

IHMA PATENT NEWSLETTER

Limited circulation patent news bulletin for the Holography Industry

FEBRUARY 2024 – 84 PATENTS

Published and granted patents

**The IHMA PATENT NEWSLETTER
is exclusively dedicated to IHMA MEMBERS.**

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Please note that:

- IHMA Patent Newsletter covers the requests for worldwide patents (WO, US, EP, FR, GB, DE, JP, CN, KR, RU...).
- Some patents can be indexed in several categories.
- Some old patents are sometimes introduced in the databases if they have not been included in the previous update.
- The full patent information is in the tables at the end of this document (See TABLES WITH REFERENCES).
- IHMA Patent Newsletter is forwarded at the end of each month and corresponds to the patents appearing during the previous month. If at any time, you do not receive your newsletter in the usual time span, please contact us, as an electronic transmission problem is always possible.

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P37342

**SECURITY & OPTICAL EFFECTS' COLUMN
BANKNOTE – CARD – RELIEF – MICROLENS**

WO202422302

CHINA BANKNOTE PRINTING & MINT | ZHONGCHAO SPECIAL SECURITY TECHNOLOGY

Inventor(s):

CUI HAIBO | SUN KAI

Application Nber / Date:

WOCN2023/108966 2023-07-24

Priority Nber / Date / Country:

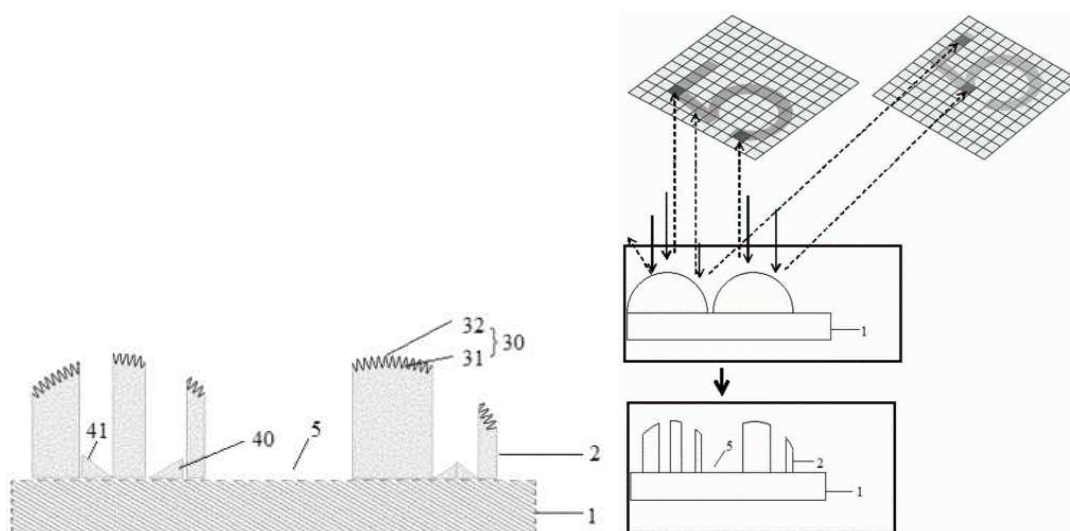
CN202210878916 2022-07-25

OPTICAL ANTI-COUNTERFEITING ELEMENT AND OPTICAL ANTI-COUNTERFEITING PRODUCT

Disclosed are an optical anti-counterfeiting element and an optical anti-counterfeiting product. The optical anti-counterfeiting element comprises a substrate (1) and a plurality of reflecting mirror surface sections (2). The reflecting mirror surface sections are arranged on the surface of one side of the substrate according to a preset rule, the plurality of reflecting mirror surface sections being spaced apart from each other to form gaps (5). The reflecting mirror surface sections and/or the gaps provide pixels of a macroscopic image, thereby forming a macroscopic dynamic and three-dimensional image. The problem of low yields of optical anti-counterfeiting elements in the prior art is solved.

ÉLÉMENT ANTI-CONTREFAÇON OPTIQUE ET PRODUIT ANTI-CONTREFAÇON OPTIQUE

L'invention divulgue un élément anti-contrefaçon optique et un produit anti-contrefaçon optique. L'élément anti-contrefaçon optique comprend un substrat (1) et une pluralité de sections de surface de miroir réfléchissant (2). Les sections de surface de miroir réfléchissant sont disposées sur la surface d'un côté du substrat selon une règle prédéfinie, les sections de la pluralité de sections de surface de miroir réfléchissant étant espacées les unes des autres pour former des espaces (5). Les sections de surface de miroir réfléchissant et/ou les espaces fournissent des pixels d'une image macroscopique, formant ainsi une image macroscopique dynamique et tridimensionnelle. La divulgation résout le problème de faibles rendements d'éléments anti-contrefaçon optiques de l'état de la technique.



CLAIM 1. An optical anti-counterfeiting element is characterized in that the optical anti-counterfeiting element comprises a base material (1) and a plurality of reflection mirror segments (2), wherein the reflection mirror segments (2) are arranged on one side surface of the base material (1) according to a preset rule, the plurality of reflection mirror segments (2) are arranged at intervals to form gaps (5), and the reflection mirror segments (2) and/or the gaps (5) provide pixels of macroscopic images, thereby forming macroscopic dynamic images and stereo images.

Equivalents : CN117485046

Status: Pending

Research Report:

INTERNATIONAL SEARCH REPORT		International application No. PCT/CN2023/108966
A. CLASSIFICATION OF SUBJECT MATTER B42D 25/00(2014.01)ii		
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) IPC: B42D 25/-		
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) CNTXT, CNABS, VEN, CNKI: 第二光学, 反射, 分开, 分离, 隔开, 间隔, 空隙, 镜, 光栅, 微浮雕, 微结构, second, optical+, reflect+, space, gap, interval, mirror+, lens, grating, grave, micro, structure		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 108603949 A (VISUAL PHYSICS LLC) 28 September 2018 (2018-09-28) description, paragraphs 45-168, and figures 1-23	1-3, 21, 22
Y	CN 108603949 A (VISUAL PHYSICS LLC) 28 September 2018 (2018-09-28) description, paragraphs 45-168, and figures 1-23	4-20
Y	CN 114537015 A (SPECIAL ANTI-COUNTERFEITING SCIENCE AND TECHNOLOGY CO., LTD. FOR MEDIUM CURRENCY et al.) 27 May 2022 (2022-05-27) description, paragraphs 51-87, and figures 1-9b	4-11
Y	CN 107379814 A (HUO CHENYAO) 24 November 2017 (2017-11-24) description, paragraphs 36-64, and figures 1-2	12-20
A	CN 103847289 A (SPECIAL ANTI-COUNTERFEITING SCIENCE AND TECHNOLOGY CO., LTD. FOR MEDIUM CURRENCY et al.) 11 June 2014 (2014-06-11) entire document	1-22
A	CN 108454264 A (SPECIAL ANTI-COUNTERFEITING SCIENCE AND TECHNOLOGY CO., LTD. FOR MEDIUM CURRENCY et al.) 28 August 2018 (2018-08-28) entire document	1-22

INTERNATIONAL SEARCH REPORT		International application No. PCT/CN2023/108966
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 112888575 A (GIESECKE+DEVRIENT CURRENCY TECHNOLOGY GMBH) 01 June 2021 (2021-06-01) entire document	1-22
A	US 2014247499 A1 (ARJOWIGGINS SECURITY) 04 September 2014 (2014-09-04) entire document	1-22

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

P37348

LABEL

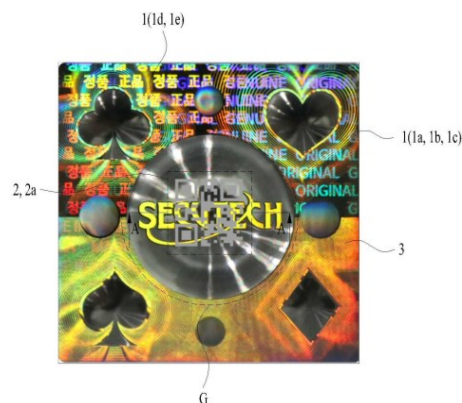
KR20240017387

RMG

Priority Date: 25/01/2024

GENUINE PRODUCT CERTIFICATION LABEL AND CERTIFICATION SYSTEM USING SAME

The present invention relates to a genuine product certification label having high security and improved appearance, and a genuine product certification system using the same. The present invention provides a genuine product authentication label and a genuine product authentication label using the same, the label comprising: a first code layer configured to include a first code comprising first authentication information on a predetermined product; a second code layer provided on the first code layer and comprising a second code comprising second authentication information on the predetermined product; and a partition layer interposed between the first code layer and the second code layer and configured to selectively cover the first code of the first code layer in response to a surrounding environment change to visually expose only the second code of the second code layer, wherein the first code of the first code layer is formed in a three-dimensional hologram, and the second code of the second code layer is formed in a two-dimensional pattern.



CLAIM 1. A genuine product authentication label comprising: a first code layer configured to include a first code composed of first authentication information for a predetermined product; a second code layer provided on the first code layer and including a second code composed of second authentication information for the predetermined product; and a partition layer interposed between the first code layer and the second code layer and configured to selectively cover the first code of the first code layer in response to a surrounding environment change to visually expose only the second code of the second code layer, wherein the first code of the first code layer is composed of a three-dimensional hologram, and the second code of the second code layer is composed of a two-dimensional pattern.

P37372

PRINTING – BANKNOTE – CARD – TRACK & TRACE

FR3138539

BUSSON BERTRAND | DINULOVIC DANIJEL | SCHLEE SERGE

Priority Date: 27/07/2022

MEANS OF PAYMENT INTEGRATING A QR-CODE PREVIOUSLY ANCHORED ON THE BLOCKCHAIN.

The present invention relates to a payment means such as a bank note and/or a bank card and/or a check where a QR-Code is affixed. A means of payment such as a bank note and/or a bank card and/or a check in which a QR-Code is affixed with several dimensions monochrome or in color and/or holographic and/or lenticular deposited directly on the support or in watermark or by embossing which is previously anchored on the blockchain in order to obtain a digital certificate of ownership called NFT or JNF or non-fungible token in French and in that the QR-code is managed by a determined software and algorithmic application.

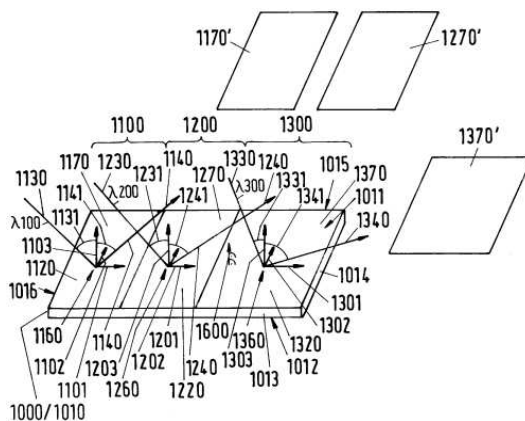
MOYENS DE PAIEMENT INTÉGRANT UN QR-CODE PRÉALABLEMENT ANCRÉ SUR LA BLOCKCHAIN.

La présente invention concerne un moyen de paiement comme un billet de banque et/ou une carte bancaire et/ou un chèque où est apposé un QR-Code. Moyen de paiement comme un billet de banque et/ou une carte bancaire et/ou un chèque où est apposé un QR-Code à plusieurs dimensions monochrome ou en couleur et/ou holographique et/ou lenticulaire déposé directement sur le support ou en filigrane ou par embossage qui est préalablement ancré sur la blockchain pour obtenir un certificat numérique de propriété dénommé NFT ou JNF ou jeton non fungible en français et en ce que la gestion du QR-code se fait par une application logicielle et algorithmique déterminée.

CLAIM 1. Banknote and/or a bank card and/or a check, characterized in that a QR-code by offset or inkjet or laser is affixed by printing techniques using indelible and indelible inks or by 3D milling, or by laser beam or by embossing and in that said QR-Code with several dimensions monochrome or in color and/or holographic for surface printing and/or by lenticular technique is previously anchored on the blockchain with all the information previously integrated which will produce a digital certificate of ownership called NFT or JNF or non-fungible token in French.

HOLOGRAM MASTER FOR MANUFACTURING A SECURITY ELEMENT WITH AN OPTICALLY VARIABLE HOLOGRAPHIC SECURITY FEATURE AND MANUFACTURING METHOD AND SECURITY ELEMENT

The invention relates to a hologram master (1000) for producing security elements (5001) having an optically variable holographic security feature, wherein a plurality of different diffraction structures (1120, 1220, 1320) are formed in a master body (1010), wherein each of the diffraction structures (1120, 1220, 1320) has a reconstruction geometry which is different from the reconstruction geometries of the other diffraction structures (1120, 1220, 1320), wherein each reconstruction geometry is defined by an exposure incidence direction and a diffraction light exit direction with respect to a surface of the master body and, when reconstruction light is irradiated in along the exposure incidence direction of the corresponding diffraction structure (1120, 1220, 1320) diffracts light in the corresponding diffraction light output direction (1140, 1240, 1340), wherein each of the diffraction structures reconstructs under the associated reconstruction geometry (1160, 1260, 1360) in each case at least one surface (1170, 1270, 1370) which has a uniform, homogeneous diffraction efficiency different from zero and can be detected in each case as a homogeneously luminous surface (1170', 1270', 1370'). The invention also relates to the production of security elements which preferably comprise personalized contact copies of the diffraction structures (1120, 1220, 1320) of the hologram master (1000), said contact copies being configured as volume holograms (2100, 2200, 2300).



CLAIM 1. A hologram master (1000) for producing security elements (5001) having an optically variable holographic security feature, comprising a master body (1010) having a surface (1011), wherein a plurality of different diffraction structures (1120, 1220, 1320) are formed in the master body (1010), wherein each of the plurality of different diffraction structures (1120, 1220, 1320) has a reconstruction geometry different from the reconstruction geometries of the other of the plurality of different diffraction structures (1120, 1220, 1320), wherein each reconstruction geometry is defined by a reconstruction light incident direction and a diffraction light exiting direction with respect to the one surface of the master body and upon irradiation of reconstruction light along the reconstruction light incidence direction of the corresponding one of the plurality of different diffraction structures (1120, 1220, 1320), diffracts this light into the diffraction light exit direction, wherein each of the plurality of different diffraction structures reconstructs, under the respective associated reconstruction geometry (1160, 1260, 1360), in each case at least one surface (1170, 1270, 1370) which is contiguous away in the mathematical sense, has a uniform homogeneous diffraction efficiency different from zero and can be detected in each case as a homogeneously luminous surface (1170', 1270', 1370'), wherein the plurality of different diffraction structures (1120, 1220, 1320) in the hologram master are related to one surface of the master body (10)

P37382

PRINTING – LABEL

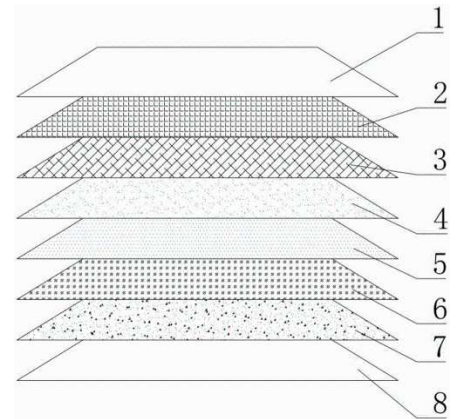
CN220509606U

Priority Date: 27/04/2023

HENAN PROVINCE WELLKING TECHNOLOGY DEVELOPMENT

DOUBLE-POSITIONING HOLOGRAPHIC LASER IMAGE-TEXT DIGITAL ANTI-COUNTERFEIT LABEL

The utility model discloses a double-positioning holographic laser image-text digital anti-counterfeiting label, which relates to the technical field of anti-counterfeiting technology, and aims to solve the problem that the commodity anti-counterfeiting technology is easy to imitate and reutilize; a positioning holographic laser image-text is arranged above the local image-text bonding layer; and a layered anti-counterfeiting foundation is arranged below the digital printing variable graph and text. The technology of positioning transfer holographic images and texts and the technology of thermoprinting and scraping layers are used for realizing the thermoprinting visual effect on the surface of the label and the verification function of displaying the secret code on the holographic scraping layer of the appointed area, the uncovering layer is fragile, the label is in layered destruction structure, the technology of positioning transfer holographic images and texts is used for realizing the thermoprinting visual effect and the verification function of displaying the secret code on the scraping layer of the appointed area, and the label forms the uncovering layer is fragile, the uncovering layer destruction structure and the technology are in layered destruction structure.



CLAIM 1. The utility model provides a dual location holographic laser picture and text digital anti-counterfeit label, includes digital printing variable picture and text (5), its characterized in that: a local image-text bonding layer (4) is arranged above the digital printing variable image-text (5); a positioning holographic laser image-text (3) is arranged above the local image-text bonding layer (4); a layered anti-counterfeiting foundation (6) is arranged below the digital printing variable graph-text (5).

P37386

PRINTING – LABEL

CN220456001U

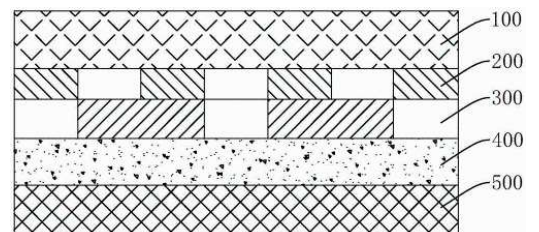
Priority Date: 28/07/2023

ZHONGSHAN GUOAN NEW MATERIAL

HOLOGRAPHIC ANTI-FAKE FILM CAPABLE OF UNCOVERING RESERVED WORDS/PICTURES

The utility model discloses a holographic anti-counterfeiting film for uncovering a reserved character/figure, which comprises the following components: the device comprises a base film layer, a yin-yang graph-text shedding layer, a color printing layer, a mould pressing layer and a metal layer, wherein the yin-yang graph-text shedding layer is arranged below the base film layer; the color printing layer is arranged below the yin-yang graph-text falling layer; the mould pressing layer is arranged below the color printing layer and is provided with mould pressing patterns; the metal layer is arranged below the mould pressing layer, so that a hologram with stronger metal sense and brightness is formed; the yin-yang pattern and text shedding layer comprises a shedding area and an attaching area, when the base film layer is torn off, the shedding area is reserved below the base film layer, the attaching area is reserved above the color printing layer, the shedding area and the attaching area are yin-yang patterns corresponding to each other, the holographic patterns are matched with the yin-yang pattern and text and the color printing layer, an anti-counterfeiting mark with an identification effect can be formed, the anti-counterfeiting force and the anti-counterfeiting uniqueness of the anti-counterfeiting film are enhanced, the imitation difficulty is high, and the anti-counterfeiting effect is relatively strong.

CLAIM 1. A holographic anti-counterfeit film with a uncovered stay-on/image, comprising: a base film layer (100); the negative and positive image-text falling layer (200), the negative and positive image-text falling layer (200) is arranged below the base film layer (100); a color printing layer (300), wherein the color printing layer (300) is arranged below the yin-yang graph-text falling layer (200); a molding layer (400), wherein the molding layer (400) is arranged below the color printing layer (300), and the molding layer (400) is provided with a molding pattern; -a metal layer (500), the metal layer (500) being arranged below the embossing layer (400); the negative and positive graph-text shedding layer (200) comprises a shedding area (201) and an attachment area (202), when the base film layer (100) is torn off, the shedding area (201) is reserved below the base film layer (100), the attachment area (202) is reserved above the color printing layer (300), and the shedding area (201) and the attachment area (202) are negative and positive graphs corresponding to each other.



P37388

CN220447553U

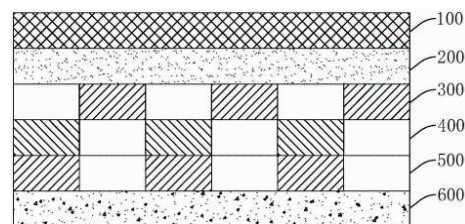
Priority Date: 03/03/2023

ZHONGSHAN GUOAN NEW MATERIAL

HOLOGRAPHIC THERMOPRINTING FILM WITH VARIABLE INFORMATION

The utility model discloses a holographic thermoprinting film with variable information, which comprises a base film layer, a release layer, a variable information layer, a mould pressing layer, a metal layer and a back glue layer which are sequentially distributed from top to bottom, wherein the variable information layer is provided with holographic variable patterns and/or characters and cursor patterns for mould pressing positioning, and the mould pressing layer is provided with mould pressing patterns corresponding to the patterns and/or characters of the variable information layer through the cursor patterns.

CLAIM 1. A holographic thermoprinting film with variable information, comprising: a base film layer (100); the release layer (200) is arranged below the base film layer (100); a variable information layer (300), wherein the variable information layer (300) is arranged below the release layer (200), and the variable information layer (300) is provided with holographic variable patterns and/or characters and cursor patterns for mould pressing positioning; the embossing layer (400) is arranged below the variable information layer (300), and the embossing layer (400) is positioned and provided with embossing patterns corresponding to patterns and/or characters of the variable information layer (300) through the cursor patterns; a metal layer (500), the metal layer (500) being provided below the molding layer (400); and the back adhesive layer (600), wherein the back adhesive layer (600) is arranged below the metal layer (500).



P37390

CN220398392U

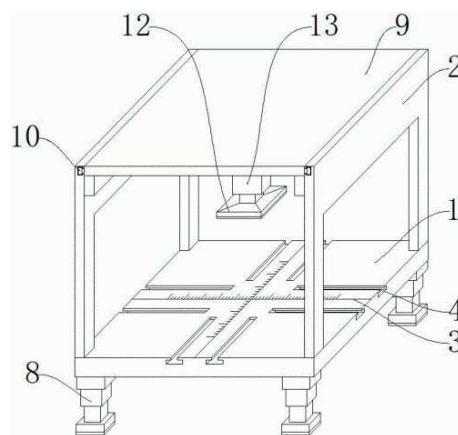
Priority Date: 17/05/2023

WUHAN YUEN ANTI COUNTERFEITING TECHNOLOGY

POSITIONING DETECTION DEVICE FOR HOLOGRAPHIC ANTI-COUNTERFEITING PAPER

The utility model relates to the technical field of holographic anti-counterfeiting and discloses a positioning detection device for holographic anti-counterfeiting paper, which comprises a bottom plate, wherein inverted concave plates are arranged on two sides of the upper surface of the bottom plate, detection devices are arranged on the side surfaces of the inverted concave plates, a cross scale is arranged in the middle of the upper surface of the bottom plate, a sliding groove is formed in the upper surface of the bottom plate, the inner wall of the sliding groove is connected with a sliding block in a sliding manner, a supporting plate is fixedly connected to the upper surface of the sliding block, a positioning plate is fixedly connected to the upper surface of the supporting plate, rubber layers are arranged on the side surfaces of the positioning plate, and supporting columns are arranged at four corners of the lower surface of the bottom plate. The utility model is convenient for positioning the detected anti-counterfeiting paper on the surface of the bottom plate by arranging the positioning plate on the surface of the bottom plate, and the specification detection of the detected anti-counterfeiting paper on the surface of the bottom plate is carried out by the cross graduated scale on the surface of the bottom plate and the cross laser below the top plate, so that the device has the advantage of accelerating the positioning detection of the holographic anti-counterfeiting paper.

CLAIM 1. The utility model provides a holographic anti-fake paper's location detection device which characterized in that: the device comprises a bottom plate (1), wherein inverted concave plates (2) are arranged on two sides of the upper surface of the bottom plate (1), and detection devices are arranged on the side surfaces of the inverted concave plates (2); the middle part of the upper surface of the bottom plate (1) is provided with a cross graduated scale (3), the upper surface of the bottom plate (1) is provided with a chute (4), the inner wall of the chute (4) is connected with a sliding block (5) in a sliding manner, the upper surface of the sliding block (5) is fixedly connected with a supporting plate (6), the upper surface of the supporting plate (6) is fixedly connected with a positioning plate (7), the side surface of the positioning plate (7) is provided with a rubber layer, and four corners of the lower surface of the bottom plate (1) are provided with supporting columns (8); the detection device comprises a top plate (9), convex plates (10) are arranged on two sides of the top plate (9), limit grooves (11) longitudinally moving with the convex plates (10) are formed in the side faces of the inverted concave plates (2), a cross laser (12) is arranged in the center of the lower surface of the top plate (9), and the upper surface of the top plate (9) and the upper surface of the inverted concave plates (2) are on the same plane.



P37391

PRINTING – LABEL – RELIEF

CN117577004

Priority Date: 08/12/2023

SHANDONG TAIBAO INFORMATION TECHNOLOGY GROUP

ANTI-COUNTERFEITING LABEL CAPABLE OF PREVENTING HOT AIR TRANSFER, AND PREPARATION METHOD AND APPLICATION THEREOF

The invention relates to an anti-counterfeiting label capable of preventing hot air transfer, a preparation method and application thereof. And a surface material layer is adhered on the upper part of the printing substrate, and the surface material layer completely covers the characteristic printing layer on the printing substrate. When hot air with the temperature of more than 90 °C blows, irreversible deformation shrinkage occurs on the surface material layer, and after the surface material layer deforms and shrinks, the content of the characteristic printing layer is exposed, so that anti-counterfeiting identification is performed. The invention intuitively judges whether the anti-counterfeit label is used and transferred or not through the surface material layer which is deformed and contracted by heating, thereby effectively avoiding the repeated use of lawless persons.

CLAIM 1. The utility model provides an anti-fake label of anti-hot wind transfer, includes printing substrate and the silicone oil paper of below, printing substrate include characteristic printing layer and anti-fake printing layer, contain laser holographic information layer and aluminizing layer, its characterized in that at the lower surface of printing substrate: a surface material layer is adhered on the upper part of the printing substrate, the surface material layer completely covers the characteristic printing layer on the printing substrate, when hot air at the temperature of more than 80 °C blows, irreversible deformation shrinkage occurs on the surface material layer, and after the surface material layer deforms and shrinks, the content of the characteristic printing layer is exposed, so that anti-counterfeiting identification is performed.

P37393

PRINTING – BRAND PROTECTION

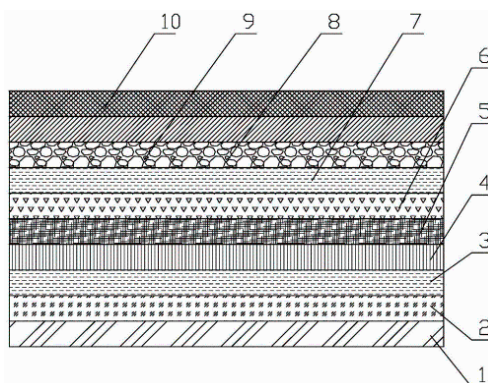
CN117567953

Priority Date: 13/11/2023

SHANDONG TAIBAO PACKAGING PRODUCT

TRANSPARENT SCRATCH-DISPLAY LASER ANTI-COUNTERFEITING ELECTROCHEMICAL ALUMINUM AND MANUFACTURING METHOD THEREOF

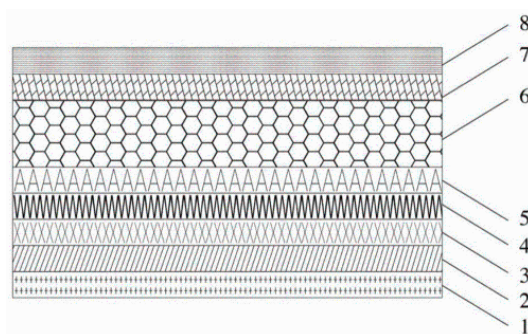
The invention particularly relates to transparent scratch-off laser anti-counterfeiting electrochemical aluminum and a manufacturing method thereof. The preparation method comprises the following steps: 1) Coating a composite mould pressing layer on the base film layer; 2) Carrying out holographic mould pressing on a mould pressing machine to form a first laser information layer; 3) Coating a release layer on the first laser information layer; 4) Coating a bearing protective layer; 5) Coating a transparent scraping layer; 6) UV molding to form a second laser information layer; 7) Coating a laser information shielding layer; 8) Vacuum evaporating a reflecting layer; 9) Coating a back adhesive layer to prepare the transparent scratch-off laser anti-counterfeiting electrochemical aluminum. The invention has the advantages of good anti-counterfeiting effect, no shielding of the ground color or printed information on the surface of the scalded object by the scraping layer, and no damage to the overall effect of the surface of the scalded object.



CLAIM 1. The transparent scratch-off laser anti-counterfeiting electrochemical aluminum is characterized in that a BOPET film is a base film layer, and the base film layer is sequentially provided with a composite mould pressing layer, a first laser information layer, a release layer, a bearing protective layer, a transparent scratch-off layer, a second laser information layer, a laser information shielding layer, a reflecting layer and a back adhesive layer from inside to outside.

PERSONALIZED ANTI-COUNTERFEITING PRINTING FILM AND PREPARATION METHOD THEREOF

The invention discloses a personalized anti-counterfeiting printing film and a preparation method thereof, wherein a release structure layer is arranged below a BOPET bearing layer, so that after personal information of a person who is authorized is printed by a digital printer and pressed into a card with a card-based material layer, the surface BOPET bearing layer and an anti-static layer can be directly torn off under the action of the release structure layer, the requirement of the personalized anti-counterfeiting printing film on the digital printer can be met, and the influence of the anti-static layer on light transmittance is minimized. The holographic pattern of the personalized anti-counterfeiting printing film is arranged on the inner side of the surface of the certificate, so that the anti-counterfeiting visualization performance of the certificate is improved. In addition, the invention realizes the enhancement of the binding force between the reflection enhancing medium layer and the PET bearing layer through the component design of the structural adhesive.



