTRE D'HOLOGRAMME VOLUMIQUE AVANCÉ (AVHF) ET SYSTÈMES D'IMAGERIE OPTIQUE UTILISANT UN TEL FILTRE

Selon la présente invention, l'ajout d'un recombineur de lumière sous la forme d'un réseau de diffraction à un système de filtre d'hologramme de volume avancé (contenant classiquement uniquement un réseau de diffraction de pré-disperseur et un filtre holographique de volume VHP configuré sous la forme d'un réseau de Bragg de volume, VBG) a démontré une récollimation et un chevauchement spatial de composantes de lumière à différentes longueurs d'onde en plus de l'optimisation de la largeur de bande spectrale et de l'amélioration signal sur bruit. Ici, la largeur de bande spectrale étendue est assurée par l'adaptation de Bragg angulaire du pré-disperseur avec le VBG. L'amélioration signal sur bruit est obtenue par la sélectivité de front d'onde du VBG. L'annulation de la dispersion spectrale est obtenue par le recombineur de lumière. L'utilisation d'un recombineur de lumière sous la forme d'un réseau de diffraction par opposition à une autre optique dispersive telle qu'un prisme optique élimine en outre le potentiel de fluctuation spatiale qui réduit normalement la facilité d'utilisation du système VHP classique dans des applications d'imagerie optique.



CLAIM 1. An optical filter system comprising: a first optical diffractive element configured to receive an input beam of light having an input light wavefront and to diffract said input light wavefront into a first light wavefront; a second optical diffractive element disposed to receive the first light wavefront and to diffract said first light wavefront into a second light wavefront; and a third optical diffractive element positioned to receive the second light wavefront and to diffract said second light wavefront into a third light wavefront; wherein the optical filter system is configured such that, when the input beam of light is a substantially collimated polychromatic beam of light containing first light at a first wavelength and second light at a second wavelength, the third light wavefront is also a substantially planar wavefront having a first portion containing the first light and a second portion containing the second light.

N9305

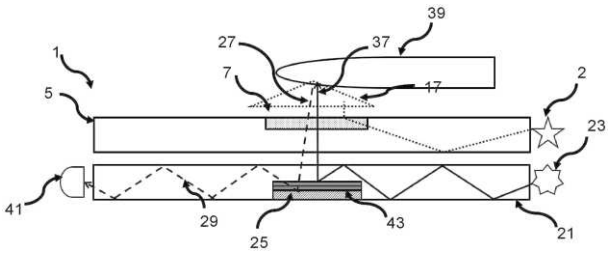
WO202352465 **CARL ZEISS JENA**
Priority Date: **29/09/2021**

HOLOGRAPHIC OPERATING ELEMENT

In one aspect, the invention relates to a light guide structure for illumination, detection and/or holographic display with at least one planar light guide for conducting electromagnetic radiation of at least one first spectrum, at least one illumination arrangement arranged on the first side surface of the light guide, at least one holographic coupling-out structure for coupling-out electromagnetic radiation guided in the light guide structure. The light radiated by the illumination arrangement can have a large angle spectrum, the holographic coupling-out structure having a small angle spectrum. The invention also relates to a production method for such a light guide structure and to an operating element comprising a light guide structure.

ÉLÉMENT DE COMMANDE HOLOGRAPHIQUE

Selon un mode de réalisation, l'invention concerne une structure de guide de lumière d'un éclairage, une détection et/ou une représentation holographique avec au moins un guide de lumière plan pour une ligne de rayonnement électromagnétique d'au moins un premier spectre, au moins un dispositif d'éclairage disposé sur la première face latérale du guide de lumière, au moins une structure de sortie holographique destinée au découplage du rayonnement électromagnétique guidé dans la structure de guide de lumière. La lumière émise par le dispositif d'éclairage peut présenter un grand spectre angulaire, la structure de découplage holographique présentant un petit spectre angulaire. L'invention concerne également un procédé de fabrication d'une telle structure de guide de lumière et un élément de commande comprenant une structure de guide de lumière.



CLAIM 1. Control element comprising: - a planar light guide structure (1) comprising at least one first planar light guide (5) - a first illumination arrangement (2) comprising at least one light source (3) for emitting electromagnetic Radiation having a first spectrum, - a detector arrangement (41) for detecting electromagnetic radiation having a second spectrum, wherein the first and the second spectrum are different, wherein the first light guide (5) is configured for conducting electromagnetic radiation of the first and second spectrum, wherein the first illumination arrangement (2) is arranged on a first side surface (6) of the first light guide (5) and is configured for coupling the emitted electromagnetic radiation of the first spectrum into the first light guide (5), wherein the detection arrangement (41) is arranged on a side surface of the light guide structure (1) and is configured for a detection of electromagnetic radiation of the second spectrum coupled into the light guide structure (1), wherein the light guide structure (1) has at least one first holographic coupling-out structure (7) spaced apart from the first side face (6) and a holographic coupling-in structure (25) spaced apart from the side face, wherein the first coupling-out structure (7) is configured for coupling-out the coupled-in electromagnetic radiation of the first illumination arrangement (2) from a first main surface (8) of the light guide structure (1) for generating a holographic representation of a three-dimensional operating region (17) to the operating element, wherein the operating region (17) with respect to the operating element lies at least partially outside the optical waveguide structure (1), wherein the coupling-in structure (25) is configured for coupling-in electromagnetic radiation with the second spectrum from the operating region (29) into the optical waveguide structure in a direction of the detection arrangement.

