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PATENT NEWSLETTER

Limited circulation patent news bulletin for the Holography Industry

SEPTEMBER 2023 – 92 PATENTS

Published and granted patents

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- The full patent information is in the tables at the end of this document (See TABLES WITH REFERENCES).
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P36808

SECURITY & OPTICAL EFFECTS' COLUMN
PRINTING – BANKNOTE – THREAD – RELIEF – MICROLENS

WO2023170132

BASF | DE LA RUE INTERNATIONAL

Inventor(s): RUIZ GOMEZ GLORIA | RICHERT MICHELLE | MESNAGE ALICE | GODFREY JOHN | ELLIS DAVID

Application Nber / Date: WOEP2023/055868 2023-03-08

Priority Nber / Date / Country: EP22161349 2022-03-10

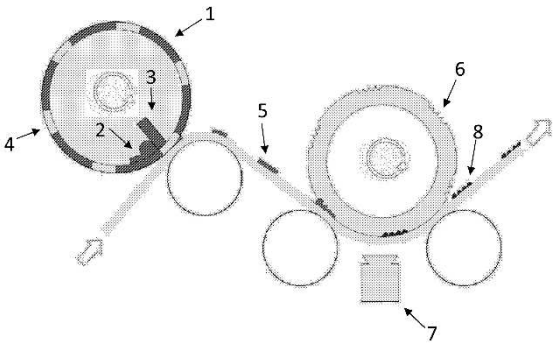
CASTING LACQUER FOR SCREEN PRINTING

The present invention relates to a radiation curable screen printing composition for cast-curing comprising one or more compounds comprising radiation curable groups, one or more photoinitiators and one or more rheology modifying agents, which composition has a specific shear rate dependent viscosity; an article comprising a substrate and a coating comprising the radiation curable composition in cured form, wherein the coating is in form of a surface relief structure, a method for producing the article comprising the steps: (i) Providing a casting tool having a relief structure defined in a surface thereof, the relief structure corresponding to the surface relief structure; (ii) Applying to the substrate and/or the relief structure of the casting tool the radiation curable composition; (iii) Cast curing the radiation curable composition by bringing the substrate into contact with a casting tool comprising a relief structure and forming the surface relief structure in the coating composition; and (iv) Radiation curing the coating composition such that the surface relief structure formed of the radiation curable composition is retained on the substrate; a security article comprising at least one inventive substrate; the use of the inventive radiation curable composition for the preparation of a surface relief structure on a substrate; the use of the radiation curable composition for screen printing, preferably rotary screen printing, and preferably subsequent cast curing; and a printing press comprising the radiation curable composition, wherein the printing press is adapted to carry out printing on a web-like or sheet-like substrate, in particular for the production of security articles such as banknotes, comprising a printing unit, preferably a screen-printing unit, the printing press further comprises an in-line casting device comprising a casting tool, wherein the printing unit is designed to apply the radiation curable composition to the substrate and/or the casting tool and the inline-casting device is adapted to replicate and form a surface relief structure in the radiation curable composition.

LAQUE DE COULÉE POUR SÉRIGRAPHIE

La présente invention concerne une composition de sérigraphie durcissable par rayonnement destinée au durcissement par coulée qui comprend un ou plusieurs composés comprenant des groupes durcissables par rayonnement, un ou plusieurs photo-initiateurs et un ou plusieurs agents de modification de rhéologie, ladite composition ayant une viscosité dépendante d'une vitesse de cisaillement spécifique ; un article comprenant un substrat et un revêtement comprenant la composition durcissable par rayonnement sous forme durcie, le revêtement se présentant sous la forme d'une structure en relief de surface ; un procédé de production de l'article comprenant les étapes consistant à : (i) fournir un outil de coulée ayant une structure en relief définie dans l'une de ses surfaces, la structure en relief correspondant à la structure en relief de surface ; (ii) appliquer la composition durcissable par rayonnement sur le substrat et/ou sur la structure en relief de l'outil de coulée ; (iii) durcir par coulée la composition durcissable par rayonnement en amenant le substrat en contact avec un outil de coulée comprenant une structure en relief et former la structure en relief de surface dans la composition de revêtement ; et (iv) durcir la composition de revêtement par rayonnement de telle sorte que la structure en relief de surface formée par la composition durcissable par rayonnement est conservée sur le substrat ; un article de sécurité comprenant au moins un substrat selon l'invention ; l'utilisation de la composition durcissable par rayonnement de l'invention pour la préparation d'une structure en relief de surface sur un substrat ; l'utilisation de la composition durcissable par rayonnement pour la sérigraphie, de préférence la sérigraphie rotative, et de préférence avec durcissement par coulée ultérieur ; et une presse d'impression comprenant la composition durcissable par rayonnement, la presse d'impression étant conçue pour effectuer une impression sur un substrat de type toile ou de type feuille, en particulier pour la production d'articles de sécurité tels que des billets de banque, et comprenant une unité d'impression, de préférence une unité d'impression sérigraphique, la presse d'impression comprenant en outre un dispositif de coulée en ligne comprenant un outil de coulée, l'unité d'impression étant conçue pour appliquer la composition durcissable par rayonnement sur le substrat et/ou l'outil de coulée, et le dispositif de coulée en ligne étant conçu pour reproduire et former une structure en relief de surface dans la composition durcissable par rayonnement.

CLAIM 1. A radiation curable, preferably UV curable, screen printing composition for cast-curing comprising a) one or more compounds comprising radiation curable, preferably UV curable, groups, preferably selected from compounds comprising free radically curable groups, e.g. photocrosslinkable (meth)acrylate and aromatic vinyl groups, one or more compounds comprising cationically curable groups, e.g. cycloaliphatic epox- ides, and combinations of compounds comprising free radically curable groups and cationically curable groups as component A, b) one or more photoinitiators as component B, c) one or more rheology modifying agents as component C, d) optionally one or more defoaming agents as component D, e) optionally one or more adhesion promoters as component E, f) optionally one or more functional material, as component F, which composition has a shear rate dependent viscosity, preferably a shear rate and time dependent viscosity, wherein the viscosity at 35°C is 15 to 40 Pa S, preferably 15 to 35 Pa S at a shear rate of 0.1 S'1 and the viscosity at 35°C is < 0.15 Pa S at a shear rate of 1000 s 1, determined ac- cording to ISO 3219-2:2021 , by a TA Instruments AR-2000 Rheometer using a truncated cone of 60 mm 2° stainless steel and plate geometry, and measurements are conducted in the rotational mode using shear rate control.



No equivalent

Status: Pending

Research Report:

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2023/055868

A. CLASSIFICATION OF SUBJECT MATTER
INV. G03F7/027 G03F7/038 G03F7/031 G03F7/029 G03F7/085 G03F7/00
ADD.
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)
G03F C08K B29D B29C B05D C09D

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	US 2015/184031 A1 (YURT SERKAN [US] ET AL) 2 July 2015 (2015-07-02) paragraphs [0087] - [0092], [0102], [0049] - [0051], [0071] - [0073], [0023] - [2937]; example 35; tables 10-19 paragraph [0117]	1-12
X	US 2018/186166 A1 (HOLMES BRIAN WILLIAM [GB] ET AL) 5 July 2018 (2018-07-05) paragraphs [0081] - [0105], [0121] - [0125], [0228] - [0246] paragraphs [0276], [0299], [0321] - [0324], [0001], [0014], [0028], [0039], [0048] - [0055]; figures 1-13	1,10, 14-27

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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2023/055868

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2020/152021 A1 (BASF SE [DE]) 30 July 2020 (2020-07-30) pages 15,16,33 pages 34,36 - page 38 page 30	1-27
X	US 2020/308426 A1 (JAMES DAVID [SE] ET AL) 1 October 2020 (2020-10-01) paragraphs [0017] - [0029], [0031], [0034] - [0036], [0043], [0053]; tables 1-3	1-6
X	JP 4 777739 B2 (NICHIBAN KK) 21 September 2011 (2011-09-21) paragraphs [0047], [0051], [0049] paragraphs [0020] - [0024], [0035], [0038], [0042], [0043], [0074], [0081] - [0086]	1,7,12
X	US 9 884 936 B2 (SUN CHEMICAL CORP [US]) 6 February 2018 (2018-02-06) column 16, line 6 - column 17, line 50; tables 1-4 column 11, lines 15-20 column 14, lines 31-54 column 9, lines 36-63	1,2,4,6, 7

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

P36792

OVD – PRINTING – BANKNOTE – LABEL – RELIEF – MICROLENS – TRACK & TRACE

WO2023177744
Priority Date: **15/03/2022**

NANOGRAFIX

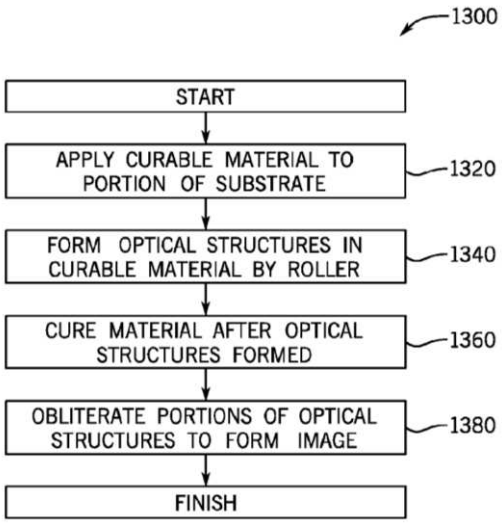
SYSTEM AND METHOD FOR GENERATING HOLOGRAPHIC OPTICAL IMAGES IN CURABLE MATERIAL

A system for generating variable optical images in curable material using generic optical matrices, the system including an applicator configured to apply the curable material to a portion of a substrate supported by a carrier web; a transparent roller comprising surface elements formed on an outside surface of the transparent roller, the transparent roller being configured to form optical structures in the curable material, wherein the surface elements on the transparent roller form the optical structures in the curable material when the surface elements contact the curable material as the substrate travels over the outside surface of the transparent roller; a radiation source within or outside the transparent roller configured to cure the curable material after the optical structures are formed in the curable material; and an image generation component configured to obliterate portions of the optical structures to form a predetermined image

SYSTÈME ET PROCÉDÉ DE GÉNÉRATION D'IMAGES OPTIQUES HOLOGRAPHIQUES DANS UN MATÉRIAU DURCISSABLE

L'invention concerne un système pour générer des images optiques variables dans un matériau durcissable à l'aide de matrices optiques génériques, le système comprenant un applicateur conçu pour appliquer le matériau durcissable à une partie d'un substrat supporté par une bande de support ; un rouleau transparent comprenant des éléments de surface formés sur une surface extérieure du rouleau transparent, le rouleau transparent étant conçu pour former des structures optiques dans le matériau durcissable, les éléments de surface sur le rouleau transparent formant les structures optiques dans le matériau durcissable lorsque les éléments de surface entrent en contact avec le matériau durcissable à mesure que le substrat se déplace sur la surface extérieure du rouleau transparent ; une source de rayonnement à l'intérieur ou à l'extérieur du rouleau transparent conçue pour durcir le matériau durcissable après que les structures optiques sont formées dans le matériau durcissable ; et un composant de génération d'image conçu pour oblitérer des parties des structures optiques pour former une image prédéterminée.

CLAIM 1. A system for generating variable optical images in curable material using generic optical matrices, the system comprising: an applicator configured to apply the curable material to a portion of a substrate supported by a carrier web; a transparent roller comprising surface elements formed on an outside surface of the transparent roller, the transparent roller being configured to form optical structures in the curable material, wherein the surface elements on the transparent roller form the optical structures in the curable material when the surface elements contact the curable material as the substrate travels over the outside surface of the transparent roller; a radiation source within the transparent roller configured to cure the curable material after the optical structures are formed in the curable material; and an image generation component configured to obliterate portions of the optical structures to form a predetermined image.

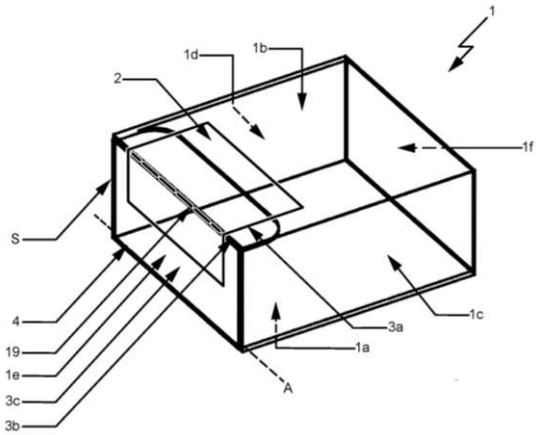


P36794 **PRINTING – SEAL – BRAND PROTECTION – THERMOCHROMY**

WO2023177297 **VOERMAN, ROELOF**
Priority Date: **18/03/2022**

A SEALING MARK, A PACKAGE AND METHODS

The invention relates to a sealing mark for sealing a package such as for packing medicaments. The sealing mark has a sealing layer and a hologram layer that at least partly covers the sealing layer. The sealing mark further comprises a thermosensitive layer that at least partly covers the hologram layer and/or the sealing layer. The thermosensitive layer includes thermochromic ink. The thermochromic ink is irreversible.



MARQUE D'ÉTANCHÉITÉ, EMBALLAGE ET PROCÉDÉS

L'invention concerne une marque d'étanchéité pour sceller un emballage, par exemple pour emballer des médicaments. La marque d'étanchéité comporte une couche d'étanchéité et une couche d'hologramme qui recouvre au moins partiellement la couche d'étanchéité. La marque d'étanchéité comprend en outre une couche thermosensible qui recouvre au moins partiellement la couche d'hologramme et/ou la couche d'étanchéité. La couche thermosensible comprend de l'encre thermochromique. L'encre thermochromique est irréversible.

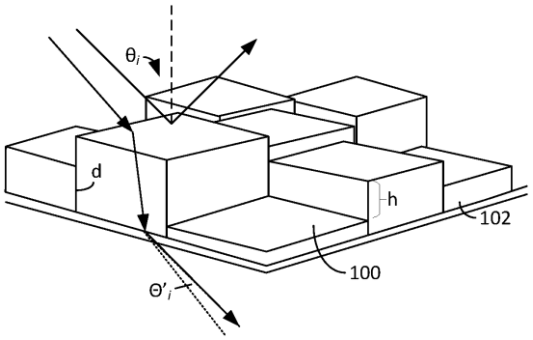
CLAIM 1. A sealing mark for sealing a package, the sealing mark comprising a sealing layer and a hologram layer at least partly covering the sealing layer, the sealing mark further comprising a thermosensitive layer at least partly covering the hologram layer and/or the sealing layer, wherein the thermosensitive layer includes thermochromic ink, and wherein the therm ochromic ink is irreversible.

P36821 **LABEL – BRAND PROTECTION**

US20230273571 **BALLYDEL TECHNOLOGIES**
Priority Date: **28/02/2022**

TAGGING AND AUTHENTICATION OF ARTICLES

A computerized system for uniquely tagging and verifying authenticity of an article comprising: an object having a curvature; a computer system adapted to: receive a three-dimensional predetermined image, create a holographic interference pattern created according to the three-dimensional predetermined image and the curvature wherein the holographic interference pattern is applied to the object, project a three-dimensional resulting image projected on a planar surface in response to the holographic interference pattern being illuminated wherein the computer system receives the three-dimensional resulting image, create validation information according to a comparison of the three-dimensional predetermined image and the three-dimensional resulting image



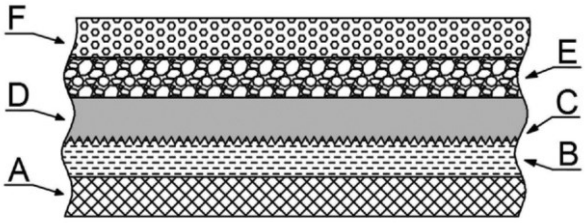
CLAIM 1. A system for uniquely tagging and verifying authenticity of an article comprising: an object having a curvature; a holographic interference pattern created according to a three-dimensional predetermined image and the curvature wherein the holographic interference pattern is applied to the object; a three-dimensional resulting image projected on a planar surface in response to the holographic interference pattern being illuminated by a first coherent light source; and, a validation information created according to a comparison of the three-dimensional predetermined image and the three-dimensional resulting image.

P36825 **BANKNOTE**

RU2802458 **GOZNAK**
Priority Date: **07/10/2022**

MULTILAYER PRODUCT CONTAINING PROTECTIVE ELEMENT, AND METHOD FOR ITS PRODUCTION

FIELD: security technologies.
SUBSTANCE: method is proposed for producing a reflective layer for protection of valuable documents against forgery, a reflective layer for protection of valuable documents against forgery, a diffractive protective element in the form of a film with a reflective layer, and a multilayer product with an identifying optically variable image, which is a valuable document. Preliminarily, a holographic grating is applied to the polymer substrate in the form of a rolled polymer material to form a lacquer layer with an embossed grating and a layer containing valuable information. Vacuum deposition of a mixture of indium and tin at a mass ratio of indium to tin from 10:90 to 2:98 is carried out by the magnetron method. The said deposition is carried out in an argon atmosphere at an operating pressure of 10(-3) -10(-4) mmHg on a rolled polymeric material moving by reeling, located on a shaft cooled to a temperature of -15 to +15°C. After the said deposition, oxidation is carried out in the air.
EFFECT: simplification of the technology for obtaining a reflective layer of a security element of valuable documents.



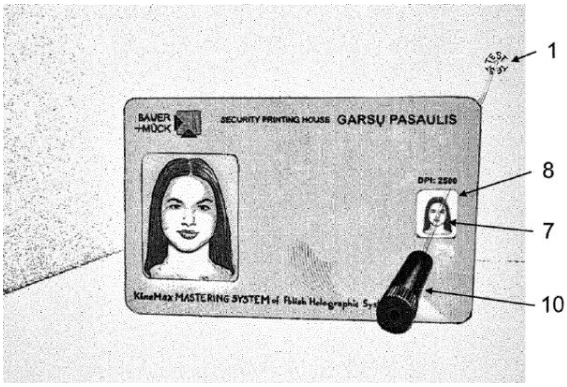
CLAIM 1. Method for obtaining a reflective layer to protect against the counterfeiting of valuable documents, including vacuum spraying of India and tin mixture per polymer substrate, followed by air oxidation, distinguishing between the vacuum spraying of India and tin in one phase on the pre-prepared polymer substrate side of the polymeric polymer material with the laminated holographic lattice a layer with a squeezed lattice and a layer containing valuable information, with vacuum spraying of the mixture India and tin with a mass ratio of India to tin between 10:90 and 2:98 using magnetron method in the argon environment at a working pressure of 10 (-3) -10 (-4) mm. Article on retractable polymer material at a cooled-down temperature of -15 ° to +15 °C, at a surface temperature of 25 to 30 °C at the surface of the polymer material, the linear velocity of the longitudinal material of 0.5 to 15 m/min and the power of the energy source of the magnetron in the range 0.5-5 0 kw.

P36827 **PRINTING – CARD**

PL2022440380 **BAUER MUECK | GARSŲ PASAULIS UAB**
Priority Date: **14/02/2022**

METHOD OF ENCODING THE HIDDEN INFORMATION, A SECURITY ELEMENT, A DATA CARRIER, METHOD OF MANUFACTURING A SECURITY ELEMENT, METHOD OF VERIFYING THE AUTHENTICITY OF A DATA CARRIER

The subject of the application is a method of encoding hidden information in images intended for laser engraving, a security element, a data carrier, a method of producing a security element, a method of verifying the authenticity of a data carrier, where all objects of protection are created as a result of the method of encoding hidden information in images intended for laser engraving. The method is characteristic in that for a hidden image loaded from a file, transformed into a grayscale bitmap, hereinafter referred to as INPUT, the Fourier hologram of the INPUT image (1) is calculated using the iterative Fourier transform IFTA algorithm by loading the gray values of the hidden image as the amplitudes of the input matrix IFTA, converts a Fourier hologram to a grayscale bitmap as a HIDDEN image by storing the phases of the Fourier hologram as proportionally assigned shades of gray.

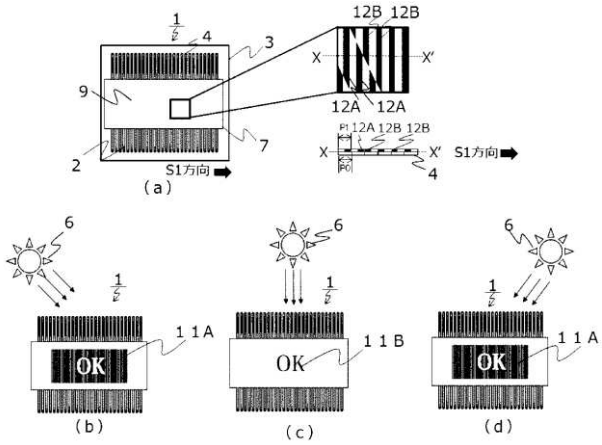


P36837 **PRINTING – BANKNOTE – CARD – LUMINESCENCE**

JP2023125427 **NATIONAL PRINTING BUREAU**
Priority Date: **28/02/2022**

PHOTOLUMINESCENT PATTERN FORMING BODY

TOPIC: To provide a photoluminescent pattern forming body in which a plurality of hidden patterns or hidden patterns having animated effects appear by superimposing a discrimination tool on a photoluminescent pattern. INVENTION: a photoluminescent element group including a plurality of photoluminescent elements disposed at a predetermined direction and at a pitch on a base material, wherein a discrimination tool includes a hidden pattern formed on a base material having transmissivity by the discrimination element group including a plurality of discrimination elements disposed at a predetermined direction and at a pitch, the discrimination tool further including: A photoluminescent pattern forming body is formed by superimposing and combining the discrimination elements of the discrimination tool, a concealment pattern appears when incident light of a specific angle is irradiated, and changes to another concealment pattern or the concealment pattern moves and is visually recognized when the angle of incident light on the photoluminescent pattern forming body is changed.



CLAIM 1. A photoluminescent pattern forming body that causes a concealment pattern to appear upon a photoluminescent pattern formed on at least a portion of a substrate, the photoluminescent pattern comprising: a plurality of photoluminescent element groups in which photoluminescent elements are arranged in a predetermined direction at a predetermined pitch; the photoluminescent elements comprising: The discrimination device includes a function of continuously moving a region of the photoluminescent element that reflects light due to a change in angle of light incident on the grating lines, the region being constituted by a plurality of grating lines, each of the grating lines being at least either linear or curved, and having a structure in which at least one of an arrangement angle of the grating lines and a density of the grating lines is continuously changed, wherein A hidden pattern is formed on at least a portion of a base material having permeability by a plurality of identification element groups in which identification elements are arranged in the same or different direction as the predetermined direction and at the same or different pitch as the predetermined pitch, and by superimposing the identification elements of the identification tool on the photoluminescent elements, When the photoluminescent pattern forming body is irradiated with incident light at a specific angle, the concealment pattern appears, and when the angle of incident light on the photoluminescent pattern forming body is changed, either an effect of changing the concealment pattern or an animated effect of moving the concealment pattern is visually recognized.

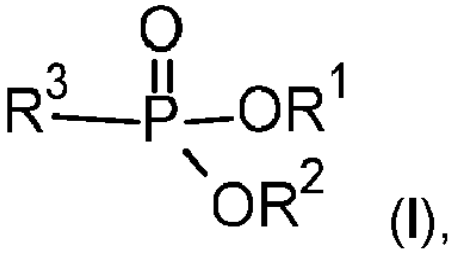
P36860 **PRINTING – BANKNOTE – CARD**

EP4234641 **BASF**
Priority Date: **25/02/2022**

COMPOSITIONS, COMPRISING MODIFIED TITANIUM DIOXIDE NANOPARTICLES AND USES THEREOF

The present invention relates to compositions, comprising (A) titanium dioxide nanoparticles,(A1) which have volume average diameter (Dv50) in the range of from 1 to 10 nm, preferably 1 to 8 nm, more preferably 2 to 6 nm;(A2) which are modified with peroxo groups, and(A2) which optionally comprise surface modifying agents selected from the group consisting of phosphates, phosphonates, beta-diketones, tertiary amines, carboxylic acids and silanes, or combinations thereof; and(B) one, or more reactive (radically polymerizable) diluents, with the proviso that the composition comprises a reactive diluent having at least 2 ethylenically unsaturated groups in the molecule; and(C) an organic solvent, and the use of the compositions for coating surface relief micro- and nanostructures (e.g. holograms), manufacturing of optical waveguides, solar panels, light outcoupling layers for display and lighting devices and anti-reflection coatings. Coatings obtained from the coating composition have a high refractive index and holograms are bright and visible from any angle, when the coating compositions are applied to them.

CLAIM 1. A composition, comprising (A) titanium dioxide nanoparticles, (A1) which have volume average diameter (Dv50) in the range of from 1 to 10 nm, preferably 1 to 8 nm, more preferably 2 to 6 nm; (A2) which are modified with peroxo groups, and (A2) which optionally comprise surface modifying agents selected from the group consisting of phosphates, phosphonates, beta-diketones, tertiary amines, carboxylic acids and silanes, or combinations thereof; and (B) one, or more reactive (radically polymerizable) diluents, with the proviso that the composition comprises at least one reactive diluent having at least 2 ethylenically unsaturated groups in the molecule; and (C) an organic solvent.



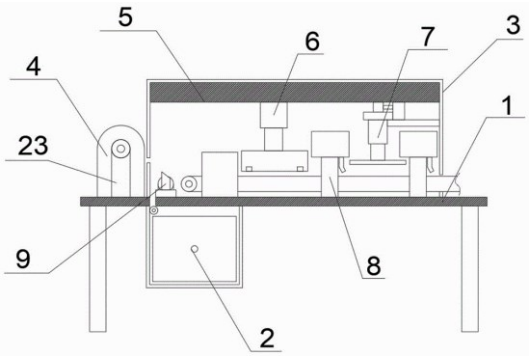
(I),

P36866 **BRAND PROTECTION**

CN219706299U **ZHEJIANG TIANQI PACKAGING MATERIAL**
Priority Date: **03/04/2023**

CAT EYE RELIEF APPARATUS OF HOLOGRAPHIC CARD PAPER

The utility model relates to the technical field of holographic paperboard, and discloses cat eye relief equipment for holographic paperboard, which comprises a workbench and a strickling device, wherein a waste box is arranged at the bottom of the workbench, a protective box is arranged at the bottom of the workbench, a winding device is arranged on one side of the protective box, a top plate is arranged at the top of the inner side of the protective box, a heating device and the strickling device are arranged at the bottom of the top plate, and a spraying device and a cutting device are arranged at the top of the inner side of the protective box. Through strickling device and cutting device constitution, untreated holographic card paper is earlier through spraying device to the surface spraying glue, then strickling the glue of spraying through strickling device, prevent that the glue from appearing unsmooth phenomenon after solidifying, influence the quality of holographic card paper, carry out spraying UV coating to the surface of holographic card paper again, carry out quick solidification to holographic card paper through heating device after the spraying is accomplished, then carry out the mould pressing projection, the cutting device is through the winding device after cutting the edge of holographic card paper.



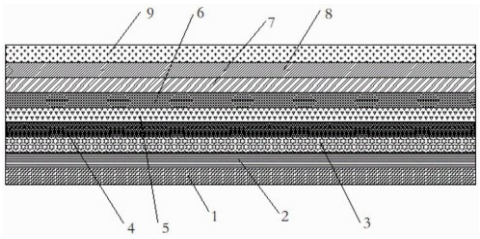
CLAIM 1. Cat eye relief apparatus of holographic card paper, including workstation (1) and strickle device (7), its characterized in that: the bottom of workstation (1) is equipped with waste bin (2), the bottom of workstation (1) is equipped with protective housing (3), one side of protective housing (3) is equipped with coiling mechanism (4), the inboard top of protective housing (3) is equipped with roof (5), the bottom of roof (5) is equipped with heating device (6) and strickle device (7), the inboard top of protective housing (3) is equipped with spraying device (8) and cutting device (9).

P36870 **PRINTING – BRAND PROTECTION**

CN219667664U **JIANGSU CIMEI NEW MATERIAL TECHNOLOGY**
Priority Date: **27/03/2022**

HOLOGRAPHIC MOULD PRESSING ANTI-FAKE EMBOSSING COMPOSITE FILM

The utility model discloses a holographic compression-molding anti-counterfeiting embossing composite film which comprises a base layer, an ink printing layer, a high-temperature-resistant coloring layer, an electroplated layer, a laser compression-molding layer, a composite adhesive layer and composite paper, wherein the base layer, the ink printing layer, the high-temperature-resistant coloring layer, the electroplated layer, the laser compression-molding layer, the anti-counterfeiting pattern layer, the composite adhesive layer and the composite paper are sequentially laminated from bottom to top. The composite film combines various positioning printing patterns, various holographic mould pressing patterns and various anti-counterfeiting patterns, thereby not only increasing the aesthetic feeling of printing art, but also enhancing the anti-counterfeiting function and increasing the anti-counterfeiting difficulty.



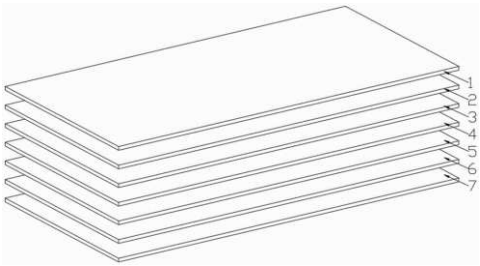
CLAIM 1. The utility model provides a holographic mould pressing anti-fake knurling embossing complex film which characterized in that: the anti-counterfeiting printing ink comprises a base layer, an ink printing layer, a high-temperature-resistant coloring layer, an electroplated layer, a laser molding layer, a composite adhesive layer and composite paper, wherein the base layer, the ink printing layer, the high-temperature-resistant coloring layer, the electroplated layer, the laser molding layer, the anti-counterfeiting pattern layer, the composite adhesive layer and the composite paper are sequentially laminated from bottom to top.

P36881 **PRINTING – BRAND PROTECTION**

CN219583809U **SHANDONG TAIBAO INFORMATION TECHNOLOGY GROUP**
Priority Date: **30/03/2023**

TRANSPARENT LASER ANTI-FAKE ELECTROCHEMICAL ALUMINIUM

The utility model discloses transparent laser anti-counterfeiting electrochemical aluminum, which comprises a substrate layer, a release layer, a laser coating layer, a die-pressing holographic information layer, a medium layer, a printing layer and a back glue layer which are sequentially arranged from top to bottom, wherein the laser coating layer and the medium layer have a transparent holographic effect. The utility model has the characteristics of transparent holographic effect, difficult counterfeiting, rapid identification and low cost, and can effectively reduce the packaging cost.



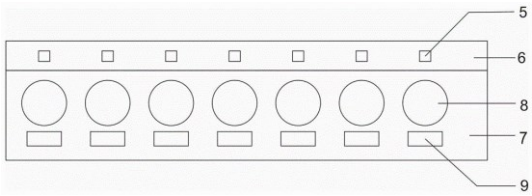
CLAIM 1. The utility model provides a transparent laser anti-fake electrochemical aluminium, includes substrate layer (1), from top to bottom sets gradually, from layer (2), laser paint layer (3), mould pressing holographic information layer (4), dielectric layer (5), printing layer (6), gum layer (7), its characterized in that: the release layer (2) is formed by drying release emulsion, the forming material of the medium layer (5) is one of zinc sulfide, zinc oxide and zirconium oxide, the laser coating layer (3) and the medium layer (5) have transparent holographic effect.

P36887

CN116749665 **HENAN PROVINCE WELLKING TECHNOLOGY DEVELOPMENT**

Priority Date: **03/08/2023**

DOUBLE-LAYER COATING HOLOGRAPHIC POSITIONING THERMOPRINT MARK AND MANUFACTURING METHOD THEREOF



The invention belongs to the technical field of holographic thermoprinting, and particularly relates to a double-layer coating holographic positioning thermoprinting mark and a manufacturing method thereof. The method comprises the following steps: coating a release layer on the film layer; coating a first color layer on the release layer by using a net wire roller; coating a second color layer on the blank area of the obtained first color layer by using a net wire roller; manufacturing a holographic positioning plate, wherein a cursor and holographic patterns are arranged on the holographic positioning plate, and the holographic positioning plate is rolled and stuck on a holographic positioning molding press; positioning and molding holographic patterns on the coating film by using the obtained holographic positioning plate, wherein the cursor is molded on a first color layer, and the holographic patterns are molded on a second color layer; carrying out digital printing on the obtained holographic film; coating the obtained holographic film; coating a back adhesive layer on the obtained coating film, positioning and cutting to obtain the final product. The invention adopts a double-layer coating mode, has high positioning hot stamping precision and uniform coating.

CLAIM 1. The manufacturing method of the double-layer coated holographic positioning thermoprint mark is characterized by comprising the following steps: s1, coating a release layer on a film layer in a full-plate manner; s2, rolling a first color layer on the release layer in the step S1 by using a net wire roller; s3, rolling a second color layer on the blank area of the first color layer obtained in the step S2 by using a net wire roller; s4, manufacturing a holographic positioning plate, wherein a cursor and holographic patterns are arranged on the holographic positioning plate, and the holographic positioning plate is rolled and stuck on a holographic positioning molding press; s5, positioning and molding holographic patterns on the coating film obtained in the step S3 by using the holographic positioning plate obtained in the step S4, wherein the cursor is molded on the first color layer, and the holographic patterns are molded on the second color layer; s6, carrying out digital printing on the holographic film obtained in the step S5; s7, coating the holographic film obtained in the step S6; and S8, coating a back adhesive layer on the coating film obtained in the step S7, and positioning and cutting to obtain the adhesive.

P36898 **PRINTING – LABEL**

CN116694252 **SHANDONG TAIBAO INFORMATION TECHNOLOGY GROUP**

Priority Date: **04/07/2023**

PREPARATION METHOD OF POSITIONING HOLOGRAPHIC ANTI-COUNTERFEITING BOPP ADHESIVE TAPE AND ADHESIVE TAPE THEREOF

The application belongs to the technical field of anti-counterfeiting adhesive tapes, and particularly relates to a preparation method of a positioning holographic anti-counterfeiting BOPP adhesive tape and the adhesive tape thereof, wherein a microstructure holographic information layer is arranged on a substrate layer, a coating layer with a hollowed-out structure is arranged on the microstructure holographic information layer of the substrate layer, anti-counterfeiting image-text information is printed in a positioning sleeve position in the hollowed-out structure of the coating layer, and adhesive layers are arranged on the coating layer and the anti-counterfeiting image-text information.