CLAIM 1. The preparation method of the personalized anti-counterfeiting printing film is characterized by comprising the following specific steps of: s1, preparing a mixed solvent with antistatic performance; s2, coating the mixed solvent obtained in the step S1 on the top surface of the BOPET bearing layer in a spraying, roller coating or casting mode to form an antistatic layer; s3, heating the diacetyl cellulose solution, and forming a release structure layer on the bottom surface of the BOPET bearing layer by laminating the heated diacetyl cellulose solution; s4, designing a holographic pattern in advance, and manufacturing a nickel plate with interference and diffraction effects by using a photoetching technology to obtain the nickel plate with the holographic pattern; s5, spraying acrylic resin on the bottom surface of the release structure layer to form an acrylic resin coating; s6, transferring the holographic pattern of the nickel plate to the bottom surface of the acrylic resin coating through hot pressing to obtain an optical structure layer; s7, carrying out corona treatment on the bottom surface of the optical structure layer; s8, forming a reflection enhancing medium layer on the bottom surface of the optical structure layer after corona treatment by adopting a vacuum coating technology; s9, coating structural adhesive on the top surface of the PET bearing layer, and compounding the top surface of the PET bearing layer on the bottom surface of the reflection enhancing medium layer; in addition, preparing a digital printing adaptation agent, and coating the digital printing adaptation agent on the bottom surface of the PET bearing layer to form a printing coating layer, so as to obtain the finished product personalized anti-counterfeiting printing film.

P37406

PRINTING – BRAND PROTECTION

CN117511431

Priority Date: 05/12/2023

SHANDONG TAIBAO INFORMATION TECHNOLOGY GROUP

NON-DEVIATION COLOR PRINTING HOLOGRAPHIC ANTI-COUNTERFEITING ADHESIVE TAPE AND PREPARATION METHOD THEREOF

The utility model discloses a non-deviation color printing holographic anti-counterfeiting adhesive tape and a preparation method thereof, and belongs to the technical field of anti-counterfeiting adhesive tapes. The technical proposal is as follows: the method comprises the following steps: s1, carrying out single-sided corona on a film layer; s2, embossing a microstructure information layer on the corona surface of the film layer, and printing a water-washing ink layer coating, an uncovering material layer and a transparent color layer; s3, vacuum aluminizing is carried out on the transparent color layer to form an aluminized layer, and the water-washing ink layer, the uncovered material layer, the transparent color layer and the aluminized layer which are covered on the water-washing ink layer are removed; s4, coating pressure-sensitive adhesive on the aluminized layer surface of the film layer, coating adhesive tape release agent on the other surface of the film layer, and respectively forming a pressure-sensitive adhesive layer and a protective release layer after drying; s5, slitting the film layer to obtain the unbiased color printing holographic anti-counterfeiting adhesive tape. The transparent color layer and the aluminized layer in the unbiased color printing holographic anti-counterfeiting adhesive tape have zero deviation sleeve positions, so that consumers can judge authenticity by observing whether the transparent color layer and the aluminized layer of the adhesive tape have deviation or not by naked eyes, and the unbiased color printing holographic anti-counterfeiting adhesive tape has higher anti-counterfeiting performance.

CLAIM 1. The preparation method of the unbiased color printing holographic anti-counterfeiting adhesive tape is characterized by comprising the following steps of: s1, carrying out single-sided corona on a film layer; s2, embossing microstructure information on the corona surface of the film layer, printing water-washing ink paint on the position, on which the anti-counterfeiting pattern is not printed, of the film layer, then printing uncovering material and transparent color paint on the surface, on which the water-washing ink paint is printed, of the film layer in sequence, and drying to form a microstructure information layer, a water-washing ink layer, an uncovering material layer and a transparent color layer; s3, after forming an aluminized layer by vacuum aluminizing on the transparent color layer, removing the water-washing ink layer, the uncovering material layer covered on the water-washing ink layer, the transparent color layer and the aluminized layer to obtain a non-deviation color printing holographic film layer; s4, coating pressure-sensitive adhesive on the aluminized layer surface of the film layer, coating adhesive tape release agent on the other surface of the film layer, and respectively forming a pressure-sensitive adhesive layer and a protective release layer after drying; s5, slitting the film obtained in the step S4 to obtain the unbiased color printing holographic anti-counterfeiting adhesive tape.

P37410

BRAND PROTECTION – LUMINESCENCE

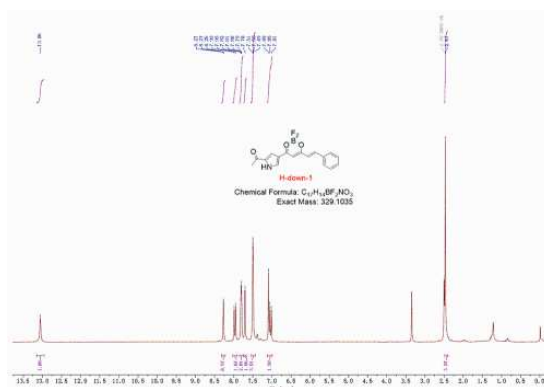
CN117510524

Priority Date: 18/10/2023

CHINA THREE GORGES UNIVERSITY

PREPARATION AND APPLICATION OF SIX-MEMBERED O, O HETEROCYCLIC COMPOUND

The invention discloses a preparation method and application of a six-membered O, O heterocyclic compound, wherein 2-acetyl pyrrole derivative and aromatic aldehyde are used as raw materials, and a series of six-membered O, O fluorine boron fluorescent dyes are finally generated through Knoevenagel condensation reaction under the action of acetic acid and piperidine catalysts. After the dye is applied to paper anti-counterfeiting, the distinction degree is high and the identification degree is large under natural light and a UV lamp. The fluorescent dye has the advantages of simple synthesis method, high fluorescence quantum yield, large Stokes shift, good stability and great potential in the field of fluorescent anti-counterfeiting packaging films and the like.



CLAIM 1. The six-membered O, O heterocyclic compound is characterized in that the structural formula of the six-membered O, O heterocyclic compound is as follows: wherein R is -Ph, -Ph-O-CH₃, -TPE, -TPA, -Ph-N(CH₃)₂, AN.

P37411

BRAND PROTECTION – LUMINESCENCE

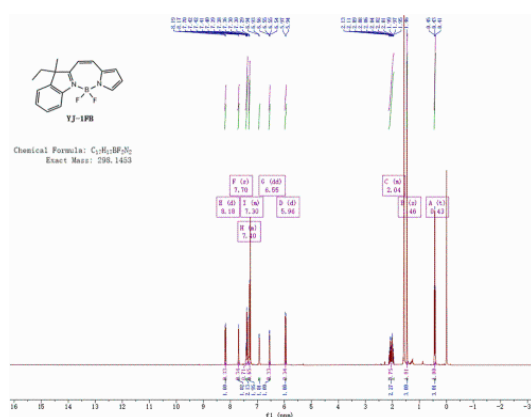
CN117510523

CHINA THREE GORGES UNIVERSITY

Priority Date: 18/10/2023

PREPARATION AND APPLICATION OF SEVEN-MEMBERED N, N HETEROCYCLIC COMPOUND

The invention discloses a preparation method and application of a seven-membered N, N heterocyclic compound, wherein 3, 3-dimethyl-2-ethylindole and 2-formylpyrrole are used as raw materials, and a seven-membered N, N-fluoroboron fluorescent dye is finally generated through Knoevenagel condensation reaction under the action of a triethylamine catalyst. The dye can be combined with acrylic resin on a film to form a film quickly, and when the concentration is low, the dye presents a transparent color when being irradiated by natural light, clear yellow fluorescence can be seen under an ultraviolet lamp, the front-back contrast difference degree is obvious, and the distinction degree is high. The fluorescent dye has the advantages of simple synthesis method, higher fluorescence quantum yield, low manufacturing cost and great potential in the fields of fluorescence holographic anti-counterfeiting packaging films, OLDE and the like.



CLAIM 1. BODIPY solid fluorescent dye, which is characterized in that the chemical structural formulas of the fluorescent dye are respectively as follows:

Click on the title to return to table of contents

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

P37335

PRINTING – BANKNOTE -THREAD – RELIEF – MICROLENS

WO202428574

DE LA RUE INTERNATIONAL

Priority Date: 03/08/2022

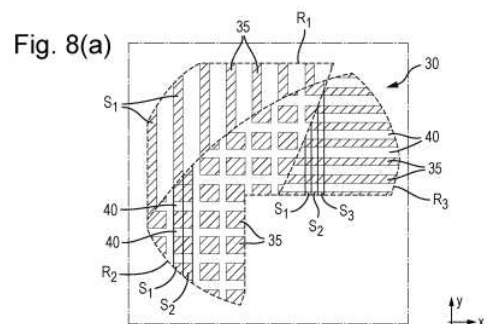
SECURITY DEVICES AND METHODS OF MANUFACTURE THEREOF

A security device is disclosed, comprising: a substrate; an array of viewing elements disposed on the substrate; and an image layer disposed in or on the substrate, wherein the image layer comprises at least first and second sets of image segments, the first set of image segments comprising image layer material that together defines a first image and the second set of image segments comprising image layer material that together defines a second image, the first set of image segments and the second set of image segments being interleaved with each other; and wherein the array of viewing elements and the image layer cooperate with each other such that at a first range of viewing angles, light from the first set of image segments is directed to a viewer such that the first image is exhibited; and at a second range of viewing angles, light from the second set of image segments is directed to the viewer such that the second image is exhibited; wherein the image layer comprises a plurality of different regions, each region being defined by the number of sets of image segments having image segments present within that region, and wherein the arrangement of the image layer material of the image segments and/or the colour density of the image segments within a region is dependent upon the number of sets of image segments having image segments present within that region, and is different for different regions such that when viewing the device within the first range of viewing angles the first image is perceived to have a uniform tone, and when viewing the device within the second range of viewing angles the second image is perceived to have a uniform tone. Methods of manufacturing such security devices are also disclosed.

DISPOSITIFS DE SÉCURITÉ ET LEURS PROCÉDÉS DE FABRICATION

Un dispositif de sécurité est divulgué, comprenant : un substrat ; un réseau d'éléments d'observation disposés sur le substrat ; et une couche d'image disposée dans ou sur le substrat, la couche d'image comprenant au moins des premier et second ensembles de segments d'image, le premier ensemble de segments d'image comprenant un matériau de couche d'image qui définit une première image et le second ensemble de segments d'image comprenant un matériau de couche d'image qui définit une seconde image, le premier ensemble de segments d'image et le second ensemble de segments d'image étant entrelacés entre eux ; et le réseau d'éléments d'observation et la couche d'image coopérant l'un avec l'autre de telle sorte que, à une première plage d'angles d'observation, une lumière provenant du premier ensemble de segments d'image est dirigée vers un observateur de telle sorte que la première image est présentée ; et, à une seconde plage d'angles d'observation, une lumière provenant du second ensemble de segments d'image est dirigée vers l'observateur de telle sorte que la seconde image est présentée ; la couche d'image comprenant une pluralité de régions différentes, chaque région étant définie par le nombre d'ensembles de segments d'image comprenant des segments d'image présents dans cette région, et l'agencement du matériau de couche d'image des segments d'image et/ou de la densité de couleur des segments d'image dans une région dépendant du nombre d'ensembles de segments d'image comprenant des segments d'image présents dans cette région, et étant différent pour des régions différentes de telle sorte que, lors de l'observation du dispositif dans la première plage d'angles d'observation, la première image est perçue comme présentant une teinte uniforme, et, lors de l'observation du dispositif dans la seconde plage d'angles d'observation, la seconde image est perçue comme présentant une teinte uniforme. Des procédés de fabrication de tels dispositifs de sécurité sont également divulgués.

CLAIM 1. A security device, comprising: a substrate; an array of viewing elements disposed on the substrate; and an image layer disposed in or on the substrate, wherein the image layer comprises at least first and second sets of image segments, the first set of image segments comprising image layer material that together defines a first image and the second set of image segments comprising image layer material that together defines a second image, the first set of image segments and the second set of image segments being interleaved with each other; and wherein the array of viewing elements and the image layer cooperate with each other such that at a first range of viewing angles, light from the first set of image segments is directed to a viewer such that the first image is exhibited; and at a second range of viewing angles, light from the second set of image segments is directed to the viewer such that the second image is exhibited; wherein the image layer comprises a plurality of different regions, each region being defined by the number of sets of image segments having image segments present within that region, and wherein the arrangement of the image layer material of the image segments and/or the colour density of the image segments within a region is dependent upon the number of sets of image segments having image segments present within that region, and is different for different regions such that when viewing the device within the first range of viewing angles the first image is perceived to have a uniform tone, and when viewing the device within the second range of viewing angles the second image is perceived to have a uniform tone.

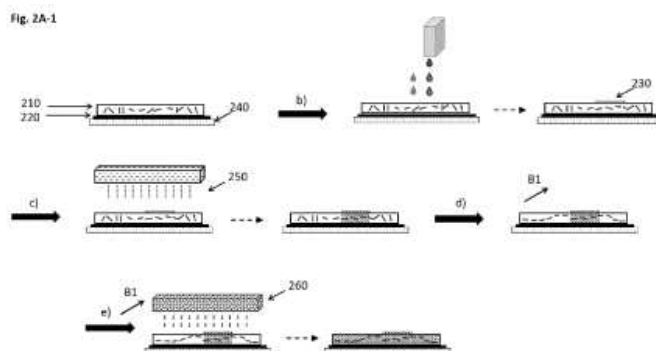


METHODS FOR PRODUCING OPTICAL EFFECT LAYERS COMPRISING MAGNETIC OR MAGNETIZABLE PIGMENT PARTICLES AND EXHIBITING ONE OR MORE INDICIA

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 DE PIGMENT MAGNÉTIQUES OU MAGNÉTISABLES ET PRÉSENTANT UN OU PLUSIEURS INDICES

L'invention se rapporte au domaine de la protection de documents de sécurité tels que 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).

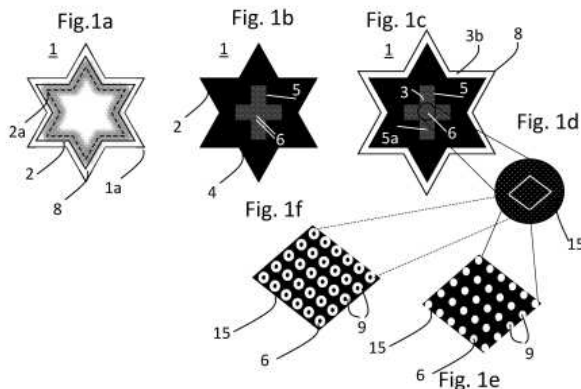


SECURITY ELEMENT FOR A VALUE DOCUMENT, HAVING AN OPTICALLY VARIABLE PRIMARY SURFACE PATTERN AND CONCEALED SECONDARY SURFACE PATTERN, AND METHOD FOR PRODUCTION THEREOF

A security element (1) for a value document, wherein the security element (1) comprises: an optically variable primary surface pattern (2) that has a metal layer (4) with a relief structure (4a); and at least one concealed secondary surface pattern (3) comprising a plurality of elements (6) that perforate the metal layer (4) and at least one luminescence layer (7) that is arranged at least in the region of the secondary surface pattern (3).

ÉLÉMENT DE SÉCURITÉ POUR DOCUMENT DE VALEUR, PRÉSENTANT UN MOTIF DE SURFACE PRIMAIRE OPTIQUEMENT VARIABLE ET UN MOTIF DE SURFACE SECONDAIRE DISSIMULÉ, ET SON PROCÉDÉ DE PRODUCTION

L'invention concerne un élément de sécurité (1) destiné à un document de valeur, l'élément de sécurité (1) comprenant : un motif de surface primaire optiquement variable (2) qui a une couche métallique (4) pourvue d'une structure en relief (4a) ; et au moins un motif de surface secondaire dissimulé (3) comprenant une pluralité d'éléments (6) qui perforent la couche métallique (4) et au moins une couche de luminescence (7) qui est disposée au moins dans la région du motif de surface secondaire (3).



CLAIM 1. Security element (1) for a value document, wherein the security element (1) comprises: an optically variable primary surface pattern (2), which comprises a metal layer (4) with a relief structure (4a); and at least one hidden secondary surface pattern (3) comprising a plurality of elements (6) perforating the metal layer (4) and at least one luminescent layer (7), which is arranged at least partially in the region of the plurality of elements (6) perforating the metal layer (4).

P37342

PATENT OF THE MONTH
BANKNOTE – CARD – RELIEF – MICROLENS

WO202422302

Priority Date: 25/07/2022

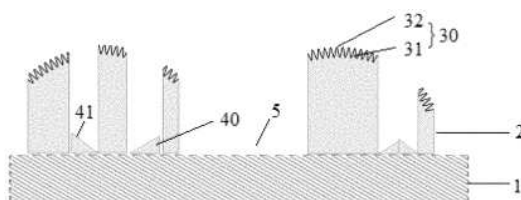
CHINA BANKNOTE PRINTING & MINT | ZHONGCHAO SPECIAL SECURITY TECHNOLOGY

OPTICAL ANTI-COUNTERFEITING ELEMENT AND OPTICAL ANTI-COUNTERFEITING PRODUCT

Disclosed are an optical anti-counterfeiting element and an optical anti-counterfeiting product. The optical anti-counterfeiting element comprises a substrate (1) and a plurality of reflecting mirror surface sections (2). The reflecting mirror surface sections are arranged on the surface of one side of the substrate according to a preset rule, the plurality of reflecting mirror surface sections being spaced apart from each other to form gaps (5). The reflecting mirror surface sections and/or the gaps provide pixels of a macroscopic image, thereby forming a macroscopic dynamic and three-dimensional image. The problem of low yields of optical anti-counterfeiting elements in the prior art is solved.

ÉLÉMENT ANTI-CONTREFAÇON OPTIQUE ET PRODUIT ANTI-CONTREFAÇON OPTIQUE

L'invention divulgue un élément anti-contrefaçon optique et un produit anti-contrefaçon optique. L'élément anti-contrefaçon optique comprend un substrat (1) et une pluralité de sections de surface de miroir réfléchissant (2). Les sections de surface de miroir réfléchissant sont disposées sur la surface d'un côté du substrat selon une règle prédéfinie, les sections de la pluralité de sections de surface de miroir réfléchissant étant espacées les unes des autres pour former des espaces (5). Les sections de surface de miroir réfléchissant et/ou les espaces fournissent des pixels d'une image macroscopique, formant ainsi une image macroscopique dynamique et tridimensionnelle. La divulgation résout le problème de faibles rendements d'éléments anti-contrefaçon optiques de l'état de la technique.



CLAIM 1. An optical anti-counterfeiting element is characterized in that the optical anti-counterfeiting element comprises a base material (1) and a plurality of reflection mirror segments (2), wherein the reflection mirror segments (2) are arranged on one side surface of the base material (1) according to a preset rule, the plurality of reflection mirror segments (2) are arranged at intervals to form gaps (5), and the reflection mirror segments (2) and/or the gaps (5) provide pixels of macroscopic images, thereby forming macroscopic dynamic images and stereo images.

P37349

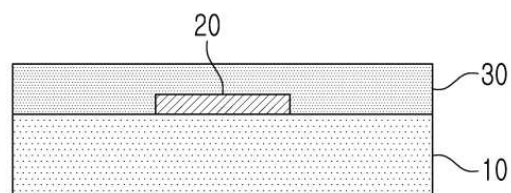
KR102632898

Priority Date: 27/04/2023

NBST

SECURITY FILM FOR PREVENTING FORGERY AND METHOD FOR AUTHENTICATING FORGERY USING THE SAME

The present invention relates to a security film for preventing forgery and alteration and a method for forgery and alteration by using the same, and more specifically, to a security film and a method for forgery and alteration authentication using the same, wherein the security film prevents reuse of the security film by including a physical taggant that cannot be identified with the eyes in a pattern layer when an attachment surface of the film and a base layer are to be separated from each other in order to check whether the stacked security film is forged or altered, and at the same time, whether the security film is forged or altered can be checked in a buckling manner through mechanical stimulation. A security film according to an embodiment of the present invention comprises: a base layer formed of a flexible material and including a high wrinkle area and a low wrinkle area; a pattern layer patterned in the high wrinkle area of the base layer and having a higher Young's modulus than that of the base layer; and an upper layer covering the low wrinkle area of the base layer and the pattern layer and having a higher Young's modulus than that of the base layer and a lower Young's modulus than that of the pattern layer, wherein the pattern layer may have a physical taggant indented therein, the physical taggant being indiscernible with the naked eye.



P37351

CARD

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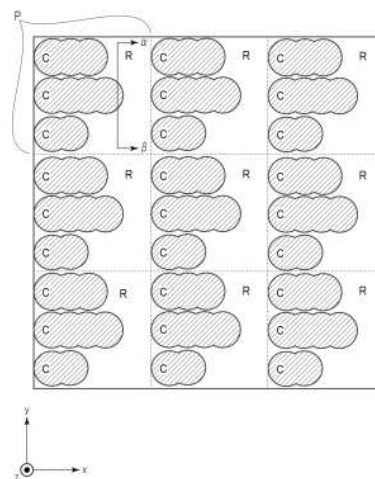
TOPPAN HOLDINGS

Priority Date: 03/08/2022

IMAGE DISPLAY MEDIUM AND METHOD FOR PRODUCING SAME

TOPIC: Provided is an image display medium capable of displaying beautiful images. INVENTION: The present invention has an image forming unit configured from a plurality of color unit sections formed in a grid shape. Each of the plurality of color unit sections is configured by layering an opaque layer and a modulation layer. The modulation layer has a plurality of transmission areas through which light can pass, and a non-transmission area which is disposed so as to surround each of the plurality of transmission areas and through which light cannot pass. In the modulation layer, each of the plurality of transmission areas has a curved outline and a long axis direction which is common to the plurality of transmission areas and is orthogonal to the long axis direction. An image display medium characterized in that the medium has a short axis direction, the length in the short axis direction is uneven along the long axis direction, and the transmitted light from an opaque layer is modulated by changing the area of a transmission area in each of a plurality of color developing unit sections in order to display an image from an image forming section.

CLAIM 1. The present invention has an image-forming unit configured from a plurality of color-developing unit sections formed in a grid shape. Each of the plurality of color-developing unit sections is configured by layering an opaque layer and a modulation layer. The modulation layer has a plurality of transmission areas through which light can pass, and an opaque area which is disposed so as to surround each of the plurality of transmission areas and through which light cannot pass. In the modulation layer, each of the plurality of transmission areas has a curved outline, a common long-axis direction for the plurality of transmission areas, and an orthogonal direction to the long-axis direction. The image display medium has a short axis direction, and the length in the short axis direction is uneven along the long axis direction. In order to display an image from the image forming unit, the area of the transmission area is changed in each of the plurality of color development unit sections, thereby modulating the transmitted light from the opaque layer.



P37352

PRINTING

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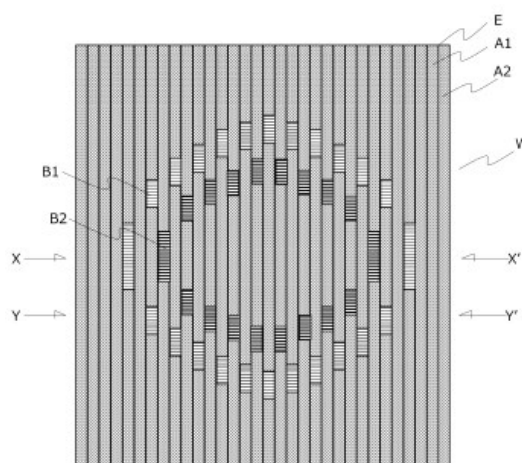
TOPPAN HOLDINGS

Priority Date: 03/08/2022

INDICATOR

TOPIC: Provided is a display body capable of delicate expression depending on the viewing angle. INVENTION: The display body has lines on the surface of a base material, the line width of the lines is in the range of 0.005-0.050 mm, the pitch D of the lines is in the range of 0.01-0.12 mm, and the lines have a line pattern of the same color as that of the lines. Furthermore, one of the other display bodies has a universal line wherein universal lines of different colors are arranged adjacent to each other on the surface of the base material, a universal line pattern of the same color as the universal line is formed on at least a part of the universal line, and the line width of the universal line is within the range of 0.005-0.050 mm.

CLAIM 1. A display having lines on the surface of a base material, wherein the line width of the lines is in the range of 0.005-0.050 mm, the pitch of the lines is in the range of 0.01-0.12 mm, and the lines have a pattern of lines having the same color as that of the lines.



P37353

LUMINESCENCE

JP2024021073

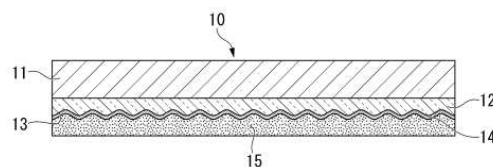
Priority Date: 02/08/2022

TOPPAN HOLDINGS

TRANSFER FOIL, AND METHOD FOR PRODUCING IMAGE DISPLAY

TOPIC: In a transfer foil of an image display requiring security and a method for manufacturing an image display using the transfer foil, the easy-to-find performance of a suspect article is easily improved. INVENTION: The transfer foil is obtained by laminating an OVD forming layer, a reflective layer, and a visible light selective absorption adhesive layer. The visible light selective absorption adhesive layer is substantially transparent in the visible light region of 400nm to 700 nm, and the reproduced light by the recessed and projected structure is white. The visible light selective absorption adhesive layer is transferred and formed by at least one of a first visible light selective absorption adhesive layer, a second visible light selective absorption adhesive layer and a third visible light selective absorption adhesive layer. An OVD image is observed through the visible light selective absorption adhesive layer. The first visible light selective absorption adhesive layer absorbs at least a wavelength of 400nm to 600 nm. The second visible light selective absorption adhesive layer absorbs at least a wavelength of 400nm to 500nm and a wavelength of 600nm to 700 nm. The third visible light selective absorption adhesive layer absorbs at least a wavelength of 500nm to 700 nm.

CLAIM 1. A transfer foil comprising at least an OVD forming layer provided on a base material and having a peelable surface having a recessed and projected structure, a reflective layer formed so as to cover at least a part of the surface of the OVD forming layer, and a visible light selective absorption adhesive layer, wherein the visible light selective absorption adhesive layer is substantially transparent in a visible light region of 400nm to 700 nm, the reproduced light by the recessed and projected structure is white, and the visible light selective absorption adhesive layer is a first visible light selective absorption adhesive layer and a second visible light selective absorption adhesive layer. The transfer foil is formed by transfer by at least one of the third visible light selective absorption adhesive layer and observes an OVD image through the visible light selective absorption adhesive layer. The transfer foil is characterized in that the first visible light selective absorption adhesive layer absorbs at least a wavelength of 400nm to 600 nm, the second visible light selective absorption adhesive layer absorbs at least a wavelength of 400nm to 500nm and a wavelength of 600nm to 700 nm, and the third visible light selective absorption adhesive layer absorbs at least a wavelength of 500nm to 700 nm.



P37354

PRINTING – BANKNOTE – CARD – LUMINESCENCE

JP2024017854

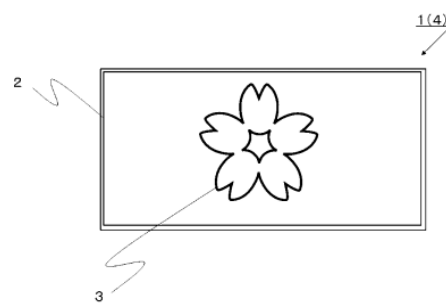
Priority Date: 28/07/2022

NATIONAL PRINTING BUREAU

BRIGHT VIDEO PATTERN

TOPIC: The present invention provides a photoluminescent moving image pattern that obtains a moving image effect and image resolution by setting the width of each uneven pattern element to a pitch greater than or equal to the pitch between adjacent uneven pattern elements in an uneven structure that generates a moving image effect by compressing and dividing and compressing a base image by applying a moiré expansion system or an integral photography system image line configuration. INVENTION: The present invention is a photoluminescent moving image pattern having a group of uneven pattern elements on at least a part of a substrate. The group of uneven pattern elements is a photoluminescent moving image pattern in which the uneven pattern elements formed by dividing and compressing a base image are arranged in a regular manner in the arrangement direction and the arrangement pitch, the width of the uneven pattern elements is greater than the arrangement pitch in the arrangement direction, and a plurality of adjacent uneven pattern elements are arranged so as to overlap.

CLAIM 1. A photoluminescent moving image pattern having a group of concave and convex pattern elements on at least a part of a base material. In the group of concave and convex pattern elements, concave and convex pattern elements formed by dividing and compressing a base image have regularity in the arrangement direction and/or the arrangement pitch, the width of the concave and convex pattern elements is larger than the arrangement pitch in the arrangement direction, and a plurality of adjacent concave and convex pattern elements are arranged so as to overlap each other. In the concave and convex pattern elements, a concave and convex structure having photoluminescence is arranged as described above. The concave-convex structures have different shapes, and the adjacent concave-convex structures have a shape that most closely approximates each other. The concave-convex pattern element group reflects light to incident light, thereby causing the base image to appear as a moving image pattern. The bright moving image pattern is characterized in that the position of the moving image pattern is changed and visually recognized by changing.