N9308

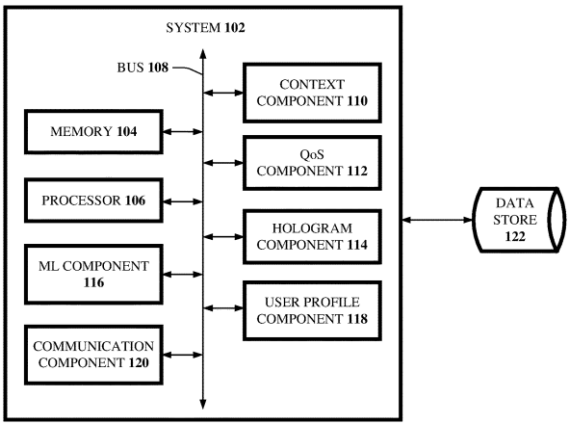
US20230096129 **AT&T INTELLECTUAL PROPERTY I**

Priority Date: **28/09/2021**

HOLOGRAM COMMUNICATION CONTINUITY

Intelligent hologram communication continuity (e.g., using a computerized tool) is enabled. A method can comprise: determining, by a device comprising a processor, a context associated with a live interaction, wherein the live interaction is associated with a user profile and transmitted via a network; determining, by the device, hardware data representative of hardware associated with transmission of the live interaction via the network; in response to a hardware criterion being determined to be threshold satisfied by the hardware data, generating, by the device, using a hologram generation model and based on the context, a synthetic hologram associated with the live interaction, wherein the hologram generation model has been generated based on machine learning applied to past context data representative of past contexts of past live interactions associated with the user profile, from prior to the live interaction; and transmitting, by the device, the synthetic hologram instead of the live interaction.

CLAIM 1. A system, comprising: a processor; and a memory that stores executable instructions that, when executed by the processor, facilitate performance of operations, comprising: determining a context associated with a live interaction, wherein the live interaction is associated with a user profile and transmitted via a network; determining quality of service data representative of a quality of service associated with transmission of the live interaction via the network; in response to a quality of service criterion being determined to be threshold satisfied by the quality of service data, generating, using a hologram generation model and based on the context, a synthetic hologram associated with the live interaction, wherein the hologram generation model has been generated based on machine learning applied to past context data representative of past contexts of past live interactions associated with the user profile, from prior to the live interaction; and replacing transmission of the live interaction with the synthetic hologram.



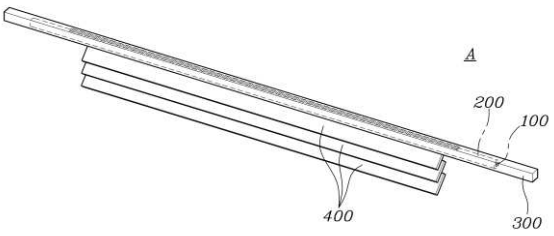
N9311

KR20230046395 **HYUNDAI MOTOR | KIA**

Priority Date: **30/09/2021**

DEVICE FOR IMPLEMENTING HOLOGRAM IMAGE OF MOBILITY

The present invention introduces an apparatus for implementing hologram images of a mobility, in which illumination is enhanced through implementation of hologram images when implementing the illumination of the mobility, a plurality of hologram images is generated, and distortion of the hologram images is minimized.



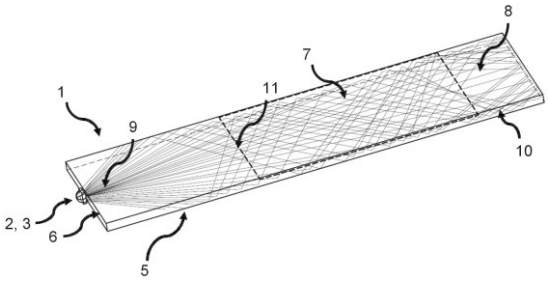
CLAIM 1. A light source configured to irradiate light, a light guide configured to enter the light emitted from the light source and diverge to the outside while moving the introduced light, a guide cover formed to surround the light guide and having a plurality of pattern holes having a specific image formed along an extending direction, and a plurality of pattern holes disposed to extend along the guide cover and having a specific image, And a plurality of half mirrors disposed on the same straight line in the vertical direction of the guide cover, wherein an image according to the pattern hole is implemented in each of the half mirrors as light emitted from the pattern hole of the guide cover is reflected and transmitted to each of the half mirrors.

N9320

DE102021210914 **CARL ZEISS JENA**
Priority Date: **29/09/2021**

SIMPLE HOLOGRAPHIC LIGHT GUIDE

In one aspect, the invention relates to a light guide structure for illumination, detection and/or holographic display with at least one planar light guide for conducting electromagnetic radiation of at least one first spectrum, at least one illumination arrangement arranged on the first side surface of the light guide, at least one holographic coupling-out structure for coupling-out electromagnetic radiation guided in the light guide structure. The light radiated by the illumination arrangement can have a large angle spectrum, the holographic coupling-out structure having a small angle spectrum. The invention also relates to a production method for such a light guide structure and to an operating element comprising a light guide structure.



CLAIM 1. A light guide structure (1) for an illumination, a detection and/or a holographic representation, comprising: - at least one planar light guide (5), which is configured for conducting electromagnetic radiation of at least a first spectrum - at least one illumination arrangement (2) arranged on a first side surface of the light guide comprising at least one light source (3) for emission of electromagnetic radiation having a first spectrum for irradiating electromagnetic radiation having the first spectrum into the optical waveguide - at least one holographic coupling-out structure (7) preferably spaced apart from the first side face (6), which is configured for decoupling electromagnetic radiation of the illumination arrangement guided in the light guide structure within an acceptance angle spectrum of the decoupling structure from a first main surface (8) of the light guide structure (1), wherein an angular spectrum of the electromagnetic radiation (19) radiated (9) by the illumination arrangement (2) and/or emitted by the light source (3) in the direction of the light guide has a magnitude of at least 15 °, preferably at least 20 °, more preferably at least 30 ° and in particular at least 40 °, and wherein an angle spectrum (11) of the radiated electromagnetic radiation (9) guided in the light guide (5) from the illumination arrangement (2) to the holographic coupling-out structure (7) and/or the acceptance angle spectrum of the holographic coupling-out structure (7) is at most 5 ° in terms of magnitude.

N9329

CN218725178U **BEIJING SPECTRUM YINBAO TECHNOLOGY**
Priority Date: **04/11/2022**

HOLOGRAPHIC OPTICAL DEVICE DETECTION EQUIPMENT

The utility model relates to a holographic optical device check out test set technical field just discloses a holographic optical device check out test set, including main part mechanism, stop gear and complementary unit, stop gear is located the rear end of main part mechanism upper end, complementary unit is located the top of main part mechanism, main part mechanism includes device body, supporting legs and slipmat, supporting legs fixed mounting is at the lower extreme of device body, supporting legs evenly distributed is at the lower extreme of device body. This holographic optical device check out test set through installing stop gear, has realized that the device body can press from both sides tightly fixedly to the detection device that the specification is not of uniform size, and the design of rotating electrical machines can drive and detect by the rotatory different angle of detection device, and the design of rubber slab and rubber pinch-off blades is for providing the skid-proof protective effect of shock attenuation for being detected the device, avoids being detected the device and producing wearing and tearing at the clamping process, has improved the protectiveness and the suitability of device.