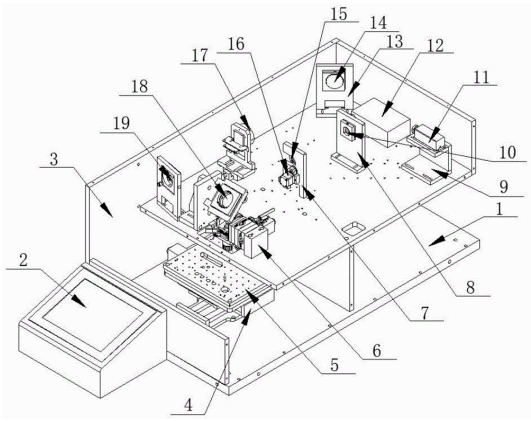
CLAIM 1. The preparation method of the positioning holographic anti-counterfeiting BOPP adhesive tape is characterized by selecting a BOPP inner corona film with the thickness of 12-50 mu m and the surface tension coefficient of more than 38 dyne value as a substrate layer (1), selecting a PET film with the thickness of 10-20 mu m as a supporting layer, rolling and compositing the substrate layer (1) and the supporting layer, preheating at 130-150 ℃, using a plate roller adhered with a holographic nickel plate for mould pressing, copying a microstructure on the holographic nickel plate onto the substrate layer (1) to form a microstructure holographic information layer (2), printing water-washing ink on the BOPP surface in an online sleeve position after mould pressing, forming a water-washing ink layer after drying in an oven, respectively carrying out separation and rolling on the supporting layer and the substrate layer (1), carrying out aluminizing on the microstructure holographic information layer (2) of the substrate layer (1) to form an initial coating structure, washing the initial coating structure by using water, and removing the initial coating structure on the water-washing ink to obtain a coating layer (3) with a hollowed-out structure, thereby forming the basic structure of the adhesive tape.

P36896 **LABEL**

CN116699945 **CHANGZHOU ZHONGHENG MACHINERY TECHNOLOGY**
Priority Date: **24/05/2022**

LASER HOLOGRAPHIC MASTER MASK PHOTOETCHING MACHINE

The application relates to the technical field of master plate making of anti-counterfeiting marks, in particular to a laser holographic master plate photoetching machine, which comprises a laser device, a first reflecting mirror, a second reflecting mirror, a light modulation component, a third reflecting mirror, a polarizer, a fourth reflecting mirror, a lens mode component and an XY workbench, wherein the laser device is connected with a laser controller to control operation, the first reflecting mirror is arranged under the support of the first reflecting mirror, the second reflecting mirror is arranged under the support of the second reflecting mirror, the light modulation component is arranged between the first reflecting mirror and the second reflecting mirror, the third reflecting mirror is arranged under the support of the third reflecting mirror, the polarizer is arranged on the parallel side of the light modulation component, the fourth reflecting mirror is arranged under the support of the fourth reflecting mirror, the lens mode component is arranged under the fourth reflecting mirror, and the XY workbench is arranged under the lens mode component and is used for loading a photoresist plate to perform bidirectional movement. According to the application, the state of the mode lens assembly can be changed through the motor, so that a plurality of modes such as + -1 level light interference, 0, 1 level light interference, 0 level light direct writing and the like can be used, and more holographic effects can be obtained.



CLAIM 1. A laser holographic master mask photoetching machine is covered in a hood (3) and is loaded on an electric appliance installation position (1) and controlled to operate by a control computer (2), and is characterized by comprising The laser device comprises a laser (11) which is connected and controlled to operate by a laser controller (12), a first reflecting mirror (14) which is arranged under the support of a first mirror bracket (13), a second reflecting mirror (19) which is arranged under the support of a second mirror bracket (21), a light modulation component (17) which is arranged between the positions of the first reflecting mirror (14) and the second reflecting mirror (19), a third reflecting mirror (10) which is arranged under the support of a third mirror bracket (8), a polarizer (15) which is arranged on the parallel side of the light modulation component (17), a fourth reflecting mirror (18) which is arranged under the support of a fourth mirror bracket (22), a lens mode component (6) which is arranged under the lens mode component (6) and an XY workbench (4) which is used for carrying a photoresist plate to do bidirectional movement; the polarizer (15) consists of a motor seat (15-2) fixed on an encryption seat (15-7), a motor III (15-1) fixed on the motor seat (15-2), a polaroid motor gear (62-6) driven by the motor III (15-1) to run, a polaroid rotating gear (62-4) meshed with the polaroid motor gear (62-6), an encryption gear shaft (15-4) fixedly connected with the polaroid rotating gear (62-4), a polaroid rotating plate (15-8) and a polaroid rotating sleeve (15-3) fixedly connected with the encryption gear shaft (15-4), an encryption lens nut (15-5) fixedly connected with the polaroid rotating plate (15-8) and a polaroid (15-6); the lens mode assembly (6) comprises a turnover assembly (62) and a diaphragm assembly (62-3) which are arranged above the objective lens (66), a focusing distance measuring probe (64) which is connected and controlled by a motor I (68) and is arranged on a probe seat (65), and XY directional movement of the lens mode assembly (6) is realized by driving and controlling the motor I (68) and the motor II (69).

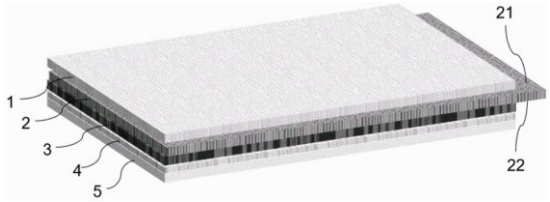
P36902

CN116661028 **WUHAN HUAGONG IMAGE TECHNOLOGY & DEVELOPMENT**
Priority Date: **21/04/2023**

TRANSPARENT HOLOGRAPHIC FILM AND PREPARATION METHOD THEREOF

The invention discloses a transparent holographic film and a preparation method thereof, wherein the layer structure of the transparent holographic film is sequentially laminated, and comprises the following components in sequence from top to bottom: the holographic film comprises a coating A, a base film layer, a coating B, a holographic layer and a medium layer. Wherein the A coating comprises 1 to 3 parts by weight of a first antistatic agent, 79 to 87 parts by weight of polymethyl methacrylate and 10 to 20 parts by weight of hydroxyl type vinyl chloride-vinyl acetate copolymer; the base film layer is arranged between the coating A and the coating B and is a biaxially oriented polyester film; the coating B comprises 0.5 to 0.8 part of a second type antistatic agent, 70 to 83 parts of polymethacrylic acid resin, 7 to 21 parts of acrylic acid modified vinyl chloride-vinyl acetate copolymer, 6 to 22.2 parts of carboxyl vinyl chloride-vinyl acetate copolymer and 0.3 to 0.8 part of flatting agent by weight; the holographic layer is arranged between the B coating and the medium layer, and holographic patterns are transferred through a high-temperature metal plate at 180-220 ℃; the light transmittance of the dielectric layer is 88% -91%. The transparent holographic film of the invention not only can not generate dendritic static lines when the ambient humidity is lower than 20%, but also can obtain clear holographic patterns, and has simple production steps and low cost.

CLAIM 1. The transparent holographic film is characterized in that the layer structure of the transparent holographic film is sequentially laminated, and comprises the following components in sequence from top to bottom: a coating: comprises 1 to 3 parts of first antistatic agent, 79 to 87 parts of polymethyl methacrylate and 10 to 20 parts of hydroxy vinyl chloride-vinyl acetate copolymer; base film layer: the polyester film is arranged between the coating A and the coating B and is a biaxially oriented polyester film; and B, coating: comprises 0.5 to 0.8 part of second antistatic agent, 70 to 83 parts of polymethacrylic acid resin, 7 to 21 parts of acrylic acid modified vinyl chloride-vinyl acetate copolymer, 6 to 22.2 parts of carboxyl vinyl chloride-vinyl acetate copolymer and 0.3 to 0.8 part of flatting agent by weight; holographic layer: the holographic pattern is transferred through the high-temperature metal plate; dielectric layer: the light transmittance is 88% -91% when the light-transmitting layer is arranged on the surface of the holographic layer.



P36903 **CARD – MAGNETISM**

CN116656267 **HENGFENG MATERIAL TECHNOLOGY ZHEJIANG**
Priority Date: **24/05/2023**

ANTI-COUNTERFEITING TRANSFER MATERIAL WITH INFORMATION STORAGE AND READING FUNCTIONS AND PREPARATION METHOD THEREOF

The invention relates to an anti-counterfeiting transfer material with information storage and reading functions and a preparation method thereof, belonging to the technical field of holographic anti-counterfeiting. The anti-counterfeiting transfer material with the information storage and reading functions structurally comprises a polyester film, a separation layer, a holographic anti-counterfeiting layer, an information bearing layer, a metal coating and a hot melt adhesive layer in sequence. The invention adds information storage and reading functions on the basis of keeping the holographic anti-counterfeiting performance of the anti-counterfeiting transfer material, can be widely applied to the fields of various anti-counterfeiting marks, magnetic cards and the like, and has the following functions: good anti-counterfeiting performance and excellent transfer effect.

CLAIM 1. An anti-counterfeiting transfer material with information storage and reading functions is characterized by comprising a polyester film, a separation layer, a holographic anti-counterfeiting layer, an information bearing layer, a metal coating and a hot melt adhesive layer in sequence; the separating layer can be effectively separated from the polyester film under the action of a certain stripping force; the holographic anti-counterfeiting layer can be used for manufacturing anti-counterfeiting images and texts of different types according to different holographic nickel plates and presents different holographic laser effects; the information bearing layer is a transparent coating which does not influence the optical effect and is a main body coating for realizing the information storage and reading functions; the metal coating can enable the transfer pictures and texts to have metal glossiness; the hot melt adhesive layer can be quickly melted at a certain temperature, and can be effectively bonded with a printing substrate under the action of pressure.

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

P36792

HOLOGRAM – PRINTING – BANKNOTE – LABEL – RELIEF – MICROLENS – TRACK & TRACE

WO2023177744
Priority Date: **15/03/2022**

NANOGRAFIX

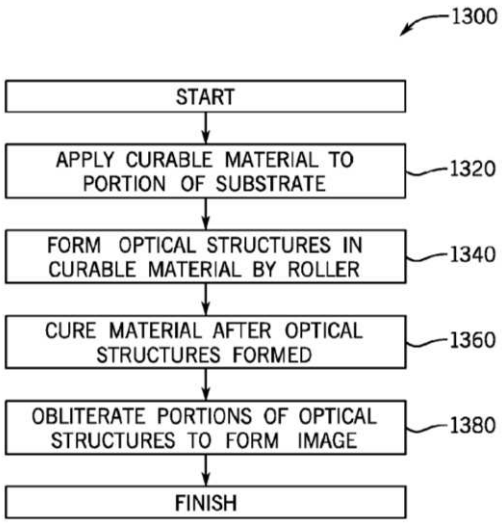
SYSTEM AND METHOD FOR GENERATING HOLOGRAPHIC OPTICAL IMAGES IN CURABLE MATERIAL

A system for generating variable optical images in curable material using generic optical matrices, the system including an applicator configured to apply the curable material to a portion of a substrate supported by a carrier web; a transparent roller comprising surface elements formed on an outside surface of the transparent roller, the transparent roller being configured to form optical structures in the curable material, wherein the surface elements on the transparent roller form the optical structures in the curable material when the surface elements contact the curable material as the substrate travels over the outside surface of the transparent roller; a radiation source within or outside the transparent roller configured to cure the curable material after the optical structures are formed in the curable material; and an image generation component configured to obliterate portions of the optical structures to form a predetermined image

SYSTÈME ET PROCÉDÉ DE GÉNÉRATION D'IMAGES OPTIQUES HOLOGRAPHIQUES DANS UN MATÉRIAU DURCISSABLE

L'invention concerne un système pour générer des images optiques variables dans un matériau durcissable à l'aide de matrices optiques génériques, le système comprenant un applicateur conçu pour appliquer le matériau durcissable à une partie d'un substrat supporté par une bande de support ; un rouleau transparent comprenant des éléments de surface formés sur une surface extérieure du rouleau transparent, le rouleau transparent étant conçu pour former des structures optiques dans le matériau durcissable, les éléments de surface sur le rouleau transparent formant les structures optiques dans le matériau durcissable lorsque les éléments de surface entrent en contact avec le matériau durcissable à mesure que le substrat se déplace sur la surface extérieure du rouleau transparent ; une source de rayonnement à l'intérieur ou à l'extérieur du rouleau transparent conçue pour durcir le matériau durcissable après que les structures optiques sont formées dans le matériau durcissable ; et un composant de génération d'image conçu pour oblitérer des parties des structures optiques pour former une image prédéterminée.

CLAIM 1. A system for generating variable optical images in curable material using generic optical matrices, the system comprising: an applicator configured to apply the curable material to a portion of a substrate supported by a carrier web; a transparent roller comprising surface elements formed on an outside surface of the transparent roller, the transparent roller being configured to form optical structures in the curable material, wherein the surface elements on the transparent roller form the optical structures in the curable material when the surface elements contact the curable material as the substrate travels over the outside surface of the transparent roller; a radiation source within the transparent roller configured to cure the curable material after the optical structures are formed in the curable material; and an image generation component configured to obliterate portions of the optical structures to form a predetermined image.



P36803 **BANKNOTE – LUMINESCENCE**

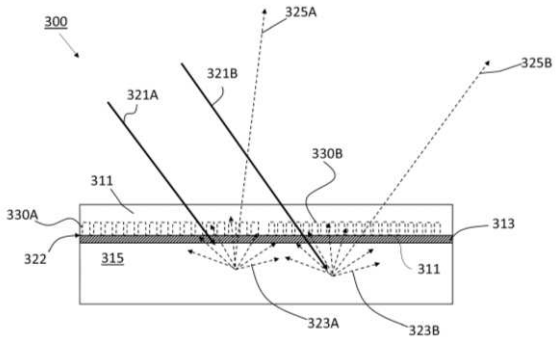
WO2023174664 **META MEDIA**
Priority Date: **18/03/2022**

DEVICES, METHODS AND A VISUAL DISPLAY INVOLVING METAMATERIAL FILTERS

Devices configured to emit colored light when illuminated with ultraviolet light and color- shifting displays containing the same are disclosed.

DISPOSITIFS, PROCÉDÉS ET AFFICHAGE VISUEL IMPLIQUANT DES FILTRES À MÉTAMATÉRIAU

L'invention concerne des dispositifs conçus pour émettre une lumière colorée lorsqu'ils sont éclairés avec une lumière ultraviolette et des affichages à changement de couleur les contenant.



CLAIM 1. A device configured to emit a color in a visible range, the device comprising: a first dielectric layer having a periodic array of nanostructures on a first side; a coating layer disposed on the periodic array, the coating layer comprising a metallic or dielectric material, wherein the combination of the coating layer and the periodic array forms an optical filter configured to transmit ultraviolet (UV) light and block visible light at a wavelength range; and a fluorescent layer disposed on or in proximity to the coating layer, the fluorescent layer comprising a plurality of fluorescent compounds dispersed therethrough, the fluorescent compounds being configured to emit visible light when illuminated by the UV light, which is filtered by the optical filter to produce the color.

P36805 **PRINTING – BANKNOTE – STRIP – RELIEF – MICROLENS**

WO2023170376 **DE LA RUE INTERNATIONAL**

Priority Date: **10/03/2022**

SECURITY DOCUMENT SUBSTRATE AND METHOD OF MANUFACTURE THEREOF

This specification discloses a method of manufacturing a security document substrate. The method comprises providing a fibrous substrate having a sizing substance incorporated therein and/or on a surface thereof and (i) providing a casting tool, the casting tool having a casting structure defined in a surface thereof, the casting structure comprising a first surface region having a surface nanostructure with a surface roughness of less than 1 micrometre. The method then comprises (ii) applying one or more curable materials to the fibrous substrate and/or the casting structure of the casting tool; and (iii) bringing the fibrous substrate and the casting tool into contact with the one or more curable materials therebetween, thereby forming the one or more curable materials into the casting structure. During and/or after the contact, the one or more curable material(s) are cured so as to form, on the fibrous substrate, a layer of one or more cured material(s) comprising a first zone having an outer surface exhibiting a surface nanostructure corresponding to the first region of the casting structure.

SUBSTRAT DE DOCUMENT DE SÉCURITÉ ET SON PROCÉDÉ DE FABRICATION

La présente invention divulgue un procédé de fabrication d'un substrat de document de sécurité. Le procédé consiste à utiliser un substrat fibreux comportant une substance d'encollage incorporée en son sein et/ou sur une surface de celui-ci et (i) à utiliser un outil de coulée, l'outil de coulée possédant une structure de coulée délimitée dans une de ses surfaces, la structure de coulée comprenant une première région de surface comportant une nanostructure de surface présentant une rugosité de surface inférieure à 1 micromètre. Le procédé consiste ensuite (ii) à appliquer un ou plusieurs matériaux durcissables sur le substrat fibreux et/ou la structure de coulée de l'outil de coulée ; et (iii) à amener le substrat fibreux et l'outil de coulée en contact avec le ou les matériaux durcissables entre eux, formant ainsi le ou les matériaux durcissables dans la structure de coulée. Pendant et/ou après la mise en contact, le ou les matériaux durcissables sont durcis de sorte à former, sur le substrat fibreux, une couche d'un ou plusieurs matériaux durcis comprenant une première zone ayant une surface externe présentant une nanostructure de surface correspondant à la première région de la structure de coulée.

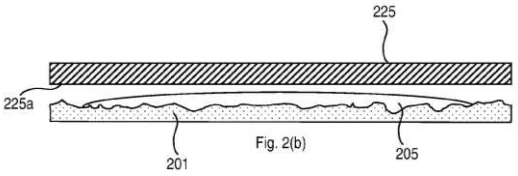


Fig. 2(b)

CLAIM 1. A method of manufacturing a security document substrate, the method comprising: providing a fibrous substrate having a sizing substance incorporated therein and/or on a surface thereof; and (i) providing a casting tool, the casting tool having a casting structure defined in a surface thereof, the casting structure comprising a first surface region having a surface nanostructure with a surface roughness of less than 1 micrometre (pm); (ii) applying one or more curable materials to the fibrous substrate and/or the casting structure of the casting tool; (iii) bringing the fibrous substrate and the casting tool into contact with the one or more curable materials therebetween, thereby forming the one or more curable materials into the casting structure; and (iv) during and/or after the contact, curing the one or more curable material(s) so as to form, on the fibrous substrate, a layer of one or more cured material(s) comprising a first zone having an outer surface exhibiting a surface nanostructure corresponding to the first region of the casting structure.

P36807 **PRINTING – CARD – WINDOW**

WO2023170146 **VERIDOS**
Priority Date: **11/03/2022**

DATA CARRIER WITH MOTIF IMAGES WHICH ARE VISIBLE FROM OPPOSITE FACES, AND CORRESPONDING PRODUCTION METHOD

The invention relates to a data carrier (10) with two different motif images which are visible from opposite faces of the data carrier, namely a front-face motif (22) and a rear-face motif (32). According to the invention, the data carrier (10) has a multilayer construction with an upper motif layer (52), a lower motif layer (62), and an intermediate layer (40) which is arranged between the motif layers (52, 62) and which is translucent at least in some regions. Furthermore, a respective sub-motif (22A, 22B) of the front-face motif (22) is arranged in the upper and lower motif layer (52, 62), wherein the two sub-motifs (22A, 22B) complement each other so as to form the front-face motif (22) when the data carrier is viewed from the front face and/or each sub-motif (32A, 32B) of the rear-face motif (32) is arranged in the upper and lower motif layer (52, 62), and the two sub-motifs (32A, 32B) complement each other so as to form the rear-face motif (32) when the data carrier is viewed from the rear face. Each of the upper and lower motif layers (52, 62) is made of a laser-modified printing ink, the motif information thereof which is produced by laser application and which forms the front-face motif (22) and the rear-face motif (32) is only visible when viewed from above and not when viewed in transmitted light.

SUPPORT DE DONNÉES COMPORTANT DES IMAGES DE MOTIFS QUI SONT VISIBLES À PARTIR DE FACES OPPOSÉES, ET PROCÉDÉ DE FABRICATION CORRESPONDANT

L'invention concerne un support de données (10) comportant deux images de motifs différentes qui sont visibles à partir de faces opposées du support de données, à savoir un motif de face avant (22) et un motif de face arrière (32). Selon l'invention, le support de données (10) a une construction multicouche comportant une couche à motifs supérieure (52), une couche à motifs inférieure (62), et une couche intermédiaire (40) qui est agencée entre les couches à motifs (52, 62) et qui est translucide au moins dans certaines régions. En outre, un sous-motif (22A, 22B) respectif du motif de face avant (22) est agencé dans les couches à motifs supérieure et inférieure (52, 62), les deux sous-motifs (22A, 22B) se complétant l'un l'autre de façon à former le motif de face avant (22) lorsque le support de données est vu depuis la face avant et/ou chaque sous-motif (32A, 32B) du motif de face arrière (32) étant agencé dans les couches à motifs supérieure et inférieure (52, 62), et les deux sous-motifs (32A, 32B) se complétant l'un l'autre de façon à former le motif de face arrière (32) lorsque le support de données est vu depuis la face arrière. Chacune des couches à motifs supérieure et inférieure (52, 62) est constituée d'une encre d'impression modifiée par laser, les informations de motif de celle-ci qui sont produites par application laser et qui forment le motif de face avant (22) et le motif de face arrière (32) n'étant visibles qu'en vue de dessus et n'étant pas visibles en lumière transmise.

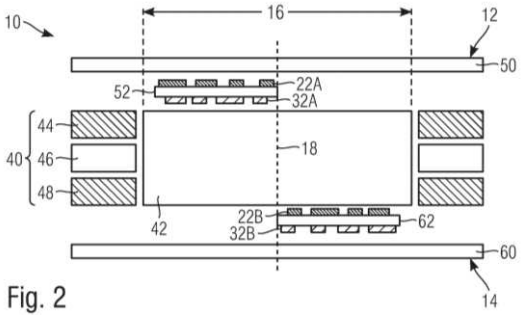


Fig. 2

CLAIM 1. A data carrier, in particular a document of value or security document, having two different motif images visible from opposite sides of the data carrier, namely a front motif and a back motif, wherein the data carrier has a multilayer structure with an upper motif layer, a lower motif layer and an at least regionally transparent intermediate layer arranged between the motif layers, in each case a partial motif of the front side motif is arranged in the upper and the lower motif layer and the two partial motifs complement one another when the data carrier is viewed from the front side to form the front side motif, and/ or in each case a partial motif of the reverse side motif is arranged in the upper and the lower motif layer and the two partial motifs complement one another when the data carrier is viewed from the reverse side to form the reverse side motif, and the upper and lower motif layers are each formed by a laser-modified printing ink, the motif information of which, which is produced by laser action and forms the front side motif and the rear side motif, is visible in each case only in a plan view but not in a transparent view.

P36808

PATENT OF THE MONTH
PRINTING – BANKNOTE – THREAD – RELIEF – MICROLENS

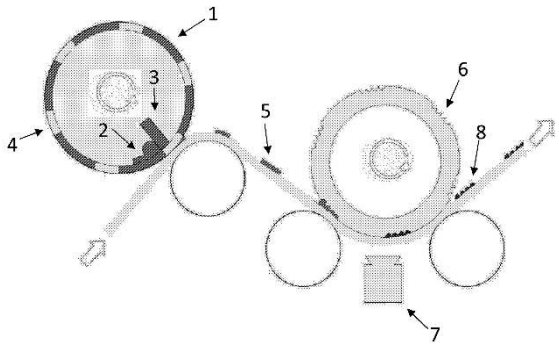
WO2023170132
Priority Date: **10/03/2022**

BASF | DE LA RUE INTERNATIONAL

CASTING LACQUER FOR SCREEN PRINTING

The present invention relates to a radiation curable screen printing composition for cast-curing comprising one or more compounds comprising radiation curable groups, one or more photoinitiators and one or more rheology modifying agents, which composition has a specific shear rate dependent viscosity; an article comprising a substrate and a coating comprising the radiation curable composition in cured form, wherein the coating is in form of a surface relief structure, a method for producing the article comprising the steps: (i) Providing a casting tool having a relief structure defined in a surface thereof, the relief structure corresponding to the surface relief structure; (ii) Applying to the substrate and/or the relief structure of the casting tool the radiation curable composition; (iii) Cast curing the radiation curable composition by bringing the substrate into contact with a casting tool comprising a relief structure and forming the surface relief structure in the coating composition; and (iv) Radiation curing the coating composition such that the surface relief structure formed of the radiation curable composition is retained on the substrate; a security article comprising at least one inventive substrate; the use of the inventive radiation curable composition for the preparation of a surface relief structure on a substrate; the use of the radiation curable composition for screen printing, preferably rotary screen printing, and preferably subsequent cast curing; and a printing press comprising the radiation curable composition, wherein the printing press is adapted to carry out printing on a web-like or sheet-like substrate, in particular for the production of security articles such as banknotes, comprising a printing unit, preferably a screen-printing unit, the printing press further comprises an in-line casting device comprising a casting tool, wherein the printing unit is designed to apply the radiation curable composition to the substrate and/or the casting tool and the inline-casting device is adapted to replicate and form a surface relief structure in the radiation curable composition.

LAQUE DE COULÉE POUR SÉRIGRAPHIE



La présente invention concerne une composition de sérigraphie durcissable par rayonnement destinée au durcissement par coulée qui comprend un ou plusieurs composés comprenant des groupes durcissables par rayonnement, un ou plusieurs photo-initiateurs et un ou plusieurs agents de modification de rhéologie, ladite composition ayant une viscosité dépendante d'une vitesse de cisaillement spécifique ; un article comprenant un substrat et un revêtement comprenant la composition durcissable par rayonnement sous forme durcie, le revêtement se présentant sous la forme d'une structure en relief de surface ; un procédé de production de l'article comprenant les étapes consistant à : (i) fournir un outil de coulée ayant une structure en relief définie dans l'une de ses surfaces, la structure en relief correspondant à la structure en relief de surface ; (ii) appliquer la composition durcissable par rayonnement sur le substrat et/ou sur la structure en relief de l'outil de coulée ; (iii) durcir par coulée la composition durcissable par rayonnement en amenant le substrat en contact avec un outil de coulée comprenant une structure en relief et former la structure en relief de surface dans la composition de revêtement ; et (iv) durcir la composition de revêtement par rayonnement de telle sorte que la structure en relief de surface formée par la composition durcissable par rayonnement est conservée sur le substrat ; un article de sécurité comprenant au moins un substrat selon l'invention ; l'utilisation de la composition durcissable par rayonnement de l'invention pour la préparation d'une structure en relief de surface sur un substrat ; l'utilisation de la composition durcissable par rayonnement pour la sérigraphie, de préférence la sérigraphie rotative, et de préférence avec durcissement par coulée ultérieur ; et une presse d'impression comprenant la composition durcissable par rayonnement, la presse d'impression étant conçue pour effectuer une impression sur un substrat de type toile ou de type feuille, en particulier pour la production d'articles de sécurité tels que des billets de banque, et comprenant une unité d'impression, de préférence une unité d'impression sérigraphique, la presse d'impression comprenant en outre un dispositif de coulée en ligne comprenant un outil de coulée, l'unité d'impression étant conçue pour appliquer la composition durcissable par rayonnement sur le substrat et/ou l'outil de coulée, et le dispositif de coulée en ligne étant conçu pour reproduire et former une structure en relief de surface dans la composition durcissable par rayonnement.

P36809 **PRINTING – CARD – RELIEF – MICROLENS**

WO2023170001 **VERIDOS**

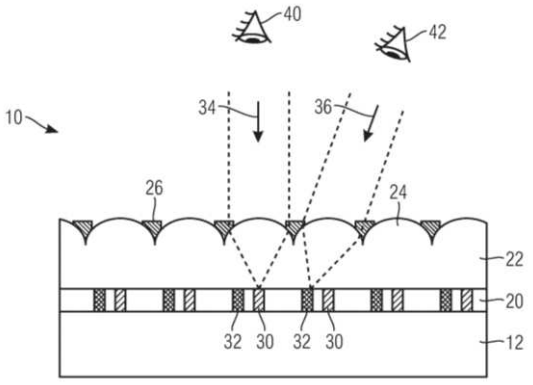
Priority Date: **11/03/2022**

IDENTIFICATION DOCUMENT AND PRODUCTION METHOD

The invention relates to an identification document (10) for identifying a person by means of a coloured identification image (50) having a substrate (12) which has a personalisation area (14) for recording image information, the personalisation area comprising a recording layer (20) for recording first image information, a lens assembly (22) for viewing the first image information, and a semi-transparent print layer (26), formed on the lens assembly, for recording second image information. The first image information contains, as first partial image information, a monochrome positive image (54) of the person and, as second partial image information, a monochrome negative image (64) of the person. The positive image (54) and the negative image (64) are each formed from a plurality of portions (30, 32) which are arranged so convolutedly in the recording layer (20) that, when viewed through the lens assembly (22), the positive image (54) is reproduced only in a substantially perpendicular viewing direction (36), and the negative image (64) is substantially only reproduced in a predetermined oblique viewing direction (36). The second image information of the semi-transparent print layer (26) contains a colour separation (52) of the coloured identification image of the person, which colour separation is visible both in the perpendicular viewing direction (34) and in the oblique viewing direction (36). When viewed perpendicularly, the coloured identification image (50) of the person is visible due to the interaction of the monochrome positive image (54) with the colour separation (52) and, when viewed obliquely, a coloured control image (60) resulting from the interaction of the monochrome negative image (64) with the colour separation (52) is visible.

DOCUMENT D'IDENTIFICATION ET PROCÉDÉ DE PRODUCTION

L'invention concerne un document d'identification (10) permettant d'identifier une personne au moyen d'une image d'identification colorée (50) dotée d'un substrat (12) qui présente une zone de personnalisation (14) pour enregistrer des informations d'image, la zone de personnalisation comprenant une couche d'enregistrement (20) pour enregistrer des premières informations d'image, un ensemble lentille (22) pour visualiser les premières informations d'image, et une couche d'impression semi-transparente (26), formée sur l'ensemble lentille, pour enregistrer des secondes informations d'image. Les premières informations d'image contiennent, en tant que premières informations d'image partielle, une image positive monochrome (54) de la personne et, en tant que secondes informations d'image partielle, une image négative monochrome (64) de la personne. L'image positive (54) et l'image négative (64) sont chacune formées à partir d'une pluralité de parties (30, 32) qui sont agencées de manière si convolutive dans la couche d'enregistrement (20) que, lorsqu'elles sont vues à travers l'ensemble lentille (22), l'image positive (54) est reproduite uniquement dans une direction de visualisation sensiblement perpendiculaire (36), et l'image négative (64) est sensiblement reproduite uniquement dans une direction de visualisation oblique prédéterminée (36). Les secondes informations d'image de la couche d'impression semi-transparente (26) contiennent une séparation de couleur (52) de l'image d'identification colorée de la personne, laquelle séparation de couleur est visible à la fois dans la direction de visualisation perpendiculaire (34) et dans la direction de visualisation oblique (36). Lorsqu'elle est vue perpendiculairement, l'image d'identification colorée (50) de la personne est visible en raison de l'interaction de l'image positive monochrome (54) avec la séparation de couleur (52) et, lorsqu'elle est vue obliquement, une image de commande colorée (60) résultant de l'interaction de l'image négative monochrome (64) avec la séparation de couleur (52) est visible.



CLAIM 1. Identification document (10) for identifying a Person with a coloured identification image (50), having a carrier (12) which has a personalisation region (14) for receiving image information, wherein the personalisation region has a recording layer (20) for receiving first image information, a lens arrangement (22) for viewing the first image information and a partially transparent printed layer (26) formed on the lens arrangement for receiving a second image information, characterized in that the first image information of the recording layer contains a black-and-white positive image (54) of the Person as a first partial image information and a black-and-white negative image (64) of the Person as a second partial image information, the positive image (54) and the negative image (64) are in each case formed from a plurality of subregions (30; 32) which are arranged interleaved in the recording layer (20) in such a way that, when viewed through the lens arrangement (22), the positive image (54) is reconstructed only in a substantially perpendicular viewing direction (34), and the negative image (64) is reconstructed substantially only at a predetermined oblique viewing direction (36), the second image information of the partially transparent printing layer (26) includes a color separation (52) of the colored identification image (50) of the person visible at both the perpendicular and oblique viewing directions, so that when the identification document is viewed vertically (34), the colored identification image (50) of the Person can be recognized by interaction of the black-and-white positive image (54) of the recording layer (20) and the color separation (52) of the partially transparent printing layer (26), and, when viewed from the oblique viewing direction (36), a colored control image (60) can be recognized which is produced by an interaction of the black-and-white negative image (64) of the recording layer (20) and the color separation (52) of the partially transparent printing layer (26).

P36810 **BANKNOTE – STRIP – RELIEF – MICROLENS**

WO2023169714 **GIESECKE & DEVRIENT CURRENCY TECHNOLOGY**

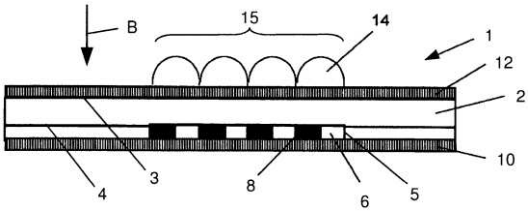
Priority Date: **07/03/2022**

SECURITY ELEMENT FOR A VALUE DOCUMENT, VALUE DOCUMENT AND METHOD FOR PRODUCING A SECURITY ELEMENT

A security element (1) for a value document, which has a substrate body (2, 16), which has a front side (3) and a rear side (4), and a see-through element (15), which offers a see-through image to a viewer in see-through. The see-through element (15) has microimaging elements (14) and alternately arranged first microimage elements (6) and second microimage elements (8) in a microimage layer (5), wherein the microimage layer (5) is applied to or embedded in the front side (3) or the rear side (4) of the substrate body (2, 16) and the microimaging elements (14) image the microimage elements (6, 8). The first microimage elements (6), together with the microimaging elements (14), provide a first view (7) of the see-through image which can be seen from a first viewing angle range, and the second microimage elements (8), together with the microimaging elements (14), provide a second view (9) of the see-through image which can be seen from a second viewing angle range. The microimage elements (6, 8) are arranged in such a way that the views (7, 9) are interleaved in relation to the microimage layer (5), and the first view (7) differs in its translucency from the second view (9).

ÉLÉMENT DE SÉCURITÉ POUR UN DOCUMENT DE VALEUR, DOCUMENT DE VALEUR ET PROCÉDÉ DE PRODUCTION D'UN ÉLÉMENT DE SÉCURITÉ

L'invention concerne un élément de sécurité (1) pour un document de valeur, lequel élément de sécurité comprend un corps de substrat (2, 16) ayant une face avant (3) et une face arrière (4), et un élément transparent (15) qui, lorsque l'on regarde à travers, présente une image transparente à un observateur. L'élément transparent (15) comprend des éléments de micro-imagerie (14), ainsi que des premiers éléments de micro-image (6) et des seconds éléments de micro-image (8) qui sont agencés de manière alternée dans une couche de micro-image (5). La couche de micro-image (5) est appliquée sur la face avant (3) ou sur la face arrière (4) du corps de substrat (2, 16) ou est incorporée dans celui-ci. Les éléments de micro-imagerie (14) imagent les éléments de micro-image (6, 8). Les premiers éléments de micro-image (6), conjointement avec les éléments de micro-imagerie (14), fournissent une première vue (7) de l'image transparente, laquelle première vue peut être vue à partir d'une première plage d'observation angulaire, et les seconds éléments de micro-image (8), conjointement avec les éléments de micro-imagerie (14), fournissent une seconde vue (9) de l'image transparente, laquelle seconde vue peut être vue à partir d'une seconde plage d'observation angulaire. Les éléments de micro-image (6, 8) sont agencés d'une manière telle que les vues (7, 9) sont entrelacées par rapport à la couche de micro-image (5), et la première vue (7) diffère de la seconde vue (9) en termes de translucidité.