P37357

PRINTING – BANKNOTE

JP2024017567

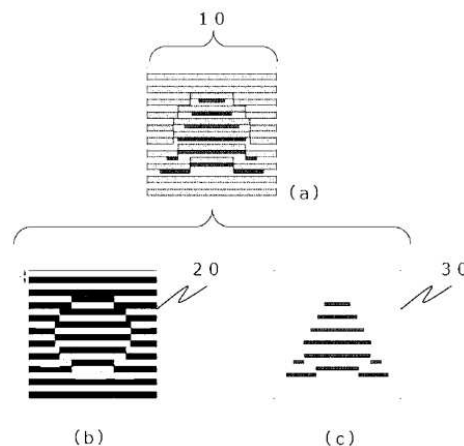
NATIONAL PRINTING BUREAU

Priority Date: 28/07/2022

LATENT IMAGE-EXPRESSING PATTERN, METHOD FOR PREPARING DATA OF LATENT IMAGE-EXPRESSING PATTERN, AND DATA OF LATENT IMAGE-EXPRESSING PATTERN

TOPIC: Provided is a latent image expression pattern that has a phase modulation pattern and visible pattern components, and in which a visible pattern can be viewed when a determination device is not used, and a latent image can be viewed when a determination device is used. INVENTION: The present invention has: a phase-modulated pattern in which a plurality of colored image lines are arranged so as to have a constant pitch in a first direction, the phase-modulated pattern constituting a latent image section and a background section by moving the phase of a portion of the colored image lines in the first direction; and a visible pattern component constituting a visible pattern. The visible pattern component is provided in a region in which the colored image lines are not provided in the phase-modulated pattern, and the phase of the latent image component constituting the latent image section in the phase-modulated pattern The latent image expression pattern has a region that does not overlap with the phase of the visible pattern component.

CLAIM 1. The all-line pattern has a plurality of colored picture lines arranged at a constant pitch in a first direction. The all-line pattern has a phase modulation pattern in which a latent image section and a background section are configured by moving the phase of a part of the colored picture lines in a first direction, and a colored visible pattern component constituting a visible pattern. The visible pattern component is provided in a region where the colored picture lines are not provided in the phase modulation pattern. The latent image component lines constituting the latent image section in the phase modulation pattern are the visible image component lines A latent image-expressing pattern having a region that does not overlap with a pattern component.



P37358

PRINTING – BANKNOTE

JP2024017436

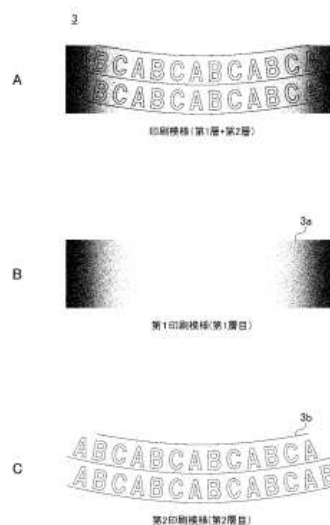
NATIONAL PRINTING BUREAU

Priority Date: 28/07/2022

ANTI-COUNTERFEITING PRINTED MATTER AND METHOD OF PRODUCING ANTI-COUNTERFEITING PRINTED MATTER

TOPIC: Provided are: an anti-counterfeiting printed matter having a print pattern that allows even a person who does not have a defect in color vision to easily recognize a change in hue; and a method for producing the anti-counterfeiting printed matter. INVENTION: The printing pattern has at least two types of chromatic color regions including a first chromatic color region composed of a first chromatic color and a second chromatic color region composed of a second chromatic color having a complementary color relationship with the first chromatic color, wherein the printing pattern is composed of a plurality of image lines regularly arranged in a predetermined direction. In the printed pattern, the boundary regions of the first chromatic color region and the second chromatic color region are configured such that the hue changes continuously.

CLAIM 1. A printed pattern for prevention of forgery is formed on a base material. The printed pattern has at least two types of chromatic regions, each of which comprises a first chromatic region composed of a first chromatic color and a second chromatic region composed of a second chromatic color having a complementary color relationship with the first chromatic color. The boundary region between the first chromatic region and the second chromatic region ranges from the first chromatic color to the second chromatic color An anti-counterfeiting printed matter configured so that the hue changes continuously.



P37363

RELIEF

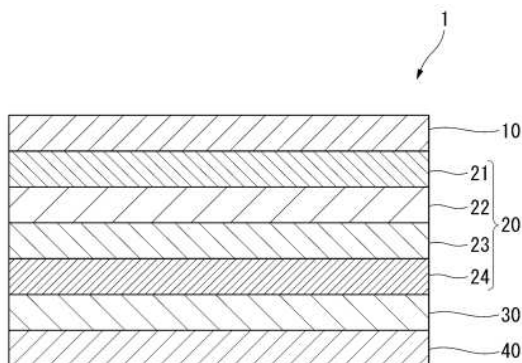
JP2024013894

TOPPAN HOLDINGS

Priority Date: 21/07/2022

TRANSFER FOIL

TOPIC: The present invention is capable of achieving both blocking resistance and adhesion. INVENTION: The transfer foil (1) has a multilayer structure formed on one surface of a support (10) by a peeling layer (21), a relief layer (22), an inorganic vapor deposition layer (23), a mask layer (24), a cushion layer (30), and an adhesive layer (40). The cushion layer (30) is a polyester, the adhesive layer (40) is a polyamide, the polyester resin of the cushion layer (30) has crystallinity and a melting point of 80-120°C, and the polyamide resin of the adhesive layer (40) is two kinds Provided is a transfer foil which is a mixed product, wherein the storage elastic modulus of one polyamide resin is 1 MPa or less at a temperature of 90°C-120°C, and the elastic modulus of the other polyamide resin is 2.5 MPa or more at a temperature of 60°C.



CLAIM 1. A transfer foil having a multilayer structure formed on one surface of a base material by a surface protective layer, an optical forming layer, a reflective layer, a lower layer protective layer, a cushion layer and an adhesive layer, wherein the cushion layer is a polyester, the adhesive layer is a polyamide, the polyester resin of the cushion layer has crystallinity and a melting point of 80-120°C, the polyamide resin of the adhesive layer is a mixture of two kinds, and the storage modulus of one polyamide resin is 90°C-120°C The transfer foil has a modulus of elasticity of 1 MPa or less at 60°C and a modulus of elasticity of 2.5 MPa or more at the other polyamide resin.

P37364

PRINTING – CARD

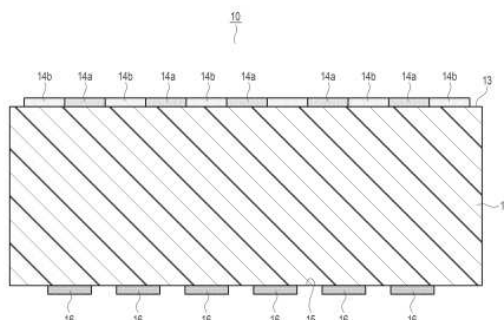
JP2024013094

TOPPAN HOLDINGS

Priority Date: 19/07/2022

INDICATOR WITH CHANGING EFFECT

TOPIC: Provided is a display body that does not require large-scale equipment for manufacturing, has a security function that can clearly determine counterfeit products, can perform on-demand color printing, and can display a clear changing image. INVENTION: The display is characterized in that the display body is provided with a transparent card, a first line printed on the first surface of the transparent card and containing a plurality of images, and a second line printed on the second surface facing the first surface of the transparent card and used for a mask for displaying a plurality of images, and the second line is individually formed for each owner so as to contain individual information of the owner of the display body.



CLAIM 1. A display body having a changing effect is provided with: a transparent card; a first universal line which is printed on a first surface of the transparent card and includes a plurality of images; and a second universal line for a mask which is printed on a second surface facing the first surface of the transparent card and displays the plurality of images. The second universal line is formed individually for each owner so as to include individual information of the owner of the display body.

P37370

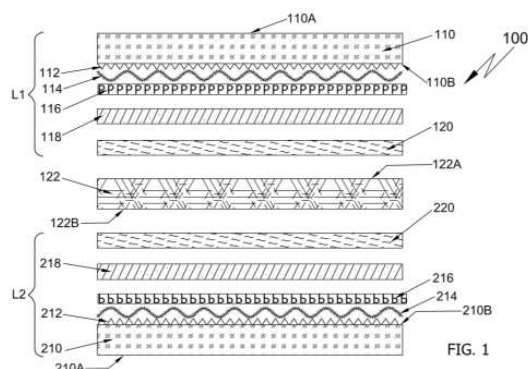
IN202411000408

Priority Date: 03/01/2024

UFLEX

A COMPOSITE PANEL AND METHOD OF MANUFACTURING THEREOF

A composite panel (100, 200) comprising a top outer laminate (L1) having a top outer layer (110) with a thickness ranging from 8 microns to 30 microns; and a top inner layer (120) of polyolefin of thickness ranging from 15 microns to 200 microns, a core layer (122) comprising of either or both of waste Type-1, and waste Type-2 in any combination having consisted of polyolefins ranging from 30% to 95% by weight; a top bottom Laminate (L2) having a bottom inner layer (220) of polyolefin of thickness ranging from 15 microns to 200 microns, to provide a structure to the composite panel (100, 200). A composite panel (200) wherein the top inner layer (120) and bottom outer layer (210) are configured by extrusion lamination.



CLAIM 1. A composite panel (100, 200) comprising: a) a top outer laminate (L1) having a top outer layer (110) with a thickness ranging from 8 microns to 30 microns, and a top inner layer (120) of polyolefin of thickness ranging from 15 microns to 200 microns; b) a core layer (122) comprising either or both of waste Type-1, and waste Type-2 in any combination consisting of polyolefins ranging from 30% to 95% by weight; and c) a top bottom laminate (L2) having a bottom inner layer (220) of polyolefin of thickness ranging from 15 microns to 200 microns, to provide a structure to the composite panel (100, 200).

P37375

BANKNOTE – THREAD

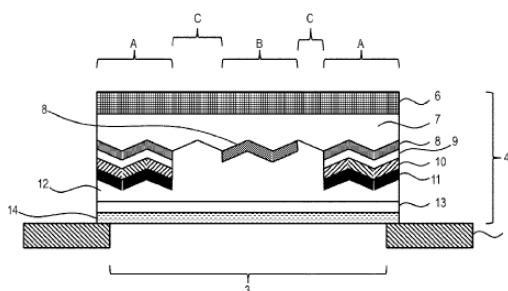
EP4311683

Priority Date: 29/07/2022

GIESECKE & DEVRIENT CURRENCY TECHNOLOGY

SECURITY ELEMENT AND VALUABLE DOCUMENT EQUIPPED WITH THE SECURITY ELEMENT

The invention relates to a security element for protecting documents of value, wherein the security element has an arrangement with an ink-tilting thin-film structure and an adhesive layer which serves to bond the security element to a document of value to be protected therewith, wherein the ink-tilting thin-film structure has, in the sequence, a semitransparent absorber layer which faces the observer, a dielectric spacer layer and a reflection layer, characterized in that the ink-tilting thin-film structure is applied in the security element arrangement by means of a chromium layer which improves the resistance of the ink-tilting thin-film structure, is adjacent to the reflection layer and has a layer thickness in a range from 20 nm to 100 nm.



CLAIM 1. A security element for securing documents of value, wherein the security element has an arrangement with a color-tilting thin-layer structure and an adhesive layer serving for bonding the security element to a document of value to be secured therewith, wherein the color-tilting thin-layer structure has, in order, a semitransparent absorber layer facing the observer, a dielectric spacer layer and a reflection layer, characterized in that the color-tilting thin-layer structure is applied in the security element arrangement by means of a chromium layer which improves the resistance of the color-tilting thin-layer structure, adjoins the reflection layer and has a layer thickness in a range from 20 nm to 100 nm. A

P37402

PRINTING – CARD

CN117533042

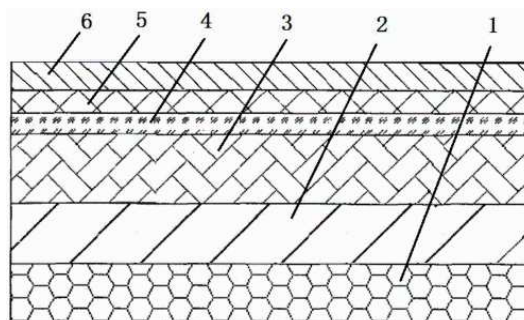
Priority Date: 09/11/2023

SHENZHEN WEILU INTELLIGENT TECHNOLOGY

MANUFACTURING METHOD OF VARIABLE PRINTING ANTI-FAKE CARD

The invention discloses a manufacturing method of a variable printing anti-fake card, which comprises the following steps: s1, prefabricating a blank card material; s2, etching user identity information on the card material by utilizing laser according to a first variable on the laser etching layer; s3, sequentially printing a transparent coating on the surface of the card material, printing the user identity information of the ink layer according to a second variable, and printing a second transparent protective layer; s4, a light-variable ink printing frame is used in the second transparent protective layer to form a contour anti-counterfeiting mark which is arranged on the periphery of the user image information and is consistent with the contour of the user image information. The invention improves the anti-counterfeiting performance of the anti-counterfeiting card by arranging multiple anti-counterfeiting judging means.

CLAIM 1. The manufacturing method of the variable printing anti-fake card is characterized by comprising the following steps of: s1, prefabricating a blank card material; s2, etching user identity information on the card material by utilizing laser according to a first variable on the laser etching layer; s3, performing a printing process on the etched card, specifically comprising the following steps: s31, printing a transparent coating on the first transparent protective layer; s32, printing ink layer user identity information on the transparent coating according to a second variable, and enabling the ink layer user identity information to be aligned and overlapped with the laser etching layer user identity information overall position; s33, printing a second transparent protective layer on the ink layer.



P37414

BANKNOTE – CARD – RELIEF – MICROLENS

CN117485048

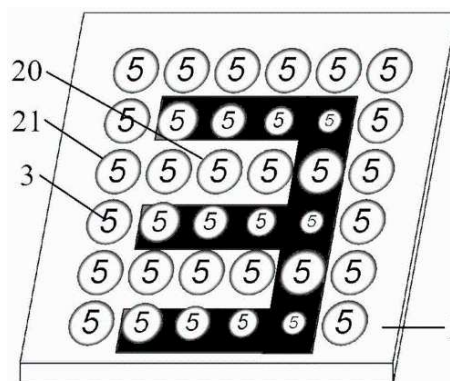
Priority Date: 25/07/2022

CHINA BANKNOTE PRINTING & MINT

OPTICAL ANTI-COUNTERFEITING ELEMENT AND OPTICAL ANTI-COUNTERFEITING PRODUCT

The invention provides an optical anti-counterfeiting element and an optical anti-counterfeiting product. The optical security element comprises a substrate; the reflecting curved mirror array is arranged on the substrate and is provided with a plurality of reflecting curved mirror units; a pattern microstructure formed on the reflecting curved mirror unit; the reflecting functional layer is arranged on the reflecting curved mirror array, and the reflecting curved mirror array samples and synthesizes the pattern microstructure to form a first pattern feature with dynamic and three-dimensional effects; the heights and/or periods of at least a part of the reflecting curved mirror units are arranged according to a preset rule to form a second pattern feature containing preset graphic and text information. The invention solves the problem that the optical anti-counterfeiting element in the prior art is difficult to manufacture by a process.

CLAIM 1. An optical security element comprising: a base material (1); a reflective curved mirror array (20), the reflective curved mirror array (20) being disposed on the substrate (1), the reflective curved mirror array (20) having a plurality of reflective curved mirror units (21); -a pattern microstructure (3), the pattern microstructure (3) being formed on the reflective curved mirror unit (21); the reflecting functional layer (4) is arranged on the reflecting curved mirror array (20), and the reflecting curved mirror array (20) samples and synthesizes the pattern microstructure (3) to form a first pattern feature with dynamic and three-dimensional effects; at least a part of the heights and/or periods of the reflecting curved mirror units (21) are arranged according to a preset rule to form second pattern features containing preset graphic and text information.



P37415

BANKNOTE – CARD – RELIEF

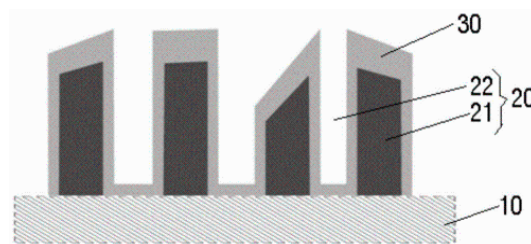
CN117485047

CHINA BANKNOTE PRINTING & MINT

Priority Date: 25/07/2022

OPTICAL SECURITY ELEMENT AND OPTICAL SECURITY PRODUCT

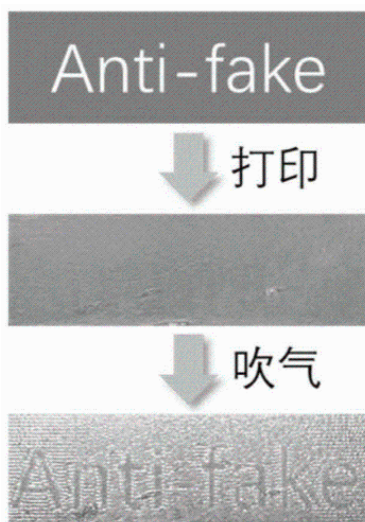
The invention provides an optical anti-counterfeiting element and an optical anti-counterfeiting product. The optical security element comprises: the micro-relief structure is arranged on one side surface of the substrate, and is provided with a protrusion and a groove, wherein the groove has a large depth-to-width ratio, and the width of the groove is more than or equal to 1 micrometer; the coating structure is arranged on one side of the micro-relief structure away from the substrate, and the thickness of the coating structure at the bulge is different from that of the coating structure at the groove so that the optical characteristics at the bulge and the optical characteristics at the groove are different; the large depth-to-width ratio of the groove means that the ratio of the depth of the groove to the width of the groove is more than or equal to 0.5. The invention solves the problems of high production cost and low manufacturing efficiency of the optical anti-counterfeiting element in the prior art.



CLAIM 1. An optical security element comprising: a base material (10), a micro-relief structure (20), the micro-relief structure (20) being provided on one side surface of the substrate (10), the micro-relief structure (20) having protrusions (21) and grooves (22), the grooves (22) having a large aspect ratio, the grooves (22) having a width of 1 micron or more; a plating structure (30), the plating structure (30) being disposed on a side of the micro-relief structure (20) remote from the substrate (10), a thickness of the plating structure (30) at the protrusion (21) being different from a thickness of the plating structure (30) at the recess (22) such that an optical characteristic at the protrusion (21) and an optical characteristic at the recess (22) are different; the large depth-to-width ratio of the groove (22) means that the ratio of the depth of the groove (22) to the width of the groove (22) is greater than or equal to 0.5.

GRADIENT HUMIDITY-SENSITIVE PHOTONIC CRYSTAL PAPER, PREPARATION METHOD AND APPLICATION THEREOF IN ANTI-COUNTERFEITING WRITING OR PRINTING

The invention belongs to the field of photonic crystal paper materials, and particularly relates to gradient humidity-sensitive photonic crystal paper, a preparation method and application thereof in anti-counterfeiting writing or printing. The photon crystal paper is prepared through assembling monodisperse microballoon synthesized through emulsion polymerization, monomer mediated shearing and trimming, and setting microballoon array in the film via initiating polymerization reaction. The photonic crystal paper can be combined with water-based ink, and after writing or printing, the local hydrophilicity of the photonic crystal paper is improved by utilizing the reaction of the ink and a matrix, and gradient humidity sensitivity is formed on the paper, namely a high humidity sensitive area and a low humidity sensitive area are formed. Under the condition that the ambient humidity changes from low to high, the reflected light of different areas of the gradient humidity-sensitive photonic crystal paper undergoes different red shifts, so that the patterns are displayed and hidden. Compared with the prior art, the preparation method of the photonic crystal paper has the potential of continuous production and can be used in the field of anti-counterfeiting printing.



CLAIM 1. A preparation method of gradient humidity-sensitive photon crystal paper is characterized in that monodisperse nano-microspheres synthesized by an emulsion polymerization method are assembled by a monomer-mediated shearing and trimming technology, and then are prepared by initiating polymerization reaction to fix microsphere arrangement in a film; the method comprises the following specific steps: (1) Uniformly and fully dispersing monodisperse nano-microspheres synthesized by emulsion polymerization in a monomer, an initiator and a cross-linking agent to obtain raw material slurry of photonic crystal paper; wherein: the monomer is a mixture composed of a first monomer and a second monomer which are liquid at normal temperature, wherein the first monomer is acrylic acid, the second monomer is selected from one of alkyl acrylate, alkyl methacrylate, hydroxyalkyl acrylate, hydroxyalkyl methacrylate or polyalcohol, and the acrylic acid accounts for 20-80% of the total mass of the monomers; the initiator is a photoinitiator or a thermal initiator; (2) Sandwiching a certain amount of raw material slurry of the photonic crystal paper between two substrates, extruding the substrates by using external force, and pressing the raw material slurry into a film; then, a speed difference is generated between the two substrates in a roller passing mode, so that relative motion is generated, and shearing regulation is carried out on microspheres in raw material slurry by utilizing shearing force, so that the photonic crystal material with obvious structural color is obtained; (3) Initiating polymerization of the photonic crystal material obtained in the step (2) under ultraviolet light or in a high-temperature environment, and removing the base material to obtain photonic crystal paper; (4) Taking an alkaline solution containing hydrophilic cations as writing ink or ink-jet printing ink, and writing or printing on the photonic crystal paper in the step (3) to obtain the gradient humidity-sensitive photonic crystal paper with writing or printing patterns; in the gradient humidity-sensitive photonic crystal paper, a written or printed part is a high humidity sensitive area, an unwritten or printed part is a low humidity sensitive area, and a written or printed pattern is displayed in a wet environment and hidden in a room temperature dry environment.

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

N9970

WO202437807

AMS INTERNATIONAL

Priority Date: 18/08/2022

MANUFACTURING METHOD, APPARATUS AND HOLOGRAM PLATE

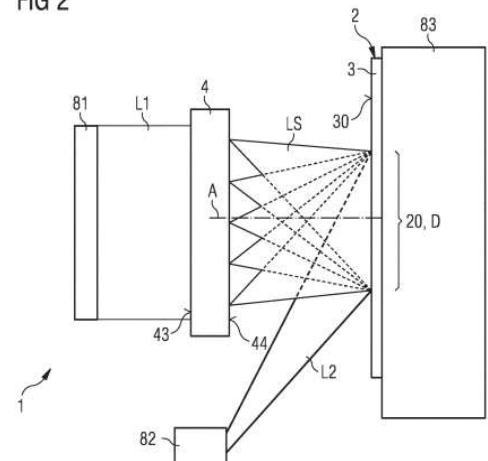
In one embodiment, the method is for manufacturing a holographic plate (2) and comprises: - providing recording geometry optics (4), - providing a photopolymer (3), and - illuminating the photopolymer (3) simultaneously with a first laser beam (L1) and a second laser beam (L2), thus generating a holographic pattern (22) in the photopolymer (3), wherein - only the first laser beam (L1) runs through the recording geometry optics (4), - a light-entrance face (43) of the recording geometry optics (4) for the first laser beam (L1) faces away from the photopolymer (3), and a light-exit face (44) of the recording geometry optics (4) faces the photopolymer (3), - the recording geometry optics (4) comprise a lens array (41) which divides the first laser beam (L1) into a plurality of sub-beams (LS), and - each one of the sub-beams (LS) illuminates most of the pattern area (20).

PROCÉDÉ DE FABRICATION, APPAREIL ET PLAQUE D'HOLOGRAMME

Dans un mode de réalisation, le présent procédé est destiné à fabriquer une plaque holographique (2), et il consiste : - à fournir un photopolymère (3), et - à éclairer le photopolymère (3) de façon simultanée avec un premier faisceau laser (L1) et avec un second faisceau laser (L2), générant ainsi un motif holographique (22) dans le photopolymère (3). Seul le premier faisceau laser (L1) traverse l'optique de géométrie d'enregistrement (4), une face d'entrée de lumière (43) de l'optique de géométrie d'enregistrement (4) pour le premier faisceau laser (L1) fait dos au photopolymère (3), et une face de sortie de lumière (44) de l'optique de géométrie d'enregistrement (4) fait face au photopolymère (3), l'optique de géométrie d'enregistrement (4) comprenant un réseau de lentilles (41) qui divise le premier faisceau laser (L1) en une pluralité de sous-faisceaux (LS), et chacun des sous-faisceaux (LS) éclairant la majeure partie de la zone de motif (20).

CLAIM 1. A method for manufacturing a holographic plate (2) comprising the following steps: - providing recording geometry optics (4), - providing a photopolymer (3), and - illuminating the photopolymer (3) simultaneously with a first laser beam (L1) and a second laser beam (L2) and thus generating a holographic pattern (22) in a pattern area (20) of the photopolymer (3), the illuminated photopolymer (3) results in the holographic plate (2), wherein - only the first laser beam (L1) runs through the recording geometry optics (4), - a light-entrance face (43) of the recording geometry optics (4) for the first laser beam (L1) faces away from the photopolymer (3), and a light-exit face (44) of the recording geometry optics (4) faces the photopolymer (3), - the recording geometry optics (4) comprise a lens array (41) which divides the first laser beam (L1) into a plurality of sub-beams (LS), - each one of the sub-beams (LS) illuminates most of the pattern area (20), - each one of the sub-beams (LS) has a focal point (5) between the pattern area (20) and the light-entrance face (43), - a secondary optical element (42) is a converging lens and is located in a plane of the focal points (5) of the subbeams (LS), and - the lens array (41) is composed of a plurality of spherical lenses (45).

FIG 2



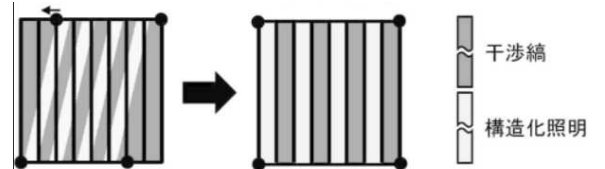
N9985

JP2024016726
Priority Date: 26/07/2022

KANSAI UNIVERSITY | KDDI

COMPUTER SYNTHESIZED HOLOGRAM REPRODUCTION DEVICE, AND STRUCTURED ILLUMINATION CALIBRATION METHOD AND PROGRAM THEREFOR

TOPIC: Provided are a device, method, and program capable of accurately calibrating a structured illumination image of an animation CGH. INVENTION: The camera 10 photographs an interference fringe area spatially multiplexed with interference fringe on the hologram surface 60 and an irradiation area of the structured illumination image irradiated on the hologram surface 60 by the projector 50. An observation image input part 20 acquires and temporarily stores images of an interference fringe region photographed by a camera 10 and an irradiation region of a structured illumination image. An irradiation region determination part 30 recognizes the position of the interference fringe region in a pixel coordinate system on the projection side based on the camera image of the interference fringe region, and determines the position of the interference fringe region as a target irradiation region of the structured illumination image. An irradiation adjustment part 40 discriminates an irradiation area of the structured illumination image on the hologram surface 60 based on the camera image, and adjusts (calibrates) a projection condition of the structured illumination image in a pixel coordinate system so that the structured illumination image is mapped to the target irradiation area.



CLAIM 1. A computer-synthesized hologram reproduction device for reproducing an animation CGH (Computer-Generated Hologram) by applying a structured illumination image to an interference fringe region in which interference fringe for a plurality of frames are spatially multiplexed. The device includes: means for acquiring a camera image of an interference fringe region in which interference fringe is spatially multiplexed and an irradiation region of the structured illumination image; means for determining the position of the interference fringe region to a target irradiation region of the structured illumination image according to the camera image; and the irradiation region of the structured illumination image according to the camera image. The computer-synthesized hologram reproducing device is provided with a means for adjusting to the target irradiation region.

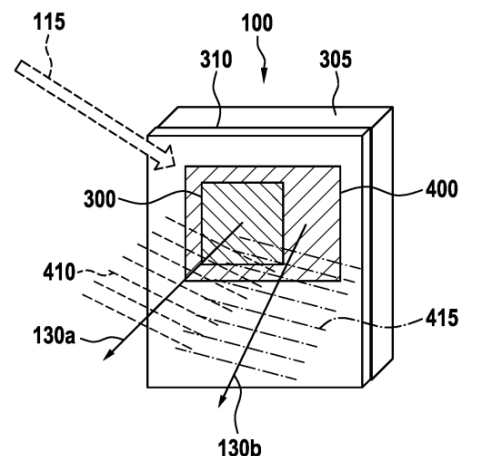
N9989

DE102023206990
Priority Date: 29/07/2022

ROBERT BOSCH

HOLOGRAPHIC OPTICAL ELEMENT, METHOD OF MANUFACTURING HOLOGRAPHIC OPTICAL ELEMENT, AND APPARATUS

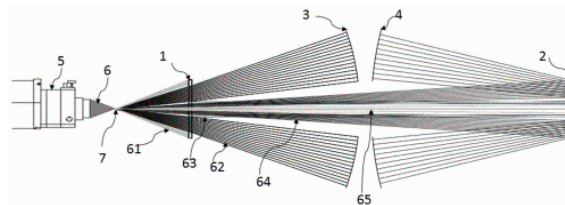
The invention relates to a holographic-optical element (100) for providing excitation light (130) for evaluating a diagnostic sample. The holographic-optical element (100) comprises at least one holographic layer (310), wherein at least one first hologram (300) and at least one second hologram (400) are arranged in the holographic layer (310). The first hologram (300) is designed to reflect light (115) from a first reflection wave range (410) by a first wavelength, and the second hologram (400) is designed to reflect light (115) from a second reflection wave range (415) by a second wavelength that differs from the first wavelength, wherein the first reflection wave range (410) and the second reflection wave range (415) at least partially overlap.