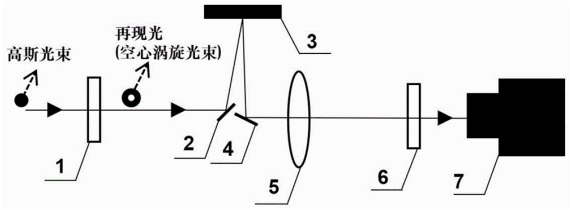
CLAIM 1. The utility model provides a holographic optical device check out test set, includes main part mechanism (1), stop gear (2) and complementary unit (3), its characterized in that: the limiting mechanism (2) is located at the rear end of the upper end of the main mechanism (1), the auxiliary mechanism (3) is located above the main mechanism (1), the main mechanism (1) comprises a device body (101), supporting legs (102) and anti-slip pads (103), the supporting legs (102) are fixedly mounted at the lower end of the device body (101), the supporting legs (102) are uniformly distributed at the lower end of the device body (101), the anti-slip pads (103) are fixedly mounted at the lower end of the supporting legs (102), the limiting mechanism (2) comprises a rotating motor (201), a detection table (202), a rubber plate (203), a fixing plate (204), an electric push rod (205), a push rod (206), a rubber clamping plate (207), a bearing plate (208), a placing groove (209), a transmission motor (210), a screw rod (211), a positioning nut (212), a guide rod (213), a connecting plate (214), a limiting ring (215), a limiting rod (216) and a limiting plate (217), and the rotating motor (201) is fixedly mounted at the front end of the device body (101).

N9330

CN115984314 **HARBIN UNIVERSITY OF SCIENCE & TECHNOLOGY**
Priority Date: **25/11/2022**

IMAGE EDGE DETECTION METHOD AND SYSTEM BASED ON SECOND-ORDER DIFFERENTIAL OF COMPUTER GENERATED HOLOGRAM

The invention discloses an image edge detection method and system based on second-order differential of computed holography, and relates to the technical field of image edge detection. The technical points of the invention comprise: interference superposition is carried out on the frequency spectrum of the image to be detected and the hollow vortex light beam, and a corresponding calculation hologram is obtained; and (3) enabling the reproduced hollow vortex light beam to be incident into a computer hologram, after diffraction, carrying out inverse Fourier transform and spatial filtering, and obtaining an edge image subjected to second-order differential processing. According to the invention, the image edge is obtained by using a second-order differential method, so that the image edge has stronger response to fine details, the generated double-line edge line is thinner, and the effect is better; the multiplexing of the hologram is calculated, so that a plurality of different images to be detected can be subjected to second-order differential operation at the same time; the whole system has the advantages of simple optical path design and structure, dynamic adjustability and large information capacity.



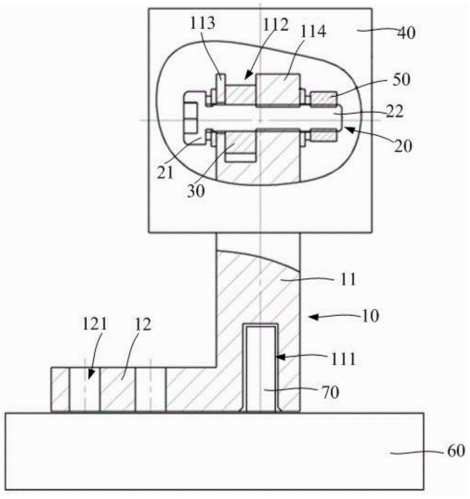
CLAIM 1. An image edge detection method based on second order differential of computer generated hologram is characterized by comprising the following steps: interference superposition is carried out on the frequency spectrum of the image to be detected and the hollow vortex light beam, and a corresponding calculation hologram is obtained; and (3) enabling the reproduced hollow vortex light beam to be incident into the calculation hologram, after diffraction, carrying out Fourier inverse transformation and spatial filtering, and obtaining an edge image subjected to second-order differential processing.

N9350

CN115875556 **SHANGHAI SHENCHI INDUSTRIAL**
Priority Date: **08/12/2022**

ANGLE ADJUSTING DEVICE AND METHOD FOR SEPARATING 1-LEVEL SPECTRUM FROM 0-LEVEL SPECTRUM IN OFF-AXIS DIGITAL HOLOGRAPHY

The invention relates to an angle adjusting device and method for separating a 1-level spectrum from a 0-level spectrum in off-axis digital holography, which comprises the following steps: the base is sleeved on the rotating shaft and detachably arranged on the platform, and the base can rotate around the rotating shaft; the shaft lever is arranged at the top end of the base and is transversely arranged; the connecting piece is sleeved on the shaft lever and can rotate around the shaft lever; the fixing plate is arranged at one end of the connecting piece away from the shaft rod; and the lens is arranged on one side of the fixing plate, which is far away from the connecting piece. The invention divides the angle adjustment into 2 independent directions which are not interfered with each other, so as to accurately control the inclined posture of the lens, thereby conveniently adjusting the position of the 1-level spectrum and utilizing the frequency domain space in holographic interferometry to the maximum extent.