CLAIM 1. A security element for a value document, wherein the security element (1) comprises: - a substrate body (2, 16) having a front side (3) and a rear side (4), and - a see-through element (15) presenting a see-through image to a viewer in see-through, characterized in that Characterized in that - the see-through element (15) has microimaging elements (14) and alternately arranged first microimage elements (6) and second microimage elements (8) in a microimage layer (5), wherein the microimage layer (5) is applied to the front side (3) or the rear side (4) of the substrate body (2, 16) Or is embedded therein and the microimaging elements (14) image the microimage elements (6, 8), - wherein the first microimage elements (6) together with the microimaging elements (14) form a first, visible from a first viewing angle range, of the see-through image, and the second microimage elements (8), together with the microimaging elements (14), provide a second view (9), visible from a second viewing angle range, of the see-through image, wherein the microimage elements (6, 8) are arranged such that the views (7, 9) are interleaved with one another with respect to the microimage layer (5), and - the first view (7) differs in its translucency from the second view (9).

P36812 **INK – BANKNOTE – MAGNETISM – LIQUID CRYSTALS**

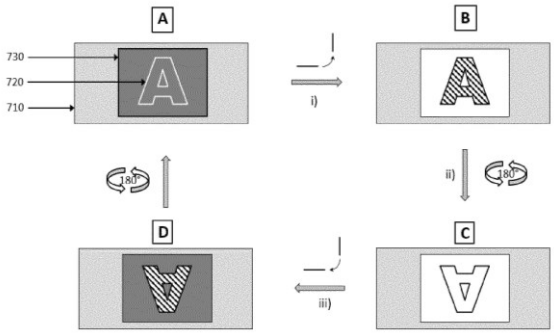
WO2023165863 **SICPA**
Priority Date: **01/03/2022**

OVERT SECURITY FEATURES

The present invention relates to the field of methods for producing eye-catching overt security features exhibiting colorshifting properties as anti-counterfeit means on security documents or security articles as well as decorative purposes. In particular, the overt security feature exhibits comprises a) a substrate (x10), a color constant layer (x20) comprising magnetically oriented platelet-shaped magnetic or magnetizable pigment particles and an optically variable layer (x30) comprising a cholesteric liquid crystal polymer (CLCP) reflecting light in the visible spectrum range, wherein the platelet-shaped magnetic or magnetizable pigment particles of the color constant layer (x20) have substantially a same elevation angle α.

CARACTÉRISTIQUES DE SÉCURITÉ MANIFESTES

La présente invention se rapporte au domaine des procédés permettant de produire des caractéristiques de sécurité manifestes qui attirent le regard présentant des propriétés de changement de couleur en tant que moyens anticontrefaçon sur des documents de sécurité ou des articles de sécurité ainsi qu'à des fins décoratives. En particulier, la caractéristique de sécurité manifeste comprend a) un substrat (x10), une couche à constante de couleur (x20) comprenant des particules de pigment magnétiques ou magnétisables en forme de plaquettes orientées magnétiquement et une couche optiquement variable (x30) comprenant un polymère à cristaux liquides cholestériques (CLCP) réfléchissant la lumière dans la plage de spectre visible, les particules de pigment magnétiques ou magnétisables en forme de plaquettes de la couche à constante de couleur (x20) présentant sensiblement un même angle d'élévation α.



CLAIM 1. An overt security feature comprising: a) a substrate (x10) made of a material selected from the group consisting of transparent materials, light absorbing materials and combinations thereof, b) a color constant layer (x20) comprising magnetically oriented platelet-shaped magnetic or magnetizable pigment particles, c) an optically variable layer (x30) comprising a cholesteric liquid crystal polymer selectively reflecting light in the visible spectrum range and being on top of the color constant layer (x20) thus forming a first area made of a superposition of the optically variable layer (x30) and the color constant layer (x20), wherein the platelet-shaped magnetic or magnetizable pigment particles of the color constant layer (x20) have substantially a same elevation angle a, said elevation angle |a| having a value between about 10° and about 45° (10°< angle |a| <45°), preferably between about 15° and about 40° (15° < angle |a| <40°); and more preferably between about 15° and about 35° (15°< angle |a| <35°).

P36814 **BANKNOTE – CARD – THREAD**

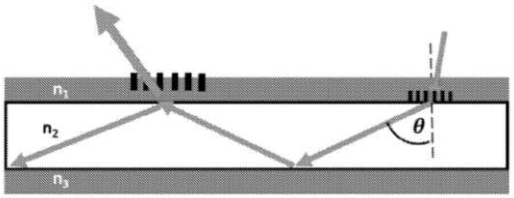
WO2023163984 **SPECTRA SYSTEMS**
Priority Date: **22/02/2022**

CODED POLYMER SUBSTRATES FOR BANKNOTE AUTHENTICATION

A system and associated method, the system including an item including a substrate including a polymer material and a first diffraction feature configured to diffract incident radiation into the substrate at an angle greater than the critical angle and launch the incident radiation into a waveguide transmission mode within the substrate to transmit the incident radiation laterally within the substrate, and a computing device including a radiation source configured to irradiate the item at a location of the first diffraction feature directly or indirectly on or within the substrate such that radiation is transmitted laterally within the substrate and a camera configured to measure emitted radiation from the substrate after lateral transmission of the incident radiation, where, in connection with irradiating with the radiation source and measuring the emitted radiation with the camera, the computing device is disposed in contact with the substrate.

SUBSTRATS POLYMÈRES CODÉS POUR L'AUTHENTIFICATION DE BILLETS DE BANQUE

L'invention concerne un système et un procédé associé, le système comprenant un article comprenant un substrat comprenant un matériau polymère et un premier élément de diffraction conçu pour diffracter un rayonnement incident dans le substrat à un angle supérieur à l'angle critique et pour lancer le rayonnement incident dans un mode de transmission de guide d'ondes à l'intérieur du substrat de façon à transmettre le rayonnement incident latéralement à l'intérieur du substrat, et un dispositif informatique comprenant une source de rayonnement conçue pour exposer à un rayonnement l'article à un emplacement du premier élément de diffraction directement ou indirectement sur le substrat, ou à l'intérieur de ce dernier, de façon à transmettre latéralement le rayonnement à l'intérieur du substrat et une caméra conçue pour mesurer le rayonnement émis par le substrat après une transmission latérale du rayonnement incident, dans lequel, en liaison avec une exposition à un rayonnement par la source de rayonnement et à une mesure du rayonnement émis par la caméra, le dispositif informatique est disposé en contact avec le substrat.



CLAIM 1. A method, comprising: providing an item including a substrate comprising a polymer material and a first diffraction feature disposed directly or indirectly on or within the substrate, the first diffraction feature configured to diffract incident radiation into the substrate at an angle greater than a critical angle and launch the incident radiation into a waveguide transmission mode within the substrate to transmit the incident radiation laterally within the substrate; irradiating, with a radiation source, the item at a location of the first diffraction feature directly or indirectly on or within the substrate; and measuring, with a camera, emitted radiation from the substrate after lateral transmission of the incident radiation; wherein the radiation source and the camera are included in a computing device; and wherein the computing device is disposed in contact with the substrate when irradiating with the radiation source and measuring the emitted radiation with the camera.

P36815 **PRINTING – INK – BANKNOTE – CARD – BRAND PROTECTION – MAGNETISM**

WO2023161464 **SICPA**

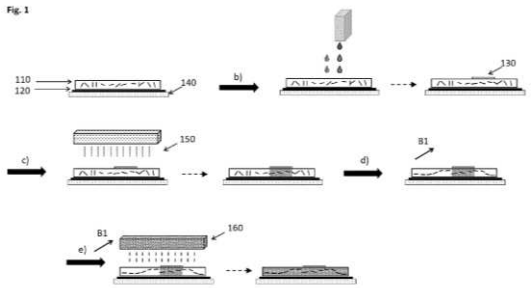
Priority Date: **28/02/2022**

METHODS FOR PRODUCING OPTICAL EFFECT LAYERS COMPRISING MAGNETIC OR MAGNETIZABLE PIGMENT PARTICLES AND EXHIBITING ONE OR MORE INDICIA

The invention relates to the field of the protection of security documents such as for example banknotes and identity documents against counterfeit and illegal reproduction. In particular, the present invention provides methods for producing optical effect layers (OELs) exhibiting one or more indicia (x30) on a substrate (x20), said method comprising a step of exposing a coating layer (x10) comprising non-spherical magnetic or magnetizable pigment particles to a magnetic field of a magnetic-field generating device so as to orient at least a part of the magnetic or magnetizable pigment particles; a step of applying a top coating composition on top of the coating layer (x10) and in the form of one or more indicia (x30), and a step of at least partially curing the coating layer (x10) and the one or more indicia (x30) with a curing unit (x50).

PROCÉDÉS DE PRODUCTION DE COUCHES À EFFET OPTIQUE COMPRENANT DES PARTICULES PIGMENTAIRES MAGNÉTIQUES OU MAGNÉTISABLES ET PRÉSENTANT UN OU PLUSIEURS INDICES

L'invention concerne le domaine de la protection de documents de sécurité, par exemple des billets de banque et des pièces d'identité, contre la contrefaçon et la reproduction illégale. Plus particulièrement, la présente invention concerne des procédés de production de couches à effet optique (OEL) présentant un ou plusieurs indices (x30) sur un substrat (x20), ledit procédé comprenant : une étape d'exposition d'une couche de revêtement (x10) comprenant des particules de pigment magnétiques ou magnétisables non sphériques à un champ magnétique d'un dispositif de génération de champ magnétique afin d'orienter au moins une partie des particules de pigment magnétiques ou magnétisables ; une étape d'application d'une composition de revêtement de surface sur la couche de revêtement (x10) et sous la forme d'un ou plusieurs indices (x30) ; et une étape de durcissement au moins partiel de la couche de revêtement (x10) et d'un ou plusieurs indices (x30) à l'aide d'une unité de durcissement (x50).



CLAIM 1. A method for producing an optical effect layer (OEL), said OEL comprising a motif made of at least two areas made of a single applied and cured layer comprising non-spherical magnetic or magnetizable pigment particles and exhibiting one or more indicia (x30) on a substrate (x20), the method comprising the steps of: a) applying on a substrate (x20) surface a radically radiation curable coating composition comprising the non-spherical magnetic or magnetizable pigment particles and one or more photo-reactive compounds not absorbing in a range from about 375 nm to about 470 nm, said radically radiation curable coating composition being in a first, liquid state so as to form a coating layer (x10); b) subsequently to step a), applying a top coating composition at least partially on top of the coating layer (x10), wherein said top coating composition is applied in the form of one or more indicia (x30) and wherein said top coating composition comprises one or more compounds absorbing in the range from about 375 nm to about 470 nm, c) partially simultaneously with or subsequently to step b), at least partially curing the one or more indicia (x30) and the one or more areas of the coating layer (x10) below said one or more indicia (x30) with a LED curing unit (x50) emitting between 375 nm and 470 nm; d) subsequently to step c), exposing the coating layer (x10) to a magnetic field of a magnetic- field generating device so as to orient at least a part of the non-spherical magnetic or magnetizable pigment particles; and e) partially simultaneously with or subsequently to step d), at least partially curing the coating layer (x10) with a curing unit (x60) at least emitting between 250 nm and 320 nm, wherein the radically radiation curable coating composition and the top coating composition are radically curable compositions, and wherein the one or more photo-reactive compounds not absorbing in the range from about 375 nm to about 470 nm of the radically radiation curable coating composition of step a) and the one or more compounds absorbing in the range from about 375 nm to about 470 nm of the top curable coating composition of step b) are selected according to one of the following combinations: i) the one or more photo-reactive compounds of the radically radiation curable coating composition of step a) are alpha-hydroxyketone compounds and the one or more compounds of the top curable coating composition of step b) are selected from the group consisting of acyl phosphine oxide compounds, alpha-amino-ketone compounds, mixtures of one or more benzophenone compounds and one or more amine compounds, glyoxylate compounds, benzyl ketal compounds, oxime ester compounds, titanocene compounds, mixtures of one or more thioxanthone compounds and one or more amine compounds, mixtures of one or more coumarin compounds and one or more amine compounds, mixtures of one or more camphorquinone compounds and one or more amine compounds; and mixtures thereof; ii) the one or more photo-reactive compounds of the radically radiation curable coating composition of step a) are mixtures of one or more benzophenone compounds different from the benzophenone compounds of the top curable coating composition of step b) and one or more amine compounds and the one or more compounds of the top curable coating composition of step b) are selected from the group consisting of acyl phosphine oxide compounds, alpha-amino-ketone compounds, benzophenone compounds different from the benzophenone of the radically radiation curable coating composition of step a), glyoxylate compounds, benzyl ketal compounds, oxime ester compounds, titanocene compounds, thioxanthone compounds, coumarin compounds, camphorquinone compounds, and mixtures thereof; or iii) the one or more photo-reactive compounds of the radically radiation curable coating composition of step a) are benzyl ketal compounds different from the benzyl ketal compounds of the top curable coating composition of step b) and the one or more compounds of the top curable coating composition of step b) are selected from the group consisting of acyl phosphine oxide compounds, alpha-amino-ketone compounds, mixtures of one or more benzophenone compounds and one or more amine compounds, glyoxylate compounds, benzyl ketal compounds different from the benzyl ketal compounds of the top curable coating composition of step a), oxime ester compounds, titanocene compounds, mixtures of one or more thioxanthone compounds and one or more amine compounds, mixtures of one or more coumarin compounds and one or more amine compounds, mixtures of one or more camphorquinone compounds and one or more amine compounds, and mixtures thereof.

P36818 **CARD – PASSPORT – RELIEF – MICROLENS**

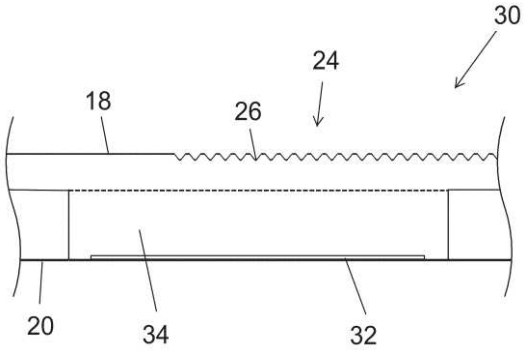
US20230294445 **ENTRUST**
Priority Date: **15/03/2022**

PERSONALIZED PLASTIC IDENTIFICATION DOCUMENT WITH LENS STRUCTURE

A security feature on a personalized plastic identification document such as a personalized plastic card and a plastic page of passport. The security feature includes a lens structure with a plurality of lenses, where the lens structure is formed using a laser at a location on the personalized plastic identification document to facilitate viewing of a security feature underlying the lens structure.

DOCUMENT D'IDENTIFICATION EN PLASTIQUE PERSONNALISÉ À STRUCTURE DE LENTILLE

Une caractéristique de sécurité sur un document d'identification en plastique personnalisé tel qu'une carte en plastique personnalisée et une page en plastique de passeport. L'élément de sécurité comprend une structure de lentille avec une pluralité de lentilles, la structure de lentille étant formée à l'aide d'un laser à un emplacement sur le document d'identification en plastique personnalisé pour permettre la visualisation d'un élément de sécurité sous-jacent à la structure de lentille.



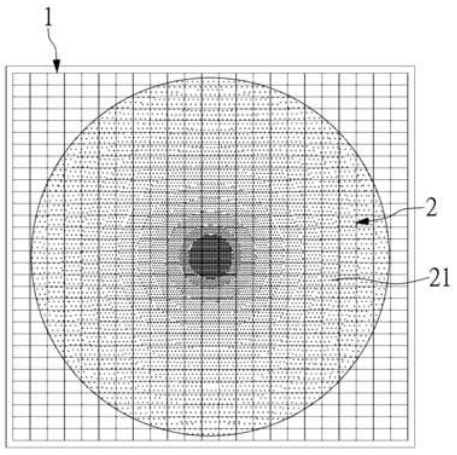
CLAIM 1. A personalized plastic identification document, comprising: a plastic identification document substrate having an image of an intended holder of the personalized plastic identification document formed thereon and text within the image; and a layer disposed on the plastic identification document substrate, the layer includes a lens structure that overlays at least a portion of the image and at least a portion of the text, and the lens structure comprises a plurality of lenses.

P36824 **LABEL**

TWM645296 **GUANGQUN LASER SCIENCE & TEC**
Priority Date: **17/04/2023**

3 D DYNAMIC SECURITY TAG AND DYNAMIC SECURITY FILM.

The present invention discloses a 3 D dynamic security tag and a dynamic security film. The 3 D dynamic security tag includes an image layer and a dynamic security film attached to the image layer. The image layer comprises at least one image, and each ink dot in the at least one image has a diameter of between 0.5 microns and 3 microns. The dynamic security film comprises a plurality of microstructures arranged in a matrix, and the distance between two adjacent microstructures in any row or column is between 0.5 microns and 3 microns, wherein the distance between two adjacent said microstructures in any row is equal to the distance between two adjacent said microstructures in any column.

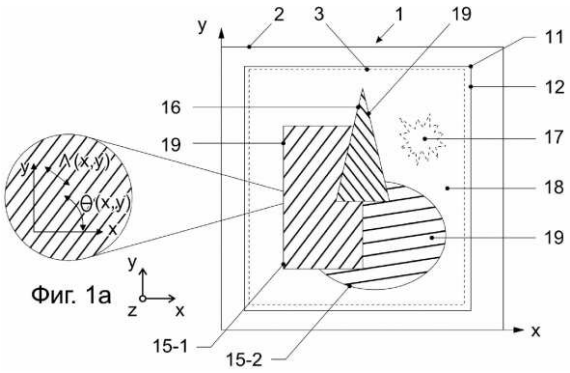


CLAIM 1. A 3 D dynamic security tag comprising: an image layer comprising at least one image and each ink dot in at least one of said images having a diameter of between 0.5 microns and 3 microns; And the distance between two adjacent said microstructures in any row or column is between 0.5 microns and 3 microns, wherein the distance between two adjacent said microstructures in any row is the same as the distance between two adjacent said microstructures in any column.

RU2801793 NAUCHNO PROIZVODSTVENNOE OBEDINENIE KRIPTEN
Priority Date: **08/08/2022**

PROTECTIVE DEVICE BASED ON ZERO-ORDER DIFFRACTIVE STRUCTURES

FIELD: protection of documents.
SUBSTANCE: invention relates to the field of protection against forgery of valuable documents and relates to a multilayer security device. The protective device contains a thin-film optically transparent in the visible region of the spectrum waveguide dielectric layer, the surface of which is pattern-relief structured in the form of a zero-order diffraction-lattice microstructure (ZODMS), and also includes a family of other surface-relief microimages other than ZODMS. On both sides, thin-film polymeric transparent coatings are applied. At least one of the thin-film polymer layers is made of an anisotropic material with luminophores introduced into at least one of them at the molecular level, transparent in the visible region of the spectrum, but absorbing in the UV region and forming hidden anisotropic protective features in the form of luminescent images, visualized as dynamically changing in color and spatial configuration of the glow when changing the inclined or rotational orientation of the protective element, as well as the state of polarization of the radiation absorbed and re-emitted by the luminophores.
EFFECT: improved protective properties of the device.



Фиг. 1a

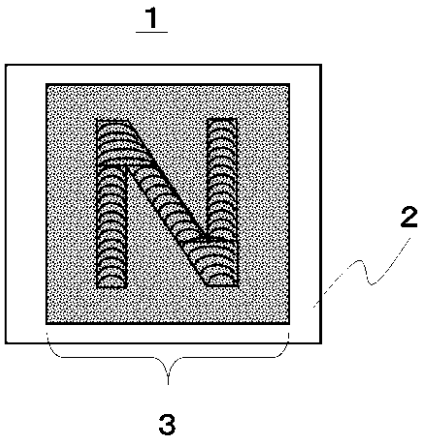
CLAIM 1. Laminated protective device with some topological spatial form ψ (x,) and placed on a temporary substrate, e. g., a split-layer polyethylene polyethylene film containing a thin-film combined fiber-borne fiber-winged spectral layer with a high refractive n [2] surface, the surface of which, on at least one side, is mapped in a graphic direction The form of at least one ZODMS ZODMSs) super high frequency diffraction and lattice micro-structure, and includes at least a family of other surface-to-surface microimages χ[i] (x,), including the type of conventional non ZODMS diffraction arrays, with thin film polymeric transparent on both sides of it by the coatings refracting n [1] and n [3] below n [2] whose internal surfaces coincide with the inner surfaces of the wrenched layer, because at least one of the fine-film polymeric layers indicated is made of single anisotropic material, e. g., uniaxial layer of organic thermoplastic polymer, or optically anisotropic black materials in the form of photo- or thermopulating liquid-crystal monomers or oligomers forming space-mapped anisotropic anisotropic polymers with at least one molecule at a molecular level of color sublimation, anisotropic and/or isotropic Organic or inorganic sublimating, visible-spectrum luminophor fluorescent fluorescent luminophors and form hidden anisotropic protective signs in the form of luminescence images, visualized as dynamically changing color and spatial light configuration when the protective element's inclination or rotational orientation changes, as well as the state of polarization of the UV luminance absorbed by the said UV detectors and the visible radiation they emit.

P36841

JP2023121490 **NATIONAL PRINTING BUREAU**
Priority Date: **21/02/2022**

IMAGE FORMING BODY

TOPIC: To provide an image forming body in which an image constituted by arc-shaped or circular elements can be dynamically and three-dimensionally visually recognized in a predetermined observation direction, and a moiré image can be visually recognized in observation in a direction different from the predetermined observation direction. INVENTION: a multilayer structure including an image on a portion of a base material, the multilayer structure including a first image as meaningful information and a second image representing moiré, the first image including a plurality of first elements regularly arranged, the first elements having arc-shaped trajectories, the first elements having concave or convex cross-sectional shapes, and at least one characteristic of light-dark flip-flop properties or color flip-flop properties; The second image comprises an 2-1 pattern in which a plurality of 2-1 elements are arranged at a predetermined pitch and at a predetermined arrangement angle, and a 2-2 element in which a plurality of 2-2 elements are arranged at least one different from the predetermined pitch or arrangement angle of the 2-1 elements.



CLAIM 1. An image display device comprising: an image on at least a portion of a substrate, the image comprising a first image as meaningful information and a second image representing moiré, wherein the first image includes a plurality of first elements regularly arranged, the first elements each having an arc-shaped track.

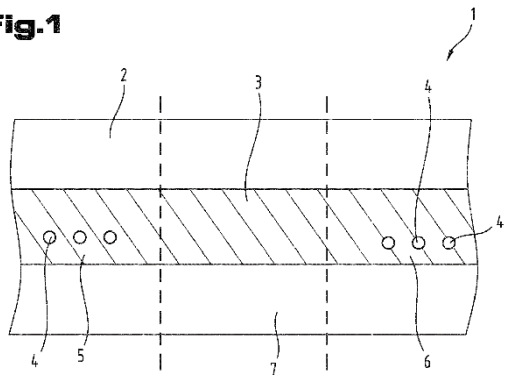
P36857 **BANKNOTE – THREAD – PERFORATIONS**

EP4242009 **HUECK FOLIEN**
Priority Date: **11/03/2022**

SECURITY ELEMENT FOR VALUABLE DOCUMENTS WITH A CARRIER FOIL AND AT LEAST ONE DECORATIVE LAYER

The invention relates to a security element (1) for value documents, comprising a carrier film (2) and at least one decorative layer (3), wherein the security element has holes (4).

Fig.1



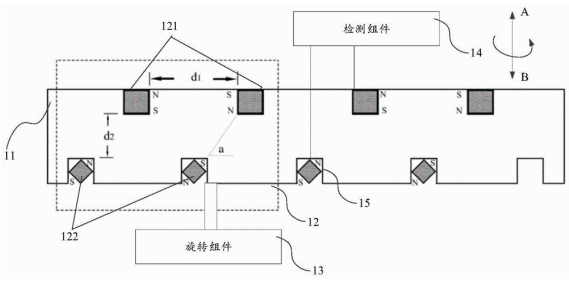
CLAIM 1. A security element (1) for value documents, wherein the security element comprises a carrier film (2) and at least one decorative layer (3), characterized in that the security element has holes (4), wherein the at least one decorative layer (3) comprises at least one metal layer and/or at least one layer of a printing ink and/or at least one layer having an optically variable effect and/or at least one thin-film element having an optically variable effect and/or at least one layer with at least one fluorescent dye.

CN116714352
Priority Date: **17/05/2023**

HUIZHOU HUAYANG OPTICAL TECHNOLOGY

FIXED MAGNETIC DEVICE AND FIXED MAGNETIC METHOD

The application discloses a fixed magnetic device and a fixed magnetic method, wherein the fixed magnetic device comprises: the device comprises a bearing platform, a magnetic field generating component and a rotating component; the first magnetic field generating set and the second magnetic field generating set of the magnetic field generating component are arranged on the bearing platform; the bearing platform is used for bearing a first composition to be magnetized, and magnetizing the first composition to be magnetized under the condition that the first magnetic field generating group and the second magnetic field generating group meet the preset first magnetization condition to obtain a first magnetized composition; the rotating component is used for rotating the first magnetic field generating group and the second magnetic field generating group along the horizontal direction by a first preset angle, and placing a second composition to be magnetized on the first magnetized composition; and magnetizing the second composition to be magnetized under the condition that the rotated first magnetic field generating group and the second magnetic field generating group meet the preset second magnetization condition to obtain a second magnetized composition. In this way, the front and side colors of the second and first magnetized compositions can be exchanged, forming an electrochromic.



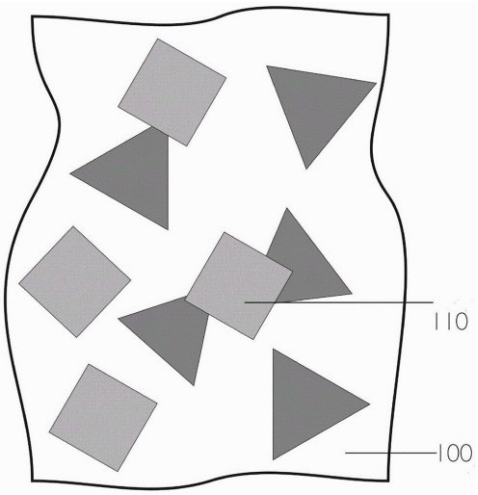
CLAIM 1. A fixed magnetic device, comprising: the magnetic field generating component and the rotating component are arranged on the bearing platform; the magnetic field generating component comprises a first magnetic field generating group and a second magnetic field generating group, the first magnetic field generating group and the second magnetic field generating group are arranged on the bearing platform, and the first magnetic field generating group and the second magnetic field generating group are arranged according to a space quadrangle; the bearing platform is used for bearing a first composition to be magnetized, and the first magnetic field generation group and the second magnetic field generation group are used for magnetizing the first composition to be magnetized under the condition that the first magnetic field generation group and the second magnetic field generation group meet the preset first magnetization condition to obtain a first magnetized composition; the rotating component is connected with the magnetic field generating component and is used for rotating the first magnetic field generating group and the second magnetic field generating group along the horizontal direction by a first preset angle, and placing a second composition to be magnetized on the first magnetized composition; and under the condition that the rotated first magnetic field generating group and the rotated second magnetic field generating group meet the preset second magnetization condition, the rotated first magnetic field generating group and the rotated second magnetic field generating group are used for magnetizing the second composition to be magnetized to obtain a second magnetized composition, and the second magnetized composition is in color-to-side matching with the front color of the first magnetized composition to form the mutual color change.

P36889 **CARD**

CN116741034 **SHANGHAI GUANZHONG OPTICAL TECHNOLOGY**
Priority Date: **15/06/2023**

ANTI-COUNTERFEITING FILM MATERIAL AND MANUFACTURING METHOD THEREOF

The application provides an anti-counterfeiting film material and a manufacturing method thereof, wherein the manufacturing method of the anti-counterfeiting film material comprises the following steps: selecting a base material, manufacturing a metal foil with a micro-nano diffraction grating structure on the base material, crushing the base material and the metal foil into particles, melting the particles prepared by crushing the base material and the metal foil at a high temperature, forming free metal micro-foil after melting the metal foil, and extruding and calendaring the base material and the metal foil after melting at the high temperature to form the anti-counterfeiting film. The metal foil is provided with the micro-nano diffraction grating structure, so that the anti-counterfeiting effect of the metal micro-foil is improved, the anti-counterfeiting film material has a certain anti-counterfeiting effect, the difficulty of illegal molecule imitation and counterfeiting is increased, meanwhile, the anti-counterfeiting film material with the metal foil can be applied to various fields, different kinds of products needing anti-counterfeiting, and can be mutually overlapped with anti-counterfeiting technologies in other products, so that the anti-counterfeiting effect of the products is increased, and the anti-counterfeiting film material has the characteristics of wide application range, difficulty in counterfeiting and the like.



CLAIM 1. The manufacturing method of the anti-counterfeiting film material is characterized by comprising the following steps of: selecting a base material; manufacturing a metal foil with a micro-nano diffraction grating structure on a substrate; pulverizing the substrate and the metal foil into particles; the particles prepared by crushing the base material and the metal foil are melted at high temperature, and the metal foil is melted to form free metal micro-foil; extruding and calendaring the high-temperature melted base material and the metal foil to form the anti-counterfeiting film.

P36900 **PRINTING – BRAND PROTECTION**

CN116675907 **HUAGONG LIYAN GUANGDONG NEW MATERIAL TECHNOLOGY | SOUTH CHINA UNIVERSITY OF TECHNOLOGY**
Priority Date: **05/06/2023**

BIOMASS-BASED STRUCTURAL-COLOR WATERPROOF MATERIAL AND PREPARATION METHOD THEREOF

The invention relates to a biomass-based structural color water-resistant material and a preparation method thereof, wherein a cholesteric cellulose nanocrystalline suspension is prepared based on hydrolysis by a traditional acid method, a cellulose nanocrystalline film with special photonic crystal optical properties is obtained through preparation processes such as alkali treatment, ultrasonic treatment, evaporation film formation and the like, and the biomass-based water-resistant structural color material is prepared through heat treatment and crushing. Compared with the prior art, the method for preparing the biomass-based water-resistant structural color material is more environment-friendly, no additive harmful to the environment and harmful to organisms is required to be added in the middle step, meanwhile, the production cost is low, and the method has multiple anti-counterfeiting functions when being applied to the water-based paint and has potential application prospects in the aspect of packaging and printing fields.

CLAIM 1. The preparation method of the biomass-based structural-color waterproof material is characterized by comprising the following steps of: s1, preparing a neutral cellulose nanocrystalline suspension; s2, preparing the neutral cellulose nanocrystalline suspension in the step a into a cellulose nanocrystalline film; and S3, preparing the cellulose nanocrystalline film in the step b into cellulose nanocrystalline photon particles.

P36904 **PRINTING – INK – BRAND PROTECTION**

CN116656180 **INSTITUTE OF CHEMISTRY - CHINESE ACADEMY OF SCIENCE**
Priority Date: **05/06/2023**

PHOTONIC CRYSTAL FOUR-COLOR INKJET INK AND MANUFACTURING METHOD OF COLOR PRINTED MATTER THEREOF

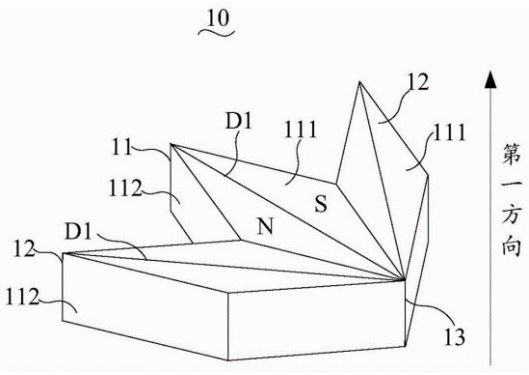
The invention discloses a photonic crystal four-color inkjet ink and a method for manufacturing a color print thereof. The ink comprises the following components in percentage by mass: 0.1-40% of monodisperse latex sphere nanoparticle dispersion, 0-10% of polymer, 0-10% of auxiliary agent, 0.01-5% of colorant and the balance of solvent. The manufacturing method of the color printed matter comprises the following steps: the prepared photonic crystal ink-jet four-color ink is ink-jet printed into a color pattern at 30-50 ℃ and is coated with a protective coating. The prepared photonic crystal color printed matter can not only meet the common color effect under weak light, but also show the structural color of the photonic crystal under strong light, and realize the color change effect of two different structural colors under large angle and small angle under strong light irradiation. The adopted protective coating ensures that the surface of the printed matter has the waterproof, antifouling and touch-proof performances, improves the durability and is widely applied in the fields of anti-counterfeiting, packaging, decoration and the like.

CLAIM 1. The photonic crystal four-color inkjet ink is characterized by comprising the following components in percentage by mass: 0.1-40% of monodisperse latex sphere nanoparticle dispersion, 0-10% of polymer, 0-10% of auxiliary agent, 0.01-5% of colorant and the balance of solvent.

P36906 **PRINTING – MAGNETISM**

CN116653464 **HUIZHOU HUAYANG OPTICAL TECHNOLOGY**
Priority Date: **11/05/2023**

MAGNETIC ORIENTATION DEVICE, PRINTING EQUIPMENT AND METHOD FOR MANUFACTURING MAGNETIC PATTERN



The application discloses a magnetic orientation device, a printing device and a method for manufacturing a magnetic pattern. The magnetic orientation device comprises at least two magnetic bodies, wherein the at least two magnetic bodies are respectively provided with two end faces arranged at intervals along a first direction and side surfaces connected with the two end faces, the two end faces are arranged in a quadrilateral mode and are provided with first diagonal lines, the north-south magnetic poles of the magnetic bodies are positioned on two sides of the first diagonal lines, two adjacent magnetic bodies are provided with adjacent side surfaces which are overlapped along the first direction, and the adjacent side surfaces of the two adjacent magnetic bodies are mutually different in magnetism. The application can form the composite magnetic field of the printing anti-counterfeiting pattern through simple combination of the magnetic bodies.

CLAIM 1. A magnetic orienting device, the magnetic orienting device comprising: The magnetic structure comprises at least two magnetic bodies, wherein the at least two magnetic bodies are respectively provided with two end faces arranged at intervals along a first direction and side surfaces connected with the two end faces, the two end faces are arranged in a quadrilateral mode and are provided with first diagonal lines, north-south magnetic poles of the magnetic bodies are positioned on two sides of the first diagonal lines, two adjacent magnetic bodies are provided with adjacent side surfaces overlapped along the first direction, and the adjacent side surfaces of the two adjacent magnetic bodies are mutually different in magnetism.