CLAIM 1. A holographic-optical element (100) for providing excitation light (130) for evaluating a diagnostic sample (105), wherein the holographic-optical element (100) comprises at least one holographic layer (310), wherein at least one first hologram (300) and at least one second hologram (400) are incorporated in the holographic layer (310), wherein the first hologram (300) is designed to reflect light (115) from a first reflection wave range (410) by a first wavelength, and wherein the second hologram (400) is designed to reflect light (115) from a second reflection wave range (415) by a second wavelength different from the first wavelength, wherein the first reflection wave range (410) and the second reflection wave range (415) differ from one another 5) at least partially overlap.

CO-REFERENCE INTERFEROMETRY METHOD FOR BACK-TO-BACK ASPHERIC MIRROR

The invention discloses a co-reference interferometry method of back-to-back aspheric mirrors, which uses a first CGH compensator to measure back-to-back first aspheric mirrors, a second CGH compensator to measure back-to-back second aspheric mirrors, the two are used by the same laser spherical wave interferometers, the first CGH compensator comprises an auxiliary alignment hologram, a test master hologram, an attitude alignment hologram and a non-holographic transmission area from outside to inside, the auxiliary alignment hologram is used for the first CGH compensator to align with the interferometer, the second CGH compensator comprises the test master hologram, the non-holographic reflection area and the auxiliary alignment hologram from outside to inside, and the auxiliary alignment hologram is used for the second CGH compensator to align with the interferometer and the first CGH compensator. The measuring method has the advantage of measuring the surface shape errors of the back-to-back aspheric reflectors by the common reference, and can obtain the surface shape errors of the two reflectors and the relative position errors thereof.



CLAIM 1. A co-reference interferometry method of back-to-back aspherical mirrors, characterized in that the measurement method uses two computational holographic compensators, a first CGH compensator (1) and a second CGH compensator (2), the first CGH compensator (1) being used for measuring a first aspherical mirror (3) of the back-to-back aspherical mirrors, the second CGH compensator (2) being used for measuring a second aspherical mirror (4) of the back-to-back aspherical mirrors, the first CGH compensator (1) and the second CGH compensator (2) using the same laser spherical wave interferometer (5); the first CGH compensator (1) comprises 4 annular belt areas, namely an auxiliary alignment hologram (11) of the first CGH compensator, a test master hologram (12) of the first CGH compensator, an attitude alignment hologram (13) of the first CGH compensator and a non-holographic transmission area (14) of the first CGH compensator are respectively arranged from outside to inside, the auxiliary alignment hologram (11) of the first CGH compensator is used for aligning the first CGH compensator (1) with the laser spherical wave interferometer (5) to obtain an auxiliary alignment hologram interference fringe pattern of the first CGH compensator, the test master hologram (12) of the first CGH compensator is used for obtaining the test master hologram interference pattern of the first CGH compensator, the attitude alignment hologram (13) of the first CGH compensator is used for aligning the attitude of the second CGH compensator (2) with the first CGH compensator (1), and the non-spherical surface compensator (14) is used for aligning the first spherical wave interferometer (5) with the second spherical wave interferometer (4); the second CGH compensator (2) comprises 3 annular zones, namely a test master hologram (21) of the second CGH compensator, a non-holographic reflection area (22) of the second CGH compensator and an auxiliary alignment hologram (23) of the second CGH compensator from outside to inside, wherein the test master hologram (21) of the second CGH compensator is used for obtaining a test master hologram interference fringe pattern of the second CGH compensator, the test master hologram interference fringe pattern is processed to obtain the surface shape error distribution of the second aspheric mirror (4), and the non-holographic reflection area (22) of the second CGH compensator is used for enabling the posture of the second CGH compensator (2) to be aligned with the first CGH compensator (1) so as to obtain a posture alignment hologram interference fringe pattern of the second CGH compensator; the auxiliary alignment hologram (23) of the second CGH compensator is used for enabling the second CGH compensator (2) to be aligned with the laser spherical wave interferometer (5) and the first CGH compensator (1) so as to obtain an auxiliary alignment hologram interference fringe pattern of the second CGH compensator; the auxiliary alignment holographic interference fringe pattern of the first CGH compensator, the test master holographic interference fringe pattern of the second CGH compensator, the gesture alignment holographic interference fringe pattern of the second CGH compensator and the auxiliary alignment holographic interference fringe pattern of the second CGH compensator are all obtained through an interferometer detector arranged in the laser spherical wave interferometer (5), and the surface errors of the first CGH compensator, the auxiliary alignment holographic interference fringe pattern of the second CGH compensator and the auxiliary alignment holographic interference fringe pattern of the second CGH compensator are all in a zero stripe state during measurement, and the test master holographic interference fringe pattern of the first CGH compensator, the test master holographic interference fringe pattern of the second CGH compensator and the relative position errors of the first aspheric mirror (3) and the second aspheric mirror (4) are processed.

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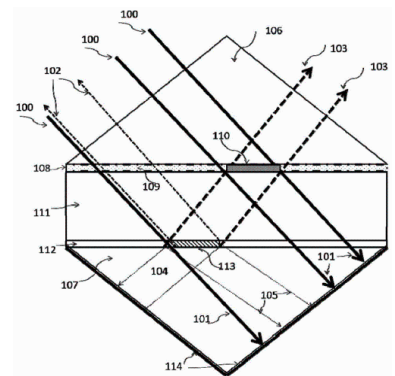
Priority Date: 26/10/2023

ZHUHAI MOJIE TECHNOLOGY

MANUFACTURING DEVICE AND MANUFACTURING METHOD OF REFLECTIVE VOLUME HOLOGRAPHIC GRATING

The invention discloses a manufacturing device and a manufacturing method of a reflection type volume holographic grating, wherein the manufacturing device comprises a light source and an exposure module; the exposure module includes: a mask plate with at least one optical diffraction module, a recording medium, a coupling prism and an exposure modulation unit; the optical diffraction module receives an incident recording light beam output by the light source, and diffracts and splits the incident recording light beam to obtain a reflected and diffracted light beam; the coupling prism adjusts the incident recording light beam to enter the recording medium at a preset angle, and the incident recording light beam and the reflected diffraction light beam are input into the recording medium to form a volume holographic grating; the exposure modulation unit controls exposure parameters on the recording medium to obtain the exposed reflection type volume holographic grating. The device and the method of the embodiment generate the multi-degree-of-freedom modulated reflective volume holographic grating by adjusting the incident angle of the incident recording light beam and controlling the exposure parameters by using the exposure modulation unit, and have simple implementation mode and high efficiency.

CLAIM 1. A manufacturing apparatus of a reflection type volume hologram grating, comprising: the light source and the exposure module are positioned on the light emitting path of the light source; the exposure module includes: a mask plate with at least one optical diffraction module, a recording medium, a coupling prism and an exposure modulation unit; the light source is used for providing an incident recording light beam; the optical diffraction module on the mask plate is used for receiving the incident recording light beam, diffracting and splitting the incident recording light beam to obtain a reflected and diffracted light beam; the coupling prism is used for adjusting the angle of incidence of the incident recording light beam into the mask plate so that the incident recording light beam is incident to the recording medium at a preset angle; the recording medium is used for generating interference fringes according to the input incident recording light beam and the reflected diffraction light beam, and forming refractive index differences in an interference intensity enhancement region and an interference intensity reduction region to form a volume hologram grating; the exposure modulation unit is used for controlling exposure parameters on the recording medium to obtain the exposed reflection type volume holographic grating.



N10012

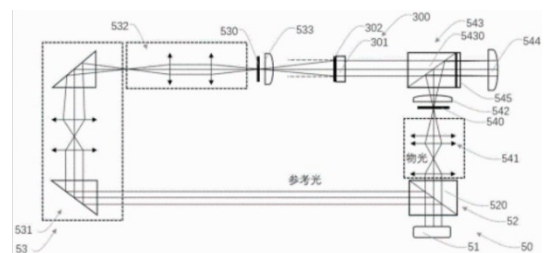
CN117518466

Priority Date: 29/07/2022

SUNNY OPTICAL ZHEJIANG RESEARCH INSTITUTE

APPARATUS AND METHOD FOR MANUFACTURING HOLOGRAPHIC OPTICAL ELEMENT AND NEAR-EYE DISPLAY DEVICE

The present invention relates to an apparatus and method for manufacturing a hologram optical element and a near-eye display device, which can prevent image leakage while improving actual transmittance, and protect use privacy of a user. The near-eye display device includes: an image projector for projecting image light; a light-splitting element disposed on a projection side of the image projector, for reflecting a part of the light and transmitting another part of the light; the holographic optical element is arranged on the reflecting side of the light splitting element and is used for reflecting the image light from the image projector to be incident on the holographic optical element in a preset spatial angle distribution, redirecting the image light incident in the preset spatial angle distribution to be transmitted to the light splitting element and transmitting the light rays incident in other spatial angle distributions.



CLAIM 1. A near-eye display device, comprising: an image projector for projecting image light; a light-splitting element disposed on a projection side of the image projector, for reflecting a part of the light and transmitting another part of the light; the holographic optical element is arranged on the reflecting side of the light splitting element, the light splitting element is used for reflecting the image light from the image projector to be incident on the holographic optical element in a preset spatial angle distribution, and the holographic optical element is used for redirecting the image light incident in the preset spatial angle distribution to propagate to the light splitting element and transmitting the light rays incident in other spatial angle distributions.

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

N9968

WO202438127

CARL ZEISS JENA

Priority Date: 18/08/2022

REPLICATING METHOD FOR COPYING HOLOGRAMS INTO LIQUID PHOTOPOLYMERS

The invention relates to, preferably, a method for continuously replicating a hologram preferably by means of a device comprising a coating module, a lamination module, an exposure module and a fixing module, wherein the method comprises the following steps: coating a first carrier film with a liquid photopolymer using a coating module; applying a second carrier film to the coated first carrier film using a lamination module, in order to obtain a photopolymer composite including a liquid photopolymer layer between two carrier films; bringing a region of the photopolymer composite in contact with an axially rotatable master element including a master hologram to be replicated in an exposure module and exposing the region of the photopolymer composite by means of a light source, such that the master hologram is replicated on the photopolymer composite; and curing a replica hologram contained in the liquid photopolymer in a fixing module.

PROCÉDÉ DE REPRODUCTION POUR REPRODUIRE DES HOLOGRAMMES DANS DES PHOTOPOLYMÈRES LIQUIDES

L'invention concerne de préférence un procédé permettant de reproduire continuellement un hologramme de préférence au moyen d'un dispositif comprenant un module de revêtement, un module de stratification, un module d'exposition et un module de fixation, le procédé comprenant les étapes suivantes : revêtir un premier film de support avec un photopolymère liquide à l'aide d'un module de revêtement ; appliquer un second film de support sur le premier film de support revêtu à l'aide d'un module de stratification afin d'obtenir un composite photopolymère comprenant une couche de photopolymère liquide entre deux films de support ; amener une région du composite photopolymère en contact avec un élément maître axialement rotatif comprenant un hologramme maître devant être reproduit dans un module d'exposition et exposer la région du composite photopolymère au moyen d'une source de lumière, de telle sorte que l'hologramme maître est reproduit sur le composite photopolymère ; et durcir une reproduction d'hologramme contenue dans le photopolymère liquide dans un module de fixation.

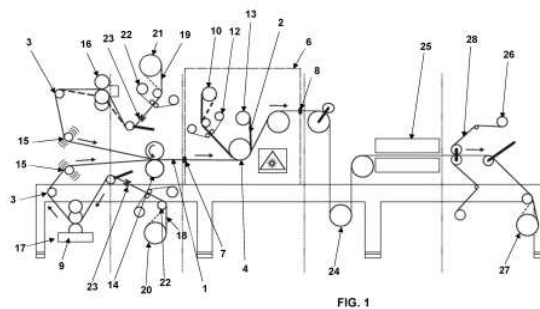


FIG. 1

CLAIM 1. Method for the continuous replication of a hologram, preferably by means of a device comprising a coating module, a lamination module, an exposure module and a fixing module, characterized in that the method comprises the following steps: a. coating a first carrier film (18) with a liquid photopolymer (9) by means of a coating module (17), b. applying a second carrier film (19) to the coated first carrier film (18) by means of a lamination module (14) in order to obtain a photopolymer composite (1) comprising a liquid photopolymer layer (9) between two carrier films (18, 19), c. bringing a region of the photopolymer composite (1) into contact with an axially rotatable master element (4) comprising a master hologram to be replicated in an exposure module and exposing the region of the photopolymer composite (1) by means of a light source (5), so that the master hologram is applied to the photopolymer composite (1), and d. curing a replica hologram contained in the liquid photopolymer (9) in a fixing module (25).

N9969

WO202438126

CARL ZEISS JENA

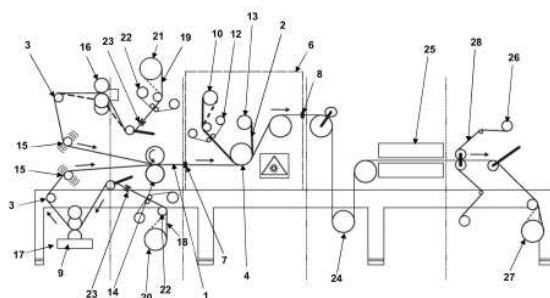
Priority Date: 18/08/2022

REPLICATING DEVICE FOR COPYING HOLOGRAMS INTO LIQUID PHOTOPOLYMERS

The invention relates to a device for continuously replicating a hologram comprising a coating module which is designed to coat a liquid photopolymer onto a first carrier film, a lamination module which is designed to apply a second carrier film to the first carrier film coated with the photopolymer, in order to obtain a photopolymer composite including a liquid photopolymer layer between two carrier films, an exposure module, wherein the exposure module has a light source and a master element with a master hologram to be replicated, wherein the master element is axially rotatably mounted and the exposure module is designed to bring the photopolymer composite in optical contact with the master element, while the light source exposes the master hologram in order to obtain a replicated hologram in a region of the photopolymer composite, and a fixing module which is designed to cure the replicated hologram in the photopolymer composite.

DISPOSITIF DE REPRODUCTION POUR REPRODUIRE DES HOLOGRAMMES DANS DES PHOTOPOLYMERES LIQUIDES

L'invention concerne un dispositif de reproduction continue d'hologramme comprenant un module de revêtement qui est conçu pour revêtir un premier film de support avec un photopolymère liquide, un module de stratification qui est conçu pour appliquer un second film de support sur le premier film de support revêtu du photopolymère afin d'obtenir un composite photopolymère comprenant une couche de photopolymère liquide entre deux films de support, un module d'exposition, le module d'exposition comportant une source de lumière et un élément maître doté d'un hologramme maître devant être reproduit, l'élément maître étant installé de manière axialement rotative et le module d'exposition étant conçu pour amener le composite photopolymère en contact optique avec l'élément maître, tandis que la source de lumière expose l'hologramme maître afin d'obtenir un hologramme reproduit dans une région du composite photopolymère, et un module de fixation qui est conçu pour durcir l'hologramme reproduit dans le composite photopolymère.



CLAIM 1. A device for the continuous replication of a hologram comprising a. a coating module (17) adapted to coat a liquid photopolymer (9) onto a first carrier film (18), b. a lamination module (14) adapted to apply a second carrier film (19) onto the first carrier film (18) coated with the photopolymer to obtain a photopolymer composite (1) comprising a liquid photopolymer layer between two carrier films, c. an exposure module, wherein the exposure module comprises a light source (5) and a master element (4) comprising a master hologram to be replicated, wherein the master element is mounted for axial rotation and the exposure module is adapted to bring the photopolymer composite (1) into optical contact with the master element while the light source (5) exposes the master hologram to obtain a replicated hologram onto a region of the photopolymer composite (1). and d. a fixing module (25) which is set up to cure the replicated hologram in the photopolymer composite (1).

N9971

WO202433357

CARL ZEISS JENA

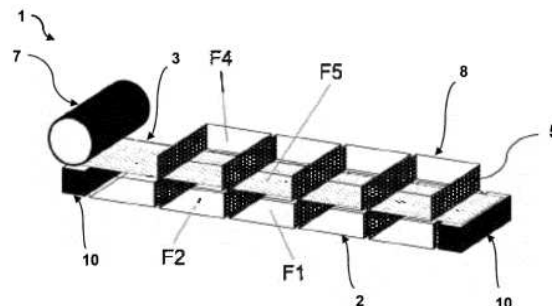
Priority Date: 09/08/2022

DEVICE FOR REPLICATING A PLURALITY OF HOLOGRAMS ACCORDING TO A TYPE-CASE PRINCIPLE

The invention relates to a device for replicating a plurality of holograms. The device comprises a first carrier means for arranging a sequence of master elements from multiple master elements according to a plurality of holograms to be replicated, so that upper faces of the master elements are aligned in a horizontal plane, and a lamination module for detachably laminating a light-sensitive composite web onto the aligned upper faces of the master elements. The device also comprises an exposure module for exposing the master elements in order to replicate the master holograms into the light-sensitive composite web, and a detachment module for detaching the exposed composite web from the master elements. The master elements are detachably inserted in the first carrier means, so that a sequence and/or composition of the master elements can be varied for the replication of the plurality of holograms. In addition, the master elements are inserted in the first carrier means in such a way that two or more faces of the master elements are optically accessible for the purpose of exposure.

DISPOSITIF DE RÉPLICATION D'UNE PLURALITÉ D'HOLOGRAMMES SELON UN PRINCIPE TYPE-CAS

L'invention concerne un dispositif de réplique d'une pluralité d'hologrammes. Le dispositif comprend un premier moyen de support pour agencer une séquence d'éléments maîtres à partir de multiples éléments maîtres selon une pluralité d'hologrammes à répliquer, de telle sorte que des faces supérieures des éléments maîtres sont alignées dans un plan horizontal, et un module de stratification pour stratifier amovible une bande composite sensible à la lumière sur les faces supérieures alignées des éléments maîtres. Le dispositif comprend également un module d'exposition pour exposer les éléments maîtres afin de reproduire les hologrammes maîtres dans la bande composite photosensible et un module de détachement pour détacher la bande composite exposée des éléments maîtres. Les éléments maîtres sont insérés amovibles dans le premier moyen de support, de telle sorte qu'une séquence et/ou une composition des éléments maîtres peuvent être modifiées pour la réplique de la pluralité d'hologrammes. De plus, les éléments maîtres sont insérés dans le premier moyen de support de telle sorte qu'au moins deux faces des éléments maîtres sont optiquement accessibles en vue d'une exposition.



CLAIM 1. A device (1) for replicating a plurality of holograms comprising a first support means (10) for arranging a sequence of master elements (2) from a plurality of master elements (2) in dependence on a plurality of holograms to be replicated so that upper surfaces of the master elements (2) are aligned in a horizontal plane, a lamination module for releasably laminating a photosensitive composite web (3) to the aligned upper surfaces of the master elements (2), and an exposure module for exposing the master elements (2) to replicate the master holograms (2) into the photosensitive composite web (3), and a release module for releasing the exposed composite web (3) from the master elements (2), characterized in that the master elements (2) are releasably incorporated in the first support means (10) so that a sequence and/or composition of the master elements (2) is variable for replicating the plurality of holograms, and wherein the master elements (2) are releasably incorporated in the first support means (10) are also incorporated in such a way that two or more surfaces of the master elements (2) are optically accessible for the purpose of exposure.

N9972

WO202433354

Priority Date: 09/08/2022

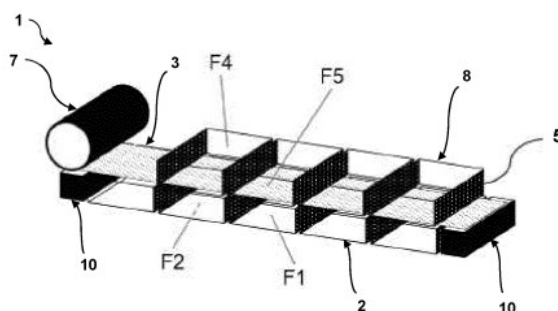
CARL ZEISS JENA

METHOD FOR REPLICATING A PLURALITY OF HOLOGRAMS BY MEANS OF A TYPECASE PRINCIPLE

The invention relates to a method comprising: Providing a multiplicity of master elements comprising a substrate body and at least one master hologram, selecting a sequence of master elements from the multiplicity of master elements in dependence on the plurality of holograms to be replicated and arranging the sequence of master elements on a first carrier means such that upper surfaces of the master elements are aligned in a horizontal plane, detachably laminating a light-sensitive composite sheet onto the aligned surfaces of the master elements, exposing the master elements in order to replicate the master holograms in the light-sensitive composite sheet, and detaching the exposed composite sheet from the master elements, wherein the master elements are detachably incorporated in the first carrier means such that a sequence and/or composition of the master elements for the replication of the plurality of holograms is variable and wherein the master elements are incorporated in the first carrier means in such a way that two or more surfaces of the master elements are optically accessible for the purpose of exposure.

PROCÉDÉ DE REPRODUCTION D'UNE PLURALITÉ D'HOLOGRAMMES AU MOYEN D'UN PRINCIPE DE CASSE

L'invention concerne un procédé qui consiste à fournir une pluralité d'éléments maîtres comprenant un corps de substrat et au moins un hologramme maître, à sélectionner une séquence d'éléments maîtres à partir de la multiplicité d'éléments maîtres en fonction de la pluralité d'hologrammes à reproduire et à agencer la séquence d'éléments maîtres sur un premier moyen de support de façon à ce que les surfaces supérieures des éléments maîtres soient alignées dans un plan horizontal, à stratifier de façon amovible une feuille composite sensible à la lumière sur les surfaces alignées des éléments maîtres, à exposer les éléments maîtres afin de reproduire les hologrammes maîtres dans la feuille composite sensible à la lumière, et à détacher la feuille composite exposée des éléments maîtres, les éléments maîtres étant incorporés de façon amovible dans le premier moyen de support de telle sorte qu'une séquence et/ou une composition des éléments maîtres pour la reproduction de la pluralité d'hologrammes est variable, et les éléments maîtres étant incorporés dans le premier moyen de support de telle sorte qu'au moins deux surfaces des éléments maîtres sont optiquement accessibles afin de pouvoir être exposées.



CLAIM 1. A method for replicating a plurality of holograms comprising the steps of: a. providing a plurality of master elements (2) comprising a substrate body (14) and at least one master hologram (6), b. selecting a sequence of master elements (2) from the plurality of master elements (2) in dependence upon the plurality of holograms to be replicated and arranging the sequence of master elements on a first support means (10) so that upper surfaces (F3) of the master elements are aligned in a horizontal plane, c. releasably laminating a photosensitive composite web (3) to the aligned surfaces of the master elements (2), d. exposing the master elements (2) to replicate the master holograms (6) into the photosensitive composite web (3), and e. detaching the exposed composite web (3) from the master elements (2), characterized in that the master elements (2) are releasably incorporated in the first support means (10) so that a sequence and/or composition of the master elements (2) for replication is provided

N10008

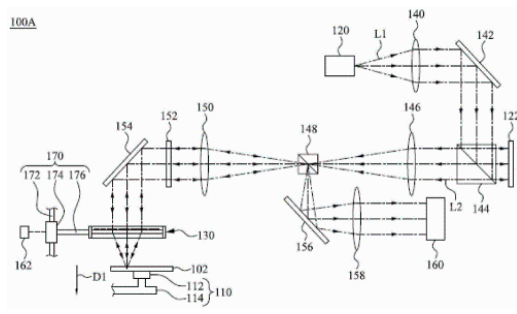
CN117524266

Priority Date: 29/07/2022

QINGDAO TAIGU PHOTOELECTRIC ENGINEERING TECHNOLOGY

HOLOGRAPHIC STORAGE DEVICE

A holographic storage device comprising a light emitter, a spatial light modulator (spatial light modulator; SLM), an objective lens and an actuator. The spatial light modulator is optically coupled to the light emitter. The objective lens is optically coupled to the spatial light modulator and aligned with the storage disk, and the objective lens includes a super surface focusing lens (metasurface focusing lens), wherein the super surface focusing lens has an optical axis that extends along a first direction. The actuator is connected with the objective lens and is used for enabling the objective lens to move along a first direction. With the above configuration, since the objective lens configured by the super-surface focusing lens can have a smaller size and a lighter weight, the change of the data reading or writing depth of the holographic storage device to the storage disk can be realized by moving the objective lens, thereby improving the accuracy and reliability of the reading or writing procedure.



CLAIM 1. A holographic storage device, comprising: a light emitter; a spatial light modulator (spatial light modulator; SLM) optically coupled to the light emitter; an objective lens optically coupled to the spatial light modulator and aligned with a storage disk, the objective lens comprising a super surface focusing lens (metasurface focusing lens), wherein the super surface focusing lens has an optical axis extending along a first direction; and and a brake connected with the objective lens for moving the objective lens along the first direction.

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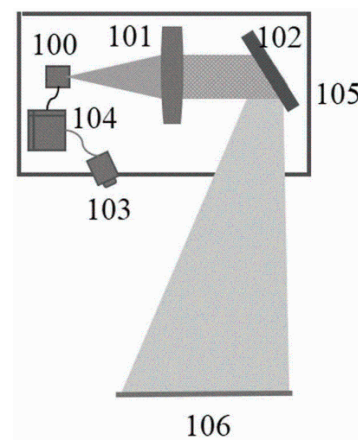
CN117518764

Priority Date: 25/10/2023

SUZHOU ZHIYUNGU AUTOMOTIVE ELECTRONIC TECHNOLOGY

INTERACTIVE DISPLAY MODULE BASED ON VOLUME HOLOGRAM AND VOLUME HOLOGRAM MANUFACTURING LIGHT PATH AND METHOD

The invention discloses an interactive display module based on volume hologram, and a light path and a method for manufacturing the volume hologram, wherein the module comprises the following components: the device comprises an illumination light source, a collimating lens, a volume hologram, a camera and a control panel; the collimating lens is used for collimating divergent spherical waves emitted by the illuminating light source to form planar illuminating light; the volume hologram records the wave front information of the required image and is manufactured by carrying out interference exposure on image light and off-axis plane reference light; the camera is used for shooting projection images and transmitting the shot images to the vehicle-mounted host through the control panel, the vehicle-mounted host operates according to the change of the projection images, the control panel is used for controlling the on or off of the illumination light source, adjusting the brightness of the illumination light source and controlling the camera to start shooting and sending the shot images to the vehicle-mounted host. The invention can avoid the problems of low conjugate image and diffraction efficiency in the traditional photoetching-based calculation hologram reproduction, improves the energy utilization rate and reduces the volume of the color display module.



CLAIM 1. An interactive display module based on volume hologram, characterized by comprising: the device comprises an illumination light source, a collimating lens, a volume hologram, a camera and a control panel; wherein, the control panel is connected with the vehicle-mounted host, the camera and the illumination light source; the collimating lens is used for collimating divergent spherical waves emitted by the illumination light source to form planar illumination light; the volume hologram records the wave front information of a required image and is manufactured by carrying out interference exposure on image light and off-axis plane reference light; the camera is used for shooting a projection image, transmitting the shot image to the vehicle-mounted host through the control panel, operating by the vehicle-mounted host according to the change of the projection image, controlling the illumination light source to be turned on or off by the control panel, adjusting the brightness of the illumination light source, controlling the camera to be turned on to shoot and transmitting the shot image to the vehicle-mounted host.

N10013

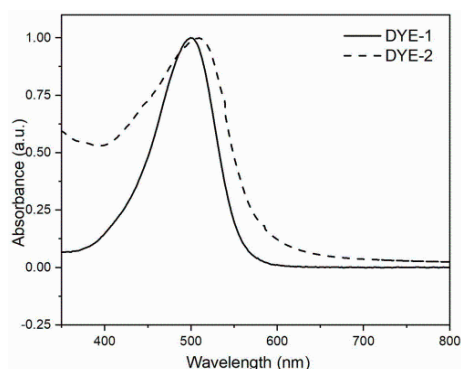
CN117510458

Priority Date: 27/10/2023

BEIJING UNIVERSITY OF TECHNOLOGY | CAPITAL NORMAL UNIVERSITY

CYCLOHEXANONE PHOTSENSITIZER, PREPARATION METHOD THEREOF, MIXED PHOTSENSITIZER AND PHOTOPOLYMER FILM

The application provides a cyclohexanone photosensitizer shown in a formula I, a preparation method thereof, a mixed photosensitizer containing the cyclohexanone photosensitizer, a photopolymerization composition and a photopolymer film, wherein the cyclohexanone photosensitizer has the following structural formula, wherein R1 and R2 are each independently selected from hydrogen or C1-C4 alkyl. The cyclohexanone photosensitizer provided by the application replaces benzene rings with thiophene, shows excellent absorption performance in a green laser wavelength range, has good matching performance with a 532nm laser, and provides more candidate photosensitizers for development of green sensitive type photopolymer films.