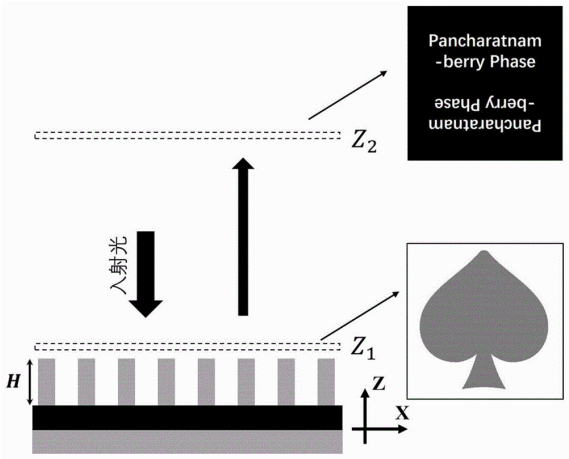
CLAIM 1. The utility model provides an angle adjusting device of 1 level and 0 level spectral separation in off-axis digital holography, installs on the platform, be equipped with the rotation axis vertically on the platform, its characterized in that, angle adjusting device includes: the base is sleeved on the rotating shaft and detachably mounted on the platform, and the base can rotate around the rotating shaft; the shaft lever is arranged at the top end of the base and is transversely arranged; the connecting piece is sleeved on the shaft lever and can rotate around the shaft lever; the fixing plate is arranged at one end of the connecting piece away from the shaft rod; and the lens is arranged on one side, far away from the connecting piece, of the fixing plate.

N9343

CN115933174 **WUHAN UNIVERSITY**
Priority Date: **05/12/2022**

PHASE MODULATION-BASED NANO PRINTING AND HOLOGRAPHIC MULTIPLEXING DESIGN METHOD

The invention discloses a design method of nano printing and holographic multiplexing based on phase modulation. The method for designing nano printing and holographic multiplexing based on phase modulation respectively encodes image information to be multiplexed according to information channels (namely different observation planes); the near field image information is encoded into a cosine distribution type phase, the far field image information is encoded into a complex amplitude hologram, the two phase distributions are superposed to obtain a final phase distribution, and the final phase distribution is mapped into the corner distribution of the super-surface nano array unit; compared with the traditional near-far field multiplexing mode, the design method of the nano printing and holographic multiplexing based on the phase modulation has the advantages that the design method is more flexible in geometric phase design mode, simple in design algorithm and extremely high in integration level, can be visually observed by naked eyes without the assistance of any optical device, can be widely applied to the fields of image display and the like, and has wide application prospect.



CLAIM 1. A design method of nano printing and holographic multiplexing based on phase modulation is characterized in that: the near-field gray scale nanometer printing display and the far-field holographic display are respectively realized through a modulation principle of a geometric phase of a super surface, different gray scale images are respectively coded in the near field and the far field of the super surface on the basis of the first class of Bessel function expansion and complex amplitude holographic design, and the multiplexing of image information is realized, wherein the specific design method comprises the following steps: step S1: reading gray information I of different target images -near And I -far ; Step S2: bessel expansion according to cosine distribution type phase and gray information I of near-field target image near (x, y) encoding the gray information of the near-field image into a cosine distribution type phase; and step S3: from the encoded near-field image amplitude distribution A near (x, y) and far field image gray scale information I far (x, y) obtaining the phase distribution of the complex amplitude hologram by GS algorithm optimization And step S4: calculating the phase distribution of the cosine distribution type phase according to the step S2 And a step S3 of calculating a phase distribution of a complex amplitude hologram> A final phase distribution is obtained> Step S5: optimizing the geometric parameters of the dielectric nano bricks in the reflective nano brick array according to the performance requirement of a half-wave plate, wherein the working wavelength is a visible light waveband; step S6: and determining the corner arrangement of the nano bricks in the dielectric super-surface nano brick array according to the calculated phase distribution.

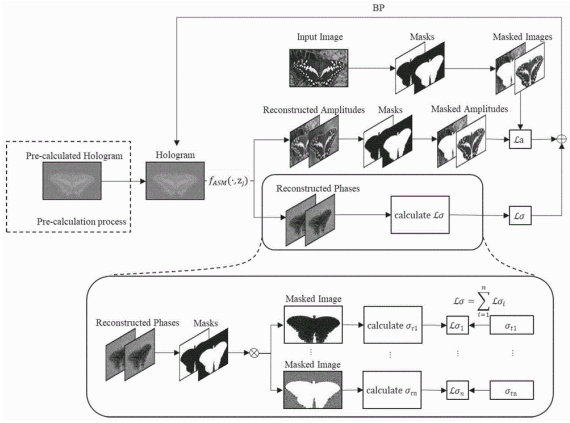
N9353

CN115857305 **ZHEJIANG UNIVERSITY OF TECHNOLOGY**

Priority Date: **30/11/2022**

ADJUSTABLE DEPTH OF FIELD HOLOGRAM RECONSTRUCTION METHOD BASED ON GRADIENT DESCENT OPTIMIZATION ALGORITHM

The invention discloses an adjustable depth of field hologram reconstruction method based on a gradient descent optimization algorithm, which takes the generation of a hologram as an optimization process, firstly generates an initial hologram through precomputation, and then optimizes the hologram by using the gradient descent algorithm with a specific loss function; in the optimization process, the random degree of the reconstruction phase in the holographic display and the depth of field of the reconstruction image are utilized, and the depth of field of the reconstruction image is adjusted by controlling the random degree of the reconstruction phase. Compared with the traditional method for adjusting the depth of field of an image, the hologram reconstructed by the method has the advantages of high image quality, dynamically adjustable depth of field, natural image blurring and the like, is more similar to a natural image observed by human eyes, and is expected to be practically applied to scenes such as holographic display, VA/AR/XR and the like.



CLAIM 1. A gradient descent based depth of field adjustable hologram reconstruction method is characterized by comprising the following steps: step 1: setting the randomness of a target phase according to the depth of field of the target; adding a random phase into the layered stereo image according to the target phase randomness, thereby establishing a target complex amplitude light field; pre-calculating according to the target complex amplitude light field to obtain an initial hologram; and 2, step: reconstructing a holographic image from the initial hologram by using a diffraction algorithm to obtain a reconstructed complex amplitude light field, and calculating the randomness of the reconstructed amplitude and the reconstructed phase; substituting the reconstructed amplitude and the target stereo image into a loss function, and calculating to obtain an amplitude loss value; substituting the randomness of the reconstructed phase and the set target randomness into a loss function to obtain a phase randomness loss value; summing the amplitude loss value and the phase randomness loss value to obtain a total loss value; and 3, step 3: calculating the gradient of the phase of the hologram according to the total loss value, updating the hologram according to a back propagation algorithm, continuously optimizing the hologram, and stopping the optimization process when the optimized times meet the set times or the quality of the reconstructed image meets the requirements; and 4, step 4: and loading the optimized hologram on a spatial light modulator so as to obtain the reconstruction of a stereoscopic image.