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

N9648

WO2023162528 **NITTO DENKO**

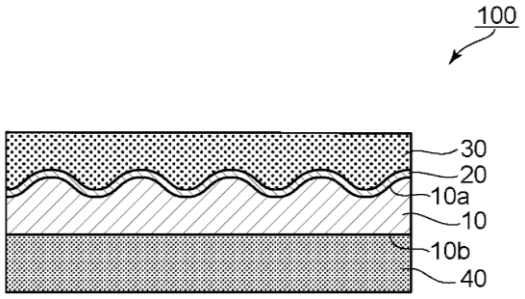
Priority Date: **28/02/2022**

MULTILAYER FILM

The present invention provides a multilayer film which comprises an optical functional layer that has a function of changing the direction of light, and an adhesive layer that protects the optical functional layer, and which is suppressed in functional deterioration of the optical functional layer due to the adhesive layer. A multilayer film according to one embodiment of the present invention comprises: an optical functional layer that has a first main surface and a second main surface, wherein the first main surface has a relief structure having a relief height of 10 nm to 100 μm; a porous layer that is provided on the first main surface of the optical functional layer; and an adhesive layer that is provided on a surface of the porous layer, the surface being on the reverse side from the optical functional layer. The optical functional layer is formed of a reflective hologram film, a microlens array film or a prism film; and the porous layer has a refractive index of 1.15 to 1.30.

FILM MULTICOUCHE

La présente invention concerne un film multicouche qui comprend une couche fonctionnelle optique qui a une fonction de changement de la direction de la lumière, et une couche adhésive qui protège la couche fonctionnelle optique, et qui est supprimée dans la détérioration fonctionnelle de la couche fonctionnelle optique due à la couche adhésive. Un film multicouche selon un mode de réalisation de la présente invention comprend : une couche fonctionnelle optique qui a une première surface principale et une seconde surface principale, la première surface principale ayant une structure en relief ayant une hauteur en relief de 10 nm à 100 μm ; une couche poreuse qui est disposée sur la première surface principale de la couche fonctionnelle optique ; et une couche adhésive qui est disposée sur une surface de la couche poreuse, la surface étant sur le côté opposé à la couche fonctionnelle optique. La couche fonctionnelle optique est formée d'un film d'hologramme réfléchissant, d'un film de réseau de microlentilles ou d'un film de prisme ; et la couche poreuse a un indice de réfraction de 1,15 à 1,30.



CLAIM 1. An optical functional layer having a first major surface and a second major surface, the first major surface having a recessing and protruding structure, and a height of the recesses and protrusions being 10 nm~ 100 μm; a porous layer provided on the first major surface of the optical functional layer; an adhesive layer provided on a side of the porous layer opposite the optical functional layer; and Wherein the optical functional layer is a reflection-type hologram film, a microlens array film, or a prism film, and a refractive index of the porous layer is 1.15~ 1.30.

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

N9642

WO2023171050 **HAMAMATSU PHOTONICS | UTSUNOMIYA UNIVERSITY**

Priority Date: **10/03/2022**

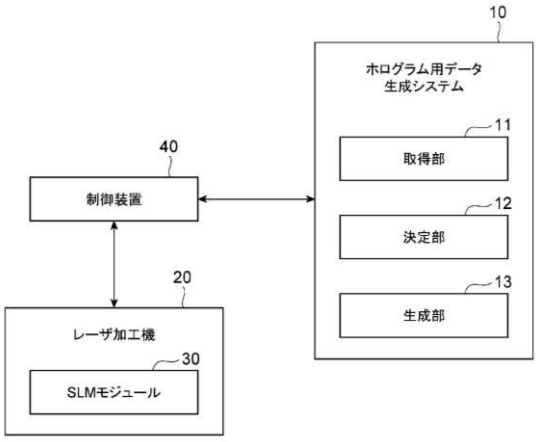
HOLOGRAM DATA GENERATION SYSTEM AND HOLOGRAM DATA GENERATION METHOD

The present invention makes holograms for use in spatial light modulators appropriate. A hologram data generation system 10 generates hologram data for realizing holograms used for modulating light in spatial light modulators and comprises: an acquisition unit 11 that acquires target information indicating the output light intensity distribution, which is the target of output light from the hologram; a determination unit 12 that determines a generation method to be used for generating hologram data according to the type of intensity distribution indicated by the target information acquired by the acquisition unit 11; and a generation unit 13 that generates hologram data from the target information acquired by the acquisition unit 11, according to the generation method determined by the determination unit 12.

SYSTÈME DE GÉNÉRATION DE DONNÉES D'HOLOGRAMME ET PROCÉDÉ DE GÉNÉRATION DE DONNÉES D'HOLOGRAMME

La présente invention rend adéquats des hologrammes destinés à être utilisés dans des modulateurs spatiaux de lumière. Un système de génération de données d'hologramme (10) génère des données d'hologramme servant à réaliser des hologrammes utilisés pour moduler la lumière dans des modulateurs spatiaux de lumière et comprend : une unité d'acquisition (11) qui acquiert des informations cibles indiquant la distribution d'intensité de lumière de sortie, celle-ci étant la cible de lumière de sortie provenant de l'hologramme ; une unité de détermination (12) qui détermine un procédé de génération à utiliser pour générer des données d'hologramme en fonction du type de distribution d'intensité indiquée par les informations cibles acquises par l'unité d'acquisition (11) ; et une unité de génération (13) qui génère des données d'hologramme à partir des informations cibles acquises par l'unité d'acquisition (11) en fonction du procédé de génération déterminé par l'unité de détermination (12).

CLAIM 1. A hologram data generation system configured to generate hologram data for realizing a hologram used for modulating light in a spatial light modulator, the hologram data generation system comprising: an acquiring unit configured to acquire target information indicating an intensity distribution of emitted light, which is a target of emitted light from the hologram; and a calculating unit configured to, in accordance with a type of intensity distribution indicated by the target information acquired by the acquiring unit, A hologram data generation system comprising: a determination unit configured to determine a generation method used for generating hologram data; and a generation unit configured to generate hologram data from the target information acquired by the acquisition unit by the generation method determined by the determination unit.



10 Hologram data generation system
11 Acquisition unit
12 Determination unit
13 Generation unit
20 Laser beam machine
30 SLM module
40 Control device

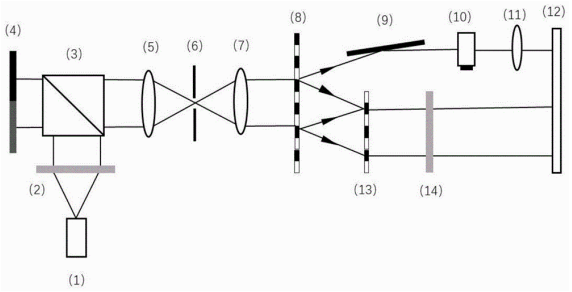
N9672

CN116774557 **KUNMING UNIVERSITY OF SCIENCE & TECHNOLOGY**

Priority Date: **07/06/2023**

POLARIZATION HOLOGRAPHIC MULTIPLEXING DISPLAY SYSTEM AND METHOD BASED ON ACOUSTO-OPTIC MODULATOR

The invention relates to a polarization holographic multiplexing display system based on an acoustic-optical modulator and a method thereof, wherein a beam splitter is arranged in front of a spatial optical modulator; the laser, the first linear polarizer, beam splitter are set up in the light path of the laser sequentially; the beam splitter reflection light path is sequentially provided with a first lens, a small hole, a second lens and a first polarization grating; four beams of circularly polarized light are arranged behind the first polarization grating; the optical path of the first light beam is sequentially provided with a reflector, an acousto-optic modulator, a third lens and an image sensor; and a second polarization grating, a second linear polarizer and an image sensor are sequentially arranged on the light paths of the second light beam, the second light beam and the fourth light beam. The invention can obtain three reconstructed images with different effects at different reconstruction distances, and has good application prospects in the fields of holographic display, holographic storage and the like.



CLAIM 1. An acousto-optic modulator-based polarization holographic multiplexing display system, comprising: a beam splitter (3) is arranged in front of the spatial light modulator (4); the laser (1), the first linear polarizer (2) and the beam splitter (3) are sequentially arranged on the light path of the laser (1), a first lens (5), a small hole (6), a second lens (7) and a first polarization grating (8) are sequentially arranged on a reflection light path of the beam splitter (3); four circularly polarized lights are arranged behind the first polarization grating (8); the optical path of the first light beam is sequentially provided with a reflector (9), an acousto-optic modulator (10), a third lens (11) and an image sensor (12); a second polarization grating (13), a second linear polarizer (14) and an image sensor (12) are sequentially arranged on the light paths of the second light beam, the second light beam and the fourth light beam; the first linear polarizer (2) is positioned on the optical path of the laser (1), reflects laser to the beam splitter (3) of the spatial light modulator (4), filters the laser modulated by the spatial light modulator (4) loaded with two pieces of holographic information through a 4f system consisting of a first lens (5), a small hole (6) and a second lens (7), and then makes the laser enter the first polarization grating (8); the first polarization grating (8) is used for decomposing the two pieces of holographic information into four beams of circularly polarized light; the first light beam is reflected to an acousto-optic modulator (10) for modulation by a reflecting mirror (9), and is imaged to an image sensor (12) by a third lens (11); the second light beam and the second light beam are overlapped at a second polarization grating (13), interfere after passing through a second linear polarizer (14), and are imaged to an image sensor (12); the fourth light beam is imaged to the image sensor (12) after passing through the second polarization grating (13).

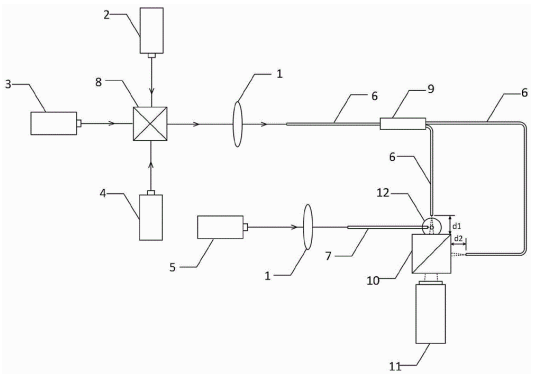
N9674

CN116755315 **KUNMING UNIVERSITY OF SCIENCE & TECHNOLOGY**

Priority Date: **21/06/2023**

COLOR SCANNING HOLOGRAPHIC DEVICE ADOPTING OPTICAL FIBER TWEEZERS AND METHOD THEREOF

The invention provides a color scanning holographic device adopting optical fiber tweezers and a method thereof.A color combining prism is arranged at the intersection of outgoing light of a red light source, a green light source and a blue light source, and a focusing lens, a first transmission optical fiber and an optical fiber beam splitter are sequentially arranged on an outgoing light path of the color combining prism; the first transmission optical fiber is divided into two bundles of optical fibers after the optical fiber beam splitter, the two bundles of optical fibers are respectively arranged on two sides of the beam splitter, and incident light on two sides of the beam splitter is respectively used as object light and reference light; a focusing lens and a second transmission optical fiber are sequentially arranged on the light path of the emergent light of the light source of the optical tweezers; the inverted microscope is arranged below the front surface of the beam splitter, and the beam splitting fiber emergent light of the first transmission optical fiber on the optical path of the object light can vertically irradiate the object and realize the scanning of the object; the CCD charge coupled device is arranged behind the emergent light surface of the beam splitter. The invention has low cost and simple construction and operation of the light path, utilizes the optical fiber as a light transmission medium, uses the double-core optical fiber as an optical tweezer, and can carry out holographic scanning shooting on tiny particles.



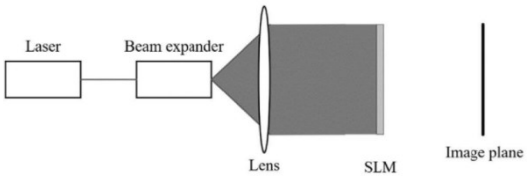
CLAIM 1. A color scanning holographic device employing optical fiber tweezers, comprising: the device comprises a focusing lens (1), a red light source (2), a green light source (3), a blue light source (4), an optical tweezers light source (5), a first transmission optical fiber (6), a second transmission optical fiber (7), a color combining prism (8), an optical fiber beam splitter (9), a beam splitting mirror (10), a CCD charge coupled device (11) and an inverted microscope (12); the emitting directions of the red light source (2), the green light source (3) and the blue light source (4) are respectively orthogonal, a color combining prism (8) is arranged at the orthogonal position, each emitting light is respectively incident to the color combining prism (8) for converging, and a focusing lens (1), a first transmission optical fiber (6) and an optical fiber beam splitter (9) are sequentially arranged on an emitting light path of the color combining prism (8); the first transmission optical fiber (6) is divided into two bundles of optical fibers after the optical fiber beam splitter (9), the two bundles of optical fibers are respectively arranged on two sides of the beam splitter (10), and incident light on two sides of the beam splitter (10) is respectively used as object light and reference light; a focusing lens (1) and a second transmission optical fiber (7) are sequentially arranged on the light path of the emergent light of the optical tweezers light source (5); the inverted microscope (12) is arranged below the front surface of the beam splitter (10), and the movement of the object is realized through the second transmission optical fiber (7), so that the light emitted by the beam splitter of the first transmission optical fiber (6) on the light path of the object can vertically irradiate the object, and the scanning of the object is realized; the CCD charge-coupled device (11) is arranged behind the emergent light surface of the beam splitter (10); the light source (2), the green light source (3) and the blue light source (4) are respectively orthogonal in emergent light direction, emergent light of the light source is respectively incident into the color combining prism (8) to be converged, the emergent light of the color combining prism (8) is coupled into the first transmission optical fiber (6) through the focusing lens (1), the first transmission optical fiber (6) is divided into two paths after passing through the optical fiber beam splitter (9), the two paths of optical fibers are respectively arranged on two sides of the beam splitter (10), the incident light on two sides of the beam splitter (10) is respectively used as object light and reference light, the emergent light of the optical tweezers light source (5) is coupled into the second transmission optical fiber (7) through the focusing lens (1), the emergent light of the second transmission optical fiber (7) forms optical tweezers to capture and fix an object, the inverted microscope (12) is arranged below the front surface of the beam splitter (10), the object is moved through observation and control of the second transmission optical fiber (7), the split optical fiber (6) can vertically irradiate the object, the emergent light of the first transmission optical fiber (6) can scan the object, the charge coupled device (11) is arranged on the emergent light of the beam splitter (10) to receive the emergent light of the object, and the charge coupled device (11) is enabled to emit the charge coupled light.

N9673

CN116774556 **ANHUI UNIVERSITY**
Priority Date: **20/06/2023**

NON-ITERATIVE THREE-DIMENSIONAL HOLOGRAM GENERATION METHOD AND DEVICE BASED ON FS-ORAP AND PHASE COMPENSATION

The invention provides a non-iterative three-dimensional hologram generating method and device based on FS-ORAP and phase compensation. The method comprises the following steps: layering three-dimensional targets to be processed along the depth to generate a plurality of two-dimensional images; generating phase-only holograms of each layer according to the amplitudes of the two-dimensional images and the full support optimization random phase generated in advance; adding compensation phases to the phase-only holograms of each layer respectively, and superposing complex amplitudes of the holograms of each layer obtained after adding the compensation phases to generate a composite phase hologram; and carrying out Fresnel transformation on the composite phase hologram to reconstruct the three-dimensional target. In this way, the limitation of the size and the position of the target amplitude fixed support of the original ORAP method in the space domain is broken through, iteration is not needed, and the generation of the three-dimensional target phase hologram is greatly quickened.



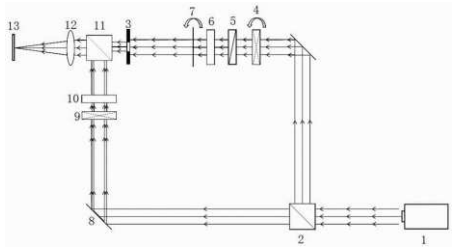
CLAIM 1. A non-iterative three-dimensional hologram generating method based on FS-ORAP and phase compensation, the method comprising: layering three-dimensional targets to be processed along the depth to generate a plurality of two-dimensional images; generating phase-only holograms of each layer according to the amplitudes of the two-dimensional images and the full support optimization random phase generated in advance; adding compensation phases to the phase-only holograms of each layer respectively, and superposing complex amplitudes of the holograms of each layer obtained after adding the compensation phases to generate a composite phase hologram; and carrying out Fresnel transformation on the composite phase hologram to reconstruct the three-dimensional target.

N9680

CN116736670 **FUJIAN NORMAL UNIVERSITY**
Priority Date: **01/06/2023**

SCALAR VORTEX BEAM GENERATION SYSTEM AND METHOD FOR COAXIAL TRADITIONAL OR POLARIZATION HOLOGRAPHY

The application relates to a scalar vortex beam generating system and method for coaxial traditional or polarization holography, wherein the system comprises: a laser light source; a polarization beam splitter for dividing laser generated by the laser light source into reference light and signal light; the signal light path is sequentially provided with an adjusting system and a first diaphragm, wherein the adjusting system comprises a first half wave plate, a quarter wave plate, a first polaroid, a fan-shaped slit, a first steering device and a second steering device; the reference light path is sequentially provided with a first reflecting mirror, a round shielding plate attached to the first reflecting mirror, a second half-wave plate and a second polarizing plate; a beam-splitting prism; the first lens is used for converging the light beams after the beam splitting prism is combined and converged; and the holographic recording material is arranged at the focal position of the first lens and is used for interfering and recording the light beams converged by the first lens. The adopted element is simple and low in cost, and the manufacturing process for generating the coaxial traditional scalar vortex beam or the scalar vortex beam of polarization holography is simple.



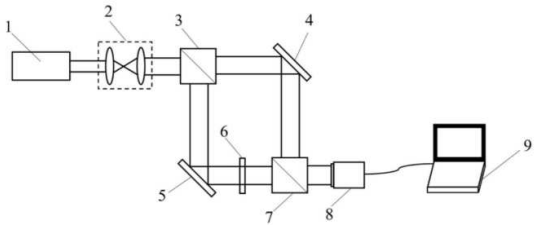
CLAIM 1. A scalar vortex beam generation system for in-line conventional or polarized holography comprising: a laser light source for generating laser light; the polarization beam splitter is used for dividing laser generated by the laser source into reference light and signal light; a reference light path for conveying the reference light; the signal light path is used for conveying the signal light; the signal light path is sequentially provided with an adjusting system and a first diaphragm, the adjusting system comprises a first half wave plate, a quarter wave plate, a first polaroid, a fan-shaped slit, a first steering device and a second steering device, the first half wave plate, the quarter wave plate, the first polaroid and the fan-shaped slit are sequentially arranged, the first steering device is used for rotating the first half wave plate, and the second steering device is used for rotating the fan-shaped slit; the reference light path is sequentially provided with a first reflecting mirror, a round shielding plate attached to the first reflecting mirror, a second half wave plate and a second polarizing plate; the beam splitting prism is used for carrying out combination and aggregation on the reference light conveyed by the reference light path and the signal light path; the first lens is used for converging the light beams after the beam splitting prism is combined and converged; the holographic recording material is arranged at the focal position of the first lens and is used for interfering and recording the light beams converged by the first lens.

N9684

CN116719147 **SHANGHAI UNIVERSITY**

Priority Date: **12/06/2023**

AUTOMATIC FOCUSING METHOD FOR DIGITAL HOLOGRAPHIC IMAGING, ELECTRONIC EQUIPMENT AND MEDIUM



The invention relates to an automatic focusing method for digital holographic imaging, comprising the following steps: acquiring an off-axis digital hologram of the measured object through an off-axis digital hologram light path device; setting a search range and the sampling number in the search range, and further calculating a sampling interval and a reconstruction distance; performing numerical reconstruction on the off-axis digital hologram at each reconstruction distance to obtain object light field distribution at different reconstruction distances; calculating amplitude image distribution under different reconstruction distances; constructing an automatic focusing evaluation function, calculating a function value according to the automatic focusing evaluation function, and normalizing the function value; and constructing a focusing evaluation function curve, and searching a corresponding value of the focusing evaluation function curve according to the attribute of the measured object, wherein the reconstruction distance corresponding to the corresponding value is the optimal reconstruction distance. Compared with the prior art, the invention is applicable to all off-axis digital holographic optical paths and can realize accurate and rapid focusing in the reconstruction process of digital holographic instrument equipment.

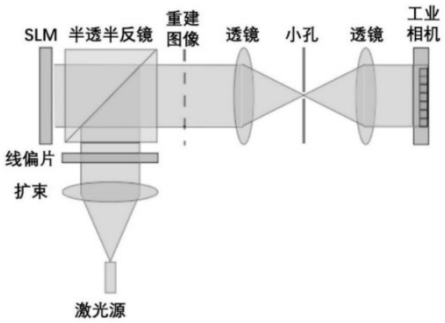
CLAIM 1. An autofocus method for digital holographic imaging, comprising the steps of: s1: acquiring an off-axis digital hologram of the measured object (6) through an off-axis digital hologram light path device; s2: setting a search range and the sampling number in the search range, and further calculating a sampling interval and a reconstruction distance; s3: performing numerical reconstruction on the off-axis digital hologram obtained in the step S1 at each reconstruction distance obtained in the step S2 to obtain object light field distribution at different reconstruction distances; s4: according to the object light field distribution obtained in the step S3, calculating amplitude image distribution under different reconstruction distances; s5: constructing an automatic focusing evaluation function, calculating a function value according to the automatic focusing evaluation function and the amplitude image acquired in the step S4, and normalizing the function value; s6: and (3) constructing a focusing evaluation function curve by taking the reconstruction distance as an abscissa and the function value calculated in the step S5 as an ordinate, performing traversal search on the function value, searching for a corresponding value of the focusing evaluation function curve according to the attribute of the measured object (6), and taking the reconstruction distance corresponding to the corresponding value as the optimal reconstruction distance.

N9698

CN116645432 **SHANGHAI JIAO TONG UNIVERSITY**

Priority Date: **07/06/2023**

HIGH-QUALITY HOLOGRAM GENERATING METHOD BASED ON IMPROVED VIT NETWORK



A high quality hologram generating method based on modified ViT network, by constructing encoding-decoding architecture, the modified Vision Transformer network is used as encoding part to encode the target image into its corresponding hologram; simulating free space propagation of light in the decoding part through an angular spectrum propagation algorithm to obtain a reconstructed image of the hologram, and performing iterative training on the encoding part of the encoding-decoding architecture by calculating a loss function between the reconstructed image and the target image; and reconstructing a high-quality holographic display image by using the pure phase hologram generated by the trained encoding-decoding architecture through a holographic display system in an online stage. The invention generates higher quality holograms and achieves holographic display by focusing on global information of the target image to improve the Vision transducer network.

CLAIM 1. A high quality hologram generating method based on a modified ViT network, characterized in that a target image is encoded into its corresponding hologram by constructing an encoding-decoding architecture and using a modified ViT as an encoding part; simulating free space propagation of light in the decoding part through an angular spectrum propagation algorithm to obtain a reconstructed image of the hologram, and performing iterative training on the encoding part of the encoding-decoding architecture by calculating a loss function between the reconstructed image and the target image; and reconstructing a high-quality holographic display image by using the pure phase hologram generated by the trained encoding-decoding architecture through a holographic display system in an online stage.

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

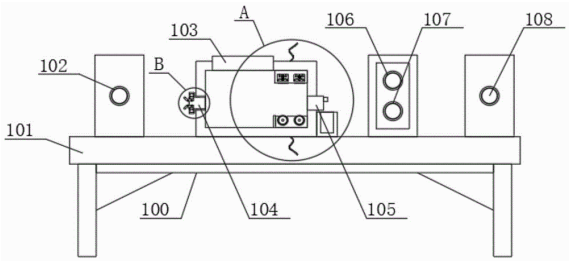
N9664

CN219706458U **JIANGSU XINCHENG PACKAGING TECHNOLOGY**

Priority Date: **31/05/2023**

HOLOGRAPHIC THERMOPRINT MEMBRANE MOULDING PRESS

The utility model discloses a holographic thermoprinting film molding press, which comprises a molding press main body, wherein the molding press main body comprises a supporting seat, a coating box, an inlet and an outlet, the coating box is fixedly arranged on the upper surface of the supporting seat through bolts, and the inlet and the outlet are respectively arranged at two ends of the coating box; through designing the mechanism of blowing, can carry out the membrane thermoprint operation at the die press main part, after the inside spraying coating of membrane entering coating case, the motor circular telegram back drives the flabellum and rotates, and carry out interim stoving processing to the slight blowing of membrane surface coating after the spraying when the flabellum rotates, consequently discharge through the export after slight stoving, and do not influence the thermoprint operation to the membrane surface to the slight stoving of coating after the spraying, strike off smoothly when the membrane is discharged through the export and is scraped unnecessary coating, be difficult for causing to strike off seriously to strike off completely, improve the result of use of membrane thermoprint once more.



CLAIM 1. The utility model provides a holographic thermoprint membrane molding press, includes molding press main part (100), molding press main part (100) include supporting seat (101), coating case (103), import (104) and export (105), coating case (103) are through bolt fixed mounting at the upper surface of supporting seat (101), import (104) set up respectively at the both ends of coating case (103) with export (105), its characterized in that: the molding press main body (100) is also provided with: the blowing mechanism comprises a blowing component, and the blowing mechanism is arranged at one end of the interior of the paint box (103); and the protection conveying mechanism comprises an elastic connecting assembly and a rolling conveying assembly, and is arranged in the inlet (104).

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

N9657

JP2023127082 **MITSUBISHI CHEMICAL**

Priority Date: **01/03/2022**

METHOD FOR MANUFACTURING OPTICAL ELEMENT

TOPIC: To manufacture an optical element in which holograms having uniform diffraction efficiency are multiplexed and recorded. INVENTION: a method for manufacturing an optical element, the method including performing multiple recording of holograms on a medium including a recording layer containing a polymerizable compound and a photopolymerization initiator, by an exposure time schedule based on Equation (1) below.[In Formula (1), TnIs the i-th recording exposure time (msec), n is an integer of 2 or greater, A is the first-recording exposure time (msec), ΣTn-1Is T1To Tn-1And B is 2 × 10-5The dimensionless constants described above are shown.

$$T_n = A \cdot Exp\left(B\left(T_{n-1} + \sum T_{n-1}\right)\right) \qquad (1)$$

CLAIM 1. A method for manufacturing an optical element, the method comprising performing hologram multiplex recording on a medium including a recording layer containing a polymerizable compound and a photopolymerization initiator by an exposure time schedule based on Equation (1) below. [In Formula (1), TnIs the i-th recording exposure time (msec), n is an integer of 2 or greater, A is the first-recording exposure time (msec), ΣTn-1Is T1To Tn-1And B is 2 × 10-5The dimensionless constants described above are shown.]

N9659

JP2023116984 **MITSUBISHI CHEMICAL**

Priority Date: **10/02/2022**

METHOD FOR MANUFACTURING OPTICAL ELEMENT

TOPIC: To manufacture an optical element in which holograms having uniform diffraction efficiency are multiplexed and recorded. INVENTION: a method for manufacturing an optical element, the method including performing multiple recording of holograms on a medium including a recording layer containing a polymerizable compound and a photopolymerization initiator, by an exposure time schedule based on Equation (1) below.[In Formula (1), TnIs the n-th recording exposure time (msec), n is an integer from 1 to m, A is the first recording exposure time (msec), m is the total number of times of multiple recording exposures and indicates an integer of 2 or greater, and x is a constant of 0.95 or greater.

$$T_n = \frac{A}{\left(1 - \frac{n-1}{m}x\right)} \qquad (1)$$

CLAIM 1. A method for manufacturing an optical element, the method comprising performing hologram multiplex recording on a medium including a recording layer containing a polymerizable compound and a photopolymerization initiator by an exposure time schedule based on Equation (1) below. [In Formula (1), TnIs the n-th recording exposure time (msec), n is an integer from 1 to m, A is the first recording exposure time (msec), m is the total number of times of multiple recording exposures and indicates an integer of 2 or greater, and x is a constant of 0.95 or greater.]

N9677

CN116751322 **KUNMING UNIVERSITY OF SCIENCE & TECHNOLOGY**
Priority Date: **20/06/2023**

PHOTOPOLYMER MATERIAL AND PREPARATION METHOD AND APPLICATION THEREOF

The invention discloses a photopolymer material, a preparation method and application thereof, and belongs to the technical field of photopolymer. The photopolymer material comprises the following raw materials: methyl methacrylate, azobisisobutyronitrile, photoinitiator 784, N-methylpyrrolidone and graphene oxide, wherein the weight ratio of the methyl methacrylate, azobisisobutyronitrile, photoinitiator 784, N-methylpyrrolidone and graphene oxide is that of methyl methacrylate: azobisisobutyronitrile: photoinitiator 784: n-methylpyrrolidone: graphene oxide = 100wt%:1-1.2wt%:4-7wt%:3wt%:0.001-0.003wt%. The photopolymer material has the advantages of low cost, high photosensitivity and transmittance, higher refractive index modulation degree and lower shrinkage rate, and can be applied to a volume holographic optical waveguide taking a volume holographic grating as a coupling device. In addition, the material also has higher polarization sensitivity in the field of polarization holography, and has potential in the manufacture and application of polarization devices.

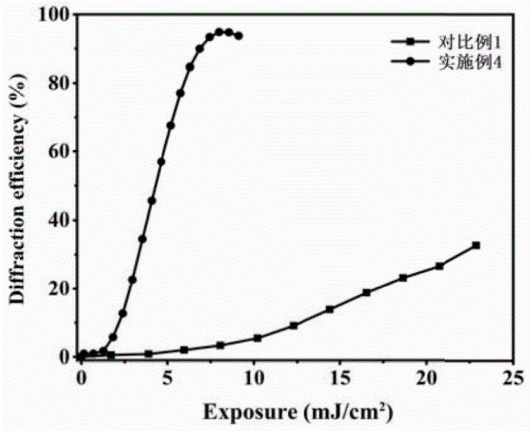
CLAIM 1. A photopolymer material characterized by comprising the following raw materials: methyl methacrylate, azobisisobutyronitrile, photoinitiator 784, N-methylpyrrolidone and graphene oxide, wherein the weight ratio of the methyl methacrylate, azobisisobutyronitrile, photoinitiator 784, N-methylpyrrolidone and graphene oxide is that of methyl methacrylate: azobisisobutyronitrile: photoinitiator 784: n-methylpyrrolidone: graphene oxide = 100wt%:1-1.2wt%:4-6wt%:3wt%:0.001-0.003wt%.

N9683

CN116730883 **TECHNICAL INSTITUTE OF PHYSICS & CHEMISTRY – CHINESE ACADEMY OF SCIENCES**
Priority Date: **09/06/2023**

ACRYLIC ESTER MONOMER WITH LOW VISCOSITY AND HIGH REFRACTIVE INDEX, PREPARATION AND APPLICATION THEREOF

The invention discloses an acrylic ester monomer with low viscosity and high refractive index, and a preparation method and application thereof. The structural general formula of the acrylic ester monomer is shown as follows, wherein R 1 、R 2 、R 3 Each independently represents an alkyl group having 1 to 20 carbon atoms, an alkylthio group having 1 to 20 carbon atoms, or a C1 to C1 carbon atoms20 alkoxy; r is R 4 Represents methyl or hydrogen; n represents an integer of 0 to 20, and m represents an integer of 1 to 20. The acrylate monomer has higher refractive index, lower viscosity and higher solubility in film-forming resin, and can be used in the preparation of a photopolymer type holographic recording medium to obtain the holographic recording medium with high sensitivity, high diffraction efficiency, high refractive index modulation degree and low haze, the diffraction efficiency is more than 90 percent, and the sensitivity is more than 0.01cm 2 With an exposure of less than 20mJ/cm 2 The haze is lower than 3%, so the prepared holographic recording medium is expected to be widely applied to the fields of high-density optical storage, holographic optical elements and the like.



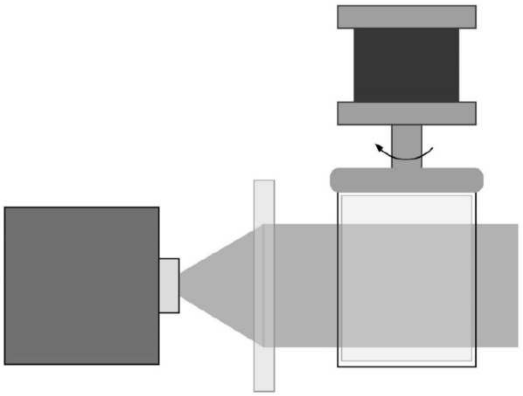
CLAIM 1. The acrylic monomer is characterized by having a structural formula as follows: wherein R is 1 ,R 2 ,R 3 Each independently represents any one of an alkyl group having 1 to 20 carbon atoms, an alkylthio group having 1 to 20 carbon atoms and an alkoxy group having 1 to 20 carbon atoms; R 4 represents methyl or hydrogen; n represents an integer of 0 to 20, and m represents an integer of 1 to 20.

N9686

CN116714241 **NINGBO MAIKE CHUO INTELLIGENT TECHNOLOGY**
Priority Date: **12/06/2023**

HOLOGRAPHIC 3D PRINTING METHOD AND DEVICE BASED ON SLICING ALGORITHM AND READABLE STORAGE MEDIUM

The application provides a holographic 3D printing method and device based on a slicing algorithm and a readable storage medium. The holographic 3D printing method based on the slicing algorithm comprises the following steps: reading a 3D file of a model to be printed and voxelizing the model to be printed according to the layer height and the resolution; converting the voxels of the model to be printed into layer data to obtain binarized images of each layer; carrying out radon transformation on the binarized image of each layer, calculating to obtain perspective effect of the binarized image under each angle, and converting the perspective effect into gray values of each layer under each angle; carrying out iterative optimization on the gray values through inverse radon transformation and a threshold function to obtain the iteratively optimized gray values of each layer under each angle; and controlling the holographic 3D printer to print the model to be printed according to the gray value of each layer after iterative optimization under each angle. The application can improve the printing precision of the holographic 3D printer.



CLAIM 1. The holographic 3D printing method based on the slicing algorithm is characterized by comprising the following steps of: reading a 3D file of a model to be printed and voxelizing the model to be printed according to the layer height and the resolution; converting the voxels of the model to be printed into layer data to obtain binarized images of each layer; carrying out radon transformation on the binarized image of each layer, calculating to obtain perspective effect of the binarized image under each angle, and converting the perspective effect into gray values of each layer under each angle; carrying out iterative optimization on the gray values through inverse radon transformation and a threshold function to obtain the iteratively optimized gray values of each layer under each angle; and controlling the holographic 3D printer to print the model to be printed according to the gray value of each layer after iterative optimization under each angle.

N9689

CN116699747 **NANCHANG VIRTUAL REALITY RESEARCH INSTITUTE**
Priority Date: **07/08/2023**

PREPARATION METHOD OF VOLUME GRATING AND VOLUME GRATING

The embodiment of the application provides a preparation method of a volume grating and the volume grating, which are characterized in that a precursor material containing an inorganic or metal element organic compound is mixed with a photosensitive monomer, the precursor material is exposed to light in an oxygen-free and moisture-free environment to prepare the holographic volume grating, and then the precursor material is subjected to the exposure under a proper condition by utilizing the activity of the precursor material, so that the precursor material at a dark place of the exposure is reacted to generate corresponding nano particles, thereby solving the technical problems of incompatibility of the pure nano particles and the photosensitive monomer and larger viscosity.

CLAIM 1. A method of fabricating a bulk grating, comprising: uniformly mixing a precursor material, a photosensitive monomer and a photoinitiator composition, spin-coating or spraying the mixture on a substrate, and exposing the substrate in an oxygen-free and moisture-free environment, wherein the precursor material is an organic compound containing inorganic or metal elements; and processing the exposed product to change the precursor material into an inorganic material or metal, thereby obtaining the bulk grating.