CLAIM 1. A cyclohexanone photosensitizer of formula i: wherein R is 1 ,R 2 Each independently selected from hydrogen or C1-C4 alkyl.

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

N9967

WO202438476

Priority Date: 17/08/2022

JORDAN UNIVERSITY OF SCIENCE & TECHNOLOGY

HUMAN BODY IMITATION AND VIRTUAL BODY TRANSFER USING HOLOGRAM-GUIDED ROBOTICS TECHNIQUES

There is provided a system and a method for human body imitation and virtual body transfer communication using hologram-guided robotics, the system may comprise a first end having one or more people, a first plurality of hologram sources may be configured to simulate a second end's surroundings, a display unit may be configured to project the second end's surroundings; a first set of image acquisition units; and a first voice recognition unit; a second end having a robot body, a second plurality of hologram sources may be configured to simulate the first end's surroundings, a second set of image acquisition units, and a second voice recognition unit; a controlling and processing unit may be configured to control the robot body, and generate spatial mapping using data acquired by the first and second image acquisition units, wherein the controlling and processing unit may be located in the robot body; and a network.

IMITATION DE CORPS HUMAIN ET TRANSFERT DE CORPS VIRTUEL À L'AIDE DE TECHNIQUES ROBOTIQUES GUIDÉES PAR HOLOGRAMME

L'invention concerne un système et un procédé d'imitation de corps humain et de communication de transfert de corps virtuel utilisant de la robotique guidée par hologramme. Le système peut comprendre un premier côté comportant une ou plusieurs personnes, une première pluralité de sources d'hologramme peuvent être configurées pour simuler l'environnement d'un second côté, une unité d'affichage peut être configurée pour projeter l'environnement du second côté ; un premier ensemble d'unités d'acquisition d'image ; et une première unité de reconnaissance vocale ; un second côté comportant un corps robotique, une seconde pluralité de sources d'hologramme peuvent être configurées pour simuler l'environnement du premier côté, un second ensemble d'unités d'acquisition d'image et une seconde unité de reconnaissance vocale ; une unité de commande et de traitement peut être configurée pour commander le corps robotique et pour générer un mappage spatial à l'aide de données acquises par les première et seconde unités d'acquisition d'image, l'unité de commande et de traitement pouvant être située dans le corps robotique ; et un réseau.

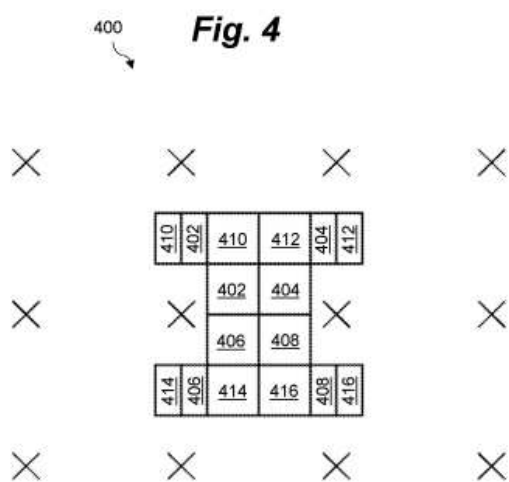
CLAIM 1. A system for human body imitation and virtual body transfer communication using hologram-guided robotics, the system comprises: A first end having one or more people, a first plurality of hologram sources configured to simulate a second end's surroundings, a display unit configured to project the second end's surroundings, a first set of image acquisition units, and a first voice recognition unit; A second end having a robot body, a second plurality of hologram sources configured to simulate the first end's surroundings, a second set of image acquisition units, and a second voice recognition unit; A controlling and processing unit configured to control the robot body, and generate spatial mapping using data acquired by the first and second image acquisition units, wherein the controlling and processing unit is located in the robot body; and A network.

HOLOGRAPHIC DISPLAY SYSTEM AND METHOD FOR EXPANDING A DISPLAY REGION

A spatial filter for positioning in a Fourier plane of a holographic display system. The spatial filter delimits a set of apertures, wherein each aperture in the set of apertures is switchable between a substantially transmissive and a substantially non-transmissive state. The set of apertures comprises a plurality of subsets of apertures, and each subset comprises at least one aperture. Each of the subsets of apertures corresponds to a Fourier transform of a target light field, $F(H)$, wherein $F(H)$ substantially does not overlap a Fourier transform of a complex conjugate of the corresponding target light field, $F(H^*)$, in the Fourier plane. The union of the set of apertures forms a shape which is at least one of simply connected and substantially space filling.

SYSTÈME D’AFFICHAGE HOLOGRAPHIQUE ET PROCÉDÉ D’EXTENSION DE RÉGION D’AFFICHAGE

L'invention concerne un filtre spatial destiné à être positionné dans un plan de Fourier d'un système d'affichage holographique. Le filtre spatial délimite un ensemble d'ouvertures, chaque ouverture dans l'ensemble d'ouvertures pouvant commuter entre un état sensiblement transmissif et un état sensiblement non transmissif. L'ensemble d'ouvertures comprend une pluralité de sous-ensembles d'ouvertures, et chaque sous-ensemble comprend au moins une ouverture. Chacun des sous-ensembles d'ouvertures correspond à une transformée de Fourier d'un champ lumineux cible $F(H)$, $F(H)$ ne chevauchant sensiblement pas une transformée de Fourier d'un conjugué complexe du champ lumineux cible correspondant $F(H^*)$ dans le plan de Fourier. L'union de l'ensemble d'ouvertures crée une forme qui est simplement connectée et/ou qui remplit sensiblement l'espace.



CLAIM 1. A spatial filter for positioning in a Fourier plane of a holographic display system, the spatial filter delimiting a set of apertures, wherein each aperture in the set of apertures is switchable between a substantially transmissive and a substantially non-transmissive state, wherein: the set of apertures comprises a plurality of subsets of apertures, each subset comprising at least one aperture; each of the subsets of apertures corresponds to a Fourier transform of a target light field, $F(H)$, wherein $F(H)$ substantially does not overlap a Fourier transform of a complex conjugate of the corresponding target light field, $F(H^*)$, in the Fourier plane, and the union of the set of apertures forms a shape which is at least one of simply connected and substantially space filling.

N9974

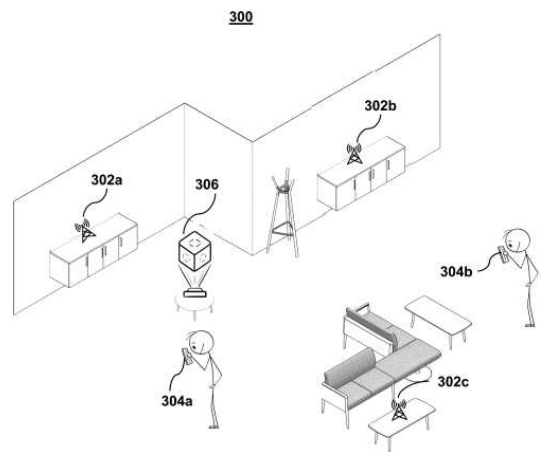
US20240053820
Priority Date: 09/08/2022

CAPITAL ONE SERVICES

SYSTEMS AND METHODS FOR ADJUSTING A VIEWING ANGLE OF A HOLOGRAPHIC DISPLAY

In some embodiments, holographic presentations despite using holographic displays having limited viewing angles may be facilitated. In some embodiments, a user may be detected via one or more sensors associated with a holographic display system, where the holographic display system being configured with a first viewing angle. Based on the detection of the user, a direction of the user may be determined. The first viewing angle of the holographic display system may also be determined. For example, the holographic display system may determine a current first viewing angle. Based on the direction of the user, the first viewing angle may be adjusted such that the user becomes within the adjusted first viewing angle of the holographic display system.

CLAIM 1. A system for facilitating holographic presentations despite using holographic displays having limited viewing angles, the system comprising: one or more processors executing computer program instructions that, when executed, cause operations comprising: detecting a user within a distance threshold of a holographic display device, the holographic display device being configured with multiple viewing angles and enabled to simultaneously provide holographic presentations via the multiple viewing angles, the multiple viewing angles comprising a first viewing angle having a first set of angle arms and a second viewing angle having a second set of angle arms different from the first set of angle arms; in response to detection of the user within the distance threshold, determining a relative direction of the user with respect to the holographic display device; selecting, based on the relative direction of the user, the first viewing angle over the second viewing angle of the multiple viewing angles of the holographic display device for a first holographic presentation to the user; and adjusting, based on the selection, the first viewing angle of the holographic display device for the first holographic presentation to the user by moving components of the holographic display device to cause the relative direction of the user to be within the adjusted first viewing angle of the holographic display device.



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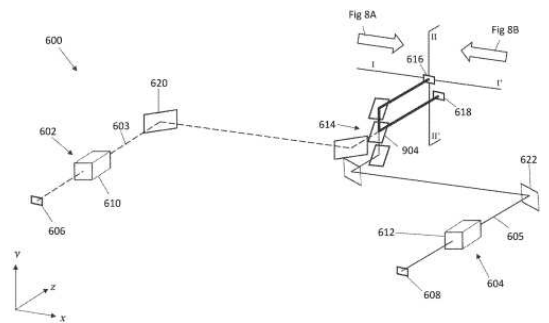
US20240045378
Priority Date: 02/08/2022

ENVISICS

PROJECTION ASSEMBLY

A projection assembly is described. The projection assembly comprises a first holographic projection channel configured to output a first holographic light field. The projection assembly further comprises a second holographic projection channel configured to output a second holographic light field. The first holographic projection channel and the second holographic projection channel are arranged such that the first holographic light field is adjoined with the second holographic light field in order to form a continuous field of view.

CLAIM 1. A projection assembly comprising: a first holographic projection channel configured to form a first holographic light field from a first hologram of a first image; and a second holographic projection channel configured to form a second holographic light field from a second hologram of a second image, wherein each hologram is configured to form a holographic light field in which content of the corresponding image in a first dimension is encoded by angle such that angular channels of holographic light each correspond to a respective slice of the corresponding image in the first dimension, and wherein the projection assembly is arranged to combine a first plurality of angular channels of the first holographic projection channel and a second plurality of angular channels of the second holographic projection channel in the first dimension in order that the first holographic light field and second holographic light field are co-receivable and transformable into an extended image comprising the first image adjoined to the second image.



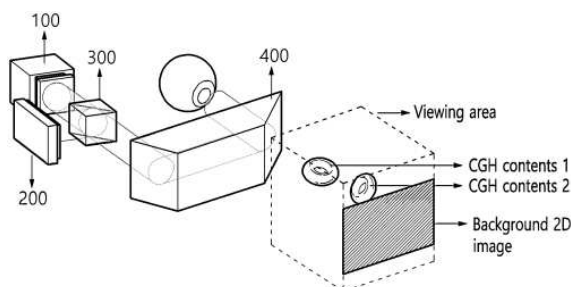
N9976

US20240036517
Priority Date: 29/07/2022

ELECTRONICS & TELECOMMUNICATIONS RESEARCH INSTITUTE

APPARATUS AND METHOD FOR REPRODUCING HOLOGRAM IMAGE

Disclosed herein is an apparatus for reproducing a hologram image. The apparatus may include a holographic display module for reproducing a digital hologram, a background display module for reproducing a background image, and a combiner for selecting the background image in consideration of the depth map of the digital hologram and reproducing a hologram image synthesized by combining the selected background image with the digital hologram.



CLAIM 1. An apparatus for reproducing a hologram image, comprising: a holographic display module for reproducing a digital hologram; a background display module for reproducing a background image; and a combiner for selecting the background image in consideration of a depth map of the digital hologram and reproducing a hologram image synthesized by combining the selected background image with the digital hologram.

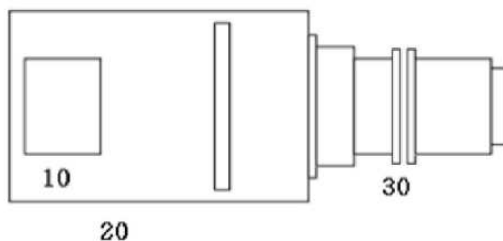
N9978

KR20240021419
Priority Date: 10/08/2022

HOLOLAB

LASER HIGH BEAM PROJECTION APPARATUS

A laser Gobo projector apparatus according to the present invention comprises: a laser light source unit consisting of a color laser diode; Gobo glasses on which at least one of advertisement designs (characters, numbers, colors, logos, pictures, etc.) are marked so as to transmit light, which is emitted from the laser light source unit, in an intended form according to the purpose of a user; and an image forming lens unit through which the advertisement design masked on the gobo glasses is formed on a hologram screen so as to be displayed as a hologram image.



CLAIM 1. The device as claimed in claim 2, comprising: a laser light source unit (10) configured as a color laser diode; gobo glasses (20) on which at least one of the gobo glasses is marked in order to transmit light emitted from the laser light source unit (10) in an intended form; and an image forming lens unit (30) on which the gobo glasses (20) masked on the gobo glasses are formed as an image on a hologram screen (31) so that the image is displayed as a hologram image, wherein the gobo glasses (20) are cylindrical gobo glasses, wherein the gobo glasses are characters, numbers, colors, logos, or pictures.

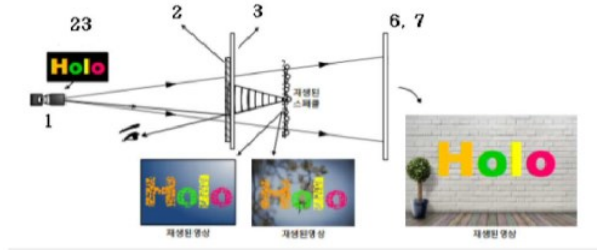
N9979

KR20240021405
Priority Date: 10/08/2022

HOLOLAB

HOLOGRAM SCREEN ADVERTISEMENT APPARATUS

The present invention relates to a hologram screen advertising device comprising: a glass display unit to which a hologram screen film is attached; and a high-resolution laser projector for projecting a hologram image onto the hologram screen.



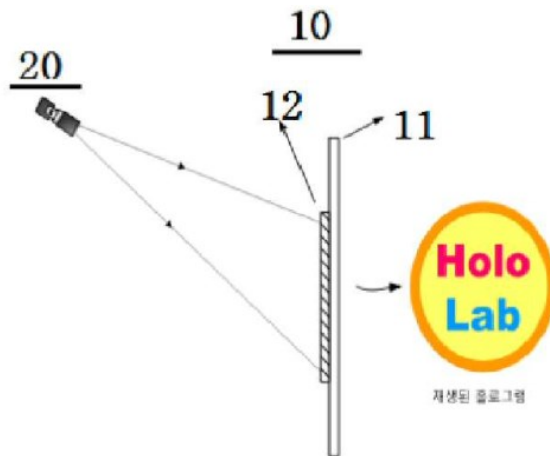
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KR20240014304
Priority Date: 25/07/2022

HOLOLAB

HOLOGRAM SCREEN ADVERTISEMENT APPARATUS

The present invention relates to a hologram screen advertising device comprising: a glass display unit (10) to which a hologram screen film is attached; and a high auxiliary name projector (20) for projecting a hologram image onto the hologram screen, wherein a hologram advertisement is displayed by irradiating Gobo light on the glass display unit (10), a bright advertisement image can be displayed during the day, and transparency is very high so as not to affect the transparency of a medium in which the hologram screen film is installed.



CLAIM 1. The apparatus for advertising a hologram screen according to claim 1, which comprises: a glass display unit (10) having a hologram screen film (11) attached thereto; and a high-resolution projector (20) for projecting a hologram image on the hologram screen, wherein the high-resolution projector (20) is installed on an upper portion or a lower portion of the glass display unit (10) to display the hologram advertisement, wherein the high-resolution projector (20) is configured to include a light source unit (21), a high-resolution glass (22), and an imaging lens unit (23), and wherein the high-resolution projector (20) is configured to include a light source unit (21), a high-resolution glass (22), and an imaging lens unit (23)

N9982

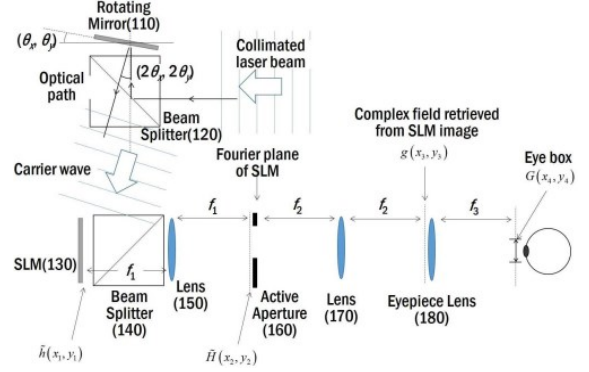
KR102631122

Priority Date: 28/12/2022

KOREA ELECTRONICS TECHNOLOGY INSTITUTE

METHOD FOR REDUCING LATENCY OF HOLOGRAPHIC NEAR-EYE DISPLAY

Provided is a method for reducing the delay time of a holographic near-eye display. A near-eye display method according to an embodiment of the present invention senses the movement of an observer and moves an image displayed on the near-eye display based on the sensed movement. Accordingly, the incident angle of the SLM and the position of the aperture through which the SLM image passes are adjusted based on the movement of the observer to adjust the image position in the direction opposite to the movement direction of the observer, thereby reducing the MTP delay time and minimizing the inconvenience of the observer.



CLAIM 1. A near-eye display method comprising: detecting a movement of an observer; and moving an image displayed on a near-eye display based on the detected movement, wherein the moving of the image comprises: a first adjustment of an incident angle at which a beam emitted from a light source is incident on a spatial light modulator (SLM); and a second adjustment of a position of an aperture through which the SLM image passes, and the moving of the image moves in a direction opposite to a direction of the detected movement to reduce a motion-to-photon (MTP) latency.

N9983

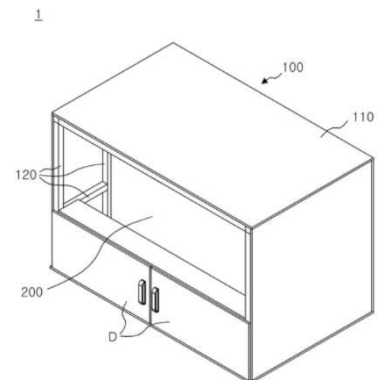
KR102630676

Priority Date: 05/09/2022

JEONGWAN

INTERACTIVE HOLOGRAM DEVICE USING LIDAR SENSOR

The present invention provides an interactive hologram device using a radio frequency identification (LIDAR) sensor, comprising: a frame having an empty inner space; a screen which is provided inside the frame, has a holography film attached to a front surface thereof, and is formed in a mesh shape; the LIDAR sensor which is provided at an upper end of the frame to face a direction of the screen, and measures a time reflected and returned through transmission of a laser pulse to generate detection data; a first projector which is provided at an upper end of the frame to irradiate a hologram image in the direction of the screen; and an interactive hologram server which detects position information of an object from the detection data transmitted from the LIDAR sensor, generates position coordinates of the object based on the detected position information, and generates a touch event on the hologram image irradiated from the first projector.



CLAIM 1. An interactive hologram device using a Radio Frequency Identification (LIDAR) sensor, the interactive hologram device comprising: a frame having an empty interior; a screen provided within the frame and having a front surface to which a holographic film is attached and formed in a mesh shape; a LIDAR sensor provided at an upper end of the frame so as to face a direction of the screen, and measuring a return time of a laser pulse to generate detection data; a first projector provided at the upper end of the frame so as to project a holographic image in the direction of the screen; and an interactive hologram server detecting position information of an object from the detection data transmitted from the LIDAR sensor, generating position coordinates of the object based on the detected position information, and generating a touch event in the holographic image projected from the first projector, wherein the interactive hologram server comprises: a measurement module simultaneously measuring the position information of the screen and the position information of the object through the LIDAR sensor measuring a reflection period of the laser pulse; a conversion module converting the position information of the screen and the object position information into digital coordinates through the measurement module; an extraction module comparing the digital coordinates to determine whether a touch occurs and to extract coordinates and size of a touch area; and an event module generating an event at a touch occurrence point on the screen, wherein the measurement module directly projects the laser pulse on the object and the screen through the LIDAR sensor, measures a return time of each laser pulse to be reflected and returned, and compares the reflection time of the object, and generates the position information of the object based on the position information fixed in accordance with the position information.

N9984

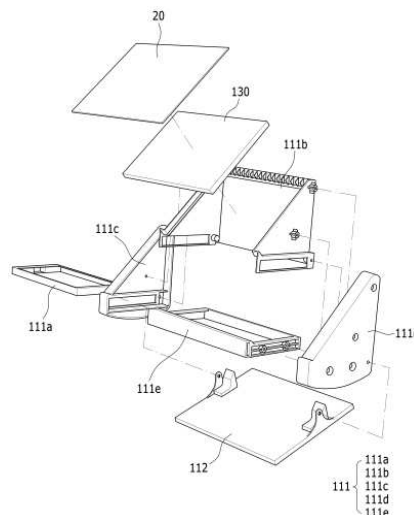
KR102628753

Priority Date: 25/11/2022

MARKETON

MOBILE HOLOGRAM DEVICE AND CONTROL METHOD THEREOF

The present invention relates to a mobile hologram device and a control method thereof. The mobile hologram device may include: a housing having a storage space for storing an external device, and having an upper surface with a predetermined inclination with respect to a bottom surface; a hologram projection unit disposed on the upper surface of the housing, and projecting an image displayed on a display of the external device into the air as a hologram image; a communication unit communicatively connected to the external device; a touch control unit sensing a non-contact input of a user to the hologram image, and converting the sensed user input into touch information; and a controller controlling the communication unit to transmit the converted touch information to the external device.



CLAIM 1. A mobile hologram device comprising: a housing having an accommodating space formed in a lower portion thereof to accommodate an external device, and having an upper surface with a predetermined inclination relative to a bottom surface of the housing; a hologram projection unit disposed on the upper surface of the housing and configured to project an image displayed on a display of the external device into an upper empty space of the housing as a hologram image; a communication unit configured to communicate with the external device; a touch control unit configured to sense a non-contact input of a user with respect to the hologram image and to convert the sensed user input into touch information; and a controller configured to control the communication unit to transmit the converted touch information to the external device, wherein the housing comprises a rear housing, a left housing, a right housing, and a lower housing, and the hologram projection unit comprises: a first housing disposed on the upper surface of the housing; and a second housing coupled to a lower portion of the first housing.

N9986

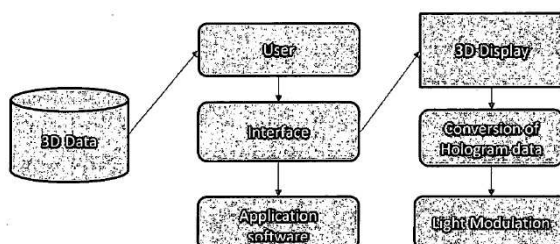
IN202441001864

Priority Date: 10/01/2024

SA ENGINEERING COLLEGE

3D HOLOGRAPHIC PROJECTOR FOR IMAGE DISPLAY ON LIGHTNING

Holography is the science that is grown from the use of the machine intelligence under the idea of dissemination of light. The "3d Holographic Projector For Image Display On Lightning Display" that was under the science of holographic LED located film Projector. It was an 3D holographic LED display fan film projector. Where these LED 3D holographic film projector display figures in the form by utilizing illumination accompanying the strips of RGB afterwards establishing and encrypting 2D or 3D concept or broadcast. These projectors will work like a fast-twisting fan enhances almost hidden to the naked eyes and projects the representations in in essence that is artificial that looks like floats the representation in air at under some climatic fulmination environments. This film projector will concede possibility be take over all present displays entirely sizes from limited telephone screen to the abundant film projector. In a looming day, these projectors will be situated effectively fields for effecting the concept. Where the consumer and spectator can feel the in-essence representation as authentic individual, by this type of advanced promoted science from now on it from people as political whole to live-in nanny in essence realm. Keywords: 3D Holographic, LED 3D Holographic, LED strips, RGB, dissemination.



CLAIM 1. Projection model and its associated procedure for displaying the images.

N9987

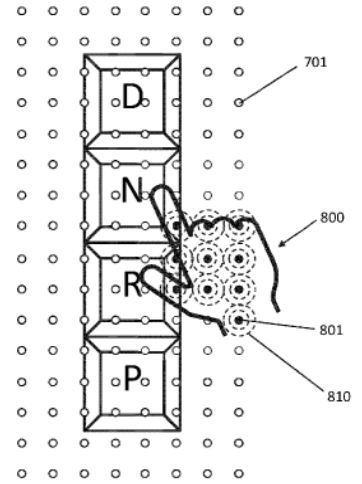
EP4325300

Priority Date: 16/08/2022

ENVISICS

HOLOGRAM WAVEGUIDING

A head-up display for a vehicle. The head-up display comprises a first light engine, a second light engine, at least one waveguide, an eye-box for a viewer and a light detector. The first light engine is arranged to form a first wavefront. The first wavefront is a first holographic wavefront formed by illuminating a first hologram of a picture. The second light engine is arranged to form a second wavefront. The waveguide comprising an input, pair of opposing, reflective surfaces; and an output. The input is arranged to receive the first holographic wavefront and second wavefront. The pair of opposing reflective surfaces is arranged to waveguide the first holographic wavefront and second wavefront therebetween by internal reflection. A first surface of the pair of opposing reflective surfaces is partially transmissive thereby forming an output port for a plurality of replicas of the first holographic wavefront and second wavefront. The eye-box for a viewer receives the first holographic wavefront. The viewer forms a first holographic image of the picture, that appears in a region between the first hologram and eye-box, from the first holographic wavefront. The second wavefront forms a light pattern in the region. The light detector is arranged to receive a light return of the light pattern if an object is present in the region.



CLAIM 1. A head-up display for a vehicle, the head-up display comprising: a first light engine arranged to form a first wavefront, wherein the first wavefront is a first holographic wavefront formed by illuminating a first hologram of a picture; a second light engine arranged to form a second wavefront; a waveguide comprising: an input arranged to receive the first holographic wavefront and second wavefront; a pair of opposing reflective surfaces arranged to waveguide the first holographic wavefront and second wavefront therebetween by internal reflection, wherein a first surface of the pair of opposing reflective surfaces is partially transmissive thereby forming an output port for a plurality of replicas of the first holographic wavefront and second wavefront; an eye-box for a viewer to receive the first holographic wavefront and form a first holographic image of the picture that appears in a region between the first hologram and eye-box, wherein the second wavefront forms a light pattern in the region; and a light detector arranged to receive a light return of the light pattern if an object is present in the region.

N9988

EP4312082

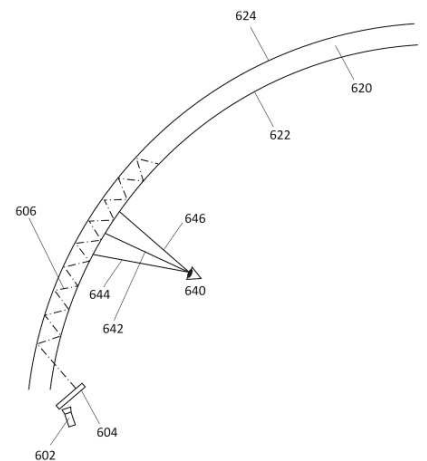
Priority Date: 29/07/2022

ENVISICS

HOLOGRAM WAVEGUIDING

A method of head-up display for a vehicle. A first step comprises displaying a hologram of an image on a display device and spatially modulating light in accordance with the displayed hologram to form a holographic wavefront. A second step comprises replicating the holographic wavefront in a first direction using a first pupil expander to form a 1D array of replicas of the holographic wavefront. A third step comprises using a windscreen of the vehicle as a second pupil expander to form a 2D array of replicas of the holographic wavefront from the 1D array of replicas.

CLAIM 1. A method of head-up display for a vehicle, the method comprising: displaying a hologram of an image on a display device and spatially modulating light in accordance with the displayed hologram to form a holographic wavefront; replicating the holographic wavefront in a first direction using a first pupil expander to form a 1D array of replicas of the holographic wavefront; and using a windscreen of the vehicle as a second pupil expander to form a 2D array of replicas of the holographic wavefront from the 1D array of replicas.



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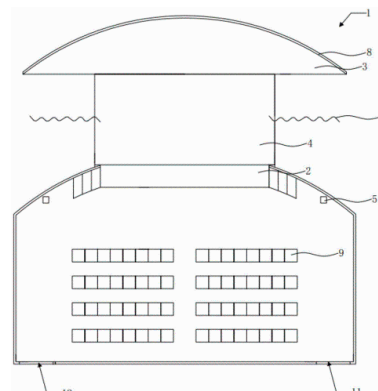
CN220491188U

Priority Date: 07/07/2023

SHANGHAI GUOWEI MUTUAL ENTERTAINMENT CULTURE
TECHNOLOGY

IMMERSIVE HOLOGRAPHIC THEATRE

The utility model provides an immersive holographic theater, which comprises a theater body, a front stage and a rear stage which are arranged in the theater body at intervals, a ground display screen which is arranged on the ground of the theater body and connected between the front stage and the rear stage, two projection parts which are symmetrically arranged on two sides of the front stage, a rolling curtain which is vertically arranged on the front stage, a holographic film which is obliquely arranged between the upper end of the rolling curtain and the front end of the rear stage by 45 degrees, a ring curtain which is vertically arranged at the rear end of the rear stage, and a viewing part which is arranged in front of the front stage at intervals, wherein the projection part projects a playing picture onto the holographic film, and the ground display screen displays corresponding pictures in a matched mode through refraction of the ring curtain, so that each position of the viewing part can feel a 3D effect. The utility model can ensure that the audience at each position of the video watching part obtains vivid watching experience.