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HOLOGRAMS - 12 PATENTS

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P36246	WO	202354570	06/04/2023	DAI NIPPON PRINTING	JP	30/09/2021	JP2021000162250	WO202354570 JP2023051508	HOLOGRAPHIC LAMINATE	
P36263	PL	2021438968	20/03/2023	POLSKA WYTWÓRNIA PAPIERÓW WARTOSCIOWYCH SPÓLKA AKCYJNA	PL	17/09/2021	PL2021000438968	PL2021438968	DATA CARRIER CONTAINING A TRANSMISSION DIFFRACTION ELEMENT AND METHOD FOR ITS MANUFACTURE	
P36291	EP	4156119	29/03/2023	FUJIFILM BUSINESS INNOVATION	JP	24/09/2021	JP2021000155853	EP4156119 US20230098952 JP2023046979 CN115866384	COLLATION DEVICE, PROGRAM, AND COLLATION METHOD	
P36296	CN	218886741	18/04/2023	PEOPLE S PRINTING PLANT OF GUANGZHOU	CN	27/09/2022	CN2022002582192	CN218886741U	ARTWORK ANTI-COUNTERFEIT LABEL	
P36305	CN	218768663	28/03/2023	HUIZHOU SHANGSHI HUA TECHNOLOGY	CN	07/12/2022	CN2022003294198	CN218768663U	HOLOGRAPHIC ULTRAVIOLET ANTI-COUNTERFEITING PLASTIC BAG	
P36306	CN	218768536	28/03/2023	ZHONGSHAN GUOAN TORCH TECHNOLOGY DEVELOPMENT	CN	12/10/2022	CN2022002693611	CN218768536U	LABEL WITH MICROPOROUS MEMBRANE STRUCTURE	
P36309	CN	218704539	24/03/2023	LYVANSHENGDE BEIJING SECURITY & ANTI COUNTERFEITING TECHNOLOGY	CN	29/07/2022	CN2022001984269	CN218704539U	LASER HOLOGRAM ANTIFALSIFICATION LABEL PRESSING DEVICE	
P36320	CN	115946466	11/04/2023	SHANTOU JIAXIN PACKING MAT	CN	08/02/2023	CN2023000083584	CN115946466	PRODUCTION PROCESS OF MULTICOLOR MULTI-PATTERN ACCURATE-REGISTRATION HOLOGRAPHIC POSITIONING ALUMITE GOLD STAMPING FILM	
P36323	CN	115934978	07/04/2023	LÜ ZHONGYAN	CN	06/10/2021	CN2021001189775	CN115934978	DOUBLE-SIDE SEAL DATABASE AND DATA GENERATION METHOD	
P36325	CN	115926672	07/04/2023	SHANTOU HENGSHUN PACKAGING MAT	CN	13/03/2023	CN2023000231498	CN115926672	HOLOGRAPHIC ANTI-COUNTERFEITING FILM DOUBLE-COLOR LAYER AND MANUFACTURING PROCESS THEREOF	
P36330	CN	115894778	04/04/2023	HUAZHONG UNIVERSITY OF SCIENCE & TECHNOLOGY	CN	05/12/2022	CN2022001549422	CN115894778	HOLOGRAPHIC POLYMER COMPOSITE MATERIAL, PREPARATION METHOD AND APPLICATION THEREOF	
P36336	CN	115874490	31/03/2023	FUJIAN TAIXIN SPECIAL PAPER	CN	30/12/2022	CN2022001722585	CN115874490	MULTILAYER ANTI-COUNTERFEITING MEDIUM FRAME PAPER AND PREPARATION METHOD THEREOF	

VARIOUS OPTICAL EFFECTS - 11 PATENTS

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P36254	WO	202351948	06/04/2023	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	29/09/2021	DE202110004910	WO202351948 DE102021004910	DISPLAY ELEMENT HAVING AN IMAGE FLOATING ABOVE AND BELOW THE SUBSTRATE	Microlens
P36262	RU	2791765	13/03/2023	GOZNAK	RU	11/04/2022	RU2022000109584	RU2791765	MULTI-LAYER STRUCTURE FOR PROTECTING IDENTIFICATION DOCUMENTS AND IDENTIFICATION DOCUMENT	Passport
P36269	KR	20230048487	11/04/2023	KOREA UNIVERSITY INDUSTRIAL & ACADEMIC COLLABORATION FOUNDATION	KR	30/03/2023	KR2023000041763	KR20230048487	METHOD FOR MANUFACTURING STRUCTURE FOR AUTHENTICITY DETERMINATION	
P36271	KR	102514746	29/03/2023	KOREA SECURITY PRINTING & MINTING	KR	11/10/2022	KR2022000129349	KR102514746	MULTI-DIRECTION HIDDEN IMAGE BODY HAVING MULTIPLE HIDDEN IMAGE ACCORDING TO OBSERVATION DIRECTION OF USER	
P36278	JP	2023042045	27/03/2023	NATIONAL PRINTING BUREAU	JP	14/09/2021	JP2021000149114	JP2023042045	ANTI-COUNTERFEITING PRINTED MATERIAL	
P36284	EP	4163121	12/04/2023	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	05/10/2021	DE202110004984	EP4163121 DE102021004984	PIGMENT AND PREPARATION THEREOF	
P36303	CN	218788245	04/04/2023	WENZHOU HAOGE ANTI COUNTERFEITING TECHNOLOGY	CN	06/12/2022	CN2022003270112	CN218788245U	MAGNETIC ROLLING LIGHT-VARIABLE ANTI-COUNTERFEITING LABEL	
P36310	CN	218702328	24/03/2023	JIANGSU YUKON PHOTOVOLTAIC MAT	CN	28/10/2022	CN2022002854714	CN218702328U	DYNAMIC ANTI-COUNTERFEITING FILM	Microlens
P36313	CN	115985181	18/04/2023	NANJING NANOTECH INSTITUTE	CN	15/10/2021	CN2021001204392	CN115985181	ANTI-COUNTERFEIT LABEL AND PREPARATION METHOD AND APPLICATION THEREOF	