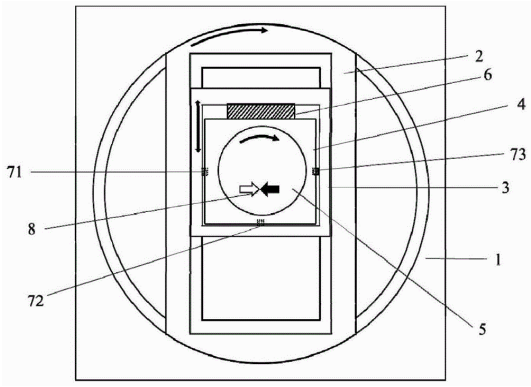
N9695

CN116665720 **GUANGDONG ZIJING INFORMATION STORAGE TECHNOLOGY**

Priority Date: **18/02/2022**

SERVO PLATFORM IN HOLOGRAPHIC OPTICAL STORAGE SYSTEM, MULTIPLEXING METHOD AND CALIBRATION METHOD

The invention discloses a servo platform, a multiplexing method and a calibration method in a holographic optical storage system, wherein the servo platform comprises an optical head, a sensor, a revolution platform, a linear translation platform, a rotation platform and a posture adjustment platform; the optical head is used for outputting read-write light and servo light; the sensor is used for detecting the attitude error of the storage medium relative to the optical head and generating a control signal; the revolution platform, the linear translation platform and the rotation platform are connected with each other and are used for placing a storage medium and driving the storage medium and the optical head to perform position transformation; the posture adjustment platform is used for supporting a platform for placing the storage medium and adjusting the posture of the storage medium relative to the optical head according to the control signal. According to the invention, shift multiplexing and cross multiplexing are realized through the position movement of the storage medium, the storage capacity of holographic optical storage is improved, and the position and the posture of the storage medium relative to the optical head are accurately corrected through the radial micro-motion platform and the vertical micro-motion platform, so that the accurate burning and reading of holograms are ensured.



CLAIM 1. A servo platform in a holographic optical storage system is applied to the holographic optical storage system to realize the adjustment of the posture of a storage medium, and comprises an optical head, a sensor, a revolution platform, a linear translation platform and a rotation platform; the optical head is used for outputting read-write light and servo light; the sensor is used for detecting the attitude error of the storage medium relative to the optical head and generating a control signal; the revolution platform, the linear translation platform and the rotation platform are connected with each other and are used for placing the storage medium and driving the storage medium and the optical head to move in position; characterized by further comprising: and the posture adjustment platform is used for supporting the platform for placing the storage medium and adjusting the position and posture of the storage medium relative to the optical head according to the control signal.

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

N9643

WO2023168511 **GLOVE SYSTEMS**

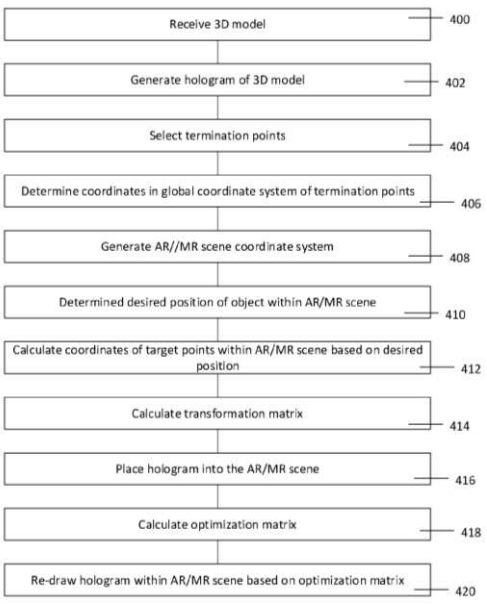
Priority Date: **09/03/2022**

METHOD AND SYSTEM FOR OVERLAYING HOLOGRAMS IN AUGMENTED REALITY/MIXED REALITY (AR/MR) APPLICATIONS

A system and method for overlaying a hologram representing an object of interest into an augmented reality/mixed reality scene including determining a set of model termination points on the object of interest and then determining a set of scene termination points relating to the set of model termination points of the object of interest in an augmented reality/mixed reality scene. A transformation matrix based on the set of model termination points and the set of scene termination points is then generated and used to map the coordinates of the object of interest into the augmented reality/mixed reality scene. An optimization matrix may also be calculated to further enhance the hologram placement.

PROCÉDÉ ET SYSTÈME DE SUPERPOSITION D'HOLOGRAMMES DANS DES APPLICATIONS DE RÉALITÉ AUGMENTÉE/ RÉALITÉ MIXTE (AR/MR)

Système et procédé de superposition d'un hologramme représentant un objet d'intérêt dans une scène de réalité augmentée/réalité mixte, consistant à déterminer un ensemble de points de terminaison de modèle sur l'objet d'intérêt puis à déterminer un ensemble de points de terminaison de scène se rapportant à l'ensemble de points de terminaison de modèle de l'objet d'intérêt dans une scène de réalité augmentée/réalité mixte. Une matrice de transformation basée sur l'ensemble de points de terminaison de modèle et l'ensemble de points de terminaison de scène est ensuite générée et utilisée pour mapper les coordonnées de l'objet d'intérêt dans la scène de réalité augmentée/réalité mixte. Une matrice d'optimisation peut également être calculée pour améliorer davantage le placement d'hologramme.



CLAIM 1. A method of coordinating placement of a hologram representing a 3D model of an object of interest in an augmented reality/mixed reality (AR/MR) scene comprising: determining a set of model termination point coordinates for a set of model termination points on the 3D model in a global coordinate system; determining a set of AR/MR scene target point coordinates for the object of interest within the AR/MR scene, the set of AR/MR scene target point coordinates corresponding to the set of termination point coordinates; calculating a transformation matrix using the set of model termination point coordinates and the set of AR/MR scene target point coordinates; applying the transformation matrix to all coordinate points on the 3D model to generate a set of hologram scene coordinates; and placing the hologram into the AR/MR scene based on the set of hologram scene coordinates.

N9645

WO2023165891 **CARL ZEISS JENA**
Priority Date: **03/03/2022**

WAVEFRONT MANIPULATOR FOR HEAD-UP DISPLAY WITH HOLOGRAPHIC ELEMENT TO CREATE A TILTED VIRTUAL IMAGE PLANE

The invention relates to a wavefront manipulator (7) for arrangement in the beam path (8) of a head-up display (10) between an imaging unit (1) and a projection surface (4). The wavefront manipulator (7) comprises a holographic assembly (3) which has at least two holographic elements (11, 12), the at least two holographic elements (11, 12) being arranged directly behind one another in the beam path (8), at least in sections, and being designed to be reflective for at least one fixed wavelength and a fixed irradiation angle range, wherein a first holographic element comprises at least one hologram which is assigned to a hologram of a second holographic element for reflection purposes. The wavefront manipulator (7) is designed for at least one fixed object plane to generate an image plane of a virtual image (6) which is tilted about a fixed tilt angle θ with respect to a plane (14) arranged perpendicular to the optical axis (13) in the region of the image plane of a virtual image (6), wherein the holographic arrangement (3) is designed for at least partial correction of at least one imaging error of a virtual image (6) generated in the tilted image plane.

MANIPULATEUR DE FRONT D'ONDE POUR AFFICHAGE TÊTE HAUTE AVEC ÉLÉMENT HOLOGRAPHIQUE POUR CRÉER UN PLAN D'IMAGE VIRTUEL INCLINÉ

L'invention concerne un manipulateur de front d'onde (7) destiné à être disposé dans le trajet de faisceau (8) d'un affichage tête haute (10) entre une unité d'imagerie (1) et une surface de projection (4). Le manipulateur de front d'onde (7) comprend un ensemble holographique (3) qui présente au moins deux éléments holographiques (11, 12), lesdits au moins deux éléments holographiques (11, 12) étant agencés directement l'un derrière l'autre dans le trajet de faisceau (8), au moins en sections, et étant conçus pour être réfléchissants pour au moins une longueur d'onde fixe et une plage d'angle d'irradiation fixe, un premier élément holographique comprenant au moins un hologramme qui est attribué à un hologramme d'un second élément holographique à des fins de réflexion. Le manipulateur de front d'onde (7) est conçu pour au moins un plan d'objet fixe pour générer un plan d'image d'une image virtuelle (6) qui est inclinée autour d'un angle d'inclinaison fixe θ par rapport à un plan (14) disposé perpendiculairement à l'axe optique (13) dans la région du plan d'image d'une image virtuelle (6), l'agencement holographique (3) étant conçu pour une correction au moins partielle d'au moins une erreur d'imagerie d'une image virtuelle (6) générée dans le plan d'image incliné.

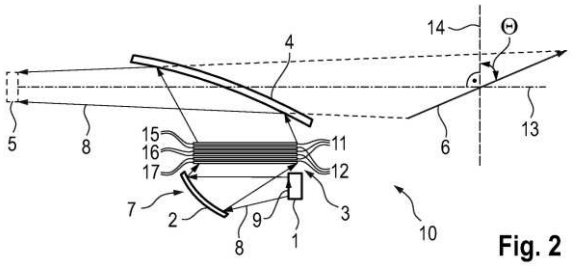


Fig. 2

CLAIM 1. Wavefront manipulator (7) for arrangement in the beam path (8) of a head-up display (10) between an imaging unit (1) and a projection surface (4), wherein the wavefront manipulator (7) comprises a holographic arrangement (3) which comprises at least two holographic elements (11, 12), wherein the at least two holographic elements (11, 12) are arranged directly one behind the other in the beam path (8) at least in sections and are designed to be selective for at least one defined wavelength and one defined irradiation angle range ref, wherein a first holographic element comprises at least one hologram, which is assigned to a hologram of a second holographic element for reflection, characterized in that the wavefront manipulator (7) for at least one defined object plane is designed to generate an image plane of a virtual image (6), which is tilted by a defined tilt angle θ with respect to a plane (14) arranged perpendicular to the optical axis (13) in the region of the image plane of a virtual image (6), wherein the holographic arrangement (3) is designed for at least partial correction of at least one imaging error of a virtual image (6) generated in the tilted image plane.

N9646

WO2023165889 **CARL ZEISS JENA**
Priority Date: **03/03/2022**

WAVEFRONT MANIPULATOR WITH TOTAL REFLECTION AND REFLECTION HOLOGRAM

The invention relates to a wavefront manipulator (1) which comprises a holographic assembly (2) and an optical element (3). The optical element (3) comprises at least one surface (5), which is totally reflective for an ascertained range of incidence angles, for emitting light waves onto the holographic assembly (2), and the holographic assembly (2) comprises at least one reflection hologram for reflecting light waves emtted onto the holographic assembly (2) by means of the optical element (3). The optical element (3) comprises a coupling device (7) for coupling light waves into the wavefront manipulator (1), said coupling device comprising at least one prism.

MANIPULATEUR DE FRONT D'ONDE À RÉFLEXION TOTALE ET HOLOGRAMME DE RÉFLEXION

L'invention concerne un manipulateur de front d'onde (1) qui comprend un ensemble holographique (2) et un élément optique (3). L'élément optique (3) comprend au moins une surface (5), qui est totalement réfléchissante pour une plage déterminée d'angles d'incidence, pour émettre des ondes lumineuses sur l'ensemble holographique (2), et l'ensemble holographique (2) comprend au moins un hologramme de réflexion pour réfléchir des ondes lumineuses émises sur l'ensemble holographique (2) au moyen de l'élément optique (3). L'élément optique (3) comprend un dispositif de couplage (7) pour coupler des ondes lumineuses dans le manipulateur de front d'onde (1), ledit dispositif de couplage comprenant au moins un prisme.

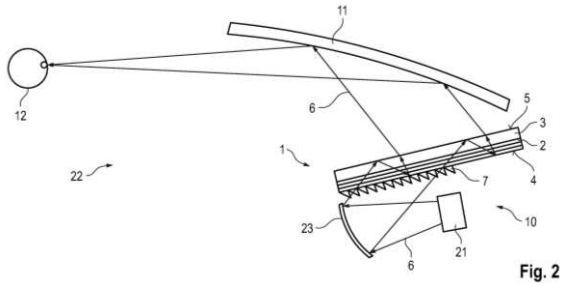


Fig. 2

CLAIM 1. Wavefront manipulator (1) comprising a holographic arrangement (2) and an optical element (3), characterized in that the optical element (3) comprises at least one surface (5) totally reflecting for a defined angle of incidence range for radiating light waves onto the holographic arrangement (2) and wherein the holographic arrangement (2) comprises at least one reflection hologram for reflecting light waves radiated onto the holographic arrangement (2) by means of the optical element (3), wherein the optical element (3) comprises a coupling-in device (7) for coupling light waves into the wavefront manipulator (1), which comprises at least one prism.

N9647

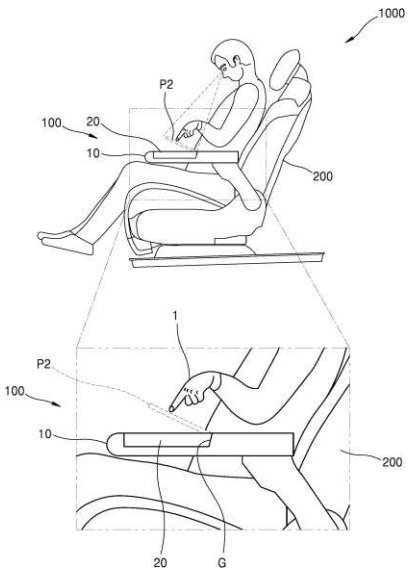
WO2023163326 **DAEWON SANUP**
Priority Date: **23/02/2022**

HOLOGRAM TOUCH SYSTEM FOR PASSENGER TRANSPORT SEAT, AND SEAT DEVICE HAVING SAME

The present invention relates to a hologram touch system for a passenger transport seat which enables input of various commands by touching a hologram virtually implemented above an armrest, and a seat device having same, comprising: an armrest body that can be installed on a seat in a passenger transportation means such as a car, a bus, a taxi, a train, an airplane, or an urban air mobility (UAM, flying car); and a hologram touch module which is installed on one side of the armrest body and is capable of implementing a virtual holographic image in the air, wherein the hologram touch module may comprise a motion sensor so as to be capable of sensing a motion of an object to be sensed touching the holographic image implemented in the air.

SYSTÈME TACTILE D'HOLOGRAMME POUR SIÈGE DE TRANSPORT DE PASSAGER ET DISPOSITIF DE SIÈGE LE COMPRENANT

La présente invention concerne un système tactile d'hologramme pour un siège de transport de passager qui permet l'entrée de diverses commandes en touchant un hologramme virtuellement mis en œuvre au-dessus d'un accoudoir et un dispositif de siège le comprenant, comprenant : un corps d'accoudoir qui peut être installé sur un siège dans un moyen de transport de passagers tel qu'une voiture, un bus, un taxi, un train, un avion ou un véhicule à mobilité aérienne urbaine (MAU, voiture volante) ; et un module tactile d'hologramme qui est installé sur un côté du corps d'accoudoir et est capable de mettre en œuvre une image holographique virtuelle dans l'air, le module tactile d'hologramme pouvant comprendre un capteur de mouvement de façon à pouvoir détecter un mouvement d'un objet à détecter touchant l'image holographique mise en œuvre dans l'air.



CLAIM 1. An armrest body that can be installed in a seat of passenger vehicles such as automobiles, buses, taxi, trains, airplanes, UAM (Urban Air mobility), and the like; and A hologram touch module installed on one surface of the armrest body and configured to implement a virtual hologram image in the air, Wherein the holographic touch module is configured to: And a motion sensing sensor configured to sense a motion of a sensing object touching the hologram image implemented in the air.

N9649

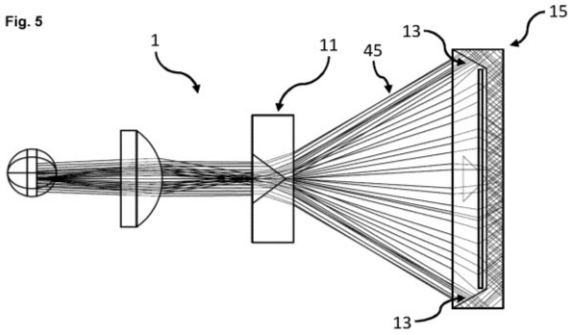
WO2023161087 **CARL ZEISS JENA**
Priority Date: **28/02/2022**

HOLOGRAPHIC LIGHTING DEVICE HAVING ELEMENTS ARRANGED ALONG A CENTRAL AXIS, AND INCOUPLING FACE IN THE EDGE REGION

The invention relates to a holographic lighting device having a central axis on which an edge-lit hologram and an illumination assembly for illuminating the hologram are arranged along the axis, which edge-lit hologram has a planar extent which is transverse to the central axis. The edge-lit hologram has a light-incoupling face at a transverse edge region of the edge-lit hologram, and the illumination assembly is designed to illuminate the light-incoupling face in order to emit illumination light into the edge-lit hologram via the light-incoupling face. The edge-lit hologram is designed to generate a holographic lighting function which is visible upon viewing the side of the edge-lit hologram that is remote from the illumination assembly. The invention further relates to an edge-lit hologram, spacers and/or an illumination assembly for an interlocking arrangement to form the holographic lighting device.

DISPOSITIF D'ÉCLAIRAGE HOLOGRAPHIQUE AYANT DES ÉLÉMENTS DISPOSÉS LE LONG D'UN AXE CENTRAL ET UNE FACE D'INJECTION DANS LA RÉGION DE BORD

L'invention concerne un dispositif d'éclairage holographique ayant un axe central sur lequel un hologramme à éclairage périphérique et un ensemble d'éclairage servant à éclairer l'hologramme sont disposés le long de l'axe, ledit hologramme à éclairage périphérique ayant une étendue plane qui est transversale à l'axe central. L'hologramme à éclairage périphérique présente une face d'injection de lumière au niveau d'une région de bord transversal de l'hologramme à éclairage périphérique, et l'ensemble d'éclairage est conçu pour éclairer la face d'injection de lumière afin d'émettre une lumière d'éclairage dans l'hologramme à éclairage périphérique par l'intermédiaire de la face d'injection de lumière. L'hologramme à éclairage périphérique est conçu pour générer une fonction d'éclairage holographique qui est visible lors du visionnement du côté de l'hologramme à éclairage périphérique qui est éloigné de l'ensemble d'éclairage. L'invention concerne en outre un hologramme à éclairage périphérique, des éléments d'espacement et/ou un ensemble d'éclairage pour un agencement imbriqué pour former le dispositif d'éclairage holographique.



CLAIM 1. Holographic lighting device (1) having a central axis (21), on which an edge-lit hologram (15) is arranged along the axis (21), flat extension and an illumination arrangement (3) for hologram illumination, wherein the edge-lit hologram (15) has a light coupling-in surface (13) at a transverse edge region (49) of the edge-lit hologram (15), wherein the edge-lit hologram (15) is configured for substantially full-area hologram illumination at an angle greater than the angle of total reflection within the edge-lit hologram (15) by illumination light radiated into the light coupling-in surface (13), wherein the edge-lit hologram (15) is configured to generate a holographic lighting function during hologram illumination, which is visible when the side (33) of the edge-lit hologram (15) remote from the illumination arrangement is viewed, wherein the illumination arrangement (3) is configured for illuminating the light coupling-in surface (13) for irradiating illumination light into the edge-lit hologram (15) through the light coupling-in surface (13).

N9650

WO2023160956 **CARL ZEISS JENA**
Priority Date: **28/02/2022**

WAVEGUIDE FOR DISPLAYING AN IMAGE, AND HOLOGRAPHIC DISPLAY HAVING SUCH A WAVEGUIDE

The invention relates to a waveguide for displaying an image, wherein: the waveguide (2) comprises a transparent base body (4) having a front face (5) and a rear face (6); the base body (4) has a coupling-in region (14) and a coupling-out region (15) which is spaced apart therefrom in a first direction, which coupling-out region has an image hologram (19) having an imprinted image; the coupling-in region (14) deflects at least some of the radiation (16) originating from a light source (3) such that the deflected part propagates as a coupled-in beam bundle (18) in the base body (4) by reflection as far as the coupling-out region (15) and impinges on the image hologram (19); the image hologram (19) deflecting at least part of the impinging beam bundle (18) in order to reconstruct the imprinted image such that the deflected part exits the base body (4) via the front face (5) or rear face (6) such that the imprinted image is perceptible for a viewer (B); the base body (4) has multiple layers, and at least one first layer (7) having a first refractive index and a second layer (9), formed on the first, having a second refractive index that is lower than the first refractive index; and the coupled-in beam bundle (18) in the first layer (7) propagates owing to internal total reflection at the boundary surface to the second layer (9).

GUIDE D'ONDES POUR L'AFFICHAGE D'UNE IMAGE ET DISPOSITIF D'AFFICHAGE HOLOGRAPHIQUE COMPORTANT CE GUIDE D'ONDES

L'invention concerne un guide d'ondes destiné à l'affichage d'une image, le guide d'ondes (2) comprenant un corps de base transparent (4) ayant une face avant (5) et une face arrière (6) ; le corps de base (4) présente une zone de couplage entrant (14) et une zone de couplage sortant (15) qui est espacée de celle-ci dans une première direction, laquelle zone de couplage sortant présente un hologramme d'image (19) comprenant une image imprimée ; la zone de couplage entrant (14) dévie au moins une partie du rayonnement (16) provenant d'une source de lumière (3) de telle sorte que la partie déviée se propage sous la forme d'un groupe de faisceaux à couplage entrant (18) dans le corps de base (4) par réflexion jusqu'à la zone de couplage sortant (15) et fasse incidence sur l'hologramme d'image (19) ; l'hologramme d'image (19) dévie au moins une partie du groupe de faisceaux incident (18) afin de reconstruire l'image imprimée de telle sorte que la partie déviée sorte du corps de base (4) par l'intermédiaire de la face avant (5) ou de la face arrière (6), de telle sorte que l'image imprimée puisse être perçue par un observateur (B) ; le corps de base (4) présente de multiples couches, et au moins une première couche (7) ayant un premier indice de réfraction et une deuxième couche (9), formée sur la première, qui a un deuxième indice de réfraction inférieur au premier indice de réfraction ; et le groupe de faisceaux à couplage entrant (18) de la première couche (7) se propage grâce à une réflexion totale interne au niveau de la surface limite de la seconde couche (9).

CLAIM 1. Waveguide for displaying an image, wherein the waveguide (2) has a transparent base body (4) with a front side (5) and a rear side (6), wherein the base body (4) has a coupling-in region (14) and a coupling-out region (15) which is spaced apart therefrom in a first direction and has an image hologram (19) with an exposed image, wherein the coupling-in region (14) deflects at least a part of radiation (16) coming from a light source (3) in such a way that the deflected part propagates as a coupled-in beam (18) in the base body (4) by reflection as far as the coupling-out region (15) and strikes the image hologram (19), wherein the image hologram (19) deflects at least one part of the incident beam (18) for reconstruction of the exposed image in such a way that the deflected part emerges from the base body (4) via the front side (5) or rear side (6) so that the exposed image is perceptible to a viewer (B), wherein the base body (4) is formed in multiple layers and comprises at least one first layer (7) with a first refractive index and a second layer (9) formed thereon with a second refractive index, which is smaller than the first refractive index, and wherein the coupled-in beam (18) propagates in the first layer (7) due to total internal reflection at the interface to the second layer (9).

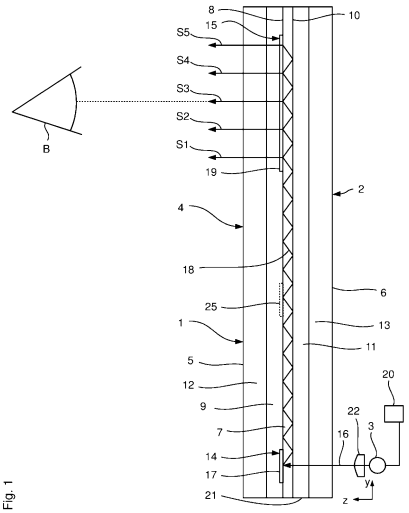


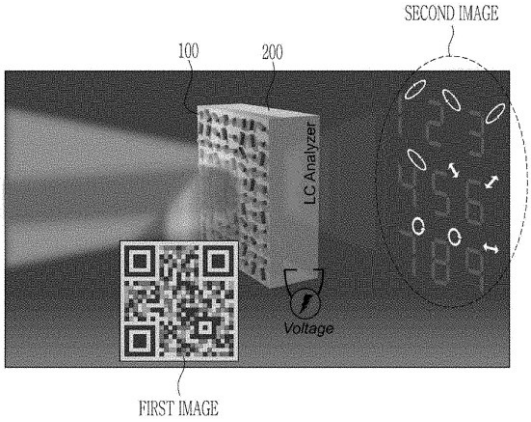
Fig. 1

N9651

US20230280694 **POSTECH RESEARCH & BUSINESS DEVELOPMENT FOUNDATION**
Priority Date: **02/03/2022**

LIGHT MODULATING DEVICE AND OPERATING METHOD THEREOF USING VOLTAGE-VARIED LC

An apparatus for creating a holographic image, comprising: a first polarizing plate; a metasurface configured to create a first holographic image by modulating a polarization state of a light beam passing through the first polarizing plate; a controller configured to supply voltage to a voltage-varied liquid crystal (LC); and the voltage-varied LC configured to create a second holographic image by modulating a polarization state of the first holographic image according to the voltage and operating method thereof are provided.



CLAIM 1. An apparatus for creating a holographic image, the apparatus comprising: a first polarizing plate; a metasurface configured to create a first holographic image by modulating a polarization state of a light beam passing through the first polarizing plate; a controller configured to supply voltage to a voltage-varied liquid crystal (LC); and the voltage-varied LC configured to create a second holographic image by modulating a polarization state of the first holographic image according to the voltage.

N9652

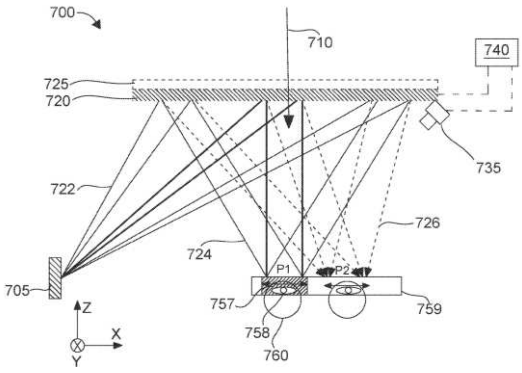
US20230280626 **META PLATFORMS TECHNOLOGIES**
Priority Date: **23/02/2022**

BLUE PHASE LIQUID CRYSTAL POLARIZATION HOLOGRAM AND DEVICE INCLUDING THE SAME

A device includes a polymer stabilized blue phase liquid crystal ("PS-BPLC") layer. The device also includes an alignment structure coupled with the PS-BPLC layer. LC molecules disposed in contact with the alignment structure are configured to have a spatially varying in-plane orientation pattern that is at least partially defined by the alignment structure. The PS-BPLC layer is configured to forwardly deflect a polarized light having a predetermined handedness, and transmit a polarized light having a handedness that is orthogonal to the predetermined handedness.

HOLOGRAMME DE POLARISATION À CRISTAUX LIQUIDES EN PHASE BLEUE ET DISPOSITIF LE COMPRENANT

Un dispositif comprend une couche de cristaux liquides à phase bleue stabilisée par un polymère ("PS-BPLC"). Le dispositif comprend également une structure d'alignement couplée à la couche PS-BPLC. Des molécules LC disposées en contact avec la structure d'alignement sont configurées pour avoir un motif d'orientation dans le plan variant dans l'espace qui est au moins partiellement défini par la structure d'alignement. La couche PS-BPLC est configurée pour dévier vers l'avant une lumière polarisée ayant une chiralité prédéterminée, et transmettre une lumière polarisée ayant une chiralité qui est orthogonale à la chiralité prédéterminée.



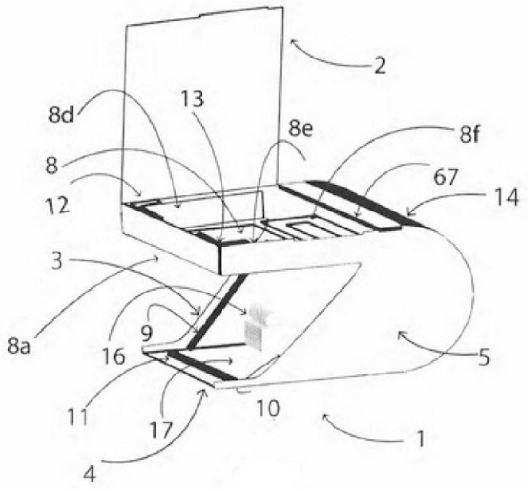
CLAIM 1. A device, comprising: a polymer stabilized blue phase liquid crystal ("PS-BPLC") layer; and an alignment structure coupled with the PS-BPLC layer, wherein LC molecules disposed in contact with the alignment structure are configured to have a spatially varying in-plane orientation pattern that is at least partially defined by the alignment structure, and wherein the PS-BPLC layer is configured to forwardly deflect a polarized light having a predetermined handedness, and transmit a polarized light having a handedness that is orthogonal to the predetermined handedness.

N9653

NL1044264 **DR MRUNAL GAWADE**
Priority Date: **17/02/2022**

PORTABLE TABLETOP 3D MEDIA PROJECTION HOLOGRAPHIC DISPLAY DEVICE

Disclosed is an implementation targeted for the consumer market with electronic 5 devices such as smartphones / tablets, a 3D media projection tabletop display (1) which may include a plurality of structural components. The structural components of the display (1) may be formed using cardboard or other suitable materials. The plurality of structural components may include a casing formed with a plurality of walls (3,4,5) and an enclosure top wall (2) for opening / closing the display hingeably 10 coupled to one of the walls in one configuration and separate in a second configuration, a cage structure (8) with mechanism to fit different sized electronic device screens that play 3D media to be projected on the inclined projection material (17) mounted below the screen, in a frame assembly, and an adjustable backlight assembly (8f). The display components may fit in a letterbox parcel size of less than 15 30 mm in thickness.

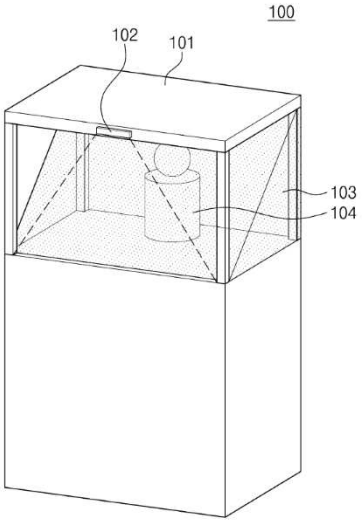


N9654

KR20230127764 **KOREA ELECTRONICS & TELECOMMUNICATIONS RESEARCH INSTITUTE**
Priority Date: **25/02/2022**

INTERACTIVE DEVICE BASED ON FLOATING HOLOGRAM AND OPERATING METHOD THEREOF

An interactive device based on a floating hologram interacting with a user is disclosed. The floating based interactive apparatus includes a display unit configured to output content based on floating holograms, a gesture recognition unit including a motion sensor, a network interface configured to communicate with an external control server, A control unit including a memory storing the content and at least one processor; and a glass unit surrounding a display, wherein the glass unit reflects the output content, and the gesture recognition unit recognizes a hand action of a user who manipulates the reflected content.



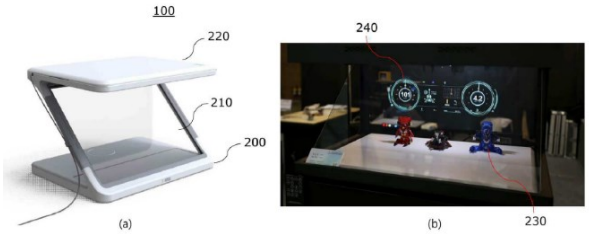
CLAIM 1. A portable electronic device comprising: a display unit configured to output content based on floating holograms; a control unit including a gesture recognition unit including a motion sensor, a network interface configured to communicate with an external control server, a memory configured to store the content, and at least one processor; And a glass unit surrounding the display, wherein the glass unit reflects the output content, and the gesture recognition unit recognizes a hand action of a user who manipulates the reflected content.

N9656

KR102573050 **TECHNET**
Priority Date: **27/01/2023**

STEREOSCOPIC IMAGE CONTENT MANUFACTURING APPARATUS FOR HOLOGRAM DEVICE AND DRIVING METHOD THEREOF

A stereoscopic image content manufacturing apparatus for a hologram device and a driving method thereof are provided. the stereoscopic image content manufacturing apparatus for a hologram device includes a communication interface unit configured to communicate with a user terminal device possessed by a purchaser of a hologram device implementing hologram content, And a controller configured to provide a web or app service for authoring, editing, or rendering hologram content in a user terminal, and to provide a custom product or custom content by predicting a demand for a product or content of the hologram device based on user experience data according to utilization of the hologram device or the hologram content.



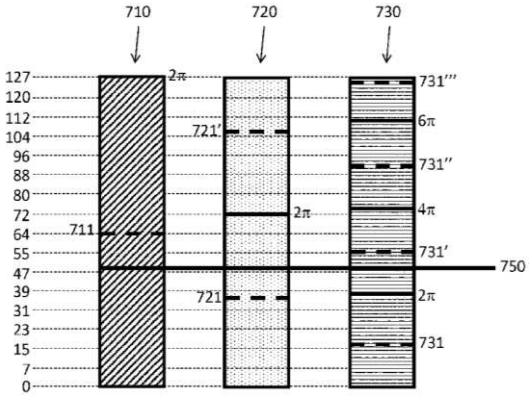
CLAIM 1. A communication system comprising: a communication interface unit configured to communicate with a user terminal device possessed by a purchaser of a hologram device implementing hologram content; and a processor configured to execute an application or an authoring tool in the user terminal device when the hologram content implemented in the hologram device is to be changed to other hologram content, Providing a service to perform replacement operations including authoring, editing, rendering of the holographic content by an interface with a user, And providing customized products or customized contents by collecting user experience data of a user experience related to a use case of the holographic device or the holographic content and analyzing the user experience data per user to predict a product or content of a designated product name or model information of the holographic device based on an analysis result, Wherein the controller performs a replacement operation of the hologram content by a user interface on a screen of the user terminal device when a first type of app having a replacement function is executed in the user terminal device, And performs a sharing operation of uploading or downloading hologram content generated by the replacement operation by communication with the user terminal device when a second type app having a sharing function is executed, wherein the control unit collects and uses, as the user experience data, data related to hologram content replaced by the user terminal device and provided directly to the hologram device, Wherein the controller adjusts pixel values including color and brightness of a stereoscopic image based on a position value of a space displayed by the hologram device when providing the hologram content replaced by the user terminal device to the hologram device and an implementation method of representing the hologram content on an image panel of the hologram device.

N9660

EP4239414 **ENVISICS**
Priority Date: **04/03/2022**

HOLOGRAM CALCULATION

A method of projecting a first image and a second image using one multi-wavelength hologram. The first image is different to the second image. The multi-wavelength hologram is arranged for illumination by light of a first wavelength to project the first image. The multi-wavelength hologram is further arranged for illumination by light of a second, shorter wavelength to project the second image.