CLAIM 1. An immersive holographic theatre, wherein: the device comprises a theater body, a front stage and a rear stage which are arranged in the theater body at intervals, a ground display screen which is arranged on the ground of the theater body and connected between the front stage and the rear stage, two projection parts which are symmetrically arranged on two sides of the front stage, a rolling curtain which is vertically arranged on the front stage, a holographic film which is obliquely arranged between the upper end of the rolling curtain and the front end of the rear stage by 45 degrees, a ring curtain which is vertically arranged at the rear end of the rear stage, and a viewing part which is arranged in front of the front stage at intervals.

N9991

CN220474309U

Priority Date: 19/07/2023

NANJING ZHIHUI TECHNOLOGY DEVELOPMENT

3D HOLOGRAPHIC SHOWCASE

The utility model discloses a 3D holographic display cabinet, which comprises: the main body display unit comprises a display base, a holographic projection host positioned right above the display base and a 3D display cover arranged at the center of the upper side wall of the holographic projection host; the cover plate positioning unit comprises a hollow box fixedly mounted on one side of the upper side wall of the holographic projection host machine and a servo motor fixedly mounted at one end of the hollow box, wherein an output shaft of the servo motor penetrates through one side of the hollow box and is fixedly connected with a bidirectional screw rod, one end of the bidirectional screw rod, far away from the output shaft of the servo motor, is rotationally connected with the inner wall of the other end of the hollow box, threads on the bidirectional screw rod are connected with thread blocks with symmetrical positions, and one side, close to the 3D display cover, of each thread block is fixedly connected with a corresponding clamping block through a connecting rod. According to the utility model, the bolts are not required to be screwed or unscrewed in sequence by using special tools, so that the 3D display cover can be replaced or detached conveniently.

CLAIM 1. A 3D holographic display cabinet, comprising: a main body display unit (100) comprising a display base (101), a holographic projection host (102) positioned right above the display base (101), and a 3D display cover (103) arranged at the center of the upper side wall of the holographic projection host (102); the cover plate positioning unit (200) comprises a hollow box (202) fixedly installed on one side of the upper side wall of the holographic projection host machine (102) and a servo motor (201) fixedly installed at one end of the hollow box (202), wherein an output shaft of the servo motor (201) penetrates through one side of the hollow box (202) and is fixedly connected with a bidirectional screw rod (203), one end of the output shaft of the bidirectional screw rod (203), far away from the output shaft of the servo motor (201), is rotationally connected with the inner wall of the other end of the hollow box (202), threaded blocks (204) with symmetrical positions are connected on the bidirectional screw rod (203), one side, close to the 3D display cover (103), of each threaded block (204) is fixedly connected with a corresponding clamping block (206) through a connecting rod (205), and a strip-shaped opening matched with the connecting rod (205) is formed in the side wall of the hollow box (202), and the width of the strip-shaped opening is smaller than the distance between the inner walls on the upper side and the lower side of the hollow box (202).

N9992

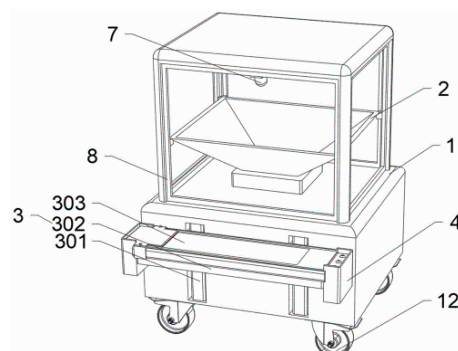
CN220473859U

Priority Date: 13/03/2023

SHANDONG MEASUREMENT SCIENCE RESEARCH INSTITUTE

DIGITAL HOLOGRAPHIC IMAGE DISPLAY PLATFORM

The utility model discloses a digital holographic image display platform, which comprises a digital display platform, wherein a fixing mechanism is arranged on one side of the digital display platform, an adjusting mechanism is connected to one side, far away from the fixing mechanism, a cleaning mechanism is arranged on two sides of the adjusting mechanism, the cleaning mechanism is close to the adjusting mechanism, the adjusting mechanism arranged on the digital display platform can be adjusted according to the use condition of a user or an operator, so that the user or the operator can conveniently display a better science popularization or metering culture, and meanwhile, the cleaning mechanism arranged on the adjusting mechanism can clean or sterilize an operation platform of the digital holographic image display platform when in use, so that cross infection is reduced, the fixing mechanism arranged on the digital display platform can fix digital holographic image equipment, stability is improved, and meanwhile, a holographic projector and a controller arranged on a holographic projection box are convenient for better representing the digital holographic image display.



CLAIM 1. The digital holographic image display platform is characterized by comprising a digital display platform (1), wherein a fixing mechanism (2) is arranged on one side of the digital display platform (1), and an adjusting mechanism (3) is connected to one side, far away from the fixing mechanism (2), of the digital display platform (1); cleaning mechanisms (4) are arranged on two sides of the adjusting mechanism (3), and the cleaning mechanisms (4) are close to the adjusting mechanism (3).

N9993

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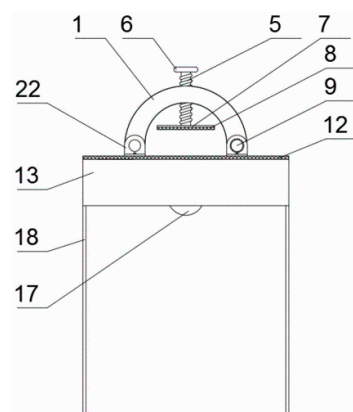
Priority Date: 27/06/2023

HAINAN RUITUO ENGINEERING SURVEY & DESIGN

HOLOGRAPHIC PLATE OF TRANSMISSION LINE

The utility model discloses a holographic plate for a power transmission line, which comprises a frame body and a movable clamping block, wherein two ends of the movable clamping block are respectively provided with a rotating shaft and a second screw hole, the middle of the movable clamping block is provided with a first screw hole, the first screw hole is in threaded connection with a screw rod, the upper end of the screw rod is provided with a rotary handle, a rubber rain-proof layer is arranged below the movable clamping block, the lower part of the rubber rain-proof layer is attached to the frame body, the inner part of the frame body is provided with a rotary motor, and a holographic lamp is arranged below the rotary motor. The utility model is provided with the movable clamping block, the pressing plate and the rubber buffer cushion, the movable clamping block can be closed to lock the power transmission line, the pressing plate and the rubber buffer cushion can clamp the power transmission line after the movable clamping block is closed to prevent the holographic plate from shaking and sliding off.

CLAIM 1. The utility model provides a holographic tablet of transmission line, includes framework (13) and activity fixture block (1), its characterized in that: one end of the movable clamping block (1) is provided with a rotating shaft hole (2), the other end of the movable clamping block is provided with a second screw hole (21), a first screw hole (4) is arranged in the middle of the movable clamping block (1), the first screw hole (4) is in threaded connection with a screw rod (5), the upper end of the screw rod (5) is provided with a rotary handle (6), the lower end of the screw rod is provided with a pressing plate (7), a rubber buffer pad (8) is arranged below the pressing plate (7), a rubber waterproof layer (12) is arranged below the movable clamping block (1), an ear plate (22) is arranged above the rubber waterproof layer (12), rotating shaft holes (2) are formed in the left two ear plates (22), through holes (3) are formed in the right two ear plates (22), one side of the right two ear plates (22) is provided with a knob (9), the other side of the right two ear plates (22) is provided with a fixing nut (10), the rear side of the screw rod (9) is provided with a first fixing screw (11), a frame body (13) is arranged below the rubber waterproof layer (12), the motor body is provided with a rotary screw (15) and the rotary handle (15) is arranged below the rotary handle (15), and holographic lamp (17) is equipped with below rotary rod (16), frame (13) below is equipped with transparent lamp shade (18), just be equipped with lamp shade screw thread (19) between transparent lamp shade (18) with frame (13).



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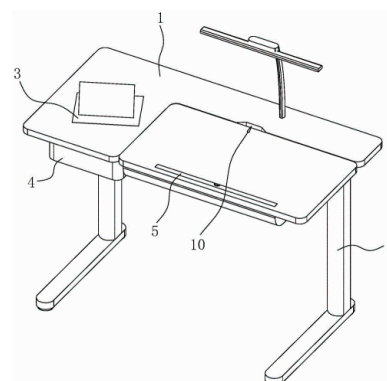
CN220403453U

Priority Date: 06/04/2023

JIANGXI XIANGHANG TECHNOLOGY | XIANGHANG RUDONG TECHNOLOGY | XIANGHANG TECHNOLOGY

HOLOGRAPHIC STUDY TABLE WITHOUT MEDIUM

The utility model relates to a desk field discloses a holographic study table of no medium, including table and table leg, the table sets up on the table leg, is provided with holographic projection module in the table, and holographic projection module includes display module and imaging module, and imaging module inlays and establishes in the table, and display module sets up in the table below and is located imaging module under, and display module projects the light path towards imaging module, imaging module reflection light path and forms aerial formation of image above the desktop. The application has the advantages that the display module and the imaging module can be adopted, the display module projects the teaching content on the multimedia computer onto the imaging module, the imaging module reflects the teaching content to the upper portion of the desktop and forms aerial imaging, and each student can clearly watch the teaching content on the desktop, so that the teaching effect of digital teaching is improved.



CLAIM 1. The utility model provides a holographic study table of no medium, includes table (1) and table leg (2), table (1) set up on table leg (2), its characterized in that: the holographic projection system is characterized in that a holographic projection module (3) is arranged in the table (1), the holographic projection module (3) comprises a display module (31) and an imaging module (32), the imaging module (32) is embedded in the table (1), the display module (31) is arranged below the table (1) and is positioned right below the imaging module (32), the display module (31) projects an optical path towards the imaging module (32), and the imaging module (32) reflects the optical path and forms aerial imaging above the table; the table leg (2) comprises a supporting leg (21), a telescopic piece (22) and a supporting frame (23), wherein the supporting leg (21) is placed on the ground, the telescopic piece (22) is arranged on the supporting leg (21), the supporting frame (23) is arranged at the top end of the telescopic piece (22), and the table plate (1) is arranged on the supporting frame (23).

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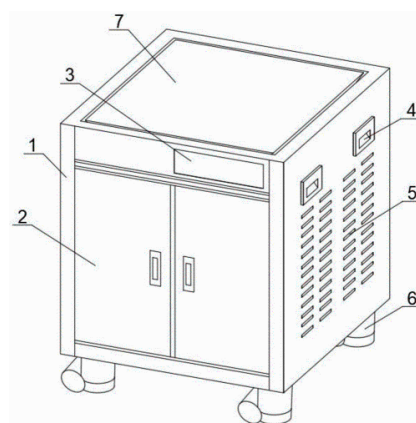
Priority Date: 12/07/2023

SHENYANG JINGXUAN INTELLIGENT DIGITAL TECHNOLOGY

BOX TYPE HOLOGRAPHIC SHOWCASE

The utility model discloses a box type holographic showcase, which comprises: an access door is hinged to the front side surface of the movable box body; wherein, remove box leading flank upper portion and be equipped with intelligent control board, and remove the box right flank and be equipped with recess and vent, remove four removal supporting legs of bottom half fixed connection, be convenient for maintain the holographic projection mechanism of shrink state through the access door that has set up the removal box, carry out certain lift rotation with holographic projection mechanism through having set up rotary mechanism cooperation central elevating system, the lift can be convenient for adjust holographic projection mechanism height and then be convenient for the masses of height difference watch, rotary projection module and imaging block increase certain propaganda effect when being convenient for the masses watch from different positions.

CLAIM 1. A box holographic display case comprising: the movable box body (1), wherein the front side surface of the movable box body (1) is hinged with an access door (2); the intelligent control device is characterized in that an intelligent control board (3) is arranged on the upper portion of the front side face of the movable box body (1), a groove (4) and a vent (5) are formed in the right side face of the movable box body (1), and four movable supporting feet (6) are fixedly connected to the bottom of the movable box body (1), and the intelligent control device is characterized in that: further comprises: the holographic projection mechanism (7), the holographic projection mechanism (7) is arranged in the movable box body (1); wherein the holographic projection mechanism (7) comprises: the imaging device comprises an imaging block (71), wherein a projection module (72) is fixedly connected to the bottom of the imaging block (71); the projection module (72) is fixedly connected to the top surface of the rotating mechanism (73), and the bottom of the rotating mechanism (73) is fixedly connected with the center lifting mechanism (74).



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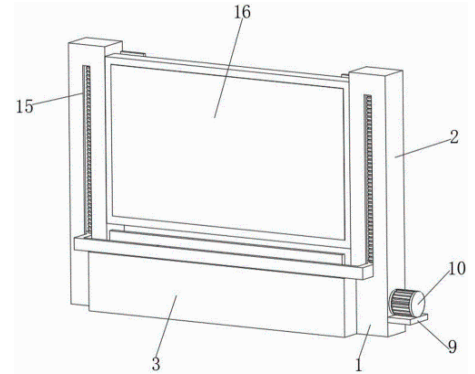
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Priority Date: 17/04/2023

SHENZHEN SHIHAI ELECTRONICS

HOLOGRAPHIC THREE-DIMENSIONAL 3D DIGITAL DISPLAY SCREEN

The utility model relates to the technical field of display screens, and discloses a holographic three-dimensional 3D digital display screen, which comprises a base, wherein side posts are fixedly connected to two ends of the base, a storage box is fixedly connected to one side surface of the base, transmission rods are rotatably connected to the inner walls of two sides of the base, braking gears are fixedly connected to two ends of the transmission rods, a screw is rotatably connected to the inside of the side posts, and a driven gear is fixedly connected to one end of the screw. This holographic three-dimensional 3D digital display screen through being provided with motor, screw rod, cleaning scraper blade, flexible protection network, can clear up the dust that adheres on the display screen, protects the display screen when not using simultaneously, after using the display screen, closes the display screen, starts the motor, drives the transfer line and rotates to drive braking gear and rotate, drive the screw rod through driven gear and rotate, finally drive the sliding plate and rise in the spout, thereby drive cleaning scraper blade and rise, cleaning scraper blade's in-process that rises.



CLAIM 1. The utility model provides a holographic three-dimensional 3D digital display screen, includes base (1), its characterized in that: the utility model discloses a cleaning device for the automobile, including base (1), slide plate (8) are cup jointed on the surface of one side of base (1), both sides inner wall rotation of base (1) is connected with transfer line (4), the equal fixedly connected with brake gear (5) in both ends of transfer line (4), the inside rotation of side post (2) is connected with screw rod (6), the one end fixedly connected with driven gear (7) of screw rod (6), intermesh between driven gear (7) and brake gear (5), spout (15) have been seted up on the one side surface of side post (2), slide plate (8) have been cup jointed on the surface of screw rod (6), slide plate (8) are located the inside of spout (15), one side surface both ends of slide plate (8) are first telescopic link (11) of fixedly connected with, the one end fixedly connected with cleaning scraper blade (12).

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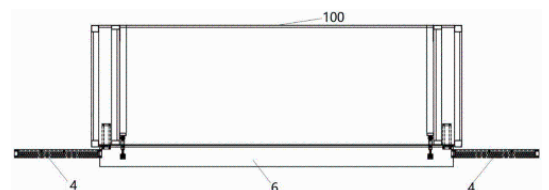
Priority Date: 02/08/2023

BEIJING TIANDI MYTHOLOGY INTERNATIONAL CULTURAL DEVELOPMENT

STORABLE HOLOGRAPHIC IMAGING CABIN FOR MOBILE HOLOGRAPHIC DISPLAY WORKSTATION

The utility model discloses a storable holographic imaging cabin for a mobile holographic display workstation, which is mainly designed in that a box body, which is used for connecting an imaging cabin with a mobile vehicle, is taken as a main body, and at least a positive screen, a ground screen, a reflecting film and two side screens are arranged in the box body, wherein the screen preferably adopts an LED screen; the front screen is mounted at the back side plate of the box body, the ground screen is mounted at the bottom plate of the box body, the reflecting film is obliquely mounted in the box body, the side screens are respectively stored at the opposite side end plates of the box body through a sliding mechanism and a hinge mechanism, and the front side plate of the box body is formed by buckling an upper turning plate located above and a lower turning plate located below. The utility model can provide expandable, rich and diversified display contents, and particularly, the structure of the storable screen and the box body is suitable for mobile display requirements, and can be matched with the design conception of a mobile holographic display workstation.

CLAIM 1. A stowable holographic imaging pod for a mobile holographic display workstation, comprising: the box body is provided with a connecting piece connected with the mobile vehicle at the outer side, and a positive screen, a ground screen, a reflecting film and two side screens are arranged in the box body; the front screen is mounted at the back side plate of the box body, the ground screen is mounted at the bottom plate of the box body, the reflecting film is obliquely mounted in the box body, the side screens are respectively arranged at the opposite side end plates of the box body through the sliding mechanism and the hinge mechanism, and the front side plate of the box body comprises an upper turning plate located above and a lower turning plate located below.



and the front side plate of the box body comprises an upper turning plate located above and a lower turning plate located below.

N9998

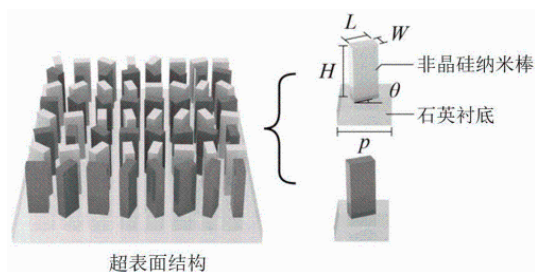
CN117572742

Priority Date: 22/11/2023

BEIHANG UNIVERSITY OF AERONAUTICS & ASTRONAUTICS

LARGE-DEPTH SUPER-SURFACE POLARIZATION HOLOGRAPHIC 3D DISPLAY METHOD

The invention provides a large-depth super-surface polarization holographic 3D display method, which comprises the following four steps: the method comprises the steps that firstly, for two different 3D objects I and 3D objects II, a large-depth super-surface hologram I and a super-surface hologram II of the two objects are obtained based on angular spectrum diffraction theory calculation; secondly, alternately inserting the super-surface hologram I and the super-surface hologram II line by line so as to encode a synthetic hologram, and then optimizing the phase of the synthetic hologram by using an error diffusion algorithm so as to obtain meta-phase information required by a super-surface structure; thirdly, designing a super-surface structure based on the meta-phase information in the second step, so that the super-surface structure of an odd line is sensitive to the left-hand circular polarized light, and the super-surface structure of an even line is sensitive to the right-hand circular polarized light, thereby realizing independent control of different polarization states; and fourthly, carrying out holographic 3D reconstruction by using laser to irradiate the super-surface structure, when the left-handed circularly polarized light irradiates the super-surface structure, seeing the large-depth holographic reconstruction image of the 3D object I, when the right-handed circularly polarized light irradiates the super-surface structure, seeing the large-depth holographic reconstruction image of the 3D object II, and when the left-handed circularly polarized light and the right-handed circularly polarized light irradiate the super-surface structure simultaneously, seeing the large-depth holographic reconstruction images of the 3D object I and the 3D object II.



CLAIM 1. A large depth super surface polarization holographic 3D display method, characterized in that the method comprises the following four steps: firstly, for two different 3D objects I and II, respectively obtaining a large-depth super-surface hologram I and a super-surface hologram II of the two objects based on angular spectrum diffraction theory calculation, wherein the super-surface hologram I and the super-surface hologram II are respectively used for left-hand circular polarization holographic reconstruction and right-hand circular polarization holographic reconstruction; secondly, alternately inserting the super-surface hologram I and the super-surface hologram II line by line so as to encode a synthetic hologram, and then optimizing the phase of the synthetic hologram by using an error diffusion algorithm so as to obtain meta-phase information required by a super-surface structure; thirdly, designing the super-surface structure based on the meta-phase information in the second step, so that the super-surface structure of the odd lines is sensitive to the left-hand circular polarized light, the super-surface structure of the even lines is sensitive to the right-hand circular polarized light, thereby realizing independent control of different polarization states, and the super-surface structures of two adjacent lines cannot generate crosstalk due to mutual diffraction in the diffraction process; and fourthly, carrying out holographic 3D reconstruction by using laser to irradiate the super-surface structure, wherein when the left-handed circularly polarized light irradiates the super-surface structure, only the super-surface structure in an odd line is sensitive to incident light, and then the light field phase is regulated and controlled, at the moment, a large-depth holographic reconstruction image of the 3D object I is seen, when the right-handed circularly polarized light irradiates the super-surface structure, only the super-surface structure in an even line is sensitive to the incident light, and then the light field phase is regulated and controlled, at the moment, a large-depth holographic reconstruction image of the 3D object II is seen, and when the left-handed circularly polarized light and the right-handed circularly polarized light irradiate the super-surface structure simultaneously, a large-depth holographic reconstruction image of the 3D object I and the 3D object II are seen simultaneously.

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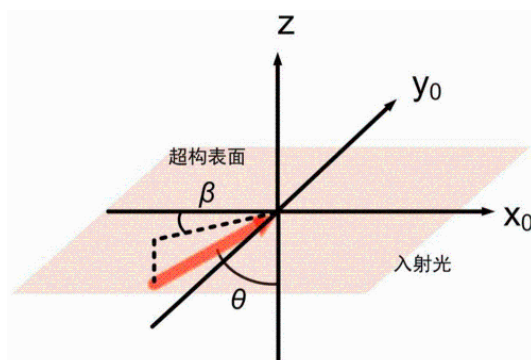
CN117572636

Priority Date: 30/11/2023

HUAZHONG UNIVERSITY OF SCIENCE & TECHNOLOGY

THREE-DIMENSIONAL AR DISPLAY SUPER-STRUCTURE HOLOGRAPHIC IMAGING DEVICE, DESIGN METHOD THEREOF AND WEARABLE EQUIPMENT

The invention discloses a three-dimensional AR display super-structure holographic imaging device, a design method thereof and wearable equipment, and belongs to the technical field of micro-nano optics and augmented reality display. The design method comprises the following steps: calculating the corresponding light field at the holographic plane from the light field of the three-dimensional target virtual image to be imaged, replacing the transmitted light amplitude of the super-structure holographic imaging device, calculating the light field of the three-dimensional target virtual image, replacing the light field with the amplitude of the target virtual image, and calculating the corresponding light field U of the holographic plane h' . Thus, the light field U corresponding to the holographic plane is recycled h' . Sufficiently converged to account for the current light field U h' . Phase distribution in (a) It is desirable to be able to form a desired virtual image at the target location. According to the method, when incident light is incident to the super-structure holographic imaging device for phase regulation, a three-dimensional target virtual image can be formed at a target position without additional optical regulation elements, confocal fusion with an external scene is achieved, and compactness and portability of the AR display system are improved.



CLAIM 1. The design method of the three-dimensional AR display super-structure holographic imaging device based on the angular spectrum theory is characterized by comprising the following steps: step S1: splitting the three-dimensional target virtual image into planar target virtual images on n different imaging planes, each of which is located at a different imaging distance, and constructing an initial light field U on the corresponding imaging plane according to the random phase and the amplitude of each planar target virtual image t, m . The amplitude is the square root of the relative intensity of each pixel in the corresponding image, $U_{t, m}$. Representing the light field on the m th imaging plane, $m=1, 2, \dots, n$; step S2: based on initial light field $U_{t, m}$. Calculating the light field U at the holographic plane h' ; Step S3: extracting the current light field $U_{h'}$. The phase of the light field U modulated by the super-structure holographic imaging device is constructed by the phase of the light field U and the amplitude of the transmitted light of the super-structure holographic imaging device h ; Step S4: computing light field U by Fourier transform h . Spatial frequency weight distribution A of (2) h ; Step S5: estimating a spatial frequency weight distribution A at an m th imaging plane $i, m = A_{h'} * H_{i, m}$. Spatial frequency weight distribution $A_{i, m}$. Performing inverse Fourier transform to obtain a light field U on an m th imaging plane i, m ; Step S6: light field $U_{i, m}$. The amplitude of the plane object virtual image at the m th imaging plane is replaced by the amplitude of the plane object virtual image at the m th imaging plane to obtain an updated light field U on the m th imaging plane i', m ; Step S7: based on the current light field $U_{i', m}$. Calculating the light field U at the holographic plane h' ; Step S8: judging light field $U_{h'}$. If not, jumping to the step S3; otherwise, executing S9; step S9: based on the latest obtained light field $U_{h'}$. Phase distribution in (a) Calculating the phase control quantity distribution of the super-structured holographic device to the incident light \rightarrow In (1) the \rightarrow The phase distribution of the incident light before the incident light enters the super-structure holographic imaging device; \rightarrow Is a two-dimensional matrix, the number of units of the matrix is the same as the number of super-structure atoms constituting the super-structure holographic device, (x_0, y_0) Two-dimensional Cartesian coordinates of a plane of the super-structured holographic imaging device; wherein, based on the light field U at the imaging plane v, m . Calculating the light field U at the holographic plane h' . Comprising: computing light field U at current imaging plane by Fourier transform v, m . Spatial frequency weight distribution A of (2) v, m ; Calculating the light field U of the holographic plane and the imaging plane v, m . Corresponding spatial frequency weight distribution $A_{h', m} = A_{v, m} / H_{i, m}$. Spatial frequency weight distribution $A_{h', m}$. Performing inverse Fourier transform to obtain a light field $U_{h', m}$. Calculating the light field at the holographic plane $H_{i, m}$. Is the transfer function of spatial frequency weights of the light field from the holographic plane to the m th imaging plane. $v=t, i'$.

N10006

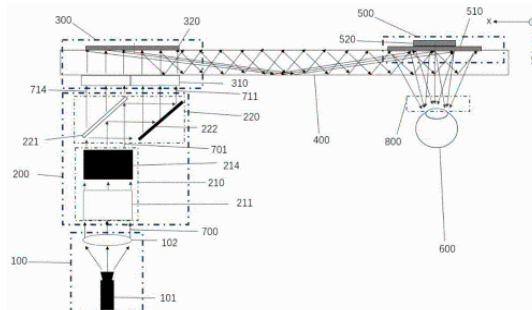
CN117539059

Priority Date: 07/10/2023

SICHUAN UNIVERSITY

LARGE EYE BOX CROSSTALK-FREE HOLOGRAPHIC OPTICAL WAVEGUIDE AUGMENTED REALITY DISPLAY DEVICE

The invention provides a large-eye-box crosstalk-free holographic optical waveguide augmented reality display device which comprises a projection module, a wavefront replication module, an in-coupling module, a waveguide and an out-coupling module. The projection module has the functions of projecting an image source and collimating the projected light waves. The wave front replication module replicates the light waves output by the projection module into six-beam planar light waves. The in-coupling module couples six planar lightwaves generated by the wave front replication module into the waveguide, and realizes the switching of the lightwaves through a PDLC (polymer dispersed liquid crystal, PDLC) module in the in-coupling module. The waveguide provides a total reflection transmission channel for the coupled light waves and has good optical transmittance for ambient light. The decoupling module is used for coupling and converging light waves in the waveguide at a certain diffraction angle to form nine viewpoints which are distributed in a 3 multiplied by 3 mode, and the optical axis of each viewpoint is coincident with the visual axis of eyes at corresponding positions.



CLAIM 1. The large-eye-box crosstalk-free holographic optical waveguide augmented reality display device is characterized by comprising a projection module, a wavefront replication module, an in-coupling module, a waveguide and an out-coupling module; the projection module comprises a projector and a collimating lens, and has the functions of projecting an image source and collimating projected light waves; the wave front replication module comprises a vertical wave front replication unit and a horizontal wave front replication unit, and the wave front replication module replicates the light waves output by the projection module into six-beam planar light waves; the in-coupling module comprises a polymer dispersed liquid crystal (polymer dispersed liquid crystal, PDLC) module and a holographic optical element I, and couples six planar lightwaves generated by the wave front replication module (200) into a waveguide; the waveguide provides a total reflection transmission channel for the coupled light waves, and has better optical transmittance for ambient light; the coupling-out module comprises a holographic optical element II and a holographic optical element III, the coupling-out module couples and converges light waves in the waveguide at a certain diffraction angle to form nine viewpoints which are distributed in a 3 multiplied by 3 mode, and the optical axis of each viewpoint is coincident with the visual axis of eyes at corresponding positions.