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VARIOUS OPTICAL EFFECTS - 11 PATENTS (continuation)

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P36321	CN	115938210	07/04/2023	CHINA BANKNOTE PRINTING & MINT | CHINA BANKNOTE SECURITY PRINTING TECHNOLOGY RESEARCH INSTITUTE	CN	29/06/2022	CN2022000747054	CN115938210	PATTERN OPTICAL ANTI-COUNTERFEITING STRUCTURE AND MANUFACTURING METHOD THEREOF AND COIN AND STAMP	
P36331	CN	115891472	04/04/2023	QINGDAO LEIGH MARDON PACKING	CN	06/01/2023	CN2023000016540	CN115891472	BIDIRECTIONAL MICRO-POINT POLARIZATION INVISIBLE ANTI-COUNTERFEITING PRINTING METHOD	

NON SECURITY HOLOGRAMS - 58 PATENTS

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
N9301	WO	202358431	13/04/2023	NTT DOCOMO	JP	06/10/2021	JP2021000164729	WO202358431	DISPLAY DEVICE	
N9302	WO	202355707	06/04/2023	UNIVERSITY OF ARIZONA	US	29/09/2021	US2021063249696	WO202355707	USE OF A DISPERSIVE OPTICAL ELEMENT AS A SPECTRAL RECOMBINER FOR AN ADVANCED VOLUME HOLOGRAM FILTER (AVHF) AND OPTICAL IMAGING SYSTEMS EMPLOYING SUCH FILTER	
N9303	WO	202354793	06/04/2023	KOREA ELECTRONICS TECHNOLOGY INSTITUTE	KR	30/09/2021	KR2021000129662	WO202354793 KR20230046552	AUGMENTED REALITY DEVICE USING HOLOGRAM LENS AND MANUFACTURING APPARATUS	
N9304	WO	202354365	06/04/2023	SONY GROUP	JP	29/09/2021	JP2021000158699	WO202354365	HOLOGRAM PHOTOSENSITIVE COMPOSITION, HOLOGRAM RECORDING MEDIUM, HOLOGRAM OPTICAL ELEMENT, OPTICAL APPARATUS, AND OPTICAL COMPONENT	
N9305	WO	202352465	06/04/2023	CARL ZEISS JENA	DE	29/09/2021	DE202110210915	WO202352465 DE102021210915	HOLOGRAPHIC OPERATING ELEMENT	
N9306	WO	202352131	06/04/2023	TRULIFE OPTICS	GB	28/09/2021	GB2021000013846	WO202352131 GB202113846 GB2611300	HOLOGRAPHIC DEVICE	
N9307	WO	202347145	30/03/2023	LAKATOS, IMRE | ERTL, ZSOLT | PAPP, ZSOLT | KORNIS, TAMÁS	HU	23/09/2021	HU2021000000330	WO202347145	METHOD, COMPUTER PROGRAM PRODUCT AND COMPUTER READABLE MEDIUM FOR CREATING A HOLOGRAM	
N9308	US	20230096129	30/03/2023	AT&T INTELLECTUAL PROPERTY I	US	28/09/2021	US2021017487068	US20230096129	HOLOGRAM COMMUNICATION CONTINUITY	
N9309	KR	20230049391	13/04/2023	KOREA PHOTONICS TECHNOLOGY INSTITUTE	KR	06/10/2021	KR2021000132497	KR20230049391	CONTACT LENS TYPE PROJECTION HOLOGRAPHIC DISPLAY DEVICE AND SYSTEM CAPABLE OF ENSURING DIFFRACTION EFFICIENCY	
N9310	KR	20230049387	13/04/2023	KOREA PHOTONICS TECHNOLOGY INSTITUTE	KR	06/10/2021	KR2021000132490	KR20230049387	CONTACT LENS PROJECTION HOLOGRAPHIC DISPLAY DEVICE AND SYSTEM	
N9311	KR	20230046395	06/04/2023	HYUNDAI MOTOR | KIA	KR	30/09/2021	KR2021000129329	KR20230046395	DEVICE FOR IMPLEMENTING HOLOGRAM IMAGE OF MOBILITY	
N9312	KR	20230040559	23/03/2023	PRINTECH	KR	16/09/2021	KR2021000123838	KR20230040559	INLINE DIGITAL HOLOGRAPHIC MICROSCOPE DEVICE USING POLARIZED CAMERA FOR EXTENDED BEACON HIGH DEFECT INSPECTION AND DEFECT INSPECTION METHOD USING THE SAME	
N9313	KR	20230039332	21/03/2023	YONSEI UNIVERSITY INDUSTRY ACADEMIC COOPERATION FOUNDATION	KR	14/09/2021	KR2021000122509	KR20230039332	DUAL-WAVELENGTH DIGITAL HOLOGRAPHY APPARATUS AND METHOD USING PHASE TRANSFORMATION BASED ON COMPOSITE WAVELENGTHS ACTING AS A SINGLE LONG WAVELENGTH	
N9314	KR	20230039277	21/03/2023	PRINTECH	KR	14/09/2021	KR2021000122374	KR20230039277	IN-LINE DIGITAL HOLOGRAPHIC MICROSCOPE APPARATUS USING POLARIZING CAMERA FOR BALL GRID ARRAY (BGA) HIGH DEFECT AND DEFECT INSPECTION METHOD USING THE SAME	
N9315	KR	20230039251	21/03/2023	HOLOLAB	KR	14/09/2021	KR2021000122317	KR20230039251	METHOD FOR IMPROVING DIGITAL HOLOGRAM MICROSCOPY IMAGE QUALITY	
N9316	JP	2023045008	03/04/2023	KDDI	JP	21/09/2021	JP2021000153177	JP2023045008	COMPUTER COMPOSITE HOLOGRAM GENERATION APPARATUS, METHOD, AND PROGRAM	
N9317	IN	202341014279	17/03/2023	CHAITANYA BHARATI INSTITUTE OF TECHNOLOGY	IN	03/03/2023	IN2023041014279	IN202341014279	AN AUGMENTED REALITY (AR) BASED PROJECTOR WITH HOLOGRAPHIC APPLICATION FOR ENHANCING LEARNING SKILLS OF STUDENTS IN RURAL REGIONS	
N9318	IN	202321011493	17/03/2023	GHOSE ANIRVAN	IN	20/02/2023	IN2023021011493	IN202321011493	A SYSTEM TO PRODUCE, TRANSMIT, AND PLAYBACK LIVE AND ARCHIVED HOLOGRAPHIC VIDEO	

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N9319	GB	2611405	05/04/2023	ENVISICS	GB	29/07/2022	GB2022000011097	GB202211097 GB2611405	HOLOGRAM WAVEGUIDING	
N9320	DE	102021210914	30/03/2023	CARL ZEISS JENA	DE	29/09/2021	DE202110210914	DE102021210914	SIMPLE HOLOGRAPHIC LIGHT GUIDE	
N9321	CN	218886528	18/04/2023	CHINA CABLE NETWORK	CN	08/12/2022	CN2022003297122	CN218886528U	HOLOGRAPHIC NAKED EYE 3D VIRTUAL SERVICE DEVICE	
N9322	CN	218868346	14/04/2023	CHINA RADIO & TELEVISION LIAONING NETWORK	CN	12/08/2022	CN2022002124332	CN218868346U	VISUAL HOLOGRAPHIC INTELLIGENT SOUND BOX	
N9323	CN	218866694	14/04/2023	SINO SINGAPORE INTERNATIONAL JOINT RESEARCH INSTITUTE	CN	20/10/2022	CN2022002770122	CN218866694U	INTERACTIVE HOLOGRAPHIC PROJECTION SHOWCASE OF INTELLIGENCE	
N9324	CN	218825129	07/04/2023	SHANGHAI MENGYUN HOLOGRAPHIC TECHNOLOGY	CN	10/11/2021	CN2021002741438	CN218825129U	VEHICLE-MOUNTED HOLOGRAPHIC SCREEN PROJECTION DEVICE BASED ON CLOUD BIM PLATFORM	
N9325	CN	218767784	28/03/2023	SHENZHEN ORANGE DIGITAL TECHNOLOGY	CN	27/12/2022	CN2022003488616	CN218767784U	HOLOGRAPHIC PROJECTION EQUIPMENT	
N9326	CN	218729213	24/03/2023	BANK OF CHINA	CN	30/09/2022	CN2022002624920	CN218729213U	PORTABLE HOLOGRAPHIC INTERACTIVE TELLER MACHINE AND HOLOGRAPHIC INTERACTIVE SYSTEM	
N9327	CN	218728626	24/03/2023	SHANGHAI EPEAN DISPLAY ORIGINALITY	CN	04/11/2022	CN2022002949956	CN218728626U	IMMERSIVE HOLOGRAPHIC DISPLAY SYSTEM	
N9328	CN	218728595	24/03/2023	ARTIZAN PHOTONIC CRYSTAL SHANDONG	CN	05/09/2022	CN2022002346194	CN218728595U	EXPOSURE SYSTEM OF HOLOGRAPHIC DISPLAY FILM FOR AUTOMOBILE A-COLUMN DISPLAY SYSTEM	
N9329	CN	218725178	24/03/2023	BEIJING SPECTRUM YINBAO TECHNOLOGY	CN	04/11/2022	CN2022002935590	CN218725178U	HOLOGRAPHIC OPTICAL DEVICE DETECTION EQUIPMENT	
N9330	CN	115984314	18/04/2023	HARBIN UNIVERSITY OF SCIENCE & TECHNOLOGY	CN	25/11/2022	CN2022001489947	CN115984314	IMAGE EDGE DETECTION METHOD AND SYSTEM BASED ON SECOND-ORDER DIFFERENTIAL OF COMPUTER GENERATED HOLOGRAM	
N9331	CN	115981126	18/04/2023	BEIHANG UNIVERSITY OF AERONAUTICS & ASTRONAUTICS	CN	09/01/2023	CN2023000023225	CN115981126	LARGE-VISUAL-ANGLE COLOR HOLOGRAPHIC 3D DISPLAY SYSTEM BASED ON LIQUID CRYSTAL GRATING	
N9332	CN	115981112	18/04/2023	CHANGCHUN UNIVERSITY OF SCIENCE & TECHNOLOGY	CN	29/01/2023	CN2023000043325	CN115981112	PHOTONIC CRYSTAL PREPARATION DEVICE BASED ON HOLOGRAPHIC INTERFERENCE LITHOGRAPHY	
N9333	CN	115978383	18/04/2023	SHENYANG JINRAN TECHNOLOGY	CN	30/12/2022	CN2022001722196	CN115978383	INTELLIGENT HOLOGRAPHIC TABLE	
N9334	CN	115963972	14/04/2023	PATEO CONNECT TECHNOLOGY SHANGHAI	CN	31/05/2021	CN2021000603020	CN115963972	METHOD AND DEVICE FOR SHARING VEHICLE-MOUNTED HOLOGRAPHIC PICTURE TO MOBILE TERMINAL AND STORAGE MEDIUM	
N9335	CN	115963633	14/04/2023	BOE TECHNOLOGY GROUP | HEFEI BOE JOINT TECHNOLOGY	CN	29/07/2022	CN2022000908033	CN115963633	HOLOGRAPHIC LIGHT FIELD DISPLAY SYSTEM	
N9336	CN	115951570	11/04/2023	TIANMA	CN	30/12/2022	CN2022001733937	CN115951570	HOLOGRAPHIC DISPLAY SYSTEM, HOLOGRAPHIC DISPLAY METHOD THEREOF AND ELECTRONIC EQUIPMENT	
N9337	CN	115938168	07/04/2023	WUHAN BOAO PENGCHENG EDUCATION TECHNOLOGY	CN	06/01/2023	CN2023000020073	CN115938168	3D HOLOGRAPHIC PROJECTION TEACHING AID SUIT AND COMBINATION	
N9338	CN	115937482	07/04/2023	SOUTHWEST JIAOTONG UNIVERSITY	CN	24/11/2022	CN2022001484940	CN115937482	HOLOGRAPHIC SCENE DYNAMIC CONSTRUCTION METHOD AND SYSTEM CAPABLE OF ADAPTING TO SCREEN SIZE	
N9339	CN	115933313	07/04/2023	HANGZHOU GUANGLI TECHNOLOGY	CN	19/12/2022	CN2022001634548	CN115933313	PHOTOPOLYMER COMPOSITION AND OPTICAL GRATING	
N9340	CN	115933208	07/04/2023	LIAOCHENG UNIVERSITY	CN	09/12/2022	CN2022001585333	CN115933208	METHOD FOR GENERATING ARBITRARY VECTOR BEAM BASED ON HOLOGRAM ENCODING	
N9341	CN	115933187	07/04/2023	CHONGQING UNIVERSITY	CN	10/10/2022	CN2022001235123	CN115933187	POLARIZER HOLOGRAPHIC COLOR BINOCULAR WAVEGUIDE DISPLAY SYSTEM	
N9342	CN	115933177	07/04/2023	HEBEI UNIVERSITY OF TECHNOLOGY	CN	24/12/2022	CN2022001669472	CN115933177	GAUSS-BESSEL BEAM GENERATION METHOD BASED ON HIGH-ORDER CURVED SURFACE	