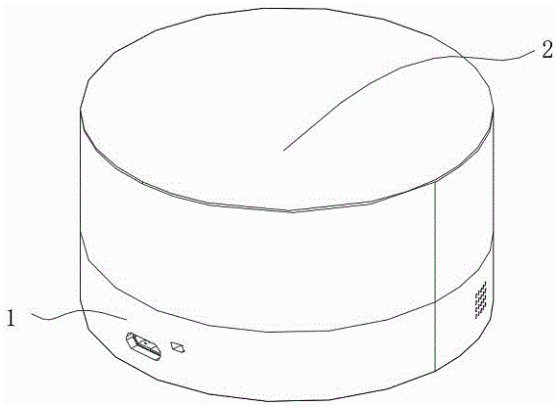
CLAIM 1. A projector arranged to project a first image and a second image using one multi-wavelength hologram, the projector comprising a display device for displaying the multi-wavelength hologram, wherein the first image is different to the second image, and wherein the multi-wavelength hologram is arranged for illumination by light of a first wavelength to project the first image and wherein the multi-wavelength hologram is further arranged for illumination by light of a second, shorter wavelength to project the second image.

N9662

CN219718336U **YIBA DAOCAO SHENZHEN TECHNOLOGY**
Priority Date: **29/03/2023**

INTELLIGENT HOLOGRAPHIC PROJECTOR

The utility model discloses an intelligent holographic projector, which relates to the field of projectors and comprises a base, wherein a holographic display screen is arranged in the base, an imaging body is movably arranged above the base, a shading reflecting sheet is fixed at the top of the imaging body, a bottom cover is movably connected to the bottom of the base, a battery is arranged between the base and the bottom cover, a control module is arranged in the base, and a microphone is fixed above the control module. The utility model is connected with the control module through the holographic display screen, images are displayed on the holographic display screen, and the bottoms of the imaging bodies are projected onto four image reflecting surfaces in the imaging bodies, so that the imaging bodies can show three-dimensional images through the outside, the effect of naked eye 3D is achieved, the control module is connected with the intelligent voice interaction electronic product Bluetooth or WiFi to achieve interconnection, and the control module sets the voice wake-up password identical to that of the intelligent voice interaction electronic product to achieve visual interaction.



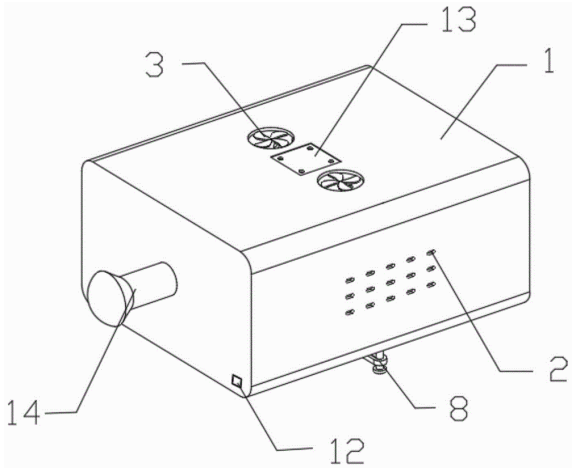
CLAIM 1. An intelligent holographic projector, includes base (1), its characterized in that: the inside of base (1) has holographic display (5), and the top movable mounting of base (1) has imaging body (2), the top of imaging body (2) is fixed with shading reflector plate (4), the bottom swing joint of base (1) has bottom (3), and installs battery (6) between base (1) and bottom (3), the inside of base (1) is provided with control module (8), the top of control module (8) is fixed with microphone (82), the inside of base (1) is provided with speaker (7), the inside of imaging body (2) is provided with imaging groove (21), and imaging groove (21) toper setting.

N9663

CN219715943U **SHENZHEN INTERGRATED GEOTECHNICAL INVESTIGATION & SURVEYING**
Priority Date: **15/04/2023**

HOLOGRAPHIC IMAGING DEVICE BASED ON BIM

The utility model discloses a BIM-based holographic imaging device, which comprises projection equipment and a shell, wherein the projection equipment is fixedly arranged in the shell, a plurality of radiating holes are formed in two opposite outer side walls of the shell, a dustproof filter screen is arranged on the inner side of the radiating holes, a pair of radiating fans are arranged at the top of the shell, a cleaning mechanism is arranged between the radiating holes and the dustproof filter screen, and comprises brush strips for cleaning dust on the dustproof filter screen and the radiating holes.



CLAIM 1. The utility model provides a holographic image device based on BIM, includes projection equipment and casing (1), its characterized in that, projection equipment is fixed to be set up in casing (1), a plurality of louvres (2) have all been seted up to two lateral walls that casing (1) are relative, louvre (2) inboard is equipped with dustproof filter screen (4), casing (1) top is equipped with a pair of radiator fan (3), be equipped with between louvre (2) and dustproof filter screen (4) and clear away mechanism, clear away mechanism including be used for carrying out brush strip (9) of clearing up dust on dustproof filter screen (4) and louvre (2), be equipped with projection lens (14) on casing (1), projection lens (14) and projection equipment fixed mounting.

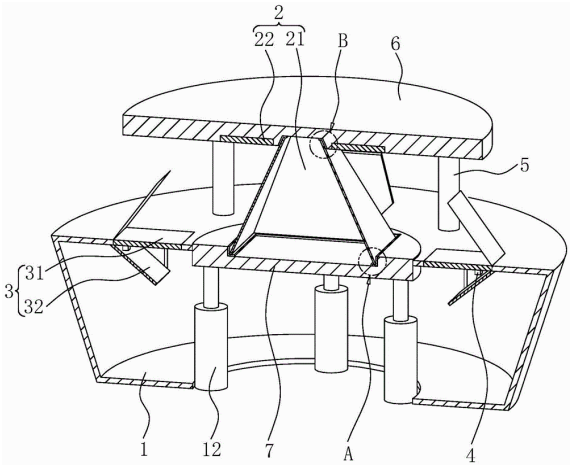
N9665

CN219696058U
Priority Date: **26/04/2023**

JIANGXI XIANGHANG TECHNOLOGY | XIANGHANG RUDONG TECHNOLOGY | XIANGHANG TECHNOLOGY

MEDIUM-FREE HOLOGRAPHIC COMBINED DEMONSTRATION EQUIPMENT

The utility model relates to the field of projection equipment and discloses a medium-free holographic combined demonstration device, which comprises a showcase, wherein a main holographic projection mechanism and an auxiliary holographic projection mechanism are arranged on the showcase, the main holographic projection mechanism comprises a projection plate and a display screen which are arranged on the showcase, the auxiliary holographic projection mechanism comprises an imaging module embedded on the showcase and a display module arranged in the showcase, the display module projects light rays towards the imaging module and forms aerial imaging above the showcase, and the display screen and the display module are electrically and mechanically connected with the inside of the showcase; an infrared sensor is arranged in the showcase, the infrared sensor directs to aerial imaging, and when a user strikes the aerial imaging, the infrared sensor transmits a strike signal into a computer and changes projection contents. The utility model can change the 3D image of the main holographic projection mechanism by adopting the auxiliary holographic projection mechanism and matching with the infrared sensor, so that the user can change the 3D image more conveniently and rapidly, and the experience of the user is improved.



CLAIM 1. The holographic combined demonstration equipment without the medium comprises a showcase (1), and is characterized in that: the display cabinet (1) is provided with a master holographic projection mechanism (2) and a slave holographic projection mechanism (3) with the same projection content, the master holographic projection mechanism (2) comprises a display screen (22) and a plurality of projection plates (21) which are arranged on the display cabinet (1), the slave holographic projection mechanism (3) comprises an imaging module (31) embedded on the display cabinet (1) and a display module (32) arranged in the display cabinet (1), the display module (32) projects light towards the imaging module (31) and forms aerial imaging above the display cabinet (1), and the display screen (22) and the display module (32) are electrically connected with the inside of the display cabinet (1); an infrared sensor (4) which is electrically connected with the computer is arranged in the showcase (1), the infrared sensor (4) directs to aerial imaging, and when a user strikes the aerial imaging, the infrared sensor (4) transmits a strike signal into a computer and changes the projection contents of the main holographic projection mechanism (2) and the auxiliary holographic projection mechanism (3) simultaneously.

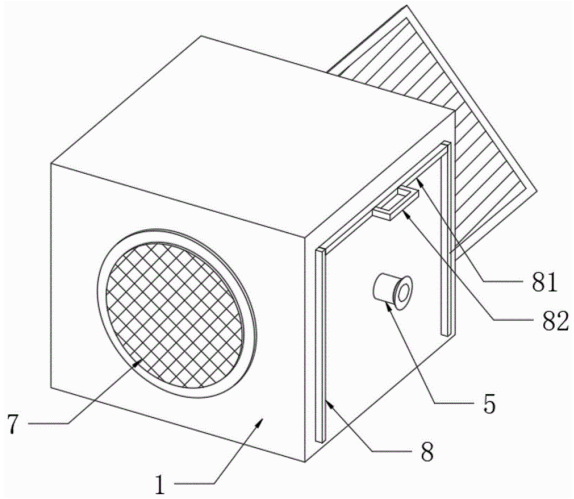
N9666

CN219676457U **HARBIN SANSHANG INFORMATION**

Priority Date: **10/05/2023**

INTERACTIVE DIGITAL HOLOGRAPHIC IMAGE DEVICE

The utility model discloses an interactive digital holographic image device, which belongs to the technical field of holographic images, and comprises a cabinet body, wherein one side of the cabinet body is fixedly connected with a first backlight display screen, the inner bottom end of the cabinet body is fixedly connected with a second backlight display screen, the inner wall of the cabinet body is fixedly connected with a nano holographic glass screen, the nano holographic glass screen is positioned between the first backlight display screen and the second backlight display screen, one side of the cabinet body is fixedly connected with an electrostatic dust removal fan, the other side of the cabinet body is fixedly connected with an exhaust fan, both sides of the inner wall of the cabinet body are slidingly connected with a light shielding plate, the pair of light shielding plates respectively correspond to the electrostatic dust removal fan and the exhaust fan, and one side of the cabinet body is penetrated and fixedly connected with an observation cylinder, so that dust adsorbed by static electricity on the first backlight display screen and the second backlight display screen can be cleaned quickly, and the projection quality and the viewing effect of personnel are prevented from being seriously influenced.



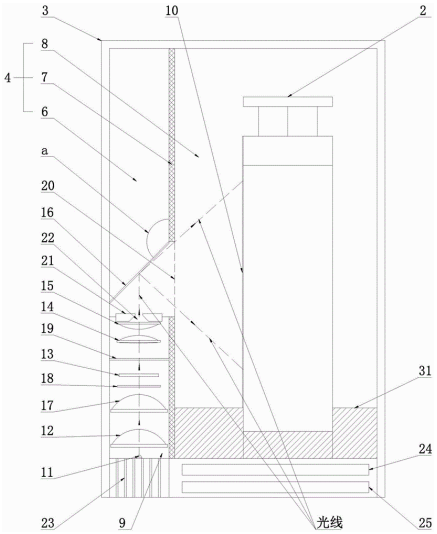
CLAIM 1. An interactive digital holographic imaging device, comprising a cabinet body (1), characterized in that: one side fixedly connected with of the cabinet body (1) is in a poor light the display screen one (2), the inner bottom fixedly connected with of the cabinet body (1) is in a poor light the display screen two (3), the inner wall fixedly connected with nanometer holographic glass screen (4) of the cabinet body (1), nanometer holographic glass screen (4) are located between display screen one (2) and the display screen two (3) in a poor light, one side fixedly connected with electrostatic precipitator fan (6) of the cabinet body (1), opposite side fixedly connected with air discharge fan (7) of the cabinet body (1), equal sliding connection in inner wall both sides of the cabinet body (1) has light screen (8), a pair of light screen (8) originally do not correspond with electrostatic precipitator fan (6) and air discharge fan (7), one side of the cabinet body (1) runs through and fixedly connected with observes section of thick bamboo (5).

N9667

CN219668767U **SU HAIFENG**
Priority Date: **23/09/2022**

BOTTLE PACKING CARTON BASED ON HOLOGRAPHIC PROJECTION

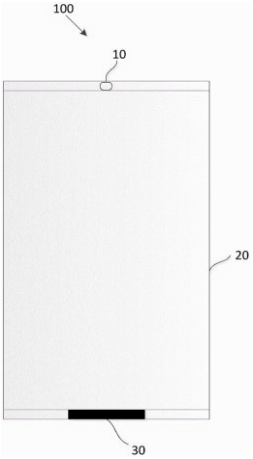
The utility model discloses a bottle packaging box based on holographic projection, which comprises a box body and a bottle, wherein the box body comprises a box shell, a box inner cavity and a box cover, the box cover is arranged at an opening at one side of the box shell, one side of the box cover is connected with one side of the box shell, the box cover and the box shell form a box inner cavity after being closed, the box inner cavity comprises a projection assembly cavity, a partition plate and a bottle placing cavity, the partition plate is arranged between the projection assembly cavity and the bottle placing cavity, the bottle is arranged in the bottle placing cavity, the projection assembly cavity is internally provided with a projection assembly box, one side surface of the partition plate is connected with one side outer wall of the projection assembly box, the outer wall of the bottle body is provided with a holographic projection film, and the holographic projection film is arranged at one side close to the partition plate. The utility model realizes the purpose of holographic projection by matching the bottle and the packaging box, simplifies the operation flow, ensures that the bottle and the packaging box have collection values, reduces the waste of resources, can customize projection content individually, and is suitable for different scenes and consumers.



CLAIM 1. The utility model provides a bottle packing carton based on holographic projection, including box body (1) and bottle (2), a serial communication port, box body (1) includes box shell (3), box inner chamber (4) and lid (5), one side opening part of box shell (3) is arranged in to lid (5), one side of lid (5) is connected with one side of box shell (3), form box inner chamber (4) after lid (5) and box shell (3) are closed, box inner chamber (4) include projection subassembly chamber (6), baffle (7) and bottle place chamber (8), baffle (7) are arranged in between projection subassembly chamber (6) and bottle place chamber (8), bottle (2) are arranged in bottle place chamber (8), be provided with projection subassembly box (9) in projection subassembly chamber (6), one side of baffle (7) is connected with one side outer wall of projection subassembly box (9), bottle body outer wall is provided with holographic projection membrane (10), holographic projection membrane (10) are arranged in one side near baffle (7); the projection assembly box (9) is internally provided with a light source (11), an A convex lens (12), a transparent display screen (13), a B convex lens (14), a C convex lens (15) and a reflecting lens (16) from bottom to top, the reflecting surface of the reflecting lens (16) is far away from the convex surface of the C convex lens (15), the convex surface of the B convex lens (14) and the convex surface of the C convex lens (15) are oppositely arranged, an included angle a is arranged between one surface of the reflecting lens (16) and the partition plate (7), and the included angle a is 128-142 degrees.

N9668

CN219609987U **SHENZHEN SUPER SMART AI TECHNOLOGY**
Priority Date: **07/03/2023**



HOLOGRAPHIC SHOWCASE

The utility model provides a holographic display cabinet which is suitable for 3D picture display. The intelligent shooting device comprises a cabinet body, shooting equipment and a main board, wherein the shooting equipment is in communication connection with the main board, the main board is arranged on the cabinet body, a transparent display screen is arranged on the cabinet body, a space is arranged on the cabinet body, and the space penetrates through the display screen; the display screen comprises a plurality of display units; the shooting equipment is used for acquiring images; the main board is used for receiving the image acquired by the shooting equipment and receiving one or more paths of images transmitted by the external equipment and displaying the images through the corresponding display units, so that the images displayed by the display units are visually displayed in the space and the 3D display effect is displayed. The utility model effectively solves the problems of heavy shooting system and single use scene of the holographic display cabinet.

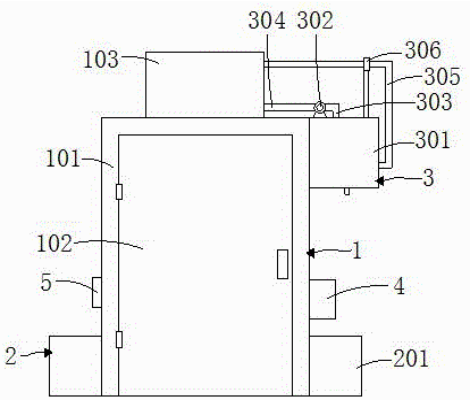
CLAIM 1. The holographic display cabinet is characterized by comprising a cabinet body, shooting equipment and a main board, wherein the shooting equipment is in communication connection with the main board, the main board is arranged on the cabinet body, a transparent display screen is arranged on the cabinet body, a space is arranged on the cabinet body, and the space penetrates through the display screen; the display screen comprises a plurality of display units; the shooting equipment is used for acquiring images; the main board is used for receiving the image acquired by the shooting equipment and receiving one or more paths of images transmitted by the external equipment and displaying the images through the corresponding display units, so that the images displayed by the display units are visually displayed in the space and the 3D display effect is displayed.

N9669

CN219590654U **QIN QIANG**
Priority Date: **16/12/2022**

HOLOGRAPHIC PROJECTION IMAGING EQUIPMENT CONVENIENT TO CARRY

The utility model discloses holographic projection imaging equipment convenient to carry, which comprises a projection mechanism, wherein the projection mechanism comprises a projection box, a projector body is fixedly arranged at the top of the projection box, a projection head is arranged at the bottom of the projector body, moving mechanisms are arranged around the projection box, the moving mechanisms comprise a base box, the base box is fixedly connected with the projection box, an electric push rod is fixedly arranged at the top of an inner cavity of the base box, a transverse plate is fixedly arranged at the output end of the electric push rod, and universal wheels are arranged at the bottom of the transverse plate. The utility model ensures the normal work of the holographic projection imaging equipment by arranging the projection mechanism, can radiate heat of the projector body by arranging the refrigeration mechanism, and is convenient for the movement of the device by arranging the movement mechanism, thereby being convenient for carrying and solving the problems of inconvenient movement and inconvenient carrying of the holographic projection equipment in the prior art.



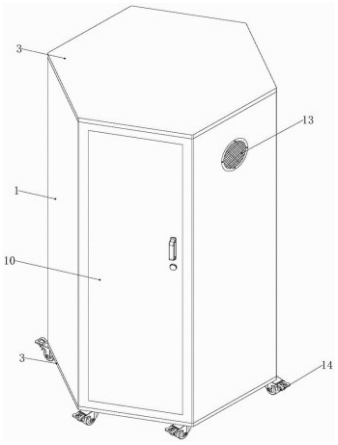
CLAIM 1. Holographic projection imaging equipment convenient to carry, comprising a projection mechanism (1), and being characterized in that: the utility model provides a projector, including projection mechanism (1), projection mechanism (101), the top fixed mounting of projection mechanism (101) has projector body (103), the bottom of projector body (103) is provided with projection head (104), all be provided with mobile mechanism (2) around projection mechanism (101), mobile mechanism (2) are base case (201) and projection mechanism (101) fixed connection, the top fixed mounting of base case (201) inner chamber has electric putter (202), the output fixed mounting of electric putter (202) has diaphragm (203), the bottom of diaphragm (203) is provided with universal wheel (204), the right side of projection mechanism (101) is provided with refrigeration mechanism (3), refrigeration mechanism (3) are provided with refrigeration case (301), the top fixed mounting of refrigeration case (301) has fan (302), the output intercommunication of fan (302) has second pipeline (304), and the other end and projector body (103) fixed connection of second pipeline (304), the output end of fan (302) has first pipeline (308), the other end (308) has first pipeline (308), the other end of the third pipeline (305) is communicated with the projector body (103), and a semiconductor refrigerator (307) is arranged at the bottom of the inner cavity of the refrigeration box (301).

N9670

CN219587289U **NANJING LOVE & TOUR SCIENCE & TECHNOLOGY**

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

HOLOGRAPHIC PROJECTION FITTING ROOM



The utility model relates to the technical field of fitting rooms, in particular to a holographic projection fitting room which comprises a shell, a bottom cover and a top cover, wherein the bottom surface of the shell is fixedly connected with the bottom cover, the top surface of the shell is fixedly connected with the top cover, a plurality of cameras are mounted on the inner wall of the shell, a mounting rod is fixedly connected with the center of the bottom surface of the top cover, a holographic projector is mounted at the bottom end of the mounting rod, the cameras are electrically connected with the holographic projector, and a projection plate matched with the holographic projector is mounted on the upper part of the inner wall of the shell. This kind of holographic projection fitting room shoots through the image data of camera to consumer's back and side to give holographic projector with image data transfer, holographic projector is with image projection to the projection board on, the consumer can learn the complete effect of fitting of clothes through the image on the projection board, helps improving the experience of consumer's use fitting room through the music player simultaneously.

CLAIM 1. The utility model provides a holographic projection fitting room, includes casing (1), bottom (2) and top cap (3), bottom surface fixed connection bottom (2) of casing (1), top surface fixed connection top cap (3) of casing (1), a serial communication port, install a plurality of cameras (4) on the inner wall of casing (1), bottom surface center department fixedly connected with installation pole (5) of top cap (3), holographic projector (6) are installed to the bottom of installation pole (5), camera (4) with holographic projector (6) electric connection, projection board (7) that use with holographic projector (6) cooperation are installed on the inner wall upper portion of casing (1).

N9671

CN116781836 **WINSEETY INTELLIGENT DIGIT TECHNOLOGY**

Priority Date: **22/08/2023**

HOLOGRAPHIC REMOTE TEACHING METHOD AND SYSTEM

The invention relates to a holographic remote teaching method and a holographic remote teaching system. The method comprises the following steps: and collecting historical data and training each edge server, processing data of each learner by each edge server so as to generate personalized local model parameters, uploading the local model parameters to a cloud server, obtaining global model parameters through aggregation and optimization, continuing to optimize each edge server according to the global model parameters, inputting received real-time teacher feature vectors into a trained holographic image model for forward propagation, and generating real-time teacher holographic image data. The method and the system are equivalent to integrating diversified data information into the global model by aggregating the model parameters of a plurality of edge servers, so that the obtained holographic image model can learn from richer and diversified data, adapt to different teaching scenes better, eliminate unstable influence of local model parameters of individual edge servers and enhance stability.

CLAIM 1. The holographic remote teaching method is characterized by comprising the following steps: collecting a large number of samples containing historical holographic interactive teaching data and generating a training set, wherein the holographic interactive teaching data of each sample comprises teacher 3D scanning data of a collection end and teacher holographic image data correspondingly presented at a reduction end; training the edge servers of each restoring end according to the historical teacher 3D scanning data and the historical teacher holographic image data of each sample of the training set to obtain the local model parameters of each trained edge server, and sending the local model parameters to the cloud server, wherein one edge server is deployed near each restoring end; The cloud server aggregates and optimizes the local model parameters of each edge server to obtain global model parameters, and sends the global model parameters to the edge servers of each restoring end; optimizing local model parameters of each edge server according to the global model parameters; the steps are repeatedly executed: uploading local model parameters to a cloud server by an edge server, carrying out model parameter aggregation optimization by the cloud server to obtain global model parameters, optimizing and updating the local model parameters of the edge server according to the global model parameters until the global model parameters tend to be stable, so as to obtain an optimized global model, and setting the optimized global model as a holographic image model; during teaching, a teacher is scanned and shot in real time through 3D scanning equipment at an acquisition end to generate real-time 3D scanning data; performing feature extraction on specific key points of a teacher in the real-time 3D scanning data to generate a real-time teacher feature vector, and encrypting and uploading the real-time teacher feature vector to a cloud; generating a real-time teacher holographic image according to the real-time teacher feature vector and through a holographic image model of the cloud server, packaging real-time teacher holographic image data into data packets, and sending the data packets to each restoring end so as to display the teacher holographic image to a learner in real time.

N9678

CN116743983 **GUIZHOU BROADCAST & TV INFORMATION NETWORK**
Priority Date: **26/04/2023**

IMMERSIVE HOLOGRAPHIC ENTITY SPECIAL-SHAPED PROJECTION SYSTEM

The invention discloses an immersive holographic real object special-shaped projection system which is arranged in a performance place, wherein the performance place comprises a spectator area, and a special-shaped projection display area is arranged in front of the spectator area. Through this technique, the user can freely move between real and virtual objects, view, feel, interact, and dynamically alter these objects.

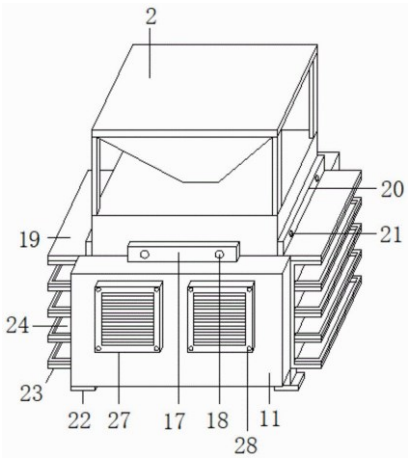
CLAIM 1. An immersive holographic object shaped projection system for placement in a performance venue comprising a spectator area, wherein: the special-shaped projection display area is further arranged in front of the audience area, and comprises: the device comprises an image holographic projection device, a panoramic sound device, a motion capture tracking device, a somatosensory interaction device and a physical object manufacturing device; the image holographic projection device comprises a plurality of 3D holographic projection devices, a camera device and a video processing device, wherein the 3D holographic projection devices are circumferentially distributed along the special-shaped projection display area, the camera device is used for collecting images and projecting the images to the special-shaped projection display area through the 3D holographic projection devices, and the video processing device is used for manufacturing virtual scenes and mapping the virtual scenes to actual projections through the projection devices; the panoramic sound device comprises sound amplifying equipment and audio playing equipment which are arranged on the back or around the special-shaped projection display area; the motion capture tracking device comprises a motion capture camera arranged around the audience area, wherein the motion capture camera is used for capturing the position information and the motion information of a user, generating a corresponding spatial position signal and transmitting the motion signal to the video processing equipment; the somatosensory interaction device comprises interaction equipment which is arranged in a spectator area and can move freely and interact; the object making device comprises 3D printing equipment and is used for converting the design drawing into an actual object to make objects or projection surfaces with irregular shapes.

N9682

CN116736613 **TAICANG GUODA METAL PRODUCTS**
Priority Date: **04/05/2023**

HOLOGRAPHIC PROJECTION CABINET AND PROJECTION METHOD

The invention discloses a holographic projection cabinet, which comprises a mounting plate and a projector, wherein the projector is arranged in the middle of the top of the mounting plate, supporting rods are arranged at four corners of the bottom of the mounting plate, a motor box is arranged at four corners of the top of the mounting plate, a motor is arranged in the motor box, the output end of the top of the motor is connected with a screw rod, and the top of the motor box is provided with a lifting column.



CLAIM 1. The utility model provides a holographic projection cabinet, includes mounting panel (1) and projector (2), a serial communication port, projector (2) set up in the middle of mounting panel (1) top, mounting panel (1) bottom four corners is provided with bracing piece (3), mounting panel (1) top four corners is provided with motor case (4), be provided with motor (5) in motor case (4), the output at motor (5) top is connected with screw rod (6), motor case (4) top is provided with lift post (7), screw hole (8) have been seted up in the middle of lift post (7) bottom, screw rod (6) top threaded connection is in screw hole (8), lift post (7) are connected with projector (2), cavity (9) have been seted up to mounting panel (1) front side, be provided with controller (10) in cavity (9), be provided with equipment board (11) in the front and back symmetry, one side bilateral symmetry that equipment board (11) are close to projector (2) has first party (12), heat conduction groove (12) are equipped with in the side symmetry board (13) and the side of laminating, side board (13) are equipped with in the heat conduction groove (13), and second square groove (14) are linked together with first square groove (12), one side equidistance that heat conduction board (13) and projector (2) are on the back is provided with fin (15), fin (15) are in second square groove (14), third square groove (29) have been seted up to one side bilateral symmetry that equipment board (11) and projector (2) are on the back, just third square groove (29) are linked together with second square groove (14), fit in third square groove (29) is provided with fan (16), just fan (16) are connected with equipment board (11), leave the clearance between fan (16) and fin (15), equipment board (11) top is provided with second fixed plate (17), just second fixed plate (17) are laminated with projector (2), second fixed plate (18) are provided with to one side bilateral symmetry that second fixed plate (17) are on the back with projector (2), just tail end fixed plate (18) are connected with projector (2) screw thread.

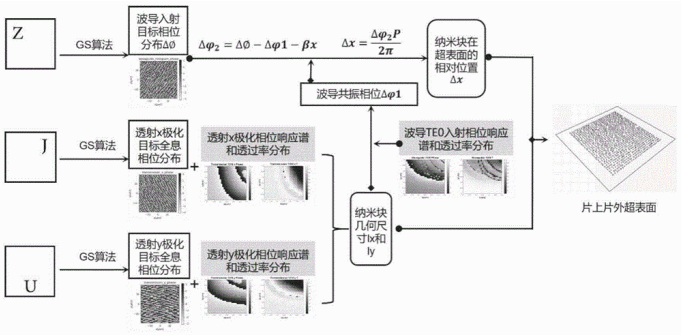
N9687

CN116699956 **ZHEJIANG UNIVERSITY**

Priority Date: **29/05/2023**

METHOD FOR DESIGNING HOLOGRAPHIC SUPER SURFACE BY ON-CHIP AND FREE SPACE MULTIPLEXING

The invention discloses a method for designing a holographic super surface by on-chip and free space multiplexing, which comprises the following steps: designing a super-surface structure; calculating resonance phase response distribution and transmittance distribution of the silicon nano block in the super surface under the on-chip input light source and the free space input light source; different holographic patterns are designed and input into a GS algorithm to obtain the phase distribution of the super-surface corresponding to the holographic image, and the phase distribution of 3 super-surfaces is generated; and 3) determining the geometric dimensions and the relative positions of all the silicon nano blocks on the super surface according to the resonance phase response distribution, the transmittance distribution and the phase distribution of the super surface obtained in the step 3), and determining the structures of the holographic super surface multiplexed on the chip and free space, thereby completing the design. The invention can solve the problem of limited application of the on-chip super surface, and provides a new super surface holographic display multiplexing thought, and three-channel holographic multiplexing under the same wavelength can be realized by combining the detour phase and resonance phase principles.



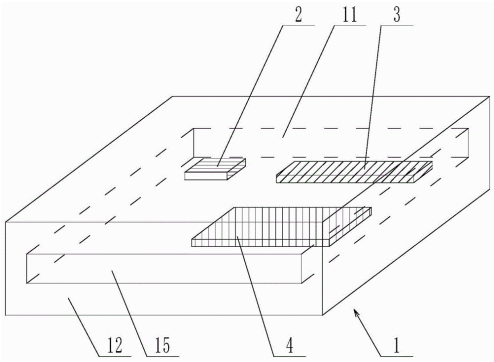
CLAIM 1. A method of designing an on-chip and free-space multiplexed holographic super surface, comprising the steps of: 1) Designing a super-surface structure; 2) Calculating resonance phase response distribution and transmittance distribution of the silicon nano block in the super surface under the on-chip input light source and the free space input light source; 3) Designing different holographic patterns, inputting the different holographic patterns into a GS algorithm, obtaining the phase distribution of the super-surface corresponding to the holographic image, and generating the phase distribution of 3 super-surfaces; 4) And determining the geometric dimensions and the relative positions of all the silicon nano blocks on the super surface according to the resonance phase response distribution and the transmittance distribution obtained in the step 2) and the phase distribution of the super surface obtained in the step 3), and determining the structures of the holographic super surface multiplexed on the chip and the free space, thereby completing the design.

N9688

CN116699759 **JIANGXI LIANHAO PHOTOELECTRIC**

Priority Date: **29/06/2023**

HOLOGRAPHIC OPTICAL WAVEGUIDE STRUCTURE WITH TWO-DIMENSIONAL PUPIL EXPANSION AND MANUFACTURING METHOD THEREOF



The application relates to the technical field of projection equipment, in particular to a two-dimensional pupil-expanding holographic optical waveguide structure and a manufacturing method thereof. The holographic optical waveguide structure comprises a liquid crystal empty box, a coupling-in grating, a turning grating and a coupling-out grating, wherein a containing cavity is arranged in the liquid crystal empty box, and the coupling-in grating, the turning grating and the coupling-out grating are arranged in the containing cavity. The optical waveguide structure of the application protects the coupling-in grating, the turning grating and the coupling-out grating through the liquid crystal empty box, has smaller overall thickness, does not need to additionally glue a waveguide sheet, can effectively reduce the weight, the volume and the thickness of the whole optical waveguide structure, and is beneficial to realizing light weight, miniaturization and light weight; according to the manufacturing method, the liquid crystal material is injected into the accommodating cavity of the liquid crystal empty box, so that the manufacturing of the coupling-in grating, the turning grating and the coupling-out grating is realized, the process of attaching the grating is omitted, the manufacturing process is simplified, the cover plate is not required to be additionally added to protect the grating, and the components are saved.

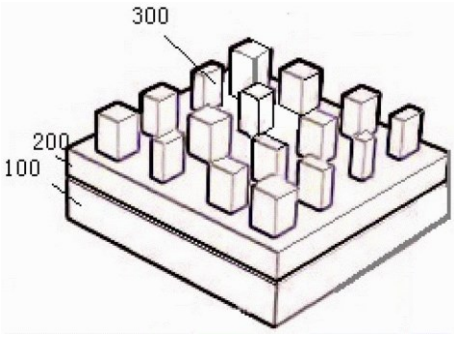
CLAIM 1. The utility model provides a holographic optical waveguide structure of two-dimensional expansion pupil for expand light beam, its characterized in that includes liquid crystal empty box (1), coupling-in grating (2), turn grating (3) and coupling-out grating (4), be provided with in liquid crystal empty box (1) and hold chamber (11), coupling-in grating (2), turn grating (3) and coupling-out grating (4) set up hold chamber (11), the light beam passes through in the z-axis direction the downside of liquid crystal empty box (1) is incident on coupling-in grating (2) takes place the diffraction to take place in the mode of taking place total reflection between downside and the upside of liquid crystal empty box (1) and continue to propagate along x-axis direction, and pass through turn grating (3) accomplish the light beam expansion of x-axis direction, simultaneously when light beam reaches a plurality of positions of turn grating (3) will take place to turn to propagate to coupling-out grating (4) along the y-axis direction, accomplish the light beam expansion of y-axis direction through coupling-out grating (4) and accomplish the coupling-out pupil on coupling-out grating (4).