N10009

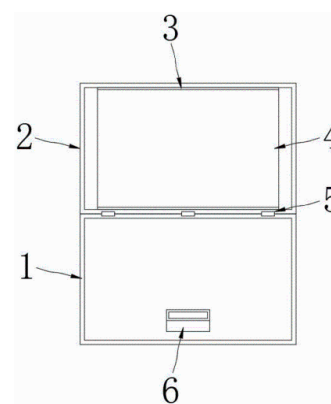
CN117524012

Priority Date: 24/11/2023

JIANGSU RUYAO DECORATION DESIGN PROPS

MODERNIZATION HOLOGRAPHIC PROJECTION SHOW CUPBOARD

The invention relates to the technical field of holographic projection equipment, in particular to a modern holographic projection display cabinet. The technical proposal comprises: the utility model provides a modernization holographic projection show cupboard, includes organism, top cap, holographic curtain and holographic projection module, install the top cap through the hinge rotation on the organism, the inside movable mounting of top cap has the magnetism to inhale the strip, be fixed with holographic curtain on the strip is inhaled to the magnetism, the inside of organism is equipped with power module, power module's top is equipped with holographic projection module, be equipped with projection lens on the holographic projection module. When the invention is not used, the storage protection of the projection lens is facilitated, and the damage of the projection lens and the projection module is further prevented.



CLAIM 1. A modernization holographic projection show cupboard which characterized in that: including organism (1), top cap (2), holographic curtain (4) and holographic projection module (8), install top cap (2) through hinge (5) rotation on organism (1), inside movable mounting of top cap (2) has magnetism to inhale strip (3), be fixed with holographic curtain (4) on the magnetism strip (3), the inside of organism (1) is equipped with power module (10), the top of power module (10) is equipped with holographic projection module (8), be equipped with projection lens (6) on the holographic projection module (8).

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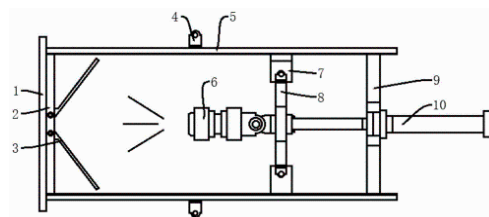
Priority Date: 09/11/2023

SANJI PHOTOELECTRIC TECHNOLOGY SUZHOU

COLOR HOLOGRAPHIC DIFFRACTION WAVEGUIDE DISPLAY DEVICE

The invention discloses a color holographic diffraction waveguide display device which comprises a display screen main body, a guide frame, a light source spot lamp and a guide frame, wherein the end part of the light source spot lamp is hinged with a middle connecting lug on one side of the guide frame through a hinge frame, both ends of the guide frame are fixed with lug bolts, the end part of the guide frame is provided with the display screen main body, the inner side of the display screen main body is provided with an inner frame, and the inner side of the inner frame is provided with an angle-adjustable diffraction column. The invention is provided with the guide frame, the middle part of the side surface of the guide frame is provided with the guide rod, the two ends of the guide frame are respectively provided with the ear frames, the end parts of the ear frames are provided with the guide lugs, the guide lugs can be connected with the guide rod in a sliding embedded manner, the telescopic ends of the electric push rods can be connected with the guide frame, the end parts of the light source spot lamps are hinged with the connection through the ear frames, the connection lugs are connected with the guide frame, the position of the light source spot lamps can be automatically controlled through the electric push rods, so that the light source spot lamps can be used more flexibly, and diffraction can be carried out in different ranges.

CLAIM 1. The utility model provides a colored holographic diffraction waveguide display device, includes display screen main part (1), guide frame (5), light source shot-light (6) and guide frame (8), its characterized in that: the tip of light source shot-light (6) is articulated through articulated frame (15) and one side middle part engaging lug (16) of guide frame (8), the both ends of guide frame (8) all are fixed with ear frame (7) bolt, the tip of guide frame (5) is equipped with display screen main part (1), the inboard of display screen main part (1) is equipped with inner frame (2), the inboard of inner frame (2) is equipped with diffraction fence (3) that can angular adjustment.



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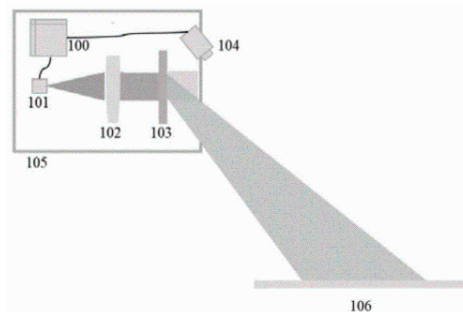
CN117499603

Priority Date: 25/10/2023

SUZHOU ZHIYUNGU AUTOMOTIVE ELECTRONIC TECHNOLOGY

VEHICLE-MOUNTED PROJECTION INTERACTION MODULE AND HIGH-RESOLUTION PURE-PHASE HOLOGRAM CALCULATION METHOD

The invention discloses a vehicle-mounted projection interaction module and a high-resolution pure phase hologram calculation method, wherein the vehicle-mounted projection interaction module comprises the following components: the device comprises an illumination light source, a collimating lens, a high-resolution pure phase hologram, a camera and a control panel, wherein the control panel is connected with the illumination light source, the camera and a vehicle-mounted host; the collimating lens is used for collimating the laser from the illumination light source to form plane waves; the high-resolution phase-only hologram is obtained by encoding a target projection image by adopting a high-resolution phase-only hologram calculation method; the camera is used for shooting projection images and transmitting the shot images to the vehicle-mounted host. The vehicle-mounted projection interaction module provided by the invention has the advantages of small volume, low cost and the like, and the high-resolution phase-only hologram calculation method has the advantages of high calculation speed and low memory consumption, and can avoid the problems that the direct calculation method consumes long time and memory is insufficient and the reproduction image is discontinuous when the low-resolution hologram is directly copied and spliced into the high-resolution phase-only hologram.



CLAIM 1. The utility model provides an on-vehicle projection interaction module which characterized in that includes: the device comprises an illumination light source, a collimating lens, a high-resolution pure phase hologram, a camera and a control panel, wherein the control panel is connected with the illumination light source, the camera and a vehicle-mounted host; the collimating lens is used for collimating the laser from the illumination light source to form plane waves; the high-resolution phase-only hologram is obtained by encoding a target projection image by adopting a high-resolution phase-only hologram calculation method; the camera is used for shooting projection images, the shot images are transmitted to the vehicle-mounted host computer through the control panel, and the vehicle-mounted host computer is operated according to the change of the projection images; the control panel is used for controlling the switch of the illumination light source and the camera to shoot projection images.

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

N10003

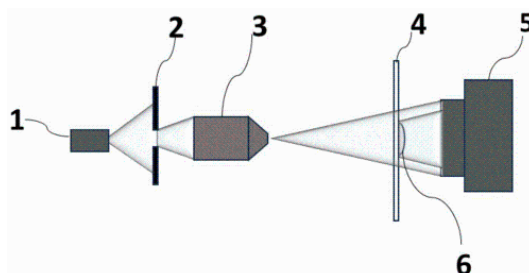
CN117554308

Priority Date: 27/11/2023

**CHANGCHUN INSTITUTE OF OPTICS FINE MECHANICS & PHYSICS –
CHINESE ACADEMY OF SCIENCES**

MULTISPECTRAL DIGITAL HOLOGRAPHIC MICROSCOPY SYSTEM AND METHOD BASED ON GABOR MODE

The invention relates to the technical field of optical microscopic imaging, and provides a multispectral digital holographic microscopic system and a multispectral digital holographic microscopic method based on a Gabor mode, wherein the multispectral digital holographic microscopic system based on the Gabor mode comprises a rotary LED light source, an adjustable aperture diaphragm, a microscope objective, a sample stage and an image sensor; the adjustable aperture diaphragm receives and limits the illumination LED light source sent by the rotary LED light source. The sample stage receives an illumination LED light source sent by the microscope objective, and the illumination LED light source irradiates a sample to be detected on the sample stage to generate scattered light and unscattered light to interfere with each other so as to generate a digital hologram corresponding to multiple spectrums. The image sensor exposes the hologram and transmits the hologram to the computer, and the computer obtains the spectrum information of the sample to be measured after the computer processes the preset image and rebuilds the value, and obtains the real form of the sample to be measured according to the spectrum information based on the Gabor mode. The multispectral digital hologram based on the Gabor mode realizes the color digital hologram microscopic reconstruction through the LED light source.



CLAIM 1. A Gabor mode-based multispectral digital holographic microscopy system, comprising: the rotary LED light source is used for providing illumination LED light sources with different wave bands in a self-rotation mode; the adjustable aperture diaphragm is used for receiving the illumination LED light source sent by the rotary LED light source and limiting the light beam of the illumination LED light source; the micro objective is used for receiving the limited illumination LED light source, wherein the adjustable aperture diaphragm and the micro objective are arranged next to the rotary LED light source and used for adjusting the aperture of an imaging light beam of the illumination LED light source and improving the spatial coherence of the rotary LED light source; the sample stage receives the illumination LED light source sent by the microscope objective, the illumination LED light source irradiates a sample to be detected on the sample stage to generate scattered light and unscattered light, and interference occurs between the scattered light and the unscattered light to generate a digital hologram corresponding to multiple spectrums; the image sensor receives the hologram generated by the sample to be detected on the sample table, wherein the image sensor exposes the hologram for a period of preset time, records the holograms generated under different wavelength illumination and transmits the holograms to a computer, and the computer obtains spectral information of the sample to be detected through a preset image processing and numerical reconstruction method and obtains the real form of the sample to be detected from the spectral information according to a Gabor mode.

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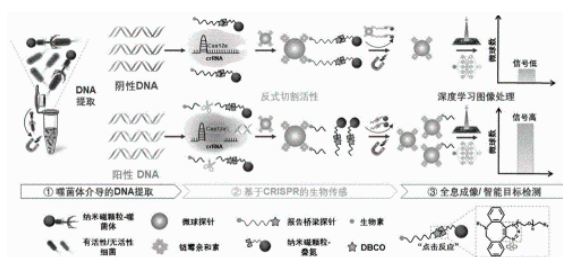
CN117551743

Priority Date: 25/10/2023

DALIAN POLYTECHNIC UNIVERSITY

DIGITAL BIOCHEMICAL ANALYSIS METHOD BASED ON HOLOGRAPHIC IMAGING AND MATCHED DETECTION EQUIPMENT THEREOF

The invention discloses a digital biochemical analysis method based on holographic imaging and matched detection equipment thereof, wherein the method comprises the following steps: extraction and separation of a target object to be detected, CRISPR/Cas12a biological sensing/antibody-antigen-based immune reaction, visual lens-free holographic imaging and deep learning target detection algorithm. The invention changes the number of microsphere signal probes through a series of biochemical reactions, directly carries out optical holographic imaging on the microsphere probes after magnetic separation, then carries out reconstruction and target identification counting on the microsphere holographic images by a deep learning algorithm, and finally realizes low cost and portable on-site instant detection of target objects; the detection method and the detection equipment have the advantages of low detection cost, portability, visual counting process, good accuracy, simple and convenient operation and higher detection speed, and can be applied to the accurate detection of nucleic acid targets and non-nucleic acid targets.



CLAIM 1. A method of digitized biochemical analysis based on holographic imaging, the method comprising: step 1: coupling phages corresponding to different target bacteria to be detected or biological recognition elements for recognizing other target objects onto the nano magnetic particles for specifically capturing living bacteria or non-nucleic acid target objects, magnetically separating and retaining nano magnetic particle-phage-bacteria complexes, standing and cracking to release DNA, and then collecting reaction liquid for standby or magnetically separating and retaining nano magnetic particle-antibody-non-nucleic acid target objects; Step 2: polystyrene microspheres are selected as signal probes: for detecting pathogenic bacteria, carrying out biochemical reaction on a polystyrene microsphere signal probe coupled with streptavidin, nano magnetic particles coupled with a click reagent 1 and two sections of report bridge probes respectively coupled with biotin and a click reagent 2 to form a polystyrene microsphere signal probe-report bridge probe-nano magnetic particle composite for standby, mixing the bacterial DNA extracted in the step 1 and Cas12a enzyme assembled with crRNA to activate trans-cleavage capacity of the bacterial DNA, then adding an activated Cas12a enzyme reaction solution into the composite to cut off the report bridge probe, and retaining supernatant containing the polystyrene microsphere signal probe after magnetic separation; for the detection of non-nucleic acid targets, such as the detection of large and small molecular targets, the nano magnetic particle-capture antibody/antigen conjugate, the biotinylated detection antibody/antibody conjugate and the target to be detected are mixed to complete the double-antibody sandwich immune reaction/competitive immune reaction; removing unreacted antibody and target after magnetic separation, reserving nano magnetic particle conjugate, adding polystyrene microsphere-streptavidin signal probe, and reserving supernatant containing polystyrene microsphere signal probe after bioorthogonal reaction; Step 3: dripping the supernatant or immune complex containing the polystyrene microspheres onto a glass slide, coating the glass slide uniformly, placing the glass slide on a holographic microscope sensing area without a lens, carrying out holographic imaging on a polystyrene microsphere signal probe by a portable holographic microscope, and transmitting the holographic image of the signal probe to a computer; step 4: and reconstructing the phase and amplitude of the polystyrene microsphere hologram by using the trained convolutional neural network, completing an automatic focusing function, simultaneously carrying out target recognition on the reconstructed polystyrene microsphere based on a Pytorch deep learning target algorithm, marking the detected microsphere, outputting the number of the microsphere, and finally calculating the content of the target object in the sample to be detected according to the number of the polymer microsphere to realize the quantitative detection of the target object.

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

N9977

RU2812809

Priority Date: 03/07/2023

**MANKEVICH SERGEJ KONSTANTINOVICH | ORLOV EVGENIJ
PROKHOROVICH | ORLOV IGOR E,SU**

LASER HOLOGRAPHIC LOCATOR

FIELD: laser ranging and quantum electronics. **SUBSTANCE:** invention is intended to create holograms of space objects of artificial and natural origin in order to obtain more complete information about them in the form of their three-dimensional image. **Essence:** a laser holographic locator contains a telescope, a laser transmitter and local oscillator, three laser amplifiers, a television camera and a photoreceiving unit, a dynamic spectral filter, scanning and frequency shifting units for laser radiation. Registration of a hologram of a moving distant space object is ensured through the use of highly efficient laser amplifiers and simultaneous compensation of the Doppler frequency shift of laser radiation reflected from the observed object. In this case, the object and reference beams of laser radiation are subjected to quantum amplification when forming a hologram of the observed space object, and the reference beam of laser radiation is formed by spatial filtering of laser radiation reflected from the observed object. When observing a space object from the Earth's surface through a layer of turbulent surface atmosphere, the proposed laser holographic locator ensures, without the use of complex and ineffective adaptive optics, the implementation of the maximum diffraction resolution of the telescope used by compensating for turbulent distortions of the atmosphere in the recorded hologram when it is processed in a computer using a special program image restoration. The proposed laser holographic locator can be used to monitor outer space in order to prevent collisions of spacecraft with worn-out elements of artificial space objects and various natural space objects, such as asteroids. **EFFECT:** increasing the efficiency of a laser holographic locator in conditions of tracking moving distant space objects, increasing sensitivity when registering a hologram of a moving space object.

CLAIM 1. The laser holographic locator comprises, mounted in series on a first optical axis, a telescope which is optically connected to a guidance unit, a retractable semitransparent mirror with a displacement unit, a first laser amplifier, a first semitransparent mirror, a dynamic spectral filter, a second semitransparent mirror, a second laser amplifier and a television camera which is connected to the control unit, and also comprises a laser transmitter, a laser heterodyne which are connected to the control unit, a laser radiation frequency shift unit, a laser radiation scanning unit, a third laser amplifier, a first and a second furier lens, an optical diaphragm, an optical lens and an optical optical optical camera the output of said diffuser is connected to the optical input of a photoreceiving unit, the output of which is connected to the spectral filter unit, first, second and third controllable attenuators with control units, a laser radiation beam expander, a controllable reflective mirror with the control unit, seven reflective mirrors and six translucent mirrors, wherein the output of the laser transmitter is optically connected to the telescope by means of a seventh reflective mirror, the optical output of the laser transmitter is optically connected to the optical input of the laser radiation beam expander by means of a translucent mirror, a first controllable attenuator and a reflective mirror, and the optical output of the laser beam expander the radiation is optically connected to the optical input of the photoreceiving unit by means of two reflective mirrors and two translucent mirrors, the optical output of the telescope is optically connected to the optical input of the objective lens by means of an optically connected retractable translucent mirror, a reflective mirror and a translucent mirror, the optical output of the objective lens is optically connected to the optical input of the photoreceiving unit, the optical output of the laser heterodyne is optically connected to the optical input of the photoreceiving unit by means of a successively optically connected laser radiation frequency shift unit, a laser radiation scanning unit, two translucent and a reflective mirrors, and the optical output of the first laser amplifier is optically connected to the optical input of the objective lens the optical output of the dynamic spectral filter is optically connected in series to the optical input of the third laser amplifier by means of the optically connected in series first fourier lens, optical diaphragm, second fourier lens and reflective mirror, the optical output of the third laser amplifier is optically connected to the optical input of the television camera by means of the optically connected in series third controllable amplifier, reflective mirror and controllable reflective mirror, and control inputs of three laser amplifiers, a dynamic spectral filter and control amplifiers control units are connected in parallel to the control unit. the inputs of a laser transmitter and laser heterodyne, units for shifting frequency and scanning laser radiation, units for controlling a retractable semitransparent mirror and a controllable reflective mirror, the output of the unit of spectral filters is connected to the control unit, and the telescope guidance unit is connected to the control unit.

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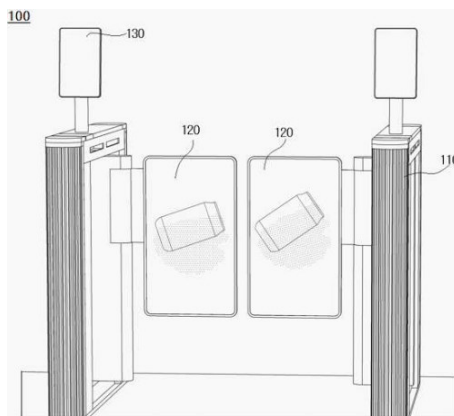
Priority Date: 28/06/2023

BYUNG-MOAN

SECURITY GATE WITH HOLOGRAM IMAGE PROJECTOR

The present invention relates to a security gate having a hologram image projector. According to an embodiment of the present invention, the hologram providing device comprises: a gate including a transparent door; a hologram providing module formed at the center of the transparent door, and providing a hologram image; and a control module receiving a control signal from a user terminal, and providing the control signal to the hologram providing module.

CLAIM 1. A security gate comprising: a gate including a transparent door; a hologram providing module formed at a center of the transparent door and providing a hologram image; and a control module receiving a control signal from a user terminal and providing the control signal to the hologram providing module, wherein the hologram providing module includes: a rotation part including a protrusion member protruding outwardly and including a motor rotating the protrusion member; a rotation blade coupled to the protrusion member; and a hologram image generator including at least one member at one surface of the rotation blade, and a coating layer applied on a surface of the rotation blade is formed as a first layer and a second layer, the first layer includes 10 parts by weight of calcium phosphate, 0.3 to 0.89 parts by weight of calcium oxide (CaO) relative to 10 parts by weight of calcium phosphate, 0.001 to 2.5 parts by weight of copper sulfate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$), 0.5 to 3.0 parts by weight of organic mineral acid, and 0.1 to 0.15 parts by weight of oxidation, and the second layer includes 10 parts by weight of a perfluorinated compound, 0.11 parts by weight of a silicon alkoxide relative to 10 parts by weight of the perfluorinated compound, 0.5 to 2.0 parts by weight of reactive silane including octadecyltrichlorosilane, 0.13 parts by weight of polytetramethylene glycol, and 10.1 parts by weight of photopolymerization initiator.



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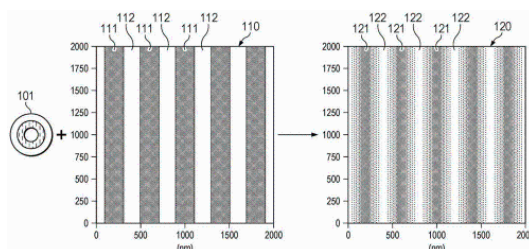
CN117572730

Priority Date: 13/12/2022

GOOGLE

MULTIPLE EXPOSURE TWO-DIMENSIONAL PATTERN USING ONE-DIMENSIONAL PHOTOLITHOGRAPHIC MASK OR HOLOGRAPHIC INTERFERENCE ETCH

The present disclosure relates to multi-exposure two-dimensional patterns using one-dimensional photolithographic masks or holographic interference etches. Systems and methods for generating a two-dimensional pattern on a photoresist layer are provided. The photoresist layer is exposed to a first series of one-dimensional features via a first exposure, the first series of one-dimensional features alternately providing a first minimum and maximum of illumination intensity along a first dimension. The photoresist layer is then exposed to a second one-dimensional series of features via a second exposure that alternately provides a second minimum and maximum of illumination intensity along a second dimension that is angularly separated from the second dimension by an exposure rotation factor.



CLAIM 1. A method, comprising: exposing the photoresist layer to a first series of one-dimensional features via a first exposure, wherein the first series of one-dimensional features provides alternating first minima and maxima of illumination intensity along a first dimension; and exposing the photoresist layer to a second one-dimensional series of features via a second exposure, wherein the second one-dimensional series of features provides alternating second minima and maxima of illumination intensity along a second dimension angularly separated from the first dimension by an exposure rotation factor.

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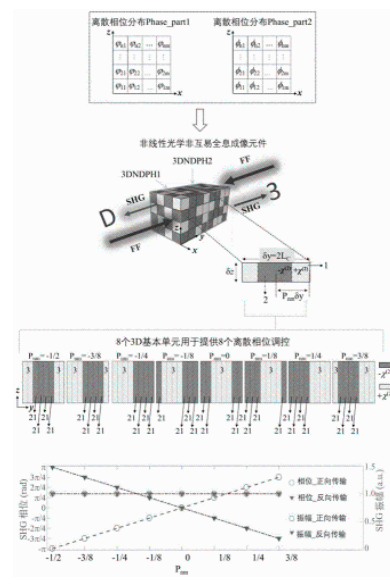
Priority Date: 01/11/2023

NINGBO UNIVERSITY

DESIGN METHOD AND APPLICATION OF NONLINEAR OPTICAL NONRECIPROCAL HOLOGRAPHIC IMAGING ELEMENT

The invention discloses a design method of a nonlinear optical nonreciprocal holographic imaging element, which comprises two 3D nonlinear detour phase holograms arranged in sequence in space, wherein the two 3D nonlinear detour phase holograms are respectively recorded as 3DNDPH1 and 3DNDPH2, and the design method of the nonlinear optical nonreciprocal holographic imaging element comprises the following steps: the discrete Phase distributions phase_part1 and phase_part2 of 3DNDPH1 and 3DNDPH2 constituting the nonlinear optical nonreciprocal holographic imaging element at different spatial positions of the holographic plane are determined from two different second harmonic hologram reconstruction images in the case of forward transmission and reverse transmission, i.e., image1 and image2, respectively. The design method can be used for designing the nonlinear optical nonreciprocal holographic imaging element so as to solve the problem that the traditional NPCs device cannot realize asymmetric second harmonic holographic imaging of different independent patterns.

CLAIM 1. The design method of the nonlinear optical nonreciprocal holographic imaging element is characterized in that the nonlinear optical nonreciprocal holographic imaging element comprises two 3D nonlinear detour phase holograms which are sequentially arranged in space, wherein the two 3D nonlinear detour phase holograms are respectively marked as 3DNDPH1 and 3DNDPH2, and the design method of the nonlinear optical nonreciprocal holographic imaging element comprises the following steps: the discrete Phase distributions phase_part1 and phase_part2 of 3DNDPH1 and 3DNDPH2 constituting the nonlinear optical nonreciprocal holographic imaging element at different spatial positions of the holographic plane are determined from two different second harmonic hologram reconstruction images in the case of forward transmission and reverse transmission, i.e., image1 and image2, respectively.



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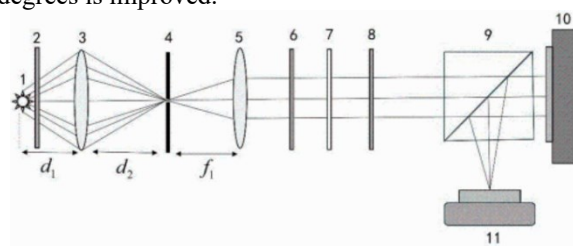
Priority Date: 19/11/2023

HARBIN UNIVERSITY OF SCIENCE & TECHNOLOGY

POLARIZATION INTERFERENCE-FREE CODED APERTURE CORRELATION HOLOGRAPHY BASED ON SPECKLE DECORRELATION

The invention discloses a polarized interference-free coded aperture correlation holography based on speckle decorrelation, and relates to the field of computational optical imaging. Based on the interference-free coded aperture correlation holography, holograms containing 0 DEG, 45 DEG and 90 DEG polarization components are recorded by using a single light path and synthesized into a single hologram, the light path structure is simple, meanwhile, the correlation between point source holograms of different polarization angles is reduced by using a speckle rotary decorrelation technology, images corresponding to the 0 DEG, 45 DEG and 90 DEG polarization components are respectively reconstructed from the single hologram, the images of the polarization components are not crosstalked during reconstruction, the calculation error of Stokes parameters is reduced, and the calculation precision of linear polarization angles and linear polarization degrees is improved.

CLAIM 1. The speckle decorrelation-based polarized interference-free coded aperture correlation holography is characterized in that the method comprises a monochromatic light emitting diode LED (Light Emitting Diode), a first polaroid, a first lens, a target object, a second lens, a second polaroid, a 1/2 wave plate, a third polaroid, a phase space light modulator PSLM (Phase Spatial Light Modulator), a beam splitter prism and an image sensor; defining the horizontal direction of a cross section perpendicular to the propagation direction of the optical path as 0 DEG, and the anticlockwise direction as the positive direction;



the method comprises the following three steps: s1, recording an object hologram OH (Object Hologram) and a point source hologram PSH (Point Spread Hologram) corresponding to polarization angles of 0 DEG, 45 DEG and 90 DEG respectively; s2, PSH rotation decorrelation of different polarization angles; s3, stokes parameters, linear polarization angle AOLP (Angle Of the Linear Polarization) and linear polarization degree DOLP (Degree Of Linear Polarization) are calculated.

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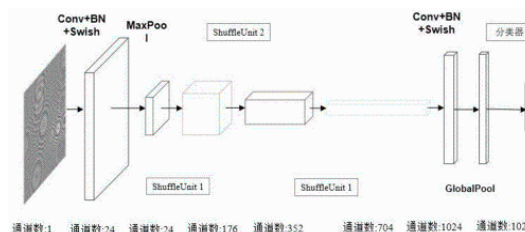
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Priority Date: 03/11/2023

CHINA OCEAN UNIVERSITY

HOLOGRAPHIC PARTICLE TRANSVERSE AND LONGITUDINAL POSITIONING METHOD, SYSTEM, EQUIPMENT AND MEDIUM

The invention discloses a method, a system, equipment and a medium for positioning holographic particles transversely and longitudinally, and relates to the technical field of digital holographic three-dimensional detection. The method comprises the following steps: acquiring a particle field hologram; using a particle reconstruction plane positioning algorithm to transversely position the particle field hologram to obtain a particle transverse segmentation map; utilizing a particle depth positioning algorithm to perform longitudinal positioning according to the particle transverse segmentation map and the particle field hologram so as to obtain a z-direction position corresponding to particles; and drawing coordinate distribution of the particles in a three-dimensional flow field according to the transverse particle segmentation diagram and the z-direction position corresponding to the particles. The method can realize the rapid and high-precision processing of the particle field hologram and efficiently acquire the coordinate distribution of particles in the three-dimensional flow field.



CLAIM 1. A method for positioning holographic particles in a transverse direction and a longitudinal direction, comprising: acquiring a particle field hologram; using a particle reconstruction plane positioning algorithm to transversely position the particle field hologram to obtain a particle transverse segmentation map; the particle reconstruction plane positioning algorithm is realized based on a modified U-net depth convolution neural network framework; the modified U-net neural network framework comprises an encoder, a decoder and an output layer which are sequentially connected; the encoder adopts a processing structure of two convolution operations; utilizing a particle depth positioning algorithm to perform longitudinal positioning according to the particle transverse segmentation map and the particle field hologram so as to obtain a z-direction position corresponding to particles; the particle depth positioning algorithm is realized based on a convolutional neural network; and drawing coordinate distribution of the particles in a three-dimensional flow field according to the transverse particle segmentation diagram and the z-direction position corresponding to the particles.

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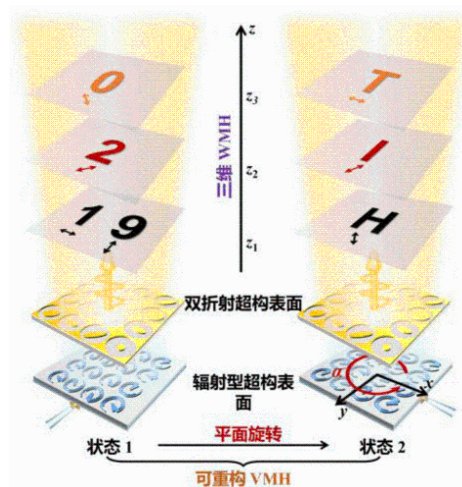
CN117492346

Priority Date: 16/11/2023

HARBIN INSTITUTE OF TECHNOLOGY

THREE-DIMENSIONAL RECONFIGURABLE VECTOR HOLOGRAPHIC DOUBLE-LAYER CASCADING SUPER-STRUCTURE DEVICE, DESIGN METHOD AND EQUIPMENT

A three-dimensional reconfigurable vector holographic double-layer cascading super-structure device, a design method and equipment belong to the technical field of holography, and solve the problems that the operation of changing a light source or a polarizer and the like is often involved in the reconfigurability of an incident wavefront, and the quick switching cannot be realized conveniently. The device of the invention comprises: the intensity and polarization response of the hologram in three-dimensional space is reconfigurable and highly customizable. The rotatable radiating super-structured surface may act as an incident wavefront modulator to excite the non-rotatable birefringent super-structured surface. By introducing a gradient descent optimization reverse design method, numerical analysis and experimental verification of three-dimensional reconfigurable vector holography are demonstrated in a microwave region. The invention is suitable for an integrated encryption device and a holographic display super-structure device.