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N9343	CN	115933174	07/04/2023	WUHAN UNIVERSITY	CN	05/12/2022	CN2022001552212	CN115933174	PHASE MODULATION-BASED NANO PRINTING AND HOLOGRAPHIC MULTIPLEXING DESIGN METHOD	
N9344	CN	115930773	07/04/2023	CHINA JILIANG UNIVERSITY	CN	13/06/2022	CN2022000661940	CN115930773	LIGHT OFF-AXIS DIGITAL HOLOGRAPHIC DETECTION DEVICE	
N9345	CN	115926809	07/04/2023	JOURNEY TECHNOLOGY	CN	23/02/2023	CN2023000152625	CN115926809	HOLOGRAPHIC POLYMER DISPERSED LIQUID CRYSTAL MATERIAL AND APPLICATION THEREOF	
N9346	CN	115903429	04/04/2023	WUHAN UNIVERSITY	CN	16/11/2022	CN2022001435262	CN115903429	DYNAMIC COLOR HOLOGRAPHIC METHOD BASED ON DIRECT PRINTING STRUCTURAL COLOR TECHNOLOGY	
N9347	CN	115903235	04/04/2023	HU DAWEN	US	23/01/2022	US2022017581945	CN115903235	DISPLAY DEVICE FOR DISPLAYING HOLOGRAM AND METHOD THEREOF	
N9348	CN	115900779	04/04/2023	HEFEI UNIVERSITY OF TECHNOLOGY	CN	22/09/2021	CN2021001105835	CN115900779	SUPER-RESOLUTION COAXIAL MICRO HOLOGRAPHIC DEVICE	
N9349	CN	115891844	04/04/2023	FAW BESTUNE CAR	CN	27/04/2022	CN2022000455675	CN115891844	VEHICLE-MOUNTED HOLOGRAPHIC PROJECTION NAVIGATION SYSTEM AND AUTOMOBILE	
N9350	CN	115875556	31/03/2023	SHANGHAI SHENCHI INDUSTRIAL	CN	08/12/2022	CN2022001572439	CN115875556	ANGLE ADJUSTING DEVICE AND METHOD FOR SEPARATING 1-LEVEL SPECTRUM FROM 0-LEVEL SPECTRUM IN OFF-AXIS DIGITAL HOLOGRAPHY	
N9351	CN	115873158	31/03/2023	FUJIAN NORMAL UNIVERSITY	CN	28/10/2022	CN2022001338085	CN115873158	TWO-DIMENSIONAL NANO MATERIAL FOR HOLOGRAPHIC STORAGE TECHNOLOGY AND PREPARATION METHOD THEREOF	
N9352	CN	115871359	31/03/2023	DONGTAI XUHAO PRECISION TECHNOLOGY	CN	20/12/2022	CN2022001644320	CN115871359	METHOD FOR FORMING DIE-PRESSING HOLOGRAPHIC PATTERN	
N9353	CN	115857305	28/03/2023	ZHEJIANG UNIVERSITY OF TECHNOLOGY	CN	30/11/2022	CN2022001519839	CN115857305	ADJUSTABLE DEPTH OF FIELD HOLOGRAM RECONSTRUCTION METHOD BASED ON GRADIENT DESCENT OPTIMIZATION ALGORITHM	
N9354	CN	115857304	28/03/2023	WUYI UNIVERSITY	CN	23/12/2022	CN2022001661318	CN115857304	COMPRESSED ULTRAFAST HOLOGRAPHIC QUANTITATIVE PHASE IMAGING METHOD, SYSTEM, EQUIPMENT AND MEDIUM	
N9355	CN	115857178	28/03/2023	NANCHANG VIRTUAL REALITY RESEARCH INSTITUTE	CN	01/03/2023	CN2023000185938	CN115857178	HOLOGRAPHIC OPTICAL WAVEGUIDE LENS AND PREPARATION METHOD THEREOF	
N9356	CN	115857066	28/03/2023	NANCHANG VIRTUAL REALITY RESEARCH INSTITUTE	CN	21/09/2022	CN2022001154681	CN115857066	POLYMER DISPERSED LIQUID CRYSTAL HOLOGRAPHIC BODY GRATING AND PREPARATION METHOD THEREOF	
N9357	CN	115840347	24/03/2023	HANGZHOU GUANGLI TECHNOLOGY	CN	18/09/2021	CN2021001111649	CN115840347	PHOTOPOLYMER HOLOGRAPHIC RECORDING MATERIAL CONTAINING MERCAPTO COMPOUND, ACRYLATE COMPOUND AND EPOXY COMPOUND AND GRATING	
N9358	CN	115838543	24/03/2023	HANGZHOU GUANGLI TECHNOLOGY	CN	18/09/2021	CN2021001112310	CN115838543	PHOTOPOLYMER COMPOSITION CONTAINING ORGANIC SILICON FILM FORMING AGENT AND GRATING	