N9690

CN116699733 **SUZHOU LANGCHAO INTELLIGENT TECHNOLOGY**

Priority Date: **07/06/2023**

MAGNETO-OPTICAL SUPER-SURFACE DEVICE AND HOLOGRAPHIC DISPLAY SIMULATION METHOD AND DEVICE THEREOF



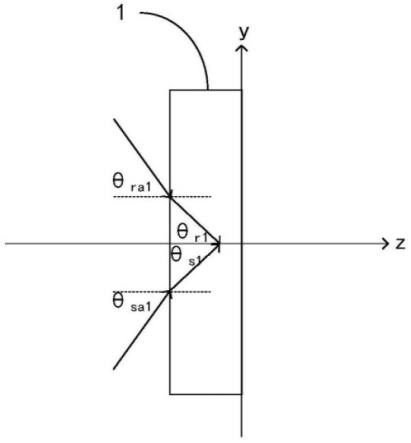
The invention provides a magneto-optical super-surface device and a holographic display simulation method and a device thereof, wherein the magneto-optical super-surface device comprises: a substrate; the medium magneto-optical layer is arranged on the substrate; the plurality of nano antennas are arranged on the medium magneto-optical layer; each nano antenna is used for modulating the amplitude and the phase of transmitted light according to a preset size, and the medium magneto-optical layer is used for modulating the rotation angle of the polarization plane of the transmitted light. The magneto-optical layer formed by the magneto-optical material is additionally arranged between the nano antenna and the substrate, so that the magneto-optical super-surface device has the asymmetric light transmission characteristic, further can be used for realizing asymmetric holographic display, and has the advantages of simple structure and low processing technology difficulty.

CLAIM 1. A magneto-optical ultra-surface device, comprising: a substrate; the medium magneto-optical layer is arranged on the substrate; and the plurality of nano antennas are arranged on the medium magneto-optical layer; each nano antenna is used for modulating the amplitude and the phase of transmitted light according to a preset size, and the medium magneto-optical layer is used for modulating the rotation angle of the polarization plane of the transmitted light.

N9692

CN116679371 **SHENZHEN LOCHN OPTICS HI TECHNOLOGY**
Priority Date: **15/05/2023**

HOLOGRAPHIC OPTICAL WAVEGUIDE, MANUFACTURING METHOD THEREOF AND DISPLAY DEVICE



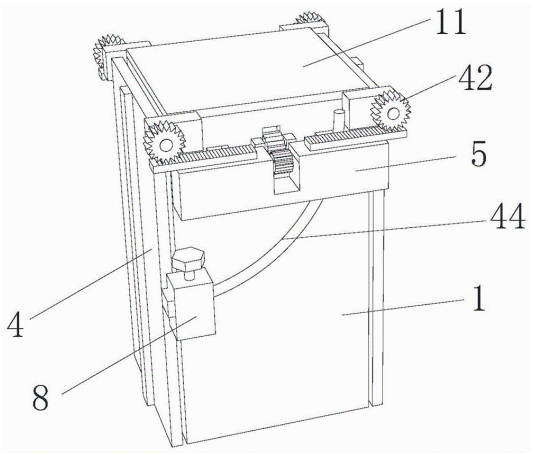
The invention provides a holographic optical waveguide, a manufacturing method thereof and display equipment, wherein the method comprises the steps of obtaining non-total reflection exposure parameters; exposing the first photosensitive material and the second photosensitive material according to the non-total reflection exposure parameters to obtain a coupling-in volume holographic grating and a coupling-out volume holographic grating; determining the period of the turning surface grating; exposing the third photosensitive material according to the period of the turning surface grating to obtain the turning surface grating; and attaching the coupling-in volume holographic grating, the turning surface grating and the coupling-out volume holographic grating on the waveguide substrate to obtain the holographic optical waveguide. In the manufacturing method, the coupling-in volume holographic grating and the coupling-out volume holographic grating are manufactured by utilizing non-total reflection exposure parameters, the turning surface grating is manufactured by utilizing the period of the turning surface grating, the coupling prism is not required to be used for exposure in the manufacturing process for manufacturing the grating, the complexity of an optical path and the manufacturing difficulty are reduced, and the method is favorable for the automatic production and manufacturing of the large-breadth two-dimensional pupil-expanding volume holographic optical waveguide.

CLAIM 1. A method of fabricating a holographic optical waveguide, comprising: acquiring non-total reflection exposure parameters; exposing the first photosensitive material according to the non-total reflection exposure parameters to obtain a coupling-in volume holographic grating; exposing the second photosensitive material according to the non-total reflection exposure parameters to obtain a coupling-out volume holographic grating; Determining the period of the turning surface grating; exposing a third photosensitive material according to the period of the turning surface grating to obtain the turning surface grating; and attaching the coupling-in volume holographic grating, the turning surface grating and the coupling-out volume holographic grating on a waveguide substrate to obtain the holographic optical waveguide.

N9693

CN116677868 **CHANGSHA NORMAL UNIVERSITY**
Priority Date: **05/06/2023**

HOLOGRAPHIC THREE-DIMENSIONAL DISPLAY DEVICE FOR PLANAR DESIGN



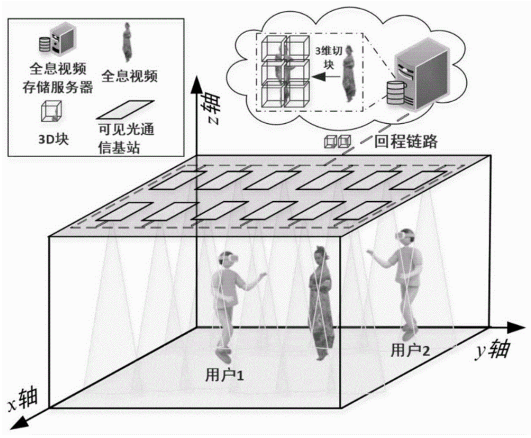
The invention relates to the technical field of holographic display, in particular to a holographic three-dimensional display device for planar design, which comprises a protective shell, a supporting support plate and a holographic projection equipment body, wherein a protective cover plate is movably arranged at the upper end of the protective shell, an air cylinder is fixedly arranged on the bottom surface of the inner wall of the protective shell, the supporting support plate is arranged in the protective shell, the upper end of an air cylinder telescopic rod is fixedly connected with the middle part of the bottom end of the supporting support plate, and a connecting base is fixedly arranged at the bottom end of the holographic projection equipment body. According to the invention, the supporting support plate and the holographic projection equipment body are driven to move downwards through the telescopic rod, so that the holographic projection equipment body moves into the protective shell, the holographic projection equipment body can be stored, the holographic projection equipment body is in a sealed space, impurities such as dust are prevented from adhering to the holographic projection equipment body to influence the definition of object display, and the holographic projection equipment body is protected.

N9694

CN116668746 **CHONGQING UNIVERSITY**
Priority Date: **15/05/2023**

HOLOGRAPHIC VIDEO COOPERATIVE TRANSMISSION METHOD BASED ON VISIBLE LIGHT COMMUNICATION

The invention relates to a holographic video cooperative transmission method based on visible light communication, and belongs to the technical field of optical communication and holographic video. The method comprises the following steps: s1: constructing a holographic video cooperative transmission system based on visible light communication; s2: under the constraint conditions of code rate selection, beam forming and channel capacity, constructing an optimization problem of joint optimization code rate selection variable and beam forming variable, and maximizing the user experience quality of the holographic video cooperative transmission service; s3: relaxing the integer variable, namely the code rate selection variable, into a continuous variable, so that the problem is converted into an optimized problem after relaxation; s4: aiming at the relaxed optimization problem, an alternating optimization iterative algorithm is adopted to obtain a low-complexity continuous solution; s5: and (3) based on the continuous solution obtained in the step (S4), adopting rounding operation to obtain the joint code rate selection and beam forming method for the holographic video cooperative transmission system. The invention can improve the user experience quality performance of the holographic video collaborative transmission system.



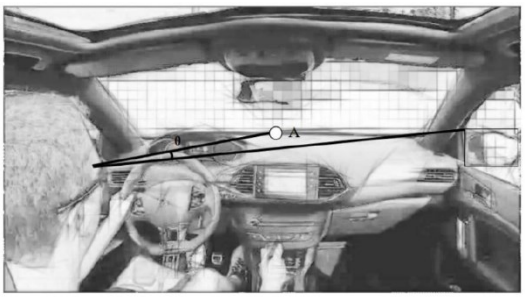
CLAIM 1. A holographic video cooperative transmission method based on visible light communication is characterized by comprising the following steps: s1: constructing a holographic video cooperative transmission system based on visible light communication, wherein the holographic video cooperative transmission system comprises a holographic video storage server, a plurality of visible light communication base stations and a plurality of mobile users, and the whole visible light communication base stations simultaneously provide video transmission services for all users by using a cooperative multi-point transmission technology and a beam forming technology; s2: under the constraint conditions of code rate selection, beam forming and channel capacity, constructing an optimization problem P1 of joint optimization code rate selection variable and beam forming variable, wherein the objective of the optimization problem is to maximize the user experience quality of the holographic video cooperative transmission service; s3: relaxing the integer variable, namely the code rate selection variable, into a continuous variable, so as to convert the optimization problem P1 into a relaxed optimization problem P2; s4: aiming at the relaxed optimization problem P2, an iterative algorithm based on an alternative optimization technology is adopted to convert the optimization problem P2 into two sub-problems P3 and P4 to optimize a code rate selection variable and a beam forming variable, so that a low-complexity continuous solution is obtained; s5: and (3) based on the continuous solution obtained in the step (S4), adopting rounding operation to obtain the joint code rate selection and beam forming method for the holographic video cooperative transmission system.

N9699

CN116643649 **CHONGQING CHANGAN AUTOMOBILE**
Priority Date: **19/04/2023**

HOLOGRAPHIC PROJECTION INTERACTION METHOD, DEVICE, VEHICLE AND MEDIUM BASED ON VISUAL TRACKING

The application relates to the technical field of man-machine interaction, in particular to a holographic projection interaction method, a device, a vehicle and a medium based on visual tracking, which comprise the following steps: detecting a driving state of a current vehicle; determining the working states and holographic projection positions of a plurality of swivel cameras and/or a plurality of eyeball tracking cameras according to the driving state, and acquiring the face rotation angles of a user by using the plurality of swivel cameras when the plurality of swivel cameras are in the starting state; determining at least one target eyeball tracking camera according to the face rotation angle and the working states of the plurality of eyeball tracking cameras, acquiring camera data acquired by the at least one target eyeball tracking camera, and carrying out holographic projection based on the position of holographic projection and the camera data. Therefore, the problems that the eyeball tracking technology in the related technology cannot adapt to multi-angle rotation of a user, the interaction interestingness of the vehicle and the machine is low and the like are solved, the interestingness is increased for the interaction of the vehicle and the machine, the visual interaction experience is improved, and the comfort of the user is improved.



CLAIM 1. The holographic projection interaction method based on visual tracking is characterized by comprising the following steps of: detecting a driving state of a current vehicle; determining working states and holographic projection positions of a plurality of swivel cameras and/or a plurality of eyeball tracking cameras according to the driving state, and acquiring face rotation angles of a user by using the swivel cameras when the swivel cameras are in an enabling state; and determining at least one target eye tracking camera according to the face rotation angle and the working states of the plurality of eye tracking cameras, acquiring camera data acquired by the at least one target eye tracking camera, and carrying out holographic projection based on the holographic projection position and the camera data.

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

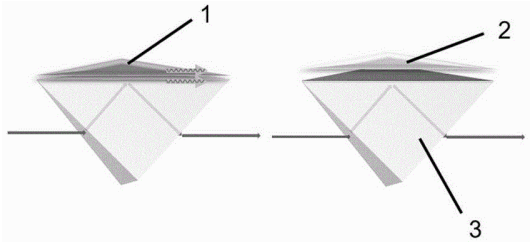
N9675

CN116755314 **SHENZHEN SANFU BEILI NEW MATERIAL SCIENCE RESEARCH**

Priority Date: **25/05/2023**

SURFACE PLASMA DIGITAL HOLOGRAPHIC FULL-COLOR MICROSCOPIC SYSTEM BASED ON OPTICAL PHASED ARRAY RADAR

The invention provides a surface plasma digital holographic full-color microscopic system based on an optical phased array radar. The optical phased array radar is utilized to realize high-precision beam deflection and regulate and control the incident angle and the incident wavelength of surface plasma, the surface plasma technology is introduced into a digital holographic light path, a multi-layer medium reflection model is built, the zero-order interference influence of the digital holographic light path is effectively eliminated, and meanwhile, the construction of a full-color microscopic system is realized through the optical phased array radar wavelength regulation technology. The planar waveguide optical phased array radar is favorable for accurate regulation and control of surface plasma wave vector matching and integral light path construction, and the novel optical microscope system provided by the invention has the characteristics of no damage and no invasiveness, has the requirements of anti-interference, large visual field and high integration of microscopic performance, and has important significance for the future non-contact microscopic field.



CLAIM 1. The preparation method of the surface plasma digital holographic microchip and the microscopic system are characterized in that the preparation of the microchip and the construction of the holographic microscopic system comprise the following steps: step a, cutting a quartz substrate into 0.5 inch wafers, sequentially soaking the wafers in ethanol, acetone and isopropanol, cleaning the wafers by using an ultrasonic machine, and placing the cleaned quartz wafers on a heating plate filled with dust-free paper for drying to finish cleaning the microchip substrates; step b, placing the cleaned quartz substrate and the accompanying sheet into an electron beam evaporation coating machine, fixing a metal target, and introducing nitrogen after vacuum treatment; and c, preheating the quartz substrate to 150 ℃, and bombarding the target material by using an electron beam. The electron gun is started to heat the evaporated film material to accumulate the film. When the film thickness reaches 120nm, the electron gun is closed, and the metal coating on the quartz surface is completed. After the vacuum chamber is cooled to room temperature, taking out the quartz substrate and the accompanying sheet of the metal coating, and measuring the thickness of the metal coating by using an electron microscope so as to ensure that the quartz substrate meets the performance requirement; step d, coating a layer of silicon dioxide on the metal layer, and adhering the prepared microchip and the prism together in a refractive index matching mode to form the plasma prism excitation structure; step e, using a tunable visible light laser with a wavelength of 400-500 nm as a light source, placing a self-focusing lens behind the laser, and controlling the incidence angle of surface plasma to be 0-90 DEG by rotating the angle of a reflecting mirror; and f, fixing the collimating mirror and connecting an optical fiber jumper, wherein the other end of the jumper is connected with the spectrometer. Adjusting the incidence angle and wavelength to realize resonance between the light beam and the metal layer on the surface of the surface plasmon chip and generate surface plasmon waves; step g, the laser emits laser, a parallel light beam is formed through a spatial filter and a convex lens, the beam splitter divides the light beam into a reference light beam and an object light beam, the reference light beam directly irradiates the beam splitter, the object light beam forms total reflection through a reflecting mirror and a prism and penetrates through a sample, and finally the object light beam is emitted to the reflecting mirror; and h, interfering the object light beam and the reference light beam on a beam splitter to form an interference pattern, recording the interference pattern by a focal plane array detector, and performing microscopic display by a small computer.

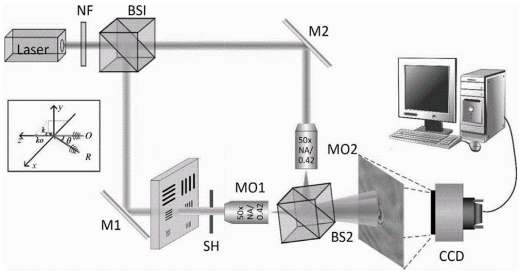
N9676

CN116755313 **TIANJIN AGRICULTURAL UNIVERCITY**

Priority Date: **24/03/2023**

HIGH-RESOLUTION IMAGING METHOD BASED ON DIGITAL HOLOGRAPHIC MICROSCOPY

The invention relates to the research field of digital holographic microscopic imaging, in particular to a high-resolution imaging method based on digital holographic microscopy. The invention uses a digital holographic microscopic system with a small hole structure to obtain a hologram and a reference image of a sample, and uses an angular spectrum method and a digital refocusing algorithm to obtain an intensity image of sample focusing. The method is characterized in that the two methods are unified in the light path from the two angles of light collection efficiency and aberration, so that the light path has two functions of optimizing resolution, and the imaging resolution is further improved.



CLAIM 1. The high-resolution imaging method based on digital holographic microscopy is characterized by comprising the following steps of: the method comprises the following steps: step 1: designing a digital holographic off-axis microscopic light path system, and recording an off-axis hologram of a sample and a reference hologram without characteristic sample information; step 2: carrying out real image filtering on the spectrums of the hologram and the reference image, carrying out two-dimensional inverse Fourier transform on the spectrums of the hologram and the reference image after filtering, and multiplying the complex conjugate of the hologram real image and the reference image real image to obtain out-of-focus object wavefront; step 3: reconstructing and reproducing the object light wave by using an angular spectrum method to obtain focused object light wave information ; Step 4: adding a small hole structure into the optical path system, debugging the optical path, and repeating the steps 1-3 by using a new optical path system to obtain new object light wave information ; Step 5: and comparing and analyzing the information of the two object light waves, and finding that the resolution of the holographic optical path system added with the small hole structure is better than that of the holographic system not added with the small hole structure.

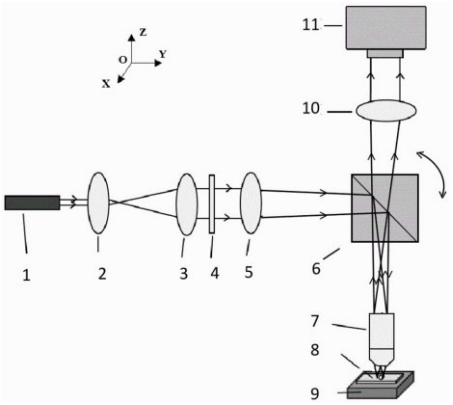
N9681

CN116736669 **ZHEJIANG LAB**

Priority Date: **17/05/2023**

INTERFERENCE SCATTERING IMAGING METHOD AND DEVICE BASED ON OFF-AXIS HOLOGRAPHY

An interference scattering imaging method and device based on off-axis holography, which is characterized in that the position and the direction of a beam splitting prism or a reflecting mirror or a two-dimensional scanning vibrating mirror in an optical path are adjusted to enable reference light, namely light which is incident on a sample surface and reflected by a cover glass, to generate an included angle with object light, namely light scattered by the sample, so that off-axis holography is formed and real-time acquisition of holographic images is carried out; and carrying out frequency domain filtering on the acquired image according to the acquired image, extracting information from the complex amplitude after eliminating the carrier frequency, reconstructing the information to obtain amplitude and phase distribution, and then expanding the wrapping phase to obtain a continuous phase distribution map. According to the method, the acquired single-particle sample image is subjected to spectrum separation in a mode of combining an interference scattering technology and a digital holographic technology, so that the real-time recovery of the sample signal to be detected under the same-level background is realized, meanwhile, abundant sample phase information can be obtained, and the multiple information acquisition capability of the method is improved.



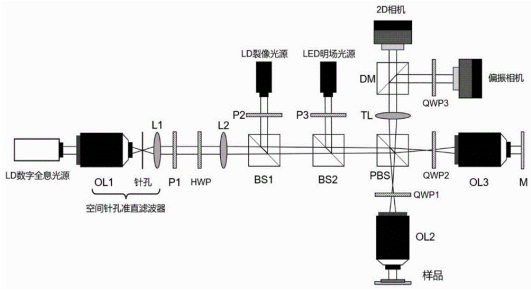
CLAIM 1. An interference scattering imaging method based on off-axis holography is characterized by comprising the following steps: (1) The laser beam is reflected by a beam-expanding collimation prism and passes through an objective lens to be projected to a sample surface; (2) The scattered light of the particles to be detected is called object light, and the light reflected by the plane of the cover glass is called reference light; enabling the reference light and the object light to generate an included angle on the sample surface to form off-axis holography; (3) After passing through the beam splitting prism, the reference light and the object light generate interference fringes at the target surface of the camera to form a hologram; (4) The image detection and acquisition module acquires data and the image acquisition card transmits the data to the image processing module; (5) The image processing module extracts the intensity and phase distribution of the object to be detected according to a frequency spectrum filtering method.

N9691

CN116679540 **JIANGSU JITRI HUST INTELLIGENT EQUIPMENT TECHNOLOGY**
Priority Date: **25/06/2023**

COMBINED TYPE 2D3D AUXILIARY FOCUSING MICROSCOPE

The invention relates to a compound 2D3D auxiliary focusing microscope. The device comprises a digital holographic microscope optical path, a 2D microscope optical path and an auxiliary focusing system optical path; an LD digital holographic light source, a space pinhole collimation filter, a first polaroid, a half wave plate, a second focusing lens, a first beam splitting prism, a second beam splitting prism, a polarization beam splitting cube, a tube mirror, a dichroic mirror, a third quarter wave plate and a polarization camera are arranged on the optical path of the digital holographic microscope; an LED bright field light source, a third polaroid, a second beam splitting prism, a polarization beam splitting cube, a tube mirror, a dichroic mirror and a 2D camera are arranged on the optical path of the 2D microscope; an LD split image light source, a second polaroid, a first beam splitter prism, a second beam splitter prism, a tube mirror, a dichroic mirror and a 2D camera are arranged on the optical path of the auxiliary focusing system. The invention can realize split image auxiliary focusing, 2D microscopic image acquisition and digital holographic microscopic image acquisition simultaneously, and complete two-dimensional image acquisition and three-dimensional graph reconstruction in real time.



CLAIM 1. The compound 2D3D auxiliary focusing microscope is characterized by comprising a digital holographic microscope light path, a 2D microscope light path and an auxiliary focusing system light path; an LD digital holographic light source, a space pinhole collimation filter, a first polaroid (P1), a Half Wave Plate (HWP), a second focusing lens (L2), a first beam splitting prism (BS 1), a second beam splitting prism (BS 2), a polarization beam splitting cube (PBS), a tube mirror (TL), a Dichroic Mirror (DM), a third quarter wave plate (QWP 3) and a polarization camera are arranged on the optical path of the digital holographic microscope, laser emitted by the LD digital holographic light source is changed into uniform and stable parallel light through the space pinhole collimation filter, and is changed into linear polarized light through the first polaroid (P1) and the Half Wave Plate (HWP), the linearly polarized light is divided into two beams of light parallel to the optical flat surface and light perpendicular to the optical flat surface by the polarization beam splitting cube (PBS) after sequentially passing through the second focusing lens (L2), the first beam splitting prism (BS 1) and the second beam splitting prism (BS 2), wherein the light which is reflected by the polarization beam splitting cube (PBS) and is perpendicular to the optical flat surface enters an object light path, the light which is transmitted by the polarization beam splitting cube (PBS) and is parallel to the optical flat surface enters a reference light path, the object light and the reference light are reflected and then returned to the polarization beam splitting cube (PBS) for beam combination, and become two beams of circularly polarized light with opposite rotation directions after passing through the tube mirror (TL), the Dichroic Mirror (DM) and the third quarter wave plate (QWP 3) and are imaged by interference of the polarization camera, thereby collecting the holographic image of the sample to be measured; an LED bright field light source, a third polarizing plate (P3), the second beam splitting prism (BS 2), the polarized beam splitting cube (PBS), the tube mirror (TL), the Dichroic Mirror (DM) and a 2D camera are arranged on the optical path of the 2D microscope, and the collimated white light emitted by the LED bright field light source is changed into linearly polarized light through the third polarizing plate (P3), the polarization direction is adjusted to be vertical to the optical plane surface, reflected by the second beam splitting prism (BS 2) and then reflected by the polarized beam splitting cube (PBS) to enter an object light path, and then reflected back to the polarized beam splitting cube (PBS) and the object light is transmitted through the tube mirror (TL) and enters the 2D camera, so that a 2D color image of a sample to be measured is acquired; an LD split image light source, a second polarizing plate (P2), a first beam splitting prism (BS 1), a second beam splitting prism (BS 2) and a 2D camera are arranged on the optical path of the auxiliary focusing system, collimated laser emitted by the LD split image light source is changed into linearly polarized light through the second polarizing plate (P2), the polarization direction is adjusted to be perpendicular to an optical platform surface, the linearly polarized light is reflected by the first beam splitting prism (BS 1) and the second beam splitting prism (BS 2) into an object light path through a polarization beam splitting cube (PBS), then reflected back to the polarization beam splitting cube (PBS) and the object light is transmitted through a dichroic mirror (TL) and enters the 2D camera, and thus split image focusing images are acquired.

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

N9644

WO2023165908 **CARL ZEISS JENA**

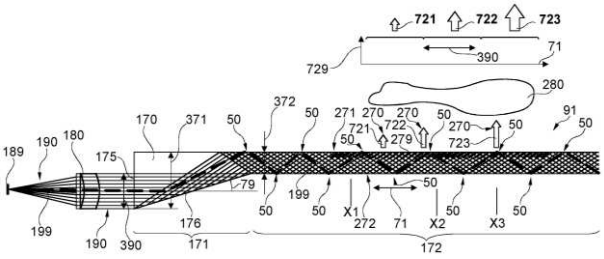
Priority Date: **02/03/2022**

COMPACT PHOTOMETRIC APPARATUS FOR RECONSTRUCTING A HOLOGRAM

A photometric apparatus (91) comprises an optical block (170) having a first coupling-in section (171) with a coupling-in face (175) which is arranged to couple light (190) into the optical block (170) and a waveguide section (172) extending away from the coupling-in section (171) and designed to guide the light (190) by multiple reflection (50) between an upper face (271) and a lower face (272) of the waveguide section (172). The optical block (170) also comprises a holographically optical element that is formed in the waveguide section (172) and is designed to reconstruct a hologram by means of the light.

APPAREIL PHOTOMÉTRIQUE COMPACT SERVANT À RECONSTRUIRE UN HOLOGRAMME

Un appareil photométrique (91) comprend un bloc optique (170) comportant une première section d'accouplement (171) dotée d'une face d'accouplement (175) qui est disposée de façon à coupler la lumière (190) dans le bloc optique (170) et une section de guide d'ondes (172) qui s'étend à l'opposé de la section d'accouplement (171) et qui est conçue pour guider la lumière (190) en lui faisant subir une réflexion multiple (50) entre une face supérieure (271) et une face inférieure (272) de la section de guide d'ondes (172). Le bloc optique (170) comprend également un élément optique holographique qui est formé dans la section de guide d'ondes (172) et conçu pour reconstruire un hologramme au moyen de la lumière.



CLAIM 1. A lighting device (61, 62, 91, 92, 93, 94) comprising: - a light source (180) configured to emit light (190) along a beam path (199), - an optical element (180) arranged along the optical path (199) and configured to reduce a divergence of the light (190), and - an optical block (170) disposed in the optical path (199) behind the optical element (180) and comprising: - a coupling-in portion (171) having a coupling-in surface (175) arranged to couple the light (190) into the optical block (170), and - a waveguide section (172) extending away from the coupling-in section (171) and configured to guide the light (190) by multiple reflection (50) between a top side (271) and a bottom side (272) of the waveguide section (172), - a holographic optical element (279) formed in the waveguide portion (172) and configured to reconstruct a hologram using the light.

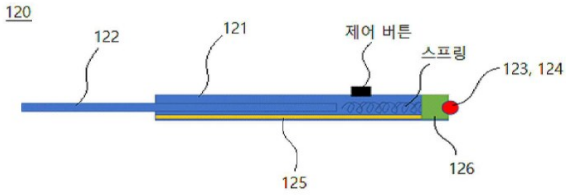
N9655

KR20230122745
Priority Date: **15/02/2022**

IINJE UNIVERSITY INDUSTRY ACADEMIC COOPERATION FOUNDATION

POINTING DEVICE FOR A 3 D HOLOGRAM

The present invention relates to a pointing system for a 3 D hologram. A three-dimensional (3 D) hologram image is displayed therein, a pointer contacting a point of the hologram display and having an overall length adjusted according to the contact, and a processor receiving coordinate information of the point contacted by the pointer from the hologram display, Receive angle information of the pointer with respect to the hologram display and length information of the pointer from the pointer, and generate position information pointed to in the 3 D hologram image based on the received information. According to the present invention, by adjusting the position of the inner rod positioned inside the pointer, the pointer can be displayed on a 3 D hologram image positioned inside the hologram display as much as the pointer is reduced, thus providing a feeling as actually explained with the pointer.



CLAIM 1. An image processing apparatus comprising: a hologram display having a 3 D hologram image displayed therein; a pointer contacting a point of the hologram display and having an overall length adjusted according to the contact; and a processor receiving coordinate information of the point contacted by the pointer from the hologram display, Receive angle information of the pointer with respect to the hologram display and length information of the pointer from the pointer, and generate position information to be pointed in the 3 D hologram image based on the received information.

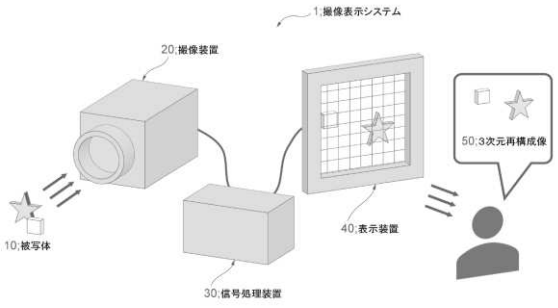
N9658

JP2023124051
Priority Date: **25/02/2022**

NIPPON HOSO KYOKAI

INCOHERENT DIGITAL HOLOGRAM SIGNAL PROCESSING DEVICE AND IMAGING DISPLAY SYSTEM

TOPIC: To provide an incoherent digital hologram signal processor and an imaging display system capable of converting depth distance information of a subject image acquired by an imaging unit based on incoherent digital holographic into information corresponding to the depth distance of an actual subject and sending the information to a display unit. INVENTION: a signal processing apparatus 30 determines, from three-dimensional image information of a digital hologram captured by an image capturing apparatus 20 based on incoherent digital holographic, Shape information (silhouette) and depth distance information of the subject 10 are extracted, correction processing is performed so that the three-dimensional image information matches information in accordance with the actual depth distance of the subject 10, and the resulting information is sent to the display device 40.



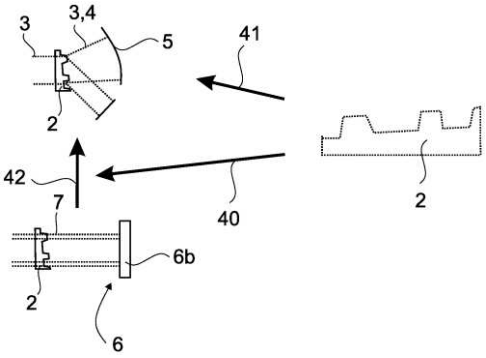
CLAIM 1. An incoherent digital hologram signal processing apparatus that receives incoherent digital hologram information obtained by shooting a subject using light self-interference, performs signal processing on the input incoherent digital hologram information, and sends the signal processing to a hologram display unit, wherein the signal processing includes: Extracts shape information and depth distance information of the subject from the input incoherent digital hologram information, performs correction processing so that three-dimensional image information of the subject matches information in accordance with an actual depth distance of the subject, and To the hologram display unit.

N9661

DE102022210024 **CARL ZEISS SMT**
Priority Date: **22/09/2022**

METHOD AND APPARATUS FOR QUALIFYING A COMPUTER-GENERATED HOLOGRAM, REGULARIZATION METHOD AND LITHOGRAPHY SYSTEM

The invention relates to a method for qualifying a computer-generated hologram (CGH) (2) which, in the case of coherent illumination with a test radiation (3), is set up to form at least one test wavefront (4) of the test radiation (3) for testing a mirror (5) of an EUV projection exposure system (100), wherein the test wavefront (4) is measured over the entire surface by means of a measuring radiation (7) by means of an optical measuring device (6) qualifying and/or simulating the CGH (2). According to the invention, provision is made for the CGH (2) to be qualified with regard to an effect on the test radiation (3) only by virtue of the fact that the effect of the CGH (2) on the test wavefront (4) and/or a phase of the test radiation (2) is reconstructed, wherein an error propagation of a residue to the at least one test wavefront (4) is taken into account, wherein the residue results from a deviation between a measurement and a simulation of an effect of the CGH (2) on the measurement radiation (7), in particular a measurement wavefront of the measurement radiation (7).



CLAIM 1. Method for qualifying a computer-generated hologram (CGH) (2) which, in the case of coherent illumination with a test radiation (3), is set up to form at least one test wavefront (4) of the test radiation (3) for testing a mirror (5) of an EUV projection exposure system (100), wherein the test wavefront (4) is measured over the entire surface by means of a measuring radiation (7) by means of an optical measuring device (6) qualifying and/or simulating the CGH (2), characterized in that In that the CGH (2) is qualified with regard to an effect on the test radiation (3) only in that the effect of the CGH (2) on the test wavefront (4) and/or a phase of the test radiation (2) is reconstructed, wherein an error propagation of a residue to the at least one test wavefront (4) is taken into account, wherein the residue results from a deviation between a measurement and a simulation of an effect of the CGH (2) on the measurement radiation (7), in particular a measurement wavefront of the measurement radiation (7).

N9679

CN116738454 **YANGZHOU UNIVERSITY**
Priority Date: **31/05/2023**

HOLOGRAPHIC ENCRYPTION METHOD BASED ON THREE-DIMENSIONAL FACE RECOGNITION AND AIR SIGNATURE

The application provides a holographic encryption method based on three-dimensional face recognition and air signature. The application combines two-dimensional face recognition, air signature and holographic encryption technology, and comprises the following steps that S1 starts a depth camera to acquire three-dimensional information of an object; s2, acquiring a fingerprint moving track and dividing a two-dimensional face image; s3, dividing the three-dimensional point cloud by using a point cloud meshing method, encrypting the point cloud images of the face and the pen, generating an encryption plaintext, and calculating an encryption key; s4, the calculation key decrypts the encrypted plaintext, and a plurality of decrypted images are combined to obtain a point cloud image; s5, carrying out Fresnel operation on the decrypted point cloud image to obtain a reconstructed hologram. Compared with the traditional holographic encryption technology, the method greatly improves the information concentration degree by encrypting the three-dimensional image, and the multi-image encryption method provides multi-level security and more flexible and simple application modes for the three-dimensional information.

CLAIM 1. A holographic encryption method based on three-dimensional face recognition and air signature, which is characterized by being applied to electronic equipment, the method comprising: s1, shooting by using a depth camera, acquiring three-dimensional information of an object, preprocessing data, and generating a point cloud image by combining a color picture and a depth picture; s2, dividing the color image of the human face to extract position information to generate a cloud image of the face point, and extracting the size and position information of the aerial signature to generate a cloud image of the handwriting point; s3, converting the point cloud into sparse point clouds by utilizing a point cloud sparsification technology, gridding the point cloud images from three RGB channels to obtain three two-dimensional image groups, performing multi-image encryption on the segmented two-dimensional images to obtain phase images of the encrypted holograms, and calculating public keys and private key groups; s4, decrypting the plurality of two-dimensional images through the key group, converting the format of the two-dimensional image group, and combining RGB color data to obtain a decrypted point cloud image; s5, carrying out Fresnel operation based on the decrypted point cloud image to obtain holographic reconstruction images with different reconstruction distances.