CLAIM 1. A three-dimensional reconfigurable vector holographic double-layer cascading super-structure device, which is characterized by comprising a radiation super-structure surface RTM and a double-refraction super-structure surface BM, wherein the RTM is rotatable and the BM is non-rotatable; RTM and BM align and cascade.

N10017

LIQUID CRYSTAL

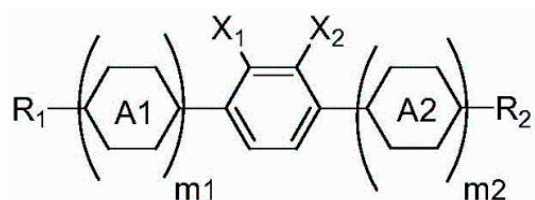
CN117467452

Priority Date: 23/10/2023

JIANGXI LIANHAO PHOTOELECTRIC

LIQUID CRYSTAL COMPOSITION AND HOLOGRAPHIC POLYMER DISPERSED LIQUID CRYSTAL GRATING

The invention discloses a liquid crystal composition, which comprises at least one of compounds shown in a general formula I and at least one of compounds shown in a general formula II. The liquid crystal composition provided by the invention has a large birefringence, and the liquid crystal composition presents a smectic phase, and as phase separation progresses, liquid crystal molecules are arranged in a layered manner, and the layered molecules keep order. The liquid crystal molecules with the layered arrangement structure can be arranged along different directions under a specified electric field, and meanwhile, after the liquid crystal molecules reach a certain arrangement mode, the liquid crystal molecules can still stably maintain the arrangement state under the action of no external electric field. The invention also discloses a holographic polymer dispersed liquid crystal grating, which comprises the liquid crystal composition provided by the invention, after phase separation, the grating has higher light transmittance, and also has higher diffraction efficiency on S light and P light, thereby providing better effect for two-dimensional pupil expansion of the grating.



CLAIM 1. A liquid crystal composition comprising: at least one of the compounds of the formula I; and At least one of the compounds of the formula II; the compound of the general formula I is: wherein R is 1 Any one selected from alkyl groups and alkoxy groups having 3 to 9 carbon atoms; R 2 selected from alkyl and alkoxy groups having 3 to 9 carbon atoms, -F, -OCF 3 - any one of CN; x is X 1 And X 2 Any one selected from H, F, methyl and ethyl respectively or simultaneously; independently selected from-> Any one of them; m 1 and m 2 Respectively or simultaneously, 0, 1, 2 or 3, and m 1 +m 2 ≠0; The compound of the general formula II is: wherein R is 3 One selected from alkyl and alkoxy with 3-12 carbon atoms; y is selected from-F, -OCF 3 -any one of CN; X 3 and X 4 One of H and F independently or simultaneously; selected from-> Any one of them; m 3 representing 1 or 2.

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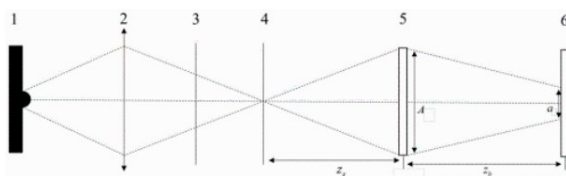
CN117452791

Priority Date: 20/10/2023

HARBIN UNIVERSITY OF SCIENCE & TECHNOLOGY

HIGH SIGNAL-TO-NOISE RATIO CODING APERTURE RELATED HOLOGRAPHIC IMAGING METHOD BASED ON BINARIZATION PHASE MASK

The invention discloses an improved method based on a binary phase code aperture related imaging system, relates to a method for applying a binary phase code mask to the code aperture related imaging system, belongs to the field of code imaging in computational optical imaging, and particularly relates to an optimization method of a binary phase hologram. The method mainly adopts an alternating random binary search algorithm to optimize the background signal of the auto-correlation of the synthetic point expansion hologram, suppresses the direct current component of the synthetic point expansion hologram through alternating iteration, and adopts a random traversal search method to accelerate the convergence speed, thereby effectively reducing the cross-correlation reconstruction noise of the code aperture correlation imaging.



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HOLOGRAMS - 13 PATENTS

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P37348	KR	20240017387	07/02/2024	RMG	KR	25/01/2024	KR2024000011820	KR20240017387	GENUINE PRODUCT CERTIFICATION LABEL AND CERTIFICATION SYSTEM USING SAME	
P37372	FR	3138539	02/02/2024	BUSSON BERTRAND DINULOVIC DANIJEL SCHLEE SERGE	FR	27/07/2022	FR2022000007713	FR3138538 FR3138539	MEANS OF PAYMENT INTEGRATING A QR-CODE PREVIOUSLY ANCHORED ON THE BLOCKCHAIN.	
P37378	DE	102022209583	01/02/2024	BUNDESDRUCKEREI	DE	13/09/2022	DE202210209583	DE102022209583	HOLOGRAM MASTER FOR MANUFACTURING A SECURITY ELEMENT WITH AN OPTICALLY VARIABLE HOLOGRAPHIC SECURITY FEATURE AND MANUFACTURING METHOD AND SECURITY ELEMENT	Passport
P37382	CN	220509606	20/02/2024	HENAN PROVINCE WELKING TECHNOLOGY DEVELOPMENT	CN	27/04/2023	CN2023020980654	CN220509606U	DOUBLE-POSITIONING HOLOGRAPHIC LASER IMAGE-TEXT DIGITAL ANTI-COUNTERFEIT LABEL	
P37386	CN	220456001	06/02/2024	ZHONGSHAN GUOAN NEW MATERIAL	CN	28/07/2023	CN2023002020913	CN220456001U	HOLOGRAPHIC ANTI-FAKE FILM CAPABLE OF UNCOVERING RESERVED WORDS/PICTURES	
P37388	CN	220447553	06/02/2024	ZHONGSHAN GUOAN NEW MATERIAL	CN	03/03/2023	CN2023000392696	CN220447553U	HOLOGRAPHIC THERMOPRINTING FILM WITH VARIABLE INFORMATION	
P37390	CN	220398392	26/01/2024	WUHAN YUEN ANTI COUNTERFEITING TECHNOLOGY	CN	17/05/2023	CN2023001187336	CN220398392U	POSITIONING DETECTION DEVICE FOR HOLOGRAPHIC ANTI-COUNTERFEITING PAPER	
P37391	CN	117577004	20/02/2024	SHANDONG TAIBAO INFORMATION TECHNOLOGY GROUP	CN	08/12/2023	CN2023011677153	CN117577004	ANTI-COUNTERFEITING LABEL CAPABLE OF PREVENTING HOT AIR TRANSFER, AND PREPARATION METHOD AND APPLICATION THEREOF	
P37393	CN	117567953	20/02/2024	SHANDONG TAIBAO PACKAGING PRODUCT	CN	13/11/2023	CN2023011510080	CN117567953	TRANSPARENT SCRATCH-DISPLAY LASER ANTI-COUNTERFEITING ELECTROCHEMICAL ALUMINUM AND MANUFACTURING METHOD THEREOF	
P37403	CN	117532979	09/02/2024	FIRST RESEARCH INSTITUTE OF MINISTRY OF PUBLIC SECURITY	CN	09/11/2023	CN2023001488772	CN117532979	PERSONALIZED ANTI-COUNTERFEITING PRINTING FILM AND PREPARATION METHOD THEREOF	
P37406	CN	117511431	06/02/2024	SHANDONG TAIBAO INFORMATION TECHNOLOGY GROUP	CN	05/12/2023	CN2023001654365	CN117511431	NON-DEVIATION COLOR PRINTING HOLOGRAPHIC ANTI-COUNTERFEITING ADHESIVE TAPE AND PREPARATION METHOD THEREOF	
P37410	CN	117510524	06/02/2024	CHINA THREE GORGES UNIVERSITY	CN	18/10/2023	CN2023001351470	CN117510524	PREPARATION AND APPLICATION OF SIX-MEMBERED O, O HETEROCYCLIC COMPOUND	
P37411	CN	117510523	06/02/2024	CHINA THREE GORGES UNIVERSITY	CN	18/10/2023	CN2023001351468	CN117510523	PREPARATION AND APPLICATION OF SEVEN-MEMBERED N, N HETEROCYCLIC COMPOUND	

VARIOUS OPTICAL EFFECTS - 19 PATENTS

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P37335	WO	202428574	08/02/2024	DE LA RUE INTERNATIONAL	GB	03/08/2022	GB2022000011330	WO202428574 GB2621154 GB202211330	SECURITY DEVICES AND METHODS OF MANUFACTURE THEREOF	Microlens
P37336	WO	202428408	08/02/2024	SICPA	EP	05/08/2022	EP2022000189085	WO202428408	METHODS FOR PRODUCING OPTICAL EFFECT LAYERS COMPRISING MAGNETIC OR MAGNETIZABLE PIGMENT PARTICLES AND EXHIBITING ONE OR MORE INDICIA	
P37337	WO	202427883	08/02/2024	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	04/08/2022	DE102022002839	WO202427883	SECURITY ELEMENT FOR A VALUE DOCUMENT, HAVING AN OPTICALLY VARIABLE PRIMARY SURFACE PATTERN AND CONCEALED SECONDARY SURFACE PATTERN, AND METHOD FOR PRODUCTION THEREOF	Microlens
P37342	WO	202422302	01/02/2024	CHINA BANKNOTE PRINTING & MINT ZHONGCHAO SPECIAL SECURITY TECHNOLOGY	CN	25/07/2022	CN2022000878916	WO202422302	OPTICAL ANTI-COUNTERFEITING ELEMENT AND OPTICAL ANTI-COUNTERFEITING PRODUCT	Microlens
P37349	KR	102632898	05/02/2024	NBST	KR	27/04/2023	KR2023000055565	KR102632898	SECURITY FILM FOR PREVENTING FORGERY AND METHOD FOR AUTHENTICATING FORGERY USING THE SAME	
P37351	JP	2024021334	16/02/2024	TOPPAN HOLDINGS	JP	03/08/2022	JP2022000124089	JP2024021334	IMAGE DISPLAY MEDIUM AND METHOD FOR PRODUCING SAME	
P37352	JP	2024021154	16/02/2024	TOPPAN HOLDINGS	JP	03/08/2022	JP2022000123790	JP2024021154	INDICATOR	
P37353	JP	2024021073	15/02/2024	TOPPAN HOLDINGS	JP	02/08/2022	JP2022000123233	JP2024021073	TRANSFER FOIL, AND METHOD FOR PRODUCING IMAGE DISPLAY	

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VARIOUS OPTICAL EFFECTS - 19 PATENTS (continuation)

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P37354	JP	2024017854	08/02/2024	NATIONAL PRINTING BUREAU	JP	28/07/2022	JP2022000120770	JP2024017854	BRIGHT VIDEO PATTERN	
P37357	JP	2024017567	08/02/2024	NATIONAL PRINTING BUREAU	JP	28/07/2022	JP2022000120287	JP2024017567	LATENT IMAGE-EXPRESSING PATTERN, METHOD FOR PREPARING DATA OF LATENT IMAGE-EXPRESSING PATTERN, AND DATA OF LATENT IMAGE-EXPRESSING PATTERN	
P37358	JP	2024017436	08/02/2024	NATIONAL PRINTING BUREAU	JP	28/07/2022	JP2022000120067	JP2024017436	ANTI-COUNTERFEITING PRINTED MATTER AND METHOD OF PRODUCING ANTI-COUNTERFEITING PRINTED MATTER	
P37363	JP	2024013894	01/02/2024	TOPPAN HOLDINGS	JP	21/07/2022	JP2022000116306	JP2024013894	TRANSFER FOIL	
P37364	JP	2024013094	31/01/2024	TOPPAN HOLDINGS	JP	19/07/2022	JP2022000115028	JP2024013094	INDICATOR WITH CHANGING EFFECT	
P37370	IN	202411000408	02/02/2024	UFLEX	IN	03/01/2024	IN2024011000408	IN202411000408	A COMPOSITE PANEL AND METHOD OF MANUFACTURING THEREOF	
P37375	EP	4311683	31/01/2024	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	29/07/2022	DE202210002765	EP4311683 DE102022002765	SECURITY ELEMENT AND VALUABLE DOCUMENT EQUIPPED WITH THE SECURITY ELEMENT	
P37402	CN	117533042	09/02/2024	SHENZHEN WEILU INTELLIGENT TECHNOLOGY	CN	09/11/2023	CN2023001489159	CN117533042	MANUFACTURING METHOD OF VARIABLE PRINTING ANTI-FAKE CARD	
P37414	CN	117485048	02/02/2024	CHINA BANKNOTE PRINTING & MINT	CN	25/07/2022	CN2022000878914	CN117485048	OPTICAL ANTI-COUNTERFEITING ELEMENT AND OPTICAL ANTI-COUNTERFEITING PRODUCT	Microlens
P37415	CN	117485047	02/02/2024	CHINA BANKNOTE PRINTING & MINT	CN	25/07/2022	CN2022000880425	CN117485047	OPTICAL SECURITY ELEMENT AND OPTICAL SECURITY PRODUCT	
P37417	CN	117467091	30/01/2024	FUDAN UNIVERSITY	CN	30/10/2023	CN2023001414122	CN117467091	GRADIENT HUMIDITY-SENSITIVE PHOTONIC CRYSTAL PAPER, PREPARATION METHOD AND APPLICATION THEREOF IN ANTI-COUNTERFEITING WRITING OR PRINTING	

NON SECURITY HOLOGRAMS - 52 PATENTS

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
N9967	WO	202438476	22/02/2024	JORDAN UNIVERSITY OF SCIENCE & TECHNOLOGY	JO	17/08/2022	JO2022000050013	WO202438476	HUMAN BODY IMITATION AND VIRTUAL BODY TRANSFER USING HOLOGRAM-GUIDED ROBOTICS TECHNIQUES	
N9968	WO	202438127	22/02/2024	CARL ZEISS JENA	DE	18/08/2022	DE102022120870	WO202438127	REPLICATING METHOD FOR COPYING HOLOGRAMS INTO LIQUID PHOTOPOLYMERS	
N9969	WO	202438126	22/02/2024	CARL ZEISS JENA	DE	18/08/2022	DE102022120865	WO202438126	REPLICATING DEVICE FOR COPYING HOLOGRAMS INTO LIQUID PHOTOPOLYMERS	
N9970	WO	202437807	22/02/2024	AMS INTERNATIONAL	DE	18/08/2022	DE102022120907	WO202437807	MANUFACTURING METHOD, APPARATUS AND HOLOGRAM PLATE	
N9971	WO	202433357	15/02/2024	CARL ZEISS JENA	DE	09/08/2022	DE102022119989	WO202433357 DE102022119989	DEVICE FOR REPLICATING A PLURALITY OF HOLOGRAMS ACCORDING TO A TYPE-CASE PRINCIPLE	
N9972	WO	202433354	15/02/2024	CARL ZEISS JENA	DE	09/08/2022	DE102022119988	WO202433354 DE102022119988	METHOD FOR REPLICATING A PLURALITY OF HOLOGRAMS BY MEANS OF A TYPECASE PRINCIPLE	
N9973	WO	202428593	08/02/2024	VIVIDQ	GB	02/08/2022	GB2022000011261	WO202428593 GB2621147 GB202211261	HOLOGRAPHIC DISPLAY SYSTEM AND METHOD FOR EXPANDING A DISPLAY REGION	
N9974	US	20240053820	15/02/2024	CAPITAL ONE SERVICES	US	09/08/2022	US2022017818633	US20240053820	SYSTEMS AND METHODS FOR ADJUSTING A VIEWING ANGLE OF A HOLOGRAPHIC DISPLAY	
N9975	US	20240045378	08/02/2024	ENVISICS	GB	02/08/2022	GB2022000011245	CN117492345 US20240045378 GB2621143 GB202211245	PROJECTION ASSEMBLY	
N9976	US	20240036517	01/02/2024	ELECTRONICS & TELECOMMUNICATIONS RESEARCH INSTITUTE	KR	29/07/2022	KR2022000094503	US20240036517	APPARATUS AND METHOD FOR REPRODUCING HOLOGRAM IMAGE	

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NON SECURITY HOLOGRAMS - 52 PATENTS (continuation)

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N9977	RU	2812809	02/02/2024	MANKEVICH SERGEJ KONSTANTINOVICH ORLOV EVGENIJ PROKHOROVICH ORLOV IGOR E.SU	RU	03/07/2023	RU2023000117495	RU2812809	LASER HOLOGRAPHIC LOCATOR	
N9978	KR	20240021419	19/02/2024	HOLOLAB	KR	10/08/2022	KR2022000099707	KR20240021419	LASER HIGH BEAM PROJECTION APPARATUS	
N9979	KR	20240021405	19/02/2024	HOLOLAB	KR	10/08/2022	KR2022000099675	KR20240021405	HOLOGRAM SCREEN ADVERTISEMENT APPARATUS	
N9980	KR	20240014304	01/02/2024	HOLOLAB	KR	25/07/2022	KR2022000091886	KR20240014304	HOLOGRAM SCREEN ADVERTISEMENT APPARATUS	
N9981	KR	102631237	29/01/2024	BYUNG-MOAN	KR	28/06/2023	KR2023000083230	KR102631237	SECURITY GATE WITH HOLOGRAM IMAGE PROJECTOR	
N9982	KR	102631122	30/01/2024	KOREA ELECTRONICS TECHNOLOGY INSTITUTE	KR	28/12/2022	KR2022000186540	KR102631122	METHOD FOR REDUCING LATENCY OF HOLOGRAPHIC NEAR-EYE DISPLAY	
N9983	KR	102630676	29/01/2024	JEONGWAN	KR	05/09/2022	KR2022000111966	KR102630676	INTERACTIVE HOLOGRAM DEVICE USING LIDAR SENSOR	
N9984	KR	102628753	24/01/2024	MARKETON	KR	25/11/2022	KR2022000160417	KR102628753	MOBILE HOLOGRAM DEVICE AND CONTROL METHOD THEREOF	
N9985	JP	2024016726	07/02/2024	KANSAI UNIVERSITY KDDI	JP	26/07/2022	JP2022000119046	JP2024016726	COMPUTER SYNTHESIZED HOLOGRAM REPRODUCTION DEVICE, AND STRUCTURED ILLUMINATION CALIBRATION METHOD AND PROGRAM THEREFOR	
N9986	IN	202441001864	09/02/2024	SA ENGINEERING COLLEGE	IN	10/01/2024	IN2024041001864	IN202441001864	3D HOLOGRAPHIC PROJECTOR FOR IMAGE DISPLAY ON LIGHTNING	
N9987	EP	4325300	21/02/2024	ENVISICS	GB	16/08/2022	GB2022000011971	EP4325300 US20240061263 GB2621599 GB202211971	HOLOGRAM WAVEGUIDING	
N9988	EP	4312082	31/01/2024	ENVISICS	GB	29/07/2022	GB2022000011094	CN117471884 EP4312082 US20240036309 GB202211094	HOLOGRAM WAVEGUIDING	
N9989	DE	102023206990	01/02/2024	ROBERT BOSCH	DE	29/07/2022	DE202210207831	DE102023206990	HOLOGRAPHIC OPTICAL ELEMENT, METHOD OF MANUFACTURING HOLOGRAPHIC OPTICAL ELEMENT, AND APPARATUS	
N9990	CN	220491188	13/02/2024	SHANGHAI GUOWEI MUTUAL ENTERTAINMENT CULTURE TECHNOLOGY	CN	07/07/2023	CN2023001791808	CN220491188U	IMMERSIVE HOLOGRAPHIC THEATRE	
N9991	CN	220474309	09/02/2024	NANJING ZHIHUI TECHNOLOGY DEVELOPMENT	CN	19/07/2023	CN2023001903428	CN220474309U	3D HOLOGRAPHIC SHOWCASE	
N9992	CN	220473859	09/02/2024	SHANDONG MEASUREMENT SCIENCE RESEARCH INSTITUTE	CN	13/03/2023	CN2023000465336	CN220473859U	DIGITAL HOLOGRAPHIC IMAGE DISPLAY PLATFORM	
N9993	CN	220416722	30/01/2024	HAINAN RUITUO ENGINEERING SURVEY & DESIGN	CN	27/06/2023	CN2023001639064	CN220416722U	HOLOGRAPHIC PLATE OF TRANSMISSION LINE	
N9994	CN	220403453	30/01/2024	JIANGXI XIANGHANG TECHNOLOGY XIANGHANG RUDONG TECHNOLOGY XIANGHANG TECHNOLOGY	CN	06/04/2023	CN2023000767748	CN220403453U	HOLOGRAPHIC STUDY TABLE WITHOUT MEDIUM	
N9995	CN	220399805	26/01/2024	SHENYANG JINGXUAN INTELLIGENT DIGITAL TECHNOLOGY	CN	12/07/2023	CN2023001823029	CN220399805U	BOX TYPE HOLOGRAPHIC SHOWCASE	
N9996	CN	220399804	26/01/2024	SHENZHEN SHIHAI ELECTRONICS	CN	17/04/2023	CN2023000846445	CN220399804U	HOLOGRAPHIC THREE-DIMENSIONAL 3D DIGITAL DISPLAY SCREEN	
N9997	CN	220392077	26/01/2024	BEIJING TIANDI MYTHOLOGY INTERNATIONAL CULTURAL DEVELOPMENT	CN	02/08/2023	CN2023002063187	CN220392077U	STORABLE HOLOGRAPHIC IMAGING CABIN FOR MOBILE HOLOGRAPHIC DISPLAY WORKSTATION	
N9998	CN	117572742	20/02/2024	BEIHANG UNIVERSITY OF AERONAUTICS & ASTRONAUTICS	CN	22/11/2023	CN2023011561884	CN117572742	LARGE-DEPTH SUPER-SURFACE POLARIZATION HOLOGRAPHIC 3D DISPLAY METHOD	
N9999	CN	117572730	20/02/2024	GOOGLE	CN	13/12/2022	CN2023011725736	CN117572730	MULTIPLE EXPOSURE TWO-DIMENSIONAL PATTERN USING ONE-DIMENSIONAL PHOTOLITHOGRAPHIC MASK OR HOLOGRAPHIC INTERFERENCE ETCH	

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N10000	CN	117572636	20/02/2024	HUAZHONG UNIVERSITY OF SCIENCE & TECHNOLOGY	CN	30/11/2023	CN2023011640462	CN117572636	THREE-DIMENSIONAL AR DISPLAY SUPER-STRUCTURE HOLOGRAPHIC IMAGING DEVICE, DESIGN METHOD THEREOF AND WEARABLE EQUIPMENT	
N10001	CN	117572633	20/02/2024	NINGBO UNIVERSITY	CN	01/11/2023	CN2023011437009	CN117572633	DESIGN METHOD AND APPLICATION OF NONLINEAR OPTICAL NONRECIPROCAL HOLOGRAPHIC IMAGING ELEMENT	
N10002	CN	117570877	20/02/2024	NATIONAL UNIVERSITY OF DEFENSE TECHNOLOGY	CN	26/10/2023	CN2023011406660	CN117570877	CO-REFERENCE INTERFEROMETRY METHOD FOR BACK-TO-BACK ASPHERIC MIRROR	
N10003	CN	117554308	13/02/2024	CHANGCHUN INSTITUTE OF OPTICS FINE MECHANICS & PHYSICS - CHINESE ACADEMY OF SCIENCES	CN	27/11/2023	CN2023001594035	CN117554308	MULTISPECTRAL DIGITAL HOLOGRAPHIC MICROSCOPY SYSTEM AND METHOD BASED ON GABOR MODE	
N10004	CN	117551743	13/02/2024	DALIAN POLYTECHNIC UNIVERSITY	CN	25/10/2023	CN2023001388803	CN117551743	DIGITAL BIOCHEMICAL ANALYSIS METHOD BASED ON HOLOGRAPHIC IMAGING AND MATCHED DETECTION EQUIPMENT THEREOF	
N10005	CN	117539139	09/02/2024	HARBIN UNIVERSITY OF SCIENCE & TECHNOLOGY	CN	19/11/2023	CN2023001545076	CN117539139	POLARIZATION INTERFERENCE-FREE CODED APERTURE CORRELATION HOLOGRAPHY BASED ON SPECKLE DECORRELATION	
N10006	CN	117539059	09/02/2024	SICHUAN UNIVERSITY	CN	07/10/2023	CN2023001284667	CN117539059	LARGE EYE BOX CROSSTALK-FREE HOLOGRAPHIC OPTICAL WAVEGUIDE AUGMENTED REALITY DISPLAY DEVICE	
N10007	CN	117538971	09/02/2024	ZHUHAI MOJIE TECHNOLOGY	CN	26/10/2023	CN2023001404563	CN117538971	MANUFACTURING DEVICE AND MANUFACTURING METHOD OF REFLECTIVE VOLUME HOLOGRAPHIC GRATING	
N10008	CN	117524266	06/02/2024	QINGDAO TAIGU PHOTOELECTRIC ENGINEERING TECHNOLOGY	CN	29/07/2022	CN2022000903004	CN117524266	HOLOGRAPHIC STORAGE DEVICE	
N10009	CN	117524012	06/02/2024	JIANGSU RUYAO DECORATION DESIGN PROPS	CN	24/11/2023	CN2023001577762	CN117524012	MODERNIZATION HOLOGRAPHIC PROJECTION SHOW CUPBOARD	
N10010	CN	117523979	06/02/2024	SANJI PHOTOELECTRIC TECHNOLOGY SUZHOU	CN	09/11/2023	CN2023001485219	CN117523979	COLOR HOLOGRAPHIC DIFFRACTION WAVEGUIDE DISPLAY DEVICE	
N10011	CN	117518764	06/02/2024	SUZHOU ZHIYUNGU AUTOMOTIVE ELECTRONIC TECHNOLOGY	CN	25/10/2023	CN2023001390397	CN117518764	INTERACTIVE DISPLAY MODULE BASED ON VOLUME HOLOGRAM AND VOLUME HOLOGRAM MANUFACTURING LIGHT PATH AND METHOD	
N10012	CN	117518466	06/02/2024	SUNNY OPTICAL ZHEJIANG RESEARCH INSTITUTE	CN	29/07/2022	CN2022000907239	CN117518466	APPARATUS AND METHOD FOR MANUFACTURING HOLOGRAPHIC OPTICAL ELEMENT AND NEAR-EYE DISPLAY DEVICE	
N10013	CN	117510458	06/02/2024	BEIJING UNIVERSITY OF TECHNOLOGY CAPITAL NORMAL UNIVERSITY	CN	27/10/2023	CN2023001414706	CN117510458	CYCLOHEXANONE PHOTOSENSITIZER, PREPARATION METHOD THEREOF, MIXED PHOTOSENSITIZER AND PHOTOPOLYMER FILM	
N10014	CN	117499603	02/02/2024	SUZHOU ZHIYUNGU AUTOMOTIVE ELECTRONIC TECHNOLOGY	CN	25/10/2023	CN2023001390568	CN117499603	VEHICLE-MOUNTED PROJECTION INTERACTION MODULE AND HIGH-RESOLUTION PURE-PHASE HOLOGRAM CALCULATION METHOD	
N10015	CN	117495963	02/02/2024	CHINA OCEAN UNIVERSITY	CN	03/11/2023	CN2023001452834	CN117495963	HOLOGRAPHIC PARTICLE TRANSVERSE AND LONGITUDINAL POSITIONING METHOD, SYSTEM, EQUIPMENT AND MEDIUM	
N10016	CN	117492346	02/02/2024	HARBIN INSTITUTE OF TECHNOLOGY	CN	16/11/2023	CN2023001529356	CN117492346	THREE-DIMENSIONAL RECONFIGURABLE VECTOR HOLOGRAPHIC DOUBLE-LAYER CASCADING SUPER-STRUCTURE DEVICE, DESIGN METHOD AND EQUIPMENT	
N10017	CN	117467452	30/01/2024	JIANGXI LIANHAO PHOTOELECTRIC	CN	23/10/2023	CN2023001369818	CN117467452	LIQUID CRYSTAL COMPOSITION AND HOLOGRAPHIC POLYMER DISPERSED LIQUID CRYSTAL GRATING	
N10018	CN	117452791	26/01/2024	HARBIN UNIVERSITY OF SCIENCE & TECHNOLOGY	CN	20/10/2023	CN2023001370194	CN117452791	HIGH SIGNAL-TO-NOISE RATIO CODING APERTURE RELATED HOLOGRAPHIC IMAGING METHOD BASED ON BINARIZATION PHASE MASK	