

IHMA PATENT NEWSLETTER

Limited circulation patent news bulletin for the Holography Industry

MARCH 2024 – 80 PATENTS

Published and granted patents

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- 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).
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Equivalents : DE102022003402

Status: Pending

Research Report:

INTERNATIONAL SEARCH REPORT		International application No. PCT/DE2023/100679
A. CLASSIFICATION OF SUBJECT MATTER		
<i>B42D 25/324</i> (2014.01)ii; <i>B42D 25/328</i> (2014.01)ii; <i>B42D 25/373</i> (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)		
B42D		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 3260302 A1 (GIESECKE+DEVRIENT CURRENCY TECH GMBH [DE]) 27 December 2017 (2017-12-27) paragraphs [0006], [0007] paragraph [0028]; figure 2(a)	1,6-16
X	DE 102005061749 A1 (GIESECKE & DEVRIENT GMBH [DE]) 05 July 2007 (2007-07-05) paragraphs [0007], [0008], [0015], [0061]	1-3,5-16
A	WO 2005038500 A1 (GIESECKE & DEVRIENT GMBH [DE]; KAULE WITTICH [DE] ET AL.) 28 April 2005 (2005-04-28) page 27, line 26 - page 28, line 13; figure 4	1
X	DE 102018004088 A1 (GIESECKE DEVRIENT CURRENCY TECH GMBH [DE]) 21 November 2019 (2019-11-21) paragraphs [0009], [0030] paragraphs [0046], [0048]; figure 3	1-3,5-16
X	EP 3800063 A1 (HUECK FOLIEN GMBH [AT]) 07 April 2021 (2021-04-07) paragraphs [0001], [0004], [0013] paragraph [0024]; figure 1	1-7,9-16

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

P37423

PATENT OF THE MONTH
OVD – BANKNOTE – CARD – RELIEF

WO202456131

Priority Date: 15/09/2022

GIESECKE & DEVRIENT CURRENCY TECHNOLOGY

OPTICAL SECURITY ELEMENT WITH EFFECT REGIONS

The invention relates to an optical security element (12) for securing valuable objects, comprising at least two effect regions (14, 16) for generating different optical effects, wherein the effect regions are adjacent to one another along a boundary line (18), and at least one of the two effect regions is formed by a micromirror region with directed reflective micromirrors. According to the invention, the boundary line (18) of the two mentioned effect regions is designed not to have smooth edges, whereby a transition region (20) in the two effect regions (14, 16) is formed along the boundary line, wherein, when being viewed, the optical effect of the first effect region (14) transitions seamlessly into the optical effect of the second effect region (16). The two effect regions can be formed by micromirror regions with directed reflective micromirrors and different micromirror effects. One of the effect regions can be formed by a micromirror region with directed reflective micromirrors and another of the effect regions can be formed by a diffractive relief structure (e.g. a hologram).

ÉLÉMENT DE SÉCURITÉ OPTIQUE AVEC RÉGIONS À EFFET

L'invention concerne un élément de sécurité optique (12) pour sécuriser des objets de valeur, comprenant au moins deux régions d'effet (14, 16) pour générer différents effets optiques, les régions d'effet étant adjacentes les unes aux autres le long d'une ligne de délimitation (18), et au moins l'une des deux régions d'effet étant formée par une région de micromiroirs comprenant des micromiroirs réfléchissants dirigés. Selon l'invention, la ligne de délimitation (18) des deux régions d'effet mentionnées est conçue pour ne pas avoir de bords lisses, une région de transition (20) dans les deux régions d'effet (14, 16) étant formée le long de la ligne de délimitation, l'effet optique de la première région d'effet (14) passant sans interruption dans l'effet optique de la deuxième région d'effet (16) lorsqu'il est observé. Les deux régions d'effet peuvent être formées par des régions de micromiroirs comprenant des micromiroirs réfléchissants dirigés et différents effets de micromiroir. L'une des régions d'effet peut être formée par une région de micromiroirs avec des micromiroirs réfléchissants dirigés et une autre des régions d'effet peut être formée par une structure de relief de diffraction (par exemple un hologramme).

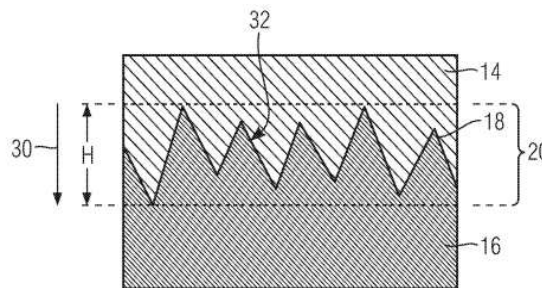


Fig. 4

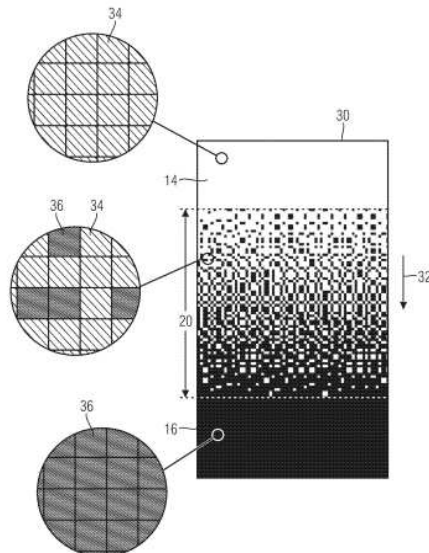
CLAIM 1. Optical security element for securing valuable objects, having at least two effect regions for producing different optical effects, the effect regions adjoining one another along a boundary line, and at least one of the two effect regions being formed by a micro-mirror region with directionally reflecting micro-mirrors, characterized in that the boundary line of the two effect regions mentioned is of non-smooth-edged design, as a result of which a transition region is formed in the two effect regions along the boundary line, in which transition region the optical effect of the first effect region merges smoothly into the optical effect of the second effect region when viewed.

OPTICAL SECURITY ELEMENT HAVING EFFECT REGIONS

The invention relates to an optical security element (12) for protecting value items, comprising at least two effect regions (14, 16) for generating different optical effects, wherein the effect regions border one another along a borderline. According to the invention, the effect regions (14, 16) each consist of a plurality of pixel elements (34; 36) and a dithered transition region (20) is formed along the borderline between a first effect region (14) and a second effect region (16), in which transition region the area percentage of the pixel elements (34) of the first effect region (14) reduces from 100% to 0% and the area percentage of the pixel elements (36) of the second effect region (16) increases from 0% to 100%, so that, in the transition region, when viewed, the optical effect of the first effect region transitions smoothly into the optical effect of the second effect region. At least one of the two effect regions can be formed by a micromirror region having directional reflective micromirrors.

ÉLÉMENT DE SÉCURITÉ OPTIQUE AYANT DES RÉGIONS D'EFFET

L'invention concerne un élément de sécurité optique (12) pour protéger des articles de valeur, comprenant au moins deux régions d'effet (14, 16) pour générer différents effets optiques, les régions d'effet étant adjacentes l'une à l'autre le long d'une limite. Selon l'invention, les régions d'effet (14, 16) sont constituées chacune d'une pluralité d'éléments pixels (34 ; 36) et une région de transition tramée (20) est formée le long de la limite entre une première région d'effet (14) et une seconde région d'effet (16), région de transition dans laquelle le pourcentage de surface des éléments pixels (34) de la première région d'effet (14) diminue de 100 % à 0 % et le pourcentage de surface des éléments pixels (36) de la deuxième zone d'effet (16) augmente de 0 % à 100 %, de sorte que, dans la région de transition, l'effet optique de la première région d'effet passe progressivement dans l'effet optique de la deuxième région d'effet. Au moins une des deux régions d'effet peut être formée par une région de micromiroirs ayant des micromiroirs réfléchissants directionnels.



CLAIM 1. Optical security element for securing objects of value, having at least two effect regions for producing different optical effects, the effect regions adjoining one another along a boundary line, characterized in that the effect regions each comprise a multiplicity of pixel elements, and in that a dithered transition region is formed along the boundary line between a first effect region and a second effect region, in which transition region the area proportion of the pixel elements of the first effect region decreases from 100% to 0% and the area proportion of the pixel elements of the second effect region increases from 0% to 100%, so that in the transition region, when viewed, the optical effect of the first effect region merges smoothly into the optical effect of the second effect region.

P37425

WO202453794

Priority Date: 07/09/2022

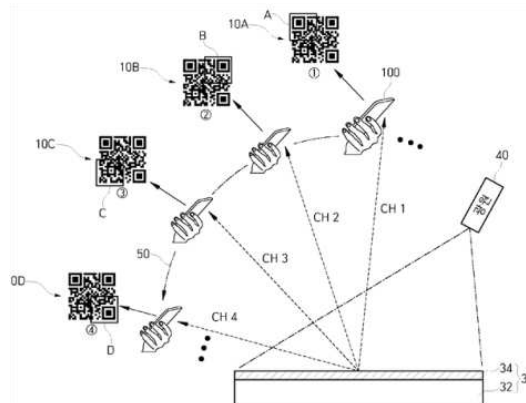
KOREA ELECTRONICS TECHNOLOGY INSTITUTE

METHOD AND USER TERMINAL FOR READING HOLOGRAM SECURITY CODE

A method for reading a hologram security code is disclosed. This method comprises the steps of: acquiring a plurality of hologram images by scanning the hologram security code by a camera of a user terminal; restoring, by a processor of the user terminal, an original security code by combining the plurality of hologram images; and reading the original security code by the processor.

PROCÉDÉ ET TERMINAL UTILISATEUR DE LECTURE DE CODE DE SÉCURITÉ D'HOLOGRAMME

L'invention divulgue un procédé de lecture d'un code de sécurité d'hologramme. Ce procédé comprend les étapes consistant à : acquérir une pluralité d'images d'hologramme par balayage du code de sécurité d'hologramme par une caméra d'un terminal utilisateur ; restaurer, par un processeur du terminal utilisateur, un code de sécurité d'origine par combinaison des images de la pluralité d'images d'hologramme ; et lire le code de sécurité d'origine par le processeur.



CLAIM 1. A method for reading a hologram comprises the steps of: scanning a plurality of hologram security images by a user terminal to obtain a plurality of hologram security codes by a camera of the user terminal; and reading the original security codes by a processor. The processor reads the original security codes, and the hologram security codes. A method for obtaining a plurality of hologram codes at the processor comprises the steps of: obtaining a plurality of security codes in a scanning direction of a plurality of holograms by a scan code in a preset scan, and obtaining a plurality of hologram codes. The method comprises the steps of: obtaining a plurality of hologram security codes in the direction of a security code by a processor; and obtaining a plurality of hologram numbers.

P37427

BANKNOTE – CARD

WO202452256

Priority Date: 07/09/2022

COVESTRO DEUTSCHLAND

SPECIFIC BENZOPYRYLIUM SALTS AS DYESTUFFS FOR PHOTOPOLYMER COMPOSITIONS

The invention relates to a benzopyrylium dyestuff of formula (I), wherein R200, R201, R202, R203, R204, R205, R206, R207 and R208 each independently represent hydrogen, C1- to C16-alkyl, C4- to C7-cycloalkyl, C7- to C16-aralkyl, C6- to C10-(het)aryl, hydroxy, C1- to C6-alkoxy, or dialkylamino, wherein the dialkylamino is selected from the group consisting of diethylamino, dimethylamino, diisopropylamino, a six-membered, saturated ring linked via the N of the amino group, which can also include an N or O and can be substituted by non-ionic random groups or a combination of at least two thereof, and/or R200 with R201 or R201 with R202 or R202 with R203 and/or R205 with R206 and/or R206 with R207 each independently together form a -CH=CH-CH=CH-bridge, with A representing a -CH2 or a -CH2-CH2-bridge, wherein the anion Ann- has a molecular weight of ≥ 200 g/mol and contains no halogen atom.

SELS DE BENZOPYRYLIUM SPÉCIFIQUES EN TANT QUE COLORANTS POUR COMPOSITIONS PHOTOPOLYMÈRES

L'invention concerne un colorant benzopyrylium de formule (I), dans laquelle R200, R201, R202, R203, R204, R205, R206, R207 et R208 représentent chacun indépendamment hydrogène, alkyle C1- à C16, cycloalkyle C4- à C7 aralkyle C7- à C16, (hét)aryle C6- à C10, hydroxy, C1- à C6- alcoxy, ou dialkylamino, le dialkylamino étant choisi parmi le groupe constitué de diéthylamino, diméthylamino, diisopropylamino, un cycle saturé à six chaînons, lié à travers le N du groupe, qui peut également inclure un N ou O and peut être substitué par des groupes aléatoires non-ioniques ou une combinaison d'au moins deux parmi deux-ci, et/ou R200 avec R201 ou R201 avec R202 ou R202 avec R203 et/ou R205 avec R206 et/ou R206 avec R207 chacun indépendamment ensemble forment un pont -CH=CH-CH=CH-, avec A représentant un pont -CH2 ou a pont-CH2-CH2-, dans lequel l'anion Ann- a un poids moléculaire de ≥ 200 g/mol ne contient aucun atome d'halogène.

CLAIM 1. A benzopyrylium dye of formula (I) (I) wherein R200, R201, R202, R203, R204, R205, R206, R207 and R208 are each independently hydrogen, alkyl, cycloalkyl, aralkyl, aryl, (Het)aryl, hydroxy, alkoxy or dialkylamino, A is a -CH2- or a -CH2-CH2- bridge, and the anion Ann- has a molecular weight of ≥ 200 g/mol and contains no halogen atom, and n is 1 to 3.

P37435

WO202441708

Priority Date: 25/08/2022

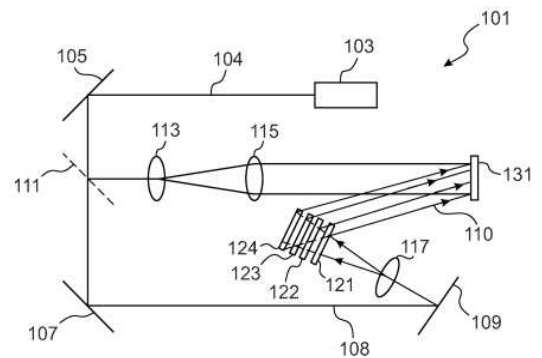
BINDER, PAUL

METHOD FOR STORING MODIFIABLE INFORMATION IN A SECURE MANNER AGAINST FALSIFICATION, METHOD FOR CHECKING THE ANTI-FALSIFICATION SECURITY OF INFORMATION, AND DEVICE

The invention relates to a method for storing modifiable information in a secure manner against falsification using a continuously expandable data volume of superimposed data sets, wherein a first data set contains the modifiable information, and a first modified data set contains first modified information. The first data set and the first modified data set are stored in a superimposed manner such that the first data set and the modified data set are stored in a superimposed manner so as to be trackable in the continuously expandable data volume. The invention additionally relates to a method for checking the anti-falsification security of information and to a device.

PROCÉDÉ DE STOCKAGE SÉCURISÉ CONTRE LA FALSIFICATION D'UNE INFORMATION MODIFIABLE, PROCÉDÉ POUR VÉRIFIER L'ABSENCE DE FALSIFICATION D'UNE INFORMATION ET DISPOSITIF

L'invention concerne un procédé de stockage sécurisé contre la falsification d'une information modifiable, au moyen d'une quantité de données extensible en continu provenant d'ensembles de données superposés, un premier ensemble de données contenant l'information modifiable et un premier ensemble de données modifié contenant une première information modifiée et le premier ensemble de données et le premier ensemble de données modifié étant stockés de manière superposée, de sorte que le premier ensemble de données et l'ensemble de données modifié puissent être stockés de manière superposée avec traçabilité dans la quantité de données extensible en continu. Cette invention concerne en outre un procédé pour vérifier l'absence de falsification d'une information ainsi qu'un dispositif.



CLAIM 1. Method for the tamper-proof storage of a variable information item by means of a continuously expandable data set comprising superimposed data records, a first data record containing the variable information item and a first modified data record containing a first modified information item, and the first data record and the first modified data record being stored in superimposed fashion, such that the first data record and the modified data record are stored in superimposed fashion in the continuously expandable data set, having the following steps: - displaying the first data record on an initial display device (121), such that a first optical image of the first modified data record is displayed, - displaying the first modified data record on a first display device (122), such that a first modified optical image of the first modified data record is displayed, - superimposing the first modified optical image on the first modified optical image, such that a first superimposed optical image (121, 122) is present, - generating a first hologram (131) of the first superimposed optical image (121, 122) so that a first superimposed hologram of the first superimposed optical image (121, 122) is present, - storing the first superimposed hologram (131) so that a first stored hologram is present, so that the variable information item is stored as tamper-proof by means of the first stored hologram.

P37448

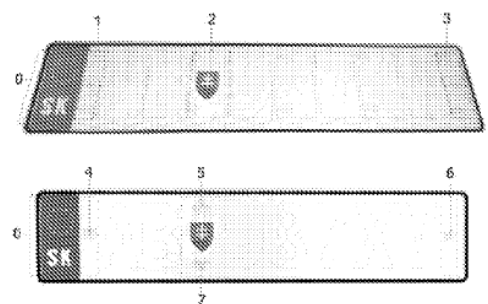
SK202300010U

Priority Date: 31/01/2023

LAKATOS JAN

LICENCE PLATE, WITH APPLIED VALIDATION, MULTIFUNCTIONAL INDICATIVELY-SECURITY ELEMENTS AND A METHOD OF THEIR APPLICATION

License plate, consisting of a solid, metallic, non-metallic or freely formable material (0, 00) table, with applied validation, multifunctional indicating and security elements, with a light-reflecting vinyl film or with another light-reflecting layer, on which they are attached in precisely determined positions, places (1, 2, 3, 8, 9, 10, 11, 12, 17, 18), secondary validation indicators (4, 5, 6, 7) or primary, validation, multifunctional indication-safety indicators (13, 14, 15, 16), in silver chrome-polyester holographic design, of specified geometric shapes with technically-legally defined graphic symbols, signs, their combinations with specific, validation, indications, optical-technical, physical properties, functions.



P37471

CARD

FR3139501

Priority Date: 14/09/2022

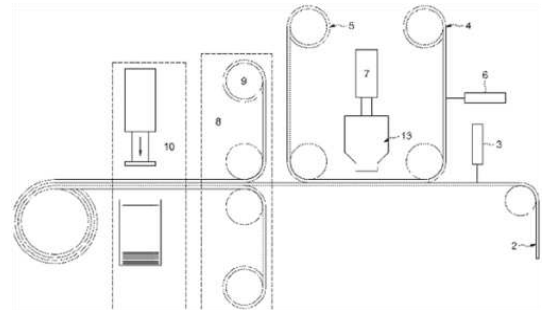
BARTOLI SABINE

SYSTEM FOR DEPOSITING A HOLOGRAPHIC OR THREE-DIMENSIONAL SECURITY ON A ROLL FOR SUPPORTING SECURE TITLES BY MEANS OF A HEATING PUNCH

This depositing system comprises a depositing punch 7 equipped with a floating head 13, a holographic security roller 4, a roller supporting personalized secure titles 2 moving flat under the punch 7.

SYSTÈME DE DÉPOSE PAR POINÇON CHAUFFANT D'UNE SÉCURITÉ HOLOGRAPHIQUE OU TRIDIMENSIONNELLE SUR UN ROULEAU SUPPORT DE TITRES SÉCURISÉS

Ce système de dépose comprend un poinçon de dépose 7 équipé d'une tête flottante 13, un rouleau de sécurités holographiques 4, un rouleau support de titres sécurisés personnalisés 2 se déplaçant à plat sous le poinçon 7.



CLAIM 1. System for depositing holograms on a roll of personalized titles, characterized in that it comprises a punch (7) equipped with a floating head (13) ensuring the transfer of the holograms from a roll supporting holograms.

P37502

CARD

CN117724318

Priority Date: 19/12/2023

HANGZHOU CITY BRAIN

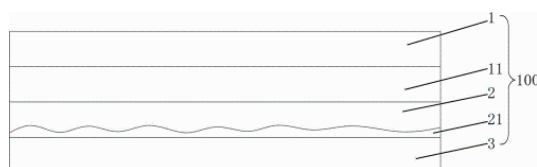
HOLOGRAPHIC ANTI-COUNTERFEITING METHOD AND DEVICE FOR ELECTRONIC IDENTITY CARD BASED ON MOBILE EQUIPMENT STATE

The invention provides a holographic anti-counterfeiting method and device for an electronic identity card based on a mobile device state, wherein the method comprises the following steps: sequentially superposing a plurality of heterogeneous holographic layers with different information to form a holographic anti-counterfeiting cover layer of the electronic identity card; dividing the holographic anti-counterfeiting cover layer into an invariable hologram layer area and a variable hologram layer area based on the information on the heterogeneous hologram layers, wherein the invariable hologram layer area contains holographic images and/or characters representing user identity information; acquiring equipment state parameters of the mobile equipment when the electronic identity card is generated in real time, wherein the equipment state parameters are related to image characteristics in the holographic anti-counterfeiting covering layer; the acquired device state parameters are converted into real-time adjustment parameters and are blended into the variable hologram layer area, so that the visibility parameters in the variable hologram layer area change in real time along with the state of the mobile device, and the visibility parameters comprise the color, the brightness and the image visibility of the variable hologram layer area.

CLAIM 1. The holographic anti-counterfeiting method for the electronic identity card based on the state of the mobile equipment is characterized by comprising the following steps of: sequentially superposing a plurality of heterogeneous holographic layers with different information to form a holographic anti-counterfeiting cover layer of the electronic identity card; dividing the holographic anti-counterfeiting cover layer into an invariable hologram layer area and a variable hologram layer area based on the information on the heterogeneous hologram layers, wherein the invariable hologram layer area contains holographic images and/or characters representing user identity information; acquiring equipment state parameters of the mobile equipment when the electronic identity card is generated in real time, wherein the equipment state parameters are related to image characteristics in the holographic anti-counterfeiting covering layer; and converting the acquired equipment state parameters into real-time adjustment parameters and integrating the real-time adjustment parameters into the variable hologram layer area so that the visibility parameters in the variable hologram layer area change in real time along with the state of the mobile equipment, wherein the visibility parameters comprise the color, the brightness and the visibility of the image of the variable hologram layer area.

PREPARATION METHOD OF HOLOGRAPHIC POSITIONING MEDIUM TRANSFER PAPER

A preparation method of holographic positioning medium transfer paper comprises the following steps of S1, coating a first laser transfer coating on a first PET film with a shearing layer; s2, molding a transfer holographic layer; s3, aluminizing to form an aluminum layer; S4-S6, manufacturing gold stamping counterpoint films according to the printing and thermoprinting files; s7, forming a reinforcing layer; s8, locally coating a dry composite adhesive layer on the reinforcing layer and drying; s9, dry-compounding the PET seamless laser transfer film and the PET aluminum washing film; s10, stripping the PET aluminum washing film after normal-temperature solidification; s11, coating a second laser transfer coating; S12-S13, molding a shading holographic layer; s14, corona; s15, plating a zinc sulfide dielectric layer; s16-17, coating glue on the base paper, and stretching and compounding the base paper at fixed length; s18, stripping the first PET film; and S19, precisely cutting varnish. The holographic positioning medium transfer paper can be prepared under the condition of no need of salty aluminum washing and hot stamping, and the printing overprinting precision and the production yield are improved.



CLAIM 1. The preparation method of the holographic positioning medium transfer paper is characterized by comprising the following steps of: s1, coating a first PET film with a shear layer to form a first laser transfer coating, wherein the first laser transfer coating is coated on the surface of the shear layer; s2, selecting a first holographic nickel plate corresponding to the thermoprinted holographic pattern, attaching the first holographic nickel plate roll on a molding press, and molding the holographic pattern on the first laser transfer coating to form a transfer holographic layer; s3, vacuum aluminizing on the transfer holographic layer to form an aluminum layer, so as to prepare the PET seamless laser transfer film; s4, manufacturing a gold stamping counterpoint film according to the printing and hot stamping file; s5, manufacturing a local rubberized electric engraving anilox roller alignment film according to the gold stamping alignment film; s6, manufacturing a local rubberizing anilox roller according to the alignment film of the local rubberizing electric engraving anilox roller; s7, coating a solvent type composite coating on the surface of the second PET film to form a reinforcing layer, so as to prepare the PET composite film; s8, locally coating a dry type composite adhesive layer on the surface of the reinforcing layer of the PET composite film by adopting a local rubberizing anilox roller, and drying to obtain the PET aluminum washing film; s9, dry-compounding the PET seamless laser transfer film prepared in the S3 and the PET aluminum washing film prepared in the S8, so that an aluminum layer of the PET seamless laser transfer film and a reinforcing layer of the PET aluminum washing film are bonded together through a dry-type compound adhesive layer; s10, after curing at normal temperature, stripping the PET aluminum washing film, locally stripping and transferring the first laser transfer coating, the transfer holographic layer and the aluminum layer of the PET seamless laser transfer film outside the original thermoprinting pattern area to the PET aluminum washing film, and reserving the first laser transfer coating, the transfer holographic layer and the aluminum layer of the original thermoprinting pattern area on the PET seamless laser transfer film so as to prepare the local aluminum washing PET seamless laser aluminizing transfer film; s11, coating a second laser transfer coating on the surface of the local aluminum washing PET seamless laser aluminized transfer film; s12, selecting a shading holographic pattern corresponding to the original hot stamping process, and cutting a second holographic nickel plate corresponding to the shading holographic pattern according to a corresponding plate taking position; s13, sticking a second holographic nickel plate roll on a molding press for molding, and molding a shading holographic pattern on the second laser transfer coating to form a shading holographic layer; s14, carrying out corona on the local aluminum washing PET seamless laser aluminized transfer film on a corona machine; s15, plating a zinc sulfide medium layer on the ground pattern holographic layer of the local aluminum washing PET seamless laser aluminized transfer film after corona to form a local aluminum washing PET positioning laser medium transfer film; s16, coating glue on the base paper; s17, placing the base paper coated with the glue and the local aluminum washing PET positioning laser medium transfer film on a fixed-length stretching wet type compounding machine, and compounding by fixed-length stretching; s18, stripping the first PET film with the shear layer between the shear layer and the first laser transfer coating; s19, coating varnish after stripping, and precisely cutting on a paper cutter according to a printing alignment film to obtain the holographic positioning medium transfer paper.

P37508

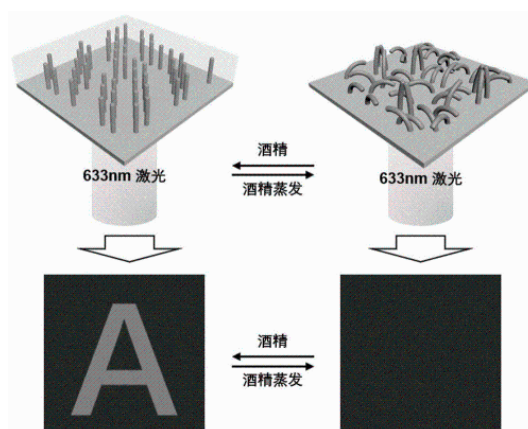
CN117687283

Priority Date: 27/12/2023

BEIJING UNIVERSITY OF TECHNOLOGY

MICROCOLUMN RECONFIGURABLE ANTI-COUNTERFEITING HOLOGRAM PREPARED BASED ON FEMTOSECOND LASER TWO-PHOTON POLYMERIZATION

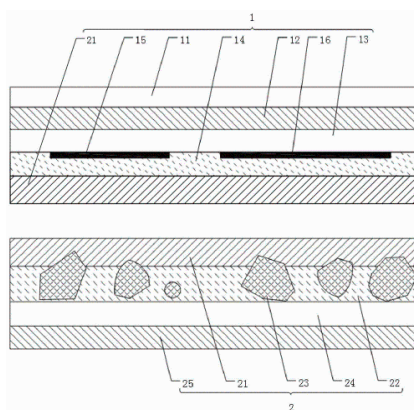
The invention discloses a microcolumn reconfigurable anti-counterfeiting hologram prepared based on femtosecond laser two-photon polymerization, and belongs to the technical field of laser application. The anti-counterfeiting computer hologram uses a femtosecond laser two-photon polymerization technology, and a microcolumn structure forming the minimum unit of the reconfigurable hologram can be processed through laser direct writing, so that the microcolumn can effectively modulate incident laser in an upright state as a micro-nano structure, and the height can be flexibly regulated and controlled. As a deformation unit, the micro-columns can recover and deform through dripping and evaporating alcohol, the micro-columns are switched between an upright state and a toppling state, and patterns are decrypted and encrypted under laser irradiation, so that the prepared holographic patterns only appear under the condition of simultaneously meeting the two conditions of laser irradiation and alcohol infiltration, the variable holographic anti-counterfeiting function is realized, and the imitation difficulty is remarkably improved. The invention has simple imaging change principle and can realize the transformation of holographic imaging without depending on a complex imaging system.



CLAIM 1. The microcolumn reconfigurable anti-counterfeiting hologram prepared based on femtosecond laser two-photon polymerization is characterized in that: processing a reconfigurable hologram formed by a minimum unit microcolumn structure by a femtosecond laser two-photon polymerization technology; the holographic anti-counterfeiting encryption is realized by utilizing the modulating capability of the microcolumn unit on the wavefront of light and the deformation and recovery characteristics of the response to liquid.

METHOD FOR MAKING AND VERIFYING FRAGILE ORIENTATION FEATURE IDENTIFICATION OF INTELLIGENT HOLOGRAPHIC RAINBOW RANDOM PARTICLES

The invention discloses a method for manufacturing and verifying fragile directional characteristic marks of intelligent holographic rainbow random particles, which belongs to the technical field of anti-counterfeiting marks, wherein the marks comprise a reserved bottom layer and an uncovering layer, the reserved bottom layer is provided with random particles and a laser rainbow layer, the uncovering layer is provided with a management code, a service code and a holographic pattern layer, the directional characteristic marks with the structure are adopted, a code scanning comparison method and a picture query method are provided for consumers to distinguish true products from false products, and the use safety of the marks is enhanced; the commodity circulation tracking verification method is used for tracking commodity circulation of products, judging whether the commodity circulation is in the condition of commodity circulation, and maintaining production benefits.



CLAIM 1. The method for manufacturing the fragile orientation feature mark of the intelligent holographic rainbow random particles is characterized by comprising the following steps of: the mark comprises a bottom layer and a surface uncovering layer, wherein the surface uncovering layer comprises a reflective protective coating, a holographic image layer, a plastic film layer, a middle adhesive layer and a bottom adhesive layer from top to bottom, holographic random patterns are arranged on the holographic image layer, service code information, management code information and layout pattern information are printed on the bottom surface of the plastic film layer, the bottom layer comprises a laser rainbow layer, a fragile paper layer, a pressure-sensitive teaching layer and silicone oil base paper from top to bottom, random particles are arranged in the fragile paper layer, the random particles are a plurality of protruding colored metal particles which are distributed randomly, the laser rainbow layer has laser rainbow gloss, the holographic random patterns are random holographic effects, an AR image two-dimensional code is adopted to track and collect holographic images by utilizing an AR image generation mode to match corresponding management codes and service codes, the service codes and the distribution images of the random particles, the holographic random patterns and the layout pattern information on the holographic image layer are bound, and a binding association relation is established by a database established by manufacturers, so that the front query, back query, the back query and the back query functions among different technologies are realized; the preparation method comprises the following steps: s1, mixing and crushing metal color belts with various colors to form hexagonal color particles with the specification of 0.5 mm; s2, adding fragile paper pulp, colored particles and water into the white glue, and fully stirring to form fragile glue; s3, adding the fragile glue into a glue spreader, coating and trowelling on a substrate, and air-drying to form a fragile paper layer with fixed forms and random-position particles; s4, manufacturing a laser rainbow layer, and compositing the laser rainbow layer on the surface of the fragile paper layer; s5, manufacturing a holographic image layer according to the holographic random pattern, and compositing the holographic image layer on the surface of the plastic film layer; s6, spraying a reflective protective coating above the holographic image layer; s7, scanning and collecting the distribution information of random particles on the bottom layer, synthesizing the holographic random pattern to generate a service code, and spraying and printing brand information, the service code and the management code on the back surface of the plastic film layer; s8, coating glue on the bottom of the plastic film layer to form an intermediate glue layer, and pressing the surface uncovering layer and the bottom reserving layer through a hot press; s9, taking the whole mark off the substrate, coating glue on the back surface of the fragile paper layer, bonding the fragile paper layer with the silicone base paper, and forming a pressure-sensitive adhesive layer by the solidified glue, thereby obtaining the anti-counterfeiting mark with directional characteristics.

Click on the title to return to table of contents

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

P37423

**PATENT OF THE MONTH
HOLOGRAM – BANKNOTE – CARD – RELIEF**

WO202456131

Priority Date: 15/09/2022

GIESECKE & DEVRIENT CURRENCY TECHNOLOGY

OPTICAL SECURITY ELEMENT WITH EFFECT REGIONS

The invention relates to an optical security element (12) for securing valuable objects, comprising at least two effect regions (14, 16) for generating different optical effects, wherein the effect regions are adjacent to one another along a boundary line (18), and at least one of the two effect regions is formed by a micromirror region with directed reflective micromirrors. According to the invention, the boundary line (18) of the two mentioned effect regions is designed not to have smooth edges, whereby a transition region (20) in the two effect regions (14, 16) is formed along the boundary line, wherein, when being viewed, the optical effect of the first effect region (14) transitions seamlessly into the optical effect of the second effect region (16). The two effect regions can be formed by micromirror regions with directed reflective micromirrors and different micromirror effects. One of the effect regions can be formed by a micromirror region with directed reflective micromirrors and another of the effect regions can be formed by a diffractive relief structure (e.g. a hologram).

ÉLÉMENT DE SÉCURITÉ OPTIQUE AVEC RÉGIONS À EFFET

L'invention concerne un élément de sécurité optique (12) pour sécuriser des objets de valeur, comprenant au moins deux régions d'effet (14, 16) pour générer différents effets optiques, les régions d'effet étant adjacentes les unes aux autres le long d'une ligne de délimitation (18), et au moins l'une des deux régions d'effet étant formée par une région de micromiroirs comprenant des micromiroirs réfléchissants dirigés. Selon l'invention, la ligne de délimitation (18) des deux régions d'effet mentionnées est conçue pour ne pas avoir de bords lisses, une région de transition (20) dans les deux régions d'effet (14, 16) étant formée le long de la ligne de délimitation, l'effet optique de la première région d'effet (14) passant sans interruption dans l'effet optique de la deuxième région d'effet (16) lorsqu'il est observé. Les deux régions d'effet peuvent être formées par des régions de micromiroirs comprenant des micromiroirs réfléchissants dirigés et différents effets de micromiroir. L'une des régions d'effet peut être formée par une région de micromiroirs avec des micromiroirs réfléchissants dirigés et une autre des régions d'effet peut être formée par une structure de relief de diffraction (par exemple un hologramme).

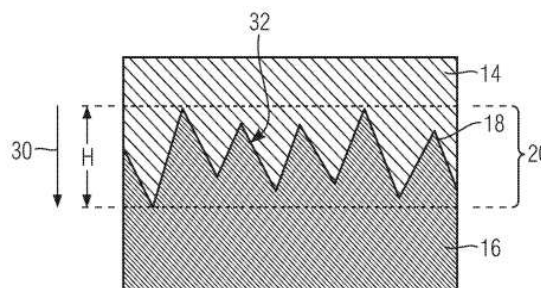


Fig. 4

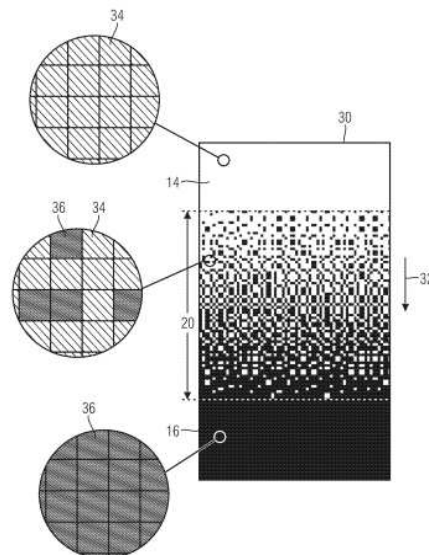
CLAIM 1. Optical security element for securing valuable objects, having at least two effect regions for producing different optical effects, the effect regions adjoining one another along a boundary line, and at least one of the two effect regions being formed by a micro-mirror region with directionally reflecting micro-mirrors, characterized in that the boundary line of the two effect regions mentioned is of non-smooth-edged design, as a result of which a transition region is formed in the two effect regions along the boundary line, in which transition region the optical effect of the first effect region merges smoothly into the optical effect of the second effect region when viewed.

OPTICAL SECURITY ELEMENT HAVING EFFECT REGIONS

The invention relates to an optical security element (12) for protecting value items, comprising at least two effect regions (14, 16) for generating different optical effects, wherein the effect regions border one another along a borderline. According to the invention, the effect regions (14, 16) each consist of a plurality of pixel elements (34; 36) and a dithered transition region (20) is formed along the borderline between a first effect region (14) and a second effect region (16), in which transition region the area percentage of the pixel elements (34) of the first effect region (14) reduces from 100% to 0% and the area percentage of the pixel elements (36) of the second effect region (16) increases from 0% to 100%, so that, in the transition region, when viewed, the optical effect of the first effect region transitions smoothly into the optical effect of the second effect region. At least one of the two effect regions can be formed by a micromirror region having directional reflective micromirrors.

ÉLÉMENT DE SÉCURITÉ OPTIQUE AYANT DES RÉGIONS D'EFFET

L'invention concerne un élément de sécurité optique (12) pour protéger des articles de valeur, comprenant au moins deux régions d'effet (14, 16) pour générer différents effets optiques, les régions d'effet étant adjacentes l'une à l'autre le long d'une limite. Selon l'invention, les régions d'effet (14, 16) sont constituées chacune d'une pluralité d'éléments pixels (34 ; 36) et une région de transition tramée (20) est formée le long de la limite entre une première région d'effet (14) et une seconde région d'effet (16), région de transition dans laquelle le pourcentage de surface des éléments pixels (34) de la première région d'effet (14) diminue de 100 % à 0 % et le pourcentage de surface des éléments pixels (36) de la deuxième zone d'effet (16) augmente de 0 % à 100 %, de sorte que, dans la région de transition, l'effet optique de la première région d'effet passe progressivement dans l'effet optique de la deuxième région d'effet. Au moins une des deux régions d'effet peut être formée par une région de micromiroirs ayant des micromiroirs réfléchissants directionnels.



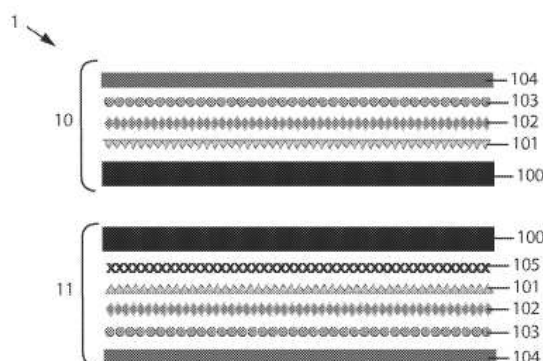
CLAIM 1. Optical security element for securing objects of value, having at least two effect regions for producing different optical effects, the effect regions adjoining one another along a boundary line, characterized in that the effect regions each comprise a multiplicity of pixel elements, and in that a dithered transition region is formed along the boundary line between a first effect region and a second effect region, in which transition region the area proportion of the pixel elements of the first effect region decreases from 100% to 0% and the area proportion of the pixel elements of the second effect region increases from 0% to 100%, so that in the transition region, when viewed, the optical effect of the first effect region merges smoothly into the optical effect of the second effect region.

LAMINATED CARD COMPRISING A THERMOCHROMIC PATTERN AND METHOD FOR MANUFACTURING SUCH A CARD

The invention relates to a laminated card and a method for manufacturing such a card. The card comprises, in order: a thermoplastics backing layer (100); an adhesive layer (101); a primer layer (102); a thermochromic pattern (103) which is printed using a thermochromic ink; and a plastics protective layer (104). The primer layer is suitable for the thermochromic ink, enabling good adhesion of the thermochromic pattern to the lower layers, i.e. to the backing layer via the adhesive layer. The adhesive layer (101) and the primer layer (102) are both water-based or both polymerised under UV radiation. The thermochromic ink comprises a liquid crystal compound.

CARTE LAMINÉE COMPRENANT UN MOTIF THERMOCHROMIQUE ET PROCÉDÉ DE FABRICATION D'UNE TELLE CARTE

Carte laminée et procédé de fabrication d'une telle carte. La carte comporte dans l'ordre : une couche de support (100) thermoplastique; une couche d'adhésif (101); une couche d'accroche (102); un motif thermochromique (103) imprimé au moyen d'une encre thermochromique; et une couche de protection (104) en plastique. La couche d'accroche est adaptée à l'encre thermochromique pour permettre une bonne adhésion du motif thermochromique aux couches inférieures, donc à la couche de support via la couche d'adhésif. La couche d'adhésif (101) et la couche d'accroche (102) sont toutes les deux à base aqueuse ou toutes les deux à polymérisation sous rayonnement ultraviolet. Ladite encre thermochromique comprend un composé à cristaux liquides.



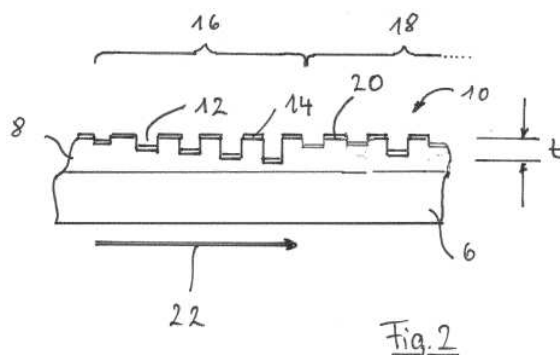
CLAIM 1. board comprising in the following order: - a thermoplastic backing layer (100); - an adhesive layer (101); - an adhesive layer (102); - a thermochromic pattern (103) printed by means of a thermochromic ink; and - a protective layer (104) of plastic, the adhesive layer (101) and the adhesive layer (102) both being aqueous-based or both ultraviolet-polymerized, said thermochromic ink comprising a liquid crystal compound.

SECURITY ELEMENT WITH COLOUR-PRODUCING NANOSTRUCTURES AND PRODUCTION METHOD THEREFOR

The invention relates to a security element having a structured layer (8), which has a base area (20) and depressions (12) recessed with respect to the base area or elevations raised with respect to the base area, and a reflector layer (14) arranged on the structured layer (8), wherein the depressions (12) or elevations are designed, in terms of their extents along the base area (20), their vertical extent (t) perpendicular to the base area (20) and their arrangement on the base area (20), as colour-producing nanostructures (10), wherein the structured layer (8) has regions (16, 18; 25a-d) in each of which the vertical extent (t) of the depressions (12) or elevations along a direction (22) varies according to a non-constant function, with the result that a mixed colour is visible in plan view in each of the regions (16, 18; 25a-d).

ÉLÉMENT DE SÉCURITÉ DOTÉ DE NANOSTRUCTURES DE PRODUCTION DE COULEUR ET SON PROCÉDÉ DE PRODUCTION

L'invention concerne un élément de sécurité ayant une couche structurée (8), qui comporte une zone de base (20) et des creux (12) en retrait par rapport à la zone de base ou des élévations surélevées par rapport à la zone de base, et une couche réfléchissante (14) agencée sur la couche structurée (8), les creux (12) ou les élévations étant conçus, en termes de leurs étendues le long de la zone de base (20), de leur étendue verticale (t) perpendiculaire à la zone de base (20) et de leur agencement sur la zone de base (20), comme des nanostructures de production de couleur (10), la couche structurée (8) ayant des régions (16, 18 ; 25a-d) dans chacune desquelles l'étendue verticale (t) des creux (12) ou des élévations le long d'un sens (22) varie selon une fonction non constante, de telle sorte qu'une couleur mélangée est visible dans une vue en plan dans chacune des régions (16, 18 ; 25a-d).



CLAIM 1. security element, which has a structured layer (8) which has a base surface (20) and depressions (12) or raised elevations lowered with respect thereto, and a reflector layer (14) arranged on the structured layer (8), the depressions (12) or elevations being designed as color-producing nanostructures (10) with regard to their extents along the base surface (20), their vertical extent (t) perpendicular to the base surface (20) and their arrangement on the base surface (20), the structured layer (8) having a plurality of regions (16, 18; 25a-d) which provide a colored motif or image, the regions (16, 18; 25a-d) preferably forming pixels, characterized in that the vertical extent (t) is formed in each of the plurality of regions (16, 18; 25a-d)

P37431

CARD – RELIEF – MICROLENS

WO202446529

Priority Date: 29/08/2022

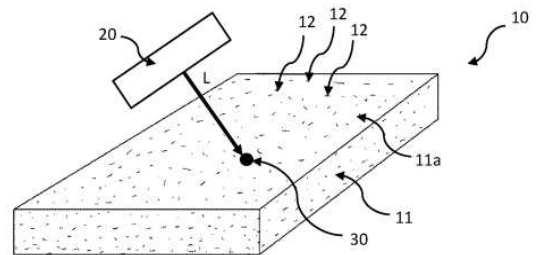
GIESECKE DEVRIENT EPAYMENTS

CARD-FORM DATA CARRIER HAVING LASER-ACTIVATABLE PIGMENTS, AND METHOD FOR PRODUCING SAME

The invention relates to a card-form data carrier (10) which has at least one film (11) with a first surface (11a) and an opposite second surface (11b), wherein the film (11) has been produced by means of an extrusion process, wherein laser-activatable pigments (12) have been incorporated into at least parts of the film (11), wherein the pigments (12) are designed such that they are activatable by means of at least one laser (20), with the result that an irreversible colour change (30) of the film (11) can be brought about. The invention also relates to a method for producing a card-form data carrier.

SUPPORT DE DONNÉES SOUS FORME DE CARTE COMPRENANT DES PIGMENTS ACTIVABLES PAR LASER ET SON PROCÉDÉ DE PRODUCTION

L'invention concerne un support de données sous forme de carte (10) qui comprend au moins un film (11) ayant une première surface (11a) et une seconde surface opposée (11b), le film (11) ayant été produit au moyen d'un procédé d'extrusion, des pigments activables par laser (12) ayant été incorporés dans au moins des parties du film (11), les pigments (12) étant conçus de telle sorte qu'ils peuvent être activés au moyen d'au moins un laser (20), ce qui permet d'obtenir un changement de couleur irréversible (30) du film (11). L'invention concerne également un procédé de production d'un support de données sous forme de carte.



CLAIM 1. Card-shaped data carrier (10) which has at least one film (11) with a first surface (11a) and an opposite second surface (11b), the film (11) being produced by means of an extrusion process, laser-activatable pigments (12) being integrated at least partially in the film (11), the pigments (12) being designed in such a way that they can be activated by means of at least one laser (20), as a result of which an irreversible color change (30) of the film (11) can be produced.

P37436

PRINTING – BANKNOTE – THREAD – MAGNETISM – RELIEF – MICROLENS

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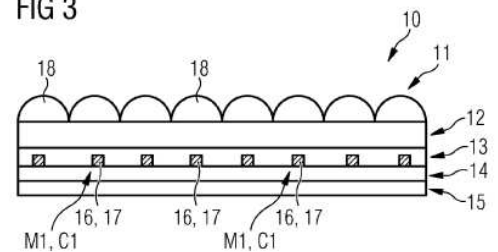
Priority Date: 21/09/2022

GIESECKE & DEVRIENT CURRENCY TECHNOLOGY

SECURITY ELEMENT WITH A MACHINE-READABLE CODE AND METHOD FOR PRODUCING THE SAME

Proposed is a security element, preferably in the form of a security stripe, security thread, or a security patch, comprising a machine-readable code and an optically variable security feature, which has a visual appearance that depends on the viewing angle. The machine-readable code is a magnetic encoding, which is produced by printing at least one opaque magnetic printing ink containing magnetic pigments, with the magnetic printing ink being incorporated or applied in at least one defined code region such that the visual appearance of the optically variable security feature is determined at least in part by the at least one incorporated or applied magnetic printing ink. The optically variable security feature comprises a micro-optical micro-lens arrangement, which covers the at least one code region in which the at least one magnetic printing ink has been incorporated or applied.

FIG 3



CLAIM 1. A security element having a machine-readable code and an optically variable security feature, which has a visual appearance that depends on the viewing angle, wherein the machine-readable code is a magnetic encoding, which is produced by printing at least one opaque magnetic printing ink containing magnetic pigments, with the magnetic printing ink being incorporated or applied in at least one defined code region such that the visual appearance of the optically variable security feature is determined at least in part by the at least one incorporated or applied magnetic printing ink, wherein the optically variable security feature comprises a micro-optical micro-lens arrangement, which covers the at least one code region in which the at least one magnetic printing ink has been incorporated or applied.

P37454

PRINTING – LABEL – LUMINESCENCE – LIQUID CRYSTALS

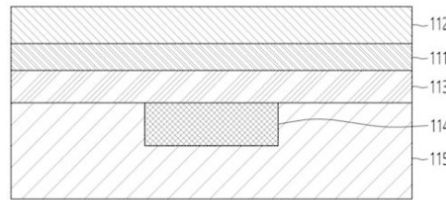
KR20240023832

NBST

Priority Date: 16/08/2022

FORGERY PREVENTION MEANS APPLICABLE TO BAROMETRIC COLOR AUTHENTICATION AND EXTERNAL STIMULUS AUTHENTICATION AND FORGERY AUTHENTICATION METHOD USING THE SAME

The present invention relates to a forgery falsification prevention means capable of ensuring that a falsification certification is provided through a falsification fluorescence layer, and that the certification is provided in a buckling manner when an external stimulus is applied to layer layers having different Young's modulations, and relates to a forgery falsification certification method using the forgery falsification prevention means.



CLAIM 1. A first layer; A second layer located on top of the first layer and including a pressure-chromic fluorescent material; A second layer located on the bottom of the first layer, made of a flexible material, and including a high wrinkle area and a low wrinkle area. 3 layers; a fourth layer patterned in the high wrinkle area, made of a material with a Young's modulus greater than that of the third layer, and adhered to the third layer; and a fifth layer bonded to cover the low radius area and the fourth layer and formed of a material having a Young's modulus greater than that of the third layer and less than that of the fourth layer.

P37461

PRINTING

JP2024032319

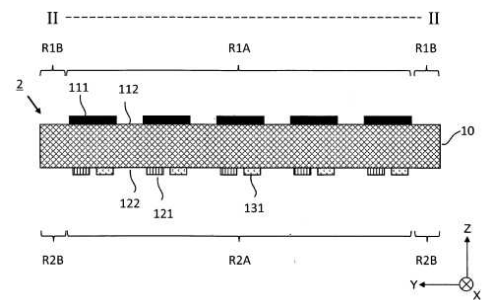
TOPPAN HOLDINGS

Priority Date: 29/08/2022

ANTI-COPY MEDIUM

TOPIC: The original and the copied object can be distinguished by observation magnified with naked eye or at a low magnification. INVENTION: The copy prevention medium has a first colored part (111) formed on a first main surface of a light-transmissive substrate (10), and a second colored part (121) and a third colored part (131) are formed via the light-transmissive substrate (10). The first colored part (111) is formed of a mixed color of the colors of the second colored part (121) and the third colored part (131), and the line width of the first colored part is formed by a line of 30-50 μm, and the second colored part (121) and the third colored part (131) are formed by a line of 5-20 μm. Furthermore, when observing with an angle inclined from two contrasting directions with respect to the normal direction of the first main surface, a change in color caused by the second colored part (121) or the third colored part (131) is visually recognized by an observer.

CLAIM 1. The present invention is configured from: a light-transmitting substrate; a first non-colored section that is formed on a first main surface of the light-transmitting substrate and that has no colored section formed thereon; and a second non-colored section that is formed on a second main surface of the light-transmitting substrate and that has no colored section formed thereon, a second colored section and a third colored section formed on a second main surface of the light-transmitting substrate. The first colored section is formed from a mixed color of an ink that forms the second colored section and the third colored section, and the second colored section and the third colored section do not overlap each other, and are in the normal direction of the first surface side. The copy prevention medium is characterized in that the medium is formed at a position overlapping the first colored portion when observed from above, the first colored portion, the second colored portion and the third colored portion are formed in different colors, the line width of the first colored portion is within a range of 30-50 μm, and the line width of the second colored portion and the third colored portion is within a range of 5-20 μm.



P37464

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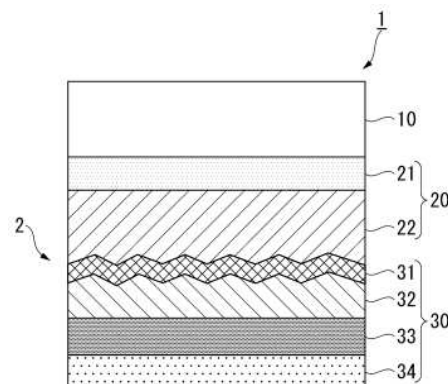
Priority Date: 17/08/2022

TOPPAN HOLDINGS

HOT STAMPING FOIL

TOPIC: To provide a hot stamping foil having excellent surface abrasion resistance. **INVENTION:** The hot stamping foil 1 comprises a carrier 10 made of a base film and a laminated optical ornament 2 formed on one surface of the carrier. The laminated optical ornament has a surface protective layer 21, an optical forming layer 22, a reflection layer 31, a lower layer protective layer 32, a cushion layer 33, and an adhesive layer 34 from a carrier side. The carrier is composed of a resin having an aromatic structure in the main chain or the side chain, and the surface protective layer contains a resin having an aromatic structure in the main chain or the side chain. The optical forming layer has substantially no aromatic structure.

CLAIM 1. A hot stamping foil is provided with a carrier comprising a base film, and a laminated optical decorative body formed on one surface of the carrier. The laminated optical decorative body has, from the carrier side, a surface protective layer, an optical protective layer, a reflective layer, a lower layer protective layer, a cushion layer, and an adhesive layer. The carrier is configured from a resin having an aromatic structure in a main chain or a side chain. The surface protective layer contains a resin having an aromatic structure in a main chain or a side chain, and the optical protective layer does not substantially have an aromatic structure.



P37474

PRINTING – BANKNOTE – MAGNETISM

EP4338854

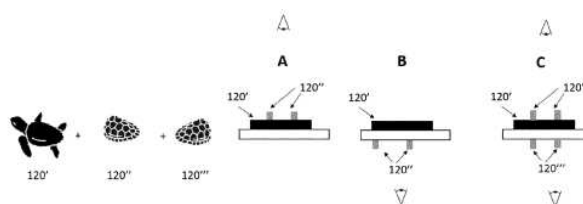
Priority Date: 20/12/2023

SICPA

PROCESSES FOR PRODUCING OPTICAL EFFECTS LAYERS

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 processes for producing optical effect layers (OELs) comprising at least a first motif and a second motif, each of said motifs independently comprising platelet-shaped magnetic or magnetizable pigment particles.

CLAIM 1. A process for producing an optical effect layer (OEL) on a substrate (x10), said optical effect layer (OEL) comprising a first motif comprising magnetically oriented platelet-shaped magnetic or magnetizable pigment particles oriented according to a first magnetic pattern and a second motif comprising magnetically oriented platelet-shaped magnetic or magnetizable pigment particles oriented according to a second magnetic pattern, said process comprising: a first set of steps consisting of a) applying onto the substrate (x10) a first radiation curable coating composition, preferably a first UV-Vis-curable curable coating composition, comprising the platelet-shaped magnetic or magnetizable pigment particles so as to form a first coating layer (x20') on said substrate (x10), said coating composition being in a first state, b) exposing the first radiation curable coating composition of step a) to a magnetic field of a magnetic assembly (x30') so as to magnetically orient at least a part of the platelet-shaped magnetic or magnetizable pigment particles; c) at least partially curing the first radiation curable coating composition of step b) to a second state so as to fix the platelet-shaped magnetic or magnetizable pigment particles in their adopted positions and orientations and so as to produce the first motif; and a second set of steps consisting of a) applying in register a second radiation curable coating composition, preferably a second UV-Vis-curable curable coating composition, comprising platelet-shaped magnetic or magnetizable pigment particles so as to form a second coating layer (x20''), said coating composition being in a first state, and at least a part of the second coating layer (x20'') being adjacent to at least a part of the first coating layer (x20') b) exposing the second radiation curable coating composition of step a) to a magnetic field of a magnetic assembly (x30'') so as to bi-axially orient at least a part of the platelet-shaped magnetic or magnetizable pigment particles to i) have both their X-axis and Y-axis substantially parallel to the substrate (x10) surface, or ii) have their X-Y plane parallel to an imaginary spheroid surface; c) at least partially curing the second radiation curable coating composition of step b) to a second state so as to fix the platelet-shaped magnetic or magnetizable pigment particles in their adopted positions and orientations and so as to produce the second motif.

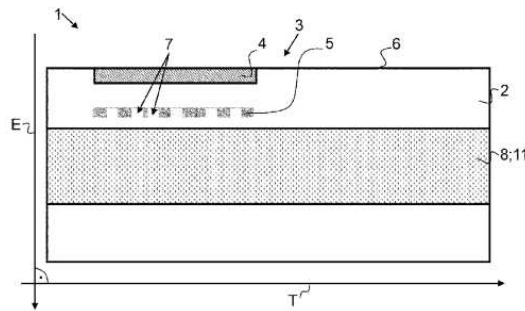


COLOR LOCK

A security document (1) comprises a document body (2) and at least one personalization element (3) comprising at least a first personalization partial element (4) and at least a second personalization partial element (5) being arranged at least partially above one another with respect to an extension direction (E). The first personalization partial element (4) comprises a print and the second personalization partial element (5) is configured to exhibit at least a first appearance (P1) when the security document (1) is viewed under a first viewing angle ($\alpha 1$) and/or when the security document (1) is illuminated under a first illumination angle ($\beta 1$) and to further exhibit a second appearance (P2) when the security document (1) is viewed under a second viewing angle ($\alpha 2$) and/or when the security document (1) is illuminated under a second illumination angle ($\beta 2$) such, that the personalization element (3) exhibits a first appearance (A1) when the security document (1) is viewed under the first viewing angle ($\alpha 1$) and/or when the security document (1) is illuminated under the first illumination angle ($\beta 1$) and further exhibits a second appearance (A2) when the security document (1) is viewed under the second viewing angle ($\alpha 2$) and/or when the security document (1) is illuminated under the second illumination angle ($\beta 2$).

VERROU DE COULEUR

L'invention se rapporte à un document de sécurité (1) comprenant un corps de document (2) et au moins un élément de personnalisation (3) qui comprend au moins un premier élément partiel de personnalisation (4) et au moins un deuxième élément partiel de personnalisation (5) disposés au moins partiellement l'un au-dessus de l'autre par rapport à une direction d'extension (E). Le premier élément partiel de personnalisation (4) comprend une impression et le deuxième élément partiel de personnalisation (5) est configuré pour présenter au moins un premier aspect (P1) lorsque le document de sécurité (1) est visualisé sous un premier angle de visualisation ($\alpha 1$) et/ou lorsque le document de sécurité (1) est éclairé sous un premier angle d'éclairage ($\beta 1$) et pour présenter en outre un deuxième aspect (P2) lorsque le document de sécurité (1) est visualisé sous un deuxième angle de visualisation ($\alpha 2$) et/ou lorsque le document de sécurité (1) est éclairé sous le deuxième angle d'éclairage ($\beta 2$), de sorte que l'élément de personnalisation présente un premier aspect (A1) lorsque le document de sécurité est visualisé sous le premier angle de visualisation ($\alpha 1$) et/ou lorsque le document de sécurité (1) est éclairé sous le premier angle d'éclairage (1) et présente en outre un deuxième aspect (A2) lorsque le document de sécurité (1) est visualisé sous le deuxième angle de visualisation ($\alpha 2$) et/ou lorsque le document de sécurité (1) est éclairé sous le deuxième angle d'éclairage ($\beta 2$).



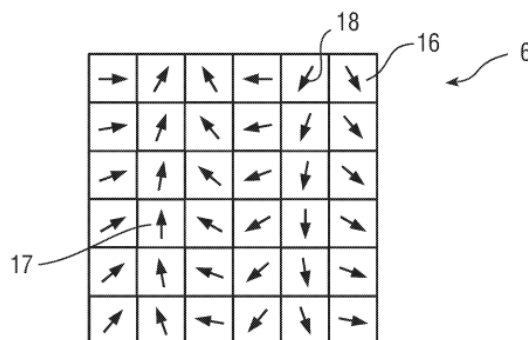
CLAIM 1. A security document (1) such as an ID card or a passport, wherein the security document (1) extends along an extension direction (E) and comprises: - a document body (2), and - at least one personalization element (3), wherein the personalization element (3) comprises at least a first personalization partial element (4) and at least a second personalization partial element (5), wherein the first personalization partial element (4) and the second personalization partial element (5) are arranged at least partially above one another with respect to the extension direction (E), and wherein the first personalization partial element (4) comprises a print, characterized in that the second personalization partial element (5) is configured to exhibit at least a first appearance (P1) when the security document (1) is viewed under a first viewing angle ($\alpha 1$) and/or when the security document (1) is illuminated under a first illumination angle ($\beta 1$) and to further exhibit a second appearance (P2) when the security document (1) is viewed under a second viewing angle ($\alpha 2$) and/or when the security document (1) is illuminated under a second illumination angle ($\beta 2$) such, that the personalization element (3) exhibits a first appearance (A1) when the security document (1) is viewed under the first viewing angle ($\alpha 1$) and/or when the security document (1) is illuminated under the first illumination angle ($\beta 1$) and further exhibits a second appearance (A2) when the security document (1) is viewed under the second viewing angle ($\alpha 2$) and/or when the security document (1) is illuminated under the second illumination angle ($\beta 2$).

SECURITY ELEMENT WITH NANOSTRUCTURES

The invention relates to a security element for objects of value or documents of value (2), comprising a sub-wavelength grid structure (24) on a substrate (20), which shows a color produced on the basis of plasmon resonance in a vertical plan view (8), wherein a plurality of partial regions (16, 17) that cannot be resolved with the naked eye are formed, in which partial regions the sub-wavelength grid structure (24) is configured in a uniform manner, wherein the sub-wavelength grid structures (24) between the partial regions (16, 17) differ in at least one structural parameter influencing the light diffraction and the plurality of partial regions that cannot be resolved with the naked eye cover a surface region (6, 32) of the security element (4), wherein the partial regions (16, 17) in the surface region (6, 32) differ in the at least one structural parameter such that an observer in the surface region (6) occupied by the partial regions (16, 17) when tilting the surface region (6) of the security element) occurs The invention relates to a security element (4) which does not perceive any angle-of-rotation-dependent diffraction effect about at least one tilting axis (10) lying in a substrate plane.

ÉLÉMENT DE SÉCURITÉ COMPRENANT DES NANOSTRUCTURES

L'invention concerne un élément de sécurité pour des objets de valeur ou des documents de valeur (2), lequel élément de sécurité comporte, sur un substrat (20), une structure de réseau de sous-longueur d'onde (24) qui présente une couleur produite sur la base de la résonance plasmonique dans une vue en plan perpendiculaire (8), une multiplicité de sections (16, 17) qui ne peuvent pas être résolues à l'œil nu et dans chacune desquelles la structure de réseau de sous-longueur d'onde (24) est formée uniformément étant formées, les structures de réseau de sous-longueur d'onde (24) entre les sections (16, 17) différant par au moins un paramètre de structure influençant la réfraction de la lumière, et la multiplicité de sections qui ne peuvent pas être résolues à l'œil nu recouvrant une surface (6, 32) de l'élément de sécurité (4), les sections (16, 17) dans la surface (6, 32) différant par le ou les paramètres de structure de telle sorte qu'un observateur ne perçoit aucun effet de réfraction dépendant de l'angle de rotation dans la surface (6) recouverte par les sections (16, 17) lorsque l'élément de sécurité (4) est incliné autour d'au moins un axe d'inclinaison (10) dans un plan de substrat.



CLAIM 1. Security element for objects of value or documents of value (2), which has on a substrate (20) a subwavelength grating structure (24) which, in vertical plan view (8), shows a color produced on the basis of plasmon resonance, a multiplicity of subregions (16, 17) which cannot be resolved with the naked eye being formed, in each of which the subwavelength grating structure (24) is of uniform design, the subwavelength grating structures (24) differing between the subregions (16, 17) in at least one structural parameter which influences the light diffraction, and the multiplicity of subregions which cannot be resolved with the naked eye covering a surface region (6, 32) of the security element (4), characterized in that the subregions (16, 17) in the surface region (6, 32) differ in the at least one structural parameter in such a way that an observer in the surface region (6) occupied by the subregions (16, 17) when tilting the surface region of the security element (6) takes place The invention relates to a security element (4) which does not perceive any angle-of-rotation-dependent diffraction effect about at least one tilting axis (10) lying in a substrate plane.

P37485

PRINTING – BANKNOTE – THREAD – MAGNETISM – RELIEF – MICROLENS

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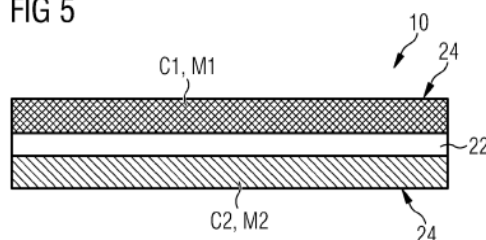
Priority Date: 21/09/2022

GIESECKE & DEVRIENT CURRENCY TECHNOLOGY

SECURITY ELEMENT WITH A MACHINE-READABLE CODE AND METHOD FOR MANUFACTURING A SECURITY ELEMENT

A security element 10, preferably in the form of a film strip 10c, film thread 10a, 10b or film patch 10d, is proposed which comprises a machine-readable code. According to the invention, the machine-readable code is a magnetic coding which is produced by printing at least two opaque magnetic printing inks M1, M2, M3, each containing different magnetic pigments. The magnetic printing inks M1, M2, M3 differ with respect to their inking and/or their magnetic properties, in particular with respect to their coercivity, and are incorporated or applied in defined code regions C1, C2, C3 of the security element 10. The magnetic printing inks M1, M2, M3 introduced or applied in the code areas C1, C2, C3 provide at least part of a visual security feature.

FIG 5



CLAIM 1. Security element (10), preferably in the form of a film strip (10c), film thread (10a, 10b) or film patch (10d), having a machine-readable code, characterized in that the machine-readable code is a magnetic coding which is produced by printing by at least two opaque magnetic printing inks (M1, M2, M3) which each contain different magnetic pigments, differ in terms of their coloration and/or magnetic properties and are incorporated or applied in defined code regions (C1, C2, C3) of the security element (10), the magnetic printing inks (M1, M2, M3) incorporated or applied in the code regions (C1, C2, C3) providing at least part of a visual security feature which is visible in plan view of the security element (10).

P37499

BRAND PROTECTION

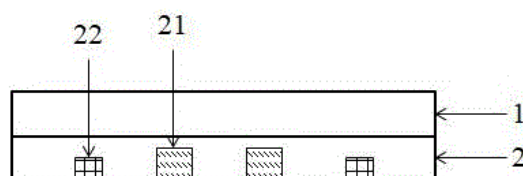
CN220520970U

Priority Date: 09/01/2024

SHANGHAI TECHSUN PACKING MATERIALS

TRANSFER BASE FILM PAPER AND PREPARATION SYSTEM THEREOF, PACKAGING FILM AND PREPARATION SYSTEM THEREOF

The utility model provides transfer base film paper and a preparation system thereof, a packaging film and a preparation system thereof, and belongs to the technical field of packaging materials. The transfer base film paper comprises laminated coated paper and a transfer base film layer; the transfer base film layer is internally provided with optical positioning information; the optical positioning information is positioned on one side of the transfer base film layer far away from the laminating paper. The utility model has the advantages that the transfer base film paper and the packaging film have good positioning effect by the design of the transfer base film layer with the optical positioning information, the structure of the packaging film is further simplified, and the industrial production of the packaging film is facilitated.



CLAIM 1. The transfer base film paper is characterized by comprising laminated coated paper and a transfer base film layer; the transfer base film layer is internally provided with optical positioning information; the optical positioning information is positioned on one side of the transfer base film layer far away from the laminating paper.

P37511

PRINTING – BRAND PROTECTION

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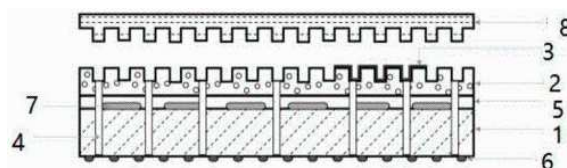
SHENZHEN JINJIA

Priority Date: 03/11/2023

PHYSICAL ANTIBACTERIAL TIPPING PAPER FOR CIGARETTES AND PREPARATION METHOD THEREOF

The invention discloses a physical antibacterial tipping paper for cigarettes and a preparation method thereof, comprising the following steps: the upper surface of the paper base 1 is provided with a physical antibacterial layer transferred by micro-nano imprinting; and/or the upper surface of the physical antibacterial layer is provided with a local aluminum transferring layer; the physical antibacterial layer is formed by using a film with a micro-nano structure layer to mould a paper base printed with a gloss oil layer, so that the gloss oil layer is rapidly solidified and formed, and the micro-nano structure transfer film is peeled off to obtain a high-precision micro-nano structure layer; the local aluminum transferring layer is formed by using a film with a micro-nano structural layer and a local aluminum plating layer on the surface to mould a paper base printed and coated with an adhesive layer, so that the adhesive layer is quickly solidified and formed, and the micro-nano structural transfer film is peeled off, thereby preparing the high-precision micro-nano structural layer, and simultaneously, the aluminum plating layer is synchronously transferred to the micro-nano structural surface of the physical antibacterial layer under the action of the adhesive force of the adhesive, and the invention has the following technical effects that: the physical and mechanical tearing effect has stronger antibacterial effect and durability, and is not easy to cause bacteria to generate drug resistance.

CLAIM 1. Physical antibacterial tipping paper for cigarettes is characterized by comprising: the paper base (1), the upper surface of the paper base (1) is provided with a physical antibacterial layer (2) transferred by micro-nano imprinting; and/or the upper surface of the physical antibacterial layer (2) is provided with a local aluminum transferring layer; wherein, the physical antibacterial layer (2) is formed by using a film with a micro-nano structure layer (a paper base (1) printed with a gloss oil layer is molded, so that the gloss oil layer is rapidly solidified and formed, and a micro-nano structure transfer film (8) is peeled off, thereby obtaining a high-precision micro-nano structure layer; the local aluminum transferring layer is formed by using a film with a micro-nano structural layer and a local aluminum plating layer (3) on the surface to mould a paper base (1) printed and coated with an adhesive layer, so that the adhesive layer is quickly solidified and formed, and a micro-nano structural transfer film (8) is peeled off, thereby preparing the high-precision micro-nano structural layer, and simultaneously, the aluminum plating layer is synchronously transferred to the micro-nano structural surface of the physical antibacterial layer (2) under the action of the adhesive force of the adhesive.



P37520

RELIEF – MICROLENS – LIQUID CRYSTALS