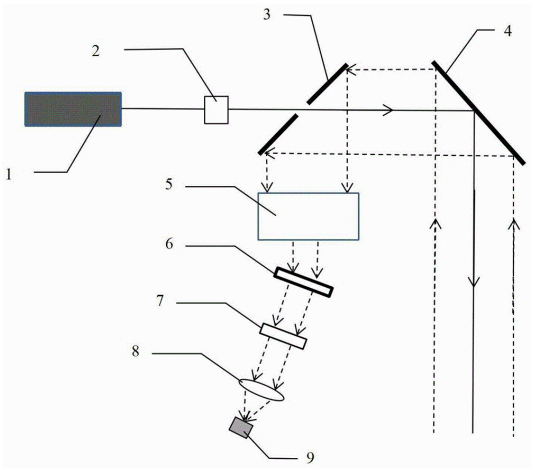
N9685

CN116719052
Priority Date: **09/06/2023**

INSTITUTE OF OPTICS & ELECTRONICS - CHINESE ACADEMY OF SCIENCES

ANGULAR MOMENTUM BEAM UNDERWATER DETECTION DEVICE BASED ON VOLUME HOLOGRAPHIC GRATING

The invention discloses an angular momentum beam underwater detection device based on a volume holographic grating, which comprises: the laser output light becomes an angular momentum beam after modulation, and the angular momentum beam is reflected and output by a two-dimensional scanning mirror after passing through a reflecting mirror with holes, so that the two-dimensional scanning of the angular momentum beam on an underwater target is realized; the signal light reflected by the underwater target and the scattered light of the water body reenter the system through the two-dimensional scanning mirror, and the aperture of the light beam is reduced by the beam shrinking device after being reflected by the reflecting mirror with holes; then, the volume holographic grating is utilized to conduct angle selection on the transmission direction of the light beam, and scattered light of the water body is filtered; then the spiral phase plate carries out spatial coherence filtering on the light beam; and finally, focusing the light beam through a focusing lens, and receiving a signal by a detector to realize detection of the underwater target. The invention fully utilizes the characteristic of angular momentum beam for resisting the interference of the water body scattering and the characteristic of angle selection of the volume holographic grating, and has the advantages of long underwater detection distance, high detection signal-to-noise ratio and the like.



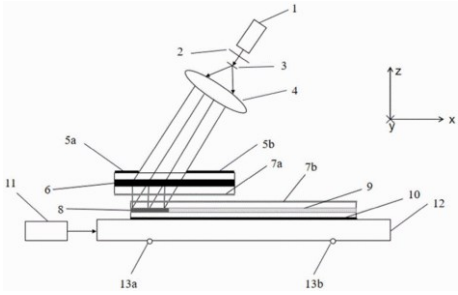
CLAIM 1. The utility model provides an angular momentum light beam detection device under water based on volume holographic grating, includes laser instrument (1), angular momentum light beam generating device (2), foraminiferous speculum (3), two-dimensional scanning mirror (4), beam shrinking device (5), volume holographic grating (6), spiral phase plate (7), focus lens (8), detector (9), its characterized in that: the output light of the laser (1) is modulated by the angular momentum beam generating device (2) to become an angular momentum beam, and the angular momentum beam is reflected and output by the two-dimensional scanning mirror (4) after passing through the perforated reflecting mirror (3), so that the two-dimensional scanning of the angular momentum beam on an underwater target is realized; the signal light reflected by the underwater target and the scattered light of the water body reenter the system through the two-dimensional scanning mirror (4), and the aperture of the light beam is reduced by the beam shrinking device (5) after being reflected by the reflecting mirror (3) with holes; then, the volume holographic grating (6) is utilized to select the angle of the transmission direction of the light beam, and the scattered light of the water body is filtered; then, the optical beam is spatially coherence filtered by a spiral phase plate (7); finally, focusing the light beams subjected to angle selection and spatial coherence filtering through a focusing lens (8), receiving signals by a detector (9), and performing subsequent data processing to realize remote detection of the underwater target; the laser (1) is a blue-green pulse laser and is suitable for underwater transmission and detection of a target distance; the angular momentum beam generating device (2) is a spatial light modulator or a phase plate with fixed vortex phase distribution and is used for generating an angular momentum beam which is transmitted under water with a distance longer than that of a Gaussian beam; the beam shrinking device (5) is used for reducing the requirement on the caliber of the volume holographic grating and reducing the processing difficulty of the volume holographic grating; the volume holographic grating (6) has high diffraction efficiency on underwater target echo signal light meeting the Bragg condition, and has very low diffraction efficiency on water scattered light which does not meet the Bragg condition, so that the background stray light is filtered, and the detection signal to noise ratio is improved; the angle selection characteristic of the volume holographic grating (6) is that the thickness, refractive index modulation degree and period of the volume holographic grating are adjusted according to the laser wavelength, so as to obtain the optimal angle selection characteristic; the spiral phase plate (7) is used for modulating the target reflected light with good spatial coherence into vortex rotation distributed in an annular mode, and not modulating the water body scattered light with poor spatial coherence into vortex light, so that the spatial separation of the target reflected light and the water body scattered light is realized; the detector (9) is an array detector and is used for recording signal light distributed in a ring shape and scattered light distributed uniformly at the same time; or a plurality of single-point detectors are used for respectively recording signal light at a certain point on the vortex ring and scattered light at the center of the annular vortex field, and the single-point detectors are higher in sensitivity and more beneficial to detecting long-distance underwater targets.

N9696

CN116661038 **ZHEJIANG CRYSTAL OPTECH**
Priority Date: **07/06/2023**

HOLOGRAPHIC GRATING EXPOSURE DEVICE

The application provides a holographic grating exposure device, which relates to the technical field of holographic grating exposure, and comprises a driving assembly, a platform and an exposure module, wherein the exposure module comprises a laser light source and a mask plate which are sequentially arranged along a light path, the mask plate divides a laser beam incident to the mask plate into a zero-order diffraction beam and a first-order diffraction beam, and the zero-order diffraction beam and the first-order diffraction beam form an interference image at a station, so that the mask plate is directly utilized for splitting light, the split light beam forms an interference image meeting the exposure requirement on the surface of a holographic substrate, and on the basis, the interference image can be used for scanning and exposing a region to be exposed of the holographic substrate by the driving of the driving assembly. Therefore, the application can effectively reduce the number of optical elements, simplify the complexity of the light path and effectively reduce the volume of the whole holographic grating exposure device.



CLAIM 1. The utility model provides a holographic grating exposure device, its characterized in that includes drive assembly, platform and exposure module, the exposure module includes laser light source and the mask plate that sets gradually along the light path, the platform has the station that is used for placing holographic base plate, the mask plate will be incident to the laser beam of mask plate divide into zero order diffraction light beam and first order diffraction light beam, and make zero order diffraction light beam with first order diffraction light beam is in the station forms interference image, drive assembly is used for control the platform with exposure module relative motion is in order to make interference image scanning holographic base plate's area of waiting to expose.

N9697

CN116659412 **SOUTH CHINA NORMAL UNIVERSITY**
Priority Date: **10/05/2023**

FOUR-WAVELENGTH DOUBLE-ORTHOGONAL DIGITAL HOLOGRAPHIC IMAGING DEVICE AND DIGITAL HOLOGRAPHIC MEASURING DEVICE

The invention relates to a four-wavelength biorthogonal digital holographic imaging device, which comprises a multi-wavelength laser coupling unit, a Mach-Zehnder interference unit, an imaging unit, a calculating unit and an objective table. The multi-wavelength laser coupling unit couples a plurality of polarized lasers with different wavelengths into a coupling beam and transmits the coupling beam to the Mach-Zehnder interference unit, the coupling beam passes through the Mach-Zehnder interference unit and forms double orthogonal carrier frequency interference fringes for recording the phase information of an object to be detected of the objective table in the imaging unit, and the calculating unit calculates related information according to the double orthogonal carrier frequency interference fringes to obtain a digital holographic picture of the object to be detected. The digital holographic technology has higher digital resolution and can obtain a measurement result with higher precision by using a noise reduction method of gradual iteration.

CLAIM 1. A four-wavelength biorthogonal digital holographic imaging device, characterized in that: the system comprises a multi-wavelength laser coupling unit, a Mach-Zehnder interference unit, an imaging unit, a calculating unit and an objective table; the Mach-Zehnder interference unit comprises a first unpolarized beam-splitting prism, a second unpolarized beam-splitting prism, a plane reflector, a Wollaston prism and a third unpolarized beam-splitting prism; the multi-wavelength laser coupling unit is used for coupling multi-wavelength laser into a coupling beam, the coupling beam is split into measuring light and reference light by the first non-polarized beam splitting prism, and the measuring light is reflected by the second non-polarized beam splitting prism and the objective table and then is emitted into the third non-polarized beam splitting prism to be combined; the reference light is emitted into the third unpolarized beam splitting prism to be combined after passing through the plane reflecting mirror and the Wollaston prism; the third unpolarized beam splitting prism is provided with a certain deflection angle, the combined beam is subjected to orthogonal carrier frequency interference at the third unpolarized beam splitting prism, the imaging unit receives the orthogonal carrier frequency interference pattern and transmits the orthogonal carrier frequency interference pattern to the calculating unit, and the calculating unit calculates related parameters to obtain a digital hologram of the object to be measured.

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HOLOGRAMS - 15 PATENTS

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P36792	WO	2023177744	21/09/2023	NANOGRAFIX	US	15/03/2022	US2022063320200	WO2023177744	SYSTEM AND METHOD FOR GENERATING HOLOGRAPHIC OPTICAL IMAGES IN CURABLE MATERIAL	OVD - Microlens
P36794	WO	2023177297	21/09/2023	VOERMAN, ROELOF	NL	18/03/2022	NL2022002031320	WO2023177297	A SEALING MARK, A PACKAGE AND METHODS	
P36821	US	20230273571	31/08/2023	BALLYDEL TECHNOLOGIES	US	28/02/2022	US2022063314533	US20230273571	TAGGING AND AUTHENTICATION OF ARTICLES	
P36825	RU	2802458	29/08/2023	GOZNAK	RU	07/10/2022	RU2022000126219	RU2802458	MULTILAYER PRODUCT CONTAINING PROTECTIVE ELEMENT, AND METHOD FOR ITS PRODUCTION	
P36827	PL	2022440380	21/08/2023	BAUER MUECK | GARSŲ PASAULIS UAB	PL	14/02/2022	PL2022000440380	PL2022440380	METHOD OF ENCODING THE HIDDEN INFORMATION, A SECURITY ELEMENT, A DATA CARRIER, METHOD OF MANUFACTURING A SECURITY ELEMENT, METHOD OF VERIFYING THE AUTHENTICITY OF A DATA CARRIER	
P36837	JP	2023125427	07/09/2023	NATIONAL PRINTING BUREAU	JP	28/02/2022	JP2022000029504	JP2023125427	PHOTOLUMINESCENT PATTERN FORMING BODY	
P36860	EP	4234641	30/08/2023	BASF	EP	25/02/2022	EP2022000159029	EP4234641	COMPOSITIONS, COMPRISING MODIFIED TITANIUM DIOXIDE NANOPARTICLES AND USES THEREOF	
P36866	CN	219706299	19/09/2023	ZHEJIANG TIANQI PACKAGING MATERIAL	CN	03/04/2023	CN2023000706137	CN219706299U	CAT EYE RELIEF APPARATUS OF HOLOGRAPHIC CARD PAPER	
P36870	CN	219667664	12/09/2023	JIANGSU CIMEI NEW MATERIAL TECHNOLOGY	CN	27/03/2022	CN2022000680651	CN219667664U	HOLOGRAPHIC MOULD PRESSING ANTI-FAKE EMBOSSING COMPOSITE FILM	
P36881	CN	219583809	25/08/2023	SHANDONG TAIBAO INFORMATION TECHNOLOGY GROUP	CN	30/03/2023	CN2023000671828	CN219583809U	TRANSPARENT LASER ANTI-FAKE ELECTROCHEMICAL ALUMINIUM	
P36887	CN	116749665	15/09/2023	HENAN PROVINCE WELLKING TECHNOLOGY DEVELOPMENT	CN	03/08/2023	CN2023000972729	CN116749665	DOUBLE-LAYER COATING HOLOGRAPHIC POSITIONING THERMOPRINT MARK AND MANUFACTURING METHOD THEREOF	
P36896	CN	116699945	05/09/2023	CHANGZHOU ZHONGHENG MACHINERY TECHNOLOGY	CN	24/05/2022	CN2022000566778	CN116699945	LASER HOLOGRAPHIC MASTER MASK PHOTOETCHING MACHINE	
P36898	CN	116694252	05/09/2023	SHANDONG TAIBAO INFORMATION TECHNOLOGY GROUP	CN	04/07/2023	CN2023000810138	CN116694252	PREPARATION METHOD OF POSITIONING HOLOGRAPHIC ANTI-COUNTERFEITING BOPP ADHESIVE TAPE AND ADHESIVE TAPE THEREOF	
P36902	CN	116661028	29/08/2023	WUHAN HUAGONG IMAGE TECHNOLOGY & DEVELOPMENT	CN	21/04/2023	CN2023000436053	CN116661028	TRANSPARENT HOLOGRAPHIC FILM AND PREPARATION METHOD THEREOF	
P36903	CN	116656267	29/08/2023	HENGFENG MATERIAL TECHNOLOGY ZHEJIANG	CN	24/05/2023	CN2023000598028	CN116656267	ANTI-COUNTERFEITING TRANSFER MATERIAL WITH INFORMATION STORAGE AND READING FUNCTIONS AND PREPARATION METHOD THEREOF	

VARIOUS OPTICAL EFFECTS - 20 PATENTS

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P36792	WO	2023177744	21/09/2023	NANOGRAFIX	US	15/03/2022	US2022063320200	WO2023177744	SYSTEM AND METHOD FOR GENERATING HOLOGRAPHIC OPTICAL IMAGES IN CURABLE MATERIAL	Hologram - Microlens
P36803	WO	2023174664	21/09/2023	META MEDIA	US	18/03/2022	US2022063321458	WO2023174664	DEVICES, METHODS AND A VISUAL DISPLAY INVOLVING METAMATERIAL FILTERS	
P36805	WO	2023170376	14/09/2023	DE LA RUE INTERNATIONAL	GB	10/03/2022	GB2022000003349	WO2023170376 GB202203349 GB2616465	SECURITY DOCUMENT SUBSTRATE AND METHOD OF MANUFACTURE THEREOF	Microlens
P36807	WO	2023170146	14/09/2023	VERIDOS	DE	11/03/2022	DE202210000859	WO2023170146	DATA CARRIER WITH MOTIF IMAGES WHICH ARE VISIBLE FROM OPPOSITE FACES, AND CORRESPONDING PRODUCTION METHOD	
P36808	WO	2023170132	14/09/2023	BASF | DE LA RUE INTERNATIONAL	EP	10/03/2022	EP2022000161349	WO2023170132	CASTING LACQUER FOR SCREEN PRINTING	Microlens
P36809	WO	2023170001	14/09/2023	VERIDOS	DE	11/03/2022	DE202210000858	WO2023170001 DE102022000858	IDENTIFICATION DOCUMENT AND PRODUCTION METHOD	Microlens

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VARIOUS OPTICAL EFFECTS - 20 PATENTS (continuation)

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P36810	WO	2023169714	14/09/2023	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	07/03/2022	DE202210000785	WO2023169714 DE102022000785	SECURITY ELEMENT FOR A VALUE DOCUMENT, VALUE DOCUMENT AND METHOD FOR PRODUCING A SECURITY ELEMENT	Microlens
P36812	WO	2023165863	07/09/2023	SICPA	EP	01/03/2022	EP2022000305229	WO2023165863	OVERT SECURITY FEATURES	
P36814	WO	2023163984	31/08/2023	SPECTRA SYSTEMS	US	22/02/2022	US2022063312432	WO2023163984	CODED POLYMER SUBSTRATES FOR BANKNOTE AUTHENTICATION	
P36815	WO	2023161464	31/08/2023	SICPA	EP	28/02/2022	EP2022000159126	WO2023161464	METHODS FOR PRODUCING OPTICAL EFFECT LAYERS COMPRISING MAGNETIC OR MAGNETIZABLE PIGMENT PARTICLES AND EXHIBITING ONE OR MORE INDICIA	
P36818	US	20230294445	21/09/2023	ENTRUST	US	15/03/2022	US2022063319904	US20230294445 WO2023175511	PERSONALIZED PLASTIC IDENTIFICATION DOCUMENT WITH LENS STRUCTURE	Passport - Microlens
P36824	TW	645296	21/08/2023	GUANGQUN LASER SCIENCE & TEC	TW	17/04/2023	TW2023000203490	TWM645296	3 D DYNAMIC SECURITY TAG AND DYNAMIC SECURITY FILM.	
P36826	RU	2801793	15/08/2023	NAUCHNO PROIZVODSTVENNOE OBEDINENIE KRIPTEN	RU	08/08/2022	RU2022000121518	RU2801793	PROTECTIVE DEVICE BASED ON ZERO-ORDER DIFFRACTIVE STRUCTURES	
P36841	JP	2023121490	31/08/2023	NATIONAL PRINTING BUREAU	JP	21/02/2022	JP2022000024856	JP2023121490	IMAGE FORMING BODY	
P36857	EP	4242009	13/09/2023	HUECK FOLIEN	EP	11/03/2022	EP2022000161500	EP4242009	SECURITY ELEMENT FOR VALUABLE DOCUMENTS WITH A CARRIER FOIL AND AT LEAST ONE DECORATIVE LAYER	
P36889	CN	116741034	12/09/2023	SHANGHAI GUANZHONG OPTICAL TECHNOLOGY	CN	15/06/2023	CN2023000711247	CN116741034	ANTI-COUNTERFEITING FILM MATERIAL AND MANUFACTURING METHOD THEREOF	
P36895	CN	116714352	08/09/2023	HUIZHOU HUAYANG OPTICAL TECHNOLOGY	CN	17/05/2023	CN2023000559279	CN116714352	FIXED MAGNETIC DEVICE AND FIXED MAGNETIC METHOD	
P36900	CN	116675907	01/09/2023	HUAGONG LIYAN GUANGDONG NEW MATERIAL TECHNOLOGY | SOUTH CHINA UNIVERSITY OF TECHNOLOGY	CN	05/06/2023	CN2023000661137	CN116675907	BIOMASS-BASED STRUCTURAL-COLOR WATERPROOF MATERIAL AND PREPARATION METHOD THEREOF	
P36904	CN	116656180	29/08/2023	INSTITUTE OF CHEMISTRY - CHINESE ACADEMY OF SCIENCE	CN	05/06/2023	CN2023000651575	CN116656180	PHOTONIC CRYSTAL FOUR-COLOR INKJET INK AND MANUFACTURING METHOD OF COLOR PRINTED MATTER THEREOF	
P36906	CN	116653464	29/08/2023	HUIZHOU HUAYANG OPTICAL TECHNOLOGY	CN	11/05/2023	CN2023000535710	CN116653464	MAGNETIC ORIENTATION DEVICE, PRINTING EQUIPMENT AND METHOD FOR MANUFACTURING MAGNETIC PATTERN	

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N9642	WO	2023171050	14/09/2023	HAMAMATSU PHOTONICS | UTSUNOMIYA UNIVERSITY	JP	10/03/2022	JP2022000036930	WO2023171050	HOLOGRAM DATA GENERATION SYSTEM AND HOLOGRAM DATA GENERATION METHOD	
N9643	WO	2023168511	14/09/2023	GLOVE SYSTEMS	WO	09/03/2022	WO2022500000341	WO2023168511	METHOD AND SYSTEM FOR OVERLAYING HOLOGRAMS IN AUGMENTED REALITY/MIXED REALITY (AR/MR) APPLICATIONS	
N9644	WO	2023165908	07/09/2023	CARL ZEISS JENA	DE	02/03/2022	DE202210104965	WO2023165908 DE102022104965	COMPACT PHOTOMETRIC APPARATUS FOR RECONSTRUCTING A HOLOGRAM	
N9645	WO	2023165891	07/09/2023	CARL ZEISS JENA	DE	03/03/2022	DE202210105039	WO2023165891 DE102022105039	WAVEFRONT MANIPULATOR FOR HEAD-UP DISPLAY WITH HOLOGRAPHIC ELEMENT TO CREATE A TILTED VIRTUAL IMAGE PLANE	
N9646	WO	2023165889	07/09/2023	CARL ZEISS JENA	DE	03/03/2022	DE202210105038	WO2023165889 DE102022105038	WAVEFRONT MANIPULATOR WITH TOTAL REFLECTION AND REFLECTION HOLOGRAM	
N9647	WO	2023163326	31/08/2023	DAEWON SANUP	KR	23/02/2022	KR2022000023877	WO2023163326 KR20230126553	HOLOGRAM TOUCH SYSTEM FOR PASSENGER TRANSPORT SEAT, AND SEAT DEVICE HAVING SAME	
N9648	WO	2023162528	31/08/2023	NITTO DENKO	JP	28/02/2022	JP2022000029194	WO2023162528 JP2023125213	MULTILAYER FILM	

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N9649	WO	2023161087	31/08/2023	CARL ZEISS JENA	DE	28/02/2022	DE202210202041	WO2023161087 DE102022202041	HOLOGRAPHIC LIGHTING DEVICE HAVING ELEMENTS ARRANGED ALONG A CENTRAL AXIS, AND INCOUPLING FACE IN THE EDGE REGION	
N9650	WO	2023160956	31/08/2023	CARL ZEISS JENA	DE	28/02/2022	DE202210104676	WO2023160956 DE102022104676	WAVEGUIDE FOR DISPLAYING AN IMAGE, AND HOLOGRAPHIC DISPLAY HAVING SUCH A WAVEGUIDE	
N9651	US	20230280694	07/09/2023	POSTECH RESEARCH & BUSINESS DEVELOPMENT FOUNDATION	KR	02/03/2022	KR2022000027067	US20230280694 KR20230129877	LIGHT MODULATING DEVICE AND OPERATING METHOD THEREOF USING VOLTAGE-VARIED LC	
N9652	US	20230280626	07/09/2023	META PLATFORMS TECHNOLOGIES	US	23/02/2022	US2022063313262	US20230280626 WO2023163929	BLUE PHASE LIQUID CRYSTAL POLARIZATION HOLOGRAM AND DEVICE INCLUDING THE SAME	
N9653	NL	1044264	05/09/2023	DR MRUNAL GAWADE	NL	17/02/2022	NL2022001044264	NL1044264	PORTABLE TABLETOP 3D MEDIA PROJECTION HOLOGRAPHIC DISPLAY DEVICE	
N9654	KR	20230127764	01/09/2023	KOREA ELECTRONICS & TELECOMMUNICATIONS RESEARCH INSTITUTE	KR	25/02/2022	KR2022000025451	KR20230127764	INTERACTIVE DEVICE BASED ON FLOATING HOLOGRAM AND OPERATING METHOD THEREOF	
N9655	KR	20230122745	22/08/2023	IINJE UNIVERSITY INDUSTRY ACADEMIC COOPERATION FOUNDATION	KR	15/02/2022	KR2022000019339	KR20230122745	POINTING DEVICE FOR A 3 D HOLOGRAM	
N9656	KR	102573050	31/08/2023	TECHNET	KR	27/01/2023	KR2023000010631	KR102573050	STEREOSCOPIC IMAGE CONTENT MANUFACTURING APPARATUS FOR HOLOGRAM DEVICE AND DRIVING METHOD THEREOF	
N9657	JP	2023127082	13/09/2023	MITSUBISHI CHEMICAL	JP	01/03/2022	JP2022000030641	JP2023127082	METHOD FOR MANUFACTURING OPTICAL ELEMENT	
N9658	JP	2023124051	06/09/2023	NIPPON HOSO KYOKAI	JP	25/02/2022	JP2022000027610	JP2023124051	INCOHERENT DIGITAL HOLOGRAM SIGNAL PROCESSING DEVICE AND IMAGING DISPLAY SYSTEM	
N9659	JP	2023116984	23/08/2023	MITSUBISHI CHEMICAL	JP	10/02/2022	JP2022000019422	JP2023116984	METHOD FOR MANUFACTURING OPTICAL ELEMENT	
N9660	EP	4239414	06/09/2023	ENVISICS	GB	04/03/2022	GB2022000003029	EP4239414 GB202203029 GB2616305 JP2023129263 CN116699957 KR20230131110	HOLOGRAM CALCULATION	
N9661	DE	102022210024	07/09/2023	CARL ZEISS SMT	DE	22/09/2022	DE202210210024	DE102022210024	METHOD AND APPARATUS FOR QUALIFYING A COMPUTER-GENERATED HOLOGRAM, REGULARIZATION METHOD AND LITHOGRAPHY SYSTEM	
N9662	CN	219718336	19/09/2023	YIBA DAOCAO SHENZHEN TECHNOLOGY	CN	29/03/2023	CN2023000651769	CN219718336U	INTELLIGENT HOLOGRAPHIC PROJECTOR	
N9663	CN	219715943	19/09/2023	SHENZHEN INTERGRATED GEOTECHNICAL INVESTIGATION & SURVEYING	CN	15/04/2023	CN2023000905834	CN219715943U	HOLOGRAPHIC IMAGING DEVICE BASED ON BIM	
N9664	CN	219706458	19/09/2023	JIANGSU XINCHENG PACKAGING TECHNOLOGY	CN	31/05/2023	CN2023001363550	CN219706458U	HOLOGRAPHIC THERMOPRINT MEMBRANE MOULDING PRESS	
N9665	CN	219696058	15/09/2023	JIANGXI XIANGHANG TECHNOLOGY | XIANGHANG RUDONG TECHNOLOGY | XIANGHANG TECHNOLOGY	CN	26/04/2023	CN2023000984118	CN219696058U	MEDIUM-FREE HOLOGRAPHIC COMBINED DEMONSTRATION EQUIPMENT	
N9666	CN	219676457	12/09/2023	HARBIN SANSHANG INFORMATION	CN	10/05/2023	CN2023001115401	CN219676457U	INTERACTIVE DIGITAL HOLOGRAPHIC IMAGE DEVICE	
N9667	CN	219668767	12/09/2023	SU HAIFENG	CN	23/09/2022	CN2022002536043	CN219668767U	BOTTLE PACKING CARTON BASED ON HOLOGRAPHIC PROJECTION	
N9668	CN	219609987	29/08/2023	SHENZHEN SUPER SMART AI TECHNOLOGY	CN	07/03/2023	CN2023000515556	CN219609987U	HOLOGRAPHIC SHOWCASE	
N9669	CN	219590654	25/08/2023	QIN QIANG	CN	16/12/2022	CN2022003374860	CN219590654U	HOLOGRAPHIC PROJECTION IMAGING EQUIPMENT CONVENIENT TO CARRY	
N9670	CN	219587289	25/08/2023	NANJING LOVE & TOUR SCIENCE & TECHNOLOGY	CN	30/12/2022	CN2022003597865	CN219587289U	HOLOGRAPHIC PROJECTION FITTING ROOM	
N9671	CN	116781836	19/09/2023	WINSEETY INTELLIGENT DIGIT TECHNOLOGY	CN	22/08/2023	CN2023001056592	CN116781836	HOLOGRAPHIC REMOTE TEACHING METHOD AND SYSTEM	

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REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
N9672	CN	116774557	19/09/2023	KUNMING UNIVERSITY OF SCIENCE & TECHNOLOGY	CN	07/06/2023	CN2023000665776	CN116774557	POLARIZATION HOLOGRAPHIC MULTIPLEXING DISPLAY SYSTEM AND METHOD BASED ON ACOUSTO-OPTIC MODULATOR	
N9673	CN	116774556	19/09/2023	ANHUI UNIVERSITY	CN	20/06/2023	CN2023000744892	CN116774556	NON-ITERATIVE THREE-DIMENSIONAL HOLOGRAM GENERATION METHOD AND DEVICE BASED ON FS-ORAP AND PHASE COMPENSATION	
N9674	CN	116755315	15/09/2023	KUNMING UNIVERSITY OF SCIENCE & TECHNOLOGY	CN	21/06/2023	CN2023000739817	CN116755315	COLOR SCANNING HOLOGRAPHIC DEVICE ADOPTING OPTICAL FIBER TWEEZERS AND METHOD THEREOF	
N9675	CN	116755314	15/09/2023	SHENZHEN SANFU BEILI NEW MATERIAL SCIENCE RESEARCH	CN	25/05/2023	CN2023000600705	CN116755314	SURFACE PLASMA DIGITAL HOLOGRAPHIC FULL-COLOR MICROSCOPIC SYSTEM BASED ON OPTICAL PHASED ARRAY RADAR	
N9676	CN	116755313	15/09/2023	TIANJIN AGRICULTURAL UNIVERCITY	CN	24/03/2023	CN2023000296621	CN116755313	HIGH-RESOLUTION IMAGING METHOD BASED ON DIGITAL HOLOGRAPHIC MICROSCOPY	
N9677	CN	116751322	15/09/2023	KUNMING UNIVERSITY OF SCIENCE & TECHNOLOGY	CN	20/06/2023	CN2023000734896	CN116751322	PHOTOPOLYMER MATERIAL AND PREPARATION METHOD AND APPLICATION THEREOF	
N9678	CN	116743983	12/09/2023	GUIZHOU BROADCAST & TV INFORMATION NETWORK	CN	26/04/2023	CN2023000463522	CN116743983	IMMERSIVE HOLOGRAPHIC ENTITY SPECIAL-SHAPED PROJECTION SYSTEM	
N9679	CN	116738454	12/09/2023	YANGZHOU UNIVERSITY	CN	31/05/2023	CN2023000630800	CN116738454	HOLOGRAPHIC ENCRYPTION METHOD BASED ON THREE-DIMENSIONAL FACE RECOGNITION AND AIR SIGNATURE	
N9680	CN	116736670	12/09/2023	FUJIAN NORMAL UNIVERSITY	CN	01/06/2023	CN2023000637527	CN116736670	SCALAR VORTEX BEAM GENERATION SYSTEM AND METHOD FOR COAXIAL TRADITIONAL OR POLARIZATION HOLOGRAPHY	
N9681	CN	116736669	12/09/2023	ZHEJIANG LAB	CN	17/05/2023	CN2023000553207	CN116736669	INTERFERENCE SCATTERING IMAGING METHOD AND DEVICE BASED ON OFF-AXIS HOLOGRAPHY	
N9682	CN	116736613	12/09/2023	TAICANG GUODA METAL PRODUCTS	CN	04/05/2023	CN2023000486403	CN116736613	HOLOGRAPHIC PROJECTION CABINET AND PROJECTION METHOD	
N9683	CN	116730883	12/09/2023	TECHNICAL INSTITUTE OF PHYSICS & CHEMISTRY - CHINESE ACADEMY OF SCIENCES	CN	09/06/2023	CN2023000685655	CN116730883	ACRYLIC ESTER MONOMER WITH LOW VISCOSITY AND HIGH REFRACTIVE INDEX, PREPARATION AND APPLICATION THEREOF	
N9684	CN	116719147	08/09/2023	SHANGHAI UNIVERSITY	CN	12/06/2023	CN2023000690826	CN116719147	AUTOMATIC FOCUSING METHOD FOR DIGITAL HOLOGRAPHIC IMAGING, ELECTRONIC EQUIPMENT AND MEDIUM	
N9685	CN	116719052	08/09/2023	INSTITUTE OF OPTICS & ELECTRONICS - CHINESE ACADEMY OF SCIENCES	CN	09/06/2023	CN2023000683421	CN116719052	ANGULAR MOMENTUM BEAM UNDERWATER DETECTION DEVICE BASED ON VOLUME HOLOGRAPHIC GRATING	
N9686	CN	116714241	08/09/2023	NINGBO MAIKE CHUO INTELLIGENT TECHNOLOGY	CN	12/06/2023	CN2023000689705	CN116714241	HOLOGRAPHIC 3D PRINTING METHOD AND DEVICE BASED ON SLICING ALGORITHM AND READABLE STORAGE MEDIUM	
N9687	CN	116699956	05/09/2023	ZHEJIANG UNIVERSITY	CN	29/05/2023	CN2023000615420	CN116699956	METHOD FOR DESIGNING HOLOGRAPHIC SUPER SURFACE BY ON-CHIP AND FREE SPACE MULTIPLEXING	
N9688	CN	116699759	05/09/2023	JIANGXI LIANHAO PHOTOELECTRIC	CN	29/06/2023	CN2023000780309	CN116699759	HOLOGRAPHIC OPTICAL WAVEGUIDE STRUCTURE WITH TWO-DIMENSIONAL PUPIL EXPANSION AND MANUFACTURING METHOD THEREOF	
N9689	CN	116699747	05/09/2023	NANCHANG VIRTUAL REALITY RESEARCH INSTITUTE	CN	07/08/2023	CN2023000984554	CN116699747	PREPARATION METHOD OF VOLUME GRATING AND VOLUME GRATING	
N9690	CN	116699733	05/09/2023	SUZHOU LANGCHAO INTELLIGENT TECHNOLOGY	CN	07/06/2023	CN2023000671648	CN116699733	MAGNETO-OPTICAL SUPER-SURFACE DEVICE AND HOLOGRAPHIC DISPLAY SIMULATION METHOD AND DEVICE THEREOF	
N9691	CN	116679540	01/09/2023	JIANGSU JITRI HUST INTELLIGENT EQUIPMENT TECHNOLOGY	CN	25/06/2023	CN2023000748446	CN116679540	COMBINED TYPE 2D3D AUXILIARY FOCUSING MICROSCOPE	
N9692	CN	116679371	01/09/2023	SHENZHEN LOCHN OPTICS HI TECHNOLOGY	CN	15/05/2023	CN2023000546541	CN116679371	HOLOGRAPHIC OPTICAL WAVEGUIDE, MANUFACTURING METHOD THEREOF AND DISPLAY DEVICE	
N9693	CN	116677868	01/09/2023	CHANGSHA NORMAL UNIVERSITY	CN	05/06/2023	CN2023000659167	CN116677868	HOLOGRAPHIC THREE-DIMENSIONAL DISPLAY DEVICE FOR PLANAR DESIGN	
N9694	CN	116668746	29/08/2023	CHONGQING UNIVERSITY	CN	15/05/2023	CN2023000543816	CN116668746	HOLOGRAPHIC VIDEO COOPERATIVE TRANSMISSION METHOD BASED ON VISIBLE LIGHT COMMUNICATION	
N9695	CN	116665720	29/08/2023	GUANGDONG ZIJING INFORMATION STORAGE TECHNOLOGY	CN	18/02/2022	CN2022000152287	CN116665720	SERVO PLATFORM IN HOLOGRAPHIC OPTICAL STORAGE SYSTEM, MULTIPLEXING METHOD AND CALIBRATION METHOD	

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N9696	CN	116661038	29/08/2023	ZHEJIANG CRYSTAL OPTECH	CN	07/06/2023	CN2023000674390	CN116661038	HOLOGRAPHIC GRATING EXPOSURE DEVICE	
N9697	CN	116659412	29/08/2023	SOUTH CHINA NORMAL UNIVERSITY	CN	10/05/2023	CN2023000525846	CN116659412	FOUR-WAVELENGTH DOUBLE-ORTHOGONAL DIGITAL HOLOGRAPHIC IMAGING DEVICE AND DIGITAL HOLOGRAPHIC MEASURING DEVICE	
N9698	CN	116645432	25/08/2023	SHANGHAI JIAO TONG UNIVERSITY	CN	07/06/2023	CN2023000665894	CN116645432	HIGH-QUALITY HOLOGRAM GENERATING METHOD BASED ON IMPROVED VIT NETWORK	
N9699	CN	116643649	25/08/2023	CHONGQING CHANGAN AUTOMOBILE	CN	19/04/2023	CN2023000421578	CN116643649	HOLOGRAPHIC PROJECTION INTERACTION METHOD, DEVICE, VEHICLE AND MEDIUM BASED ON VISUAL TRACKING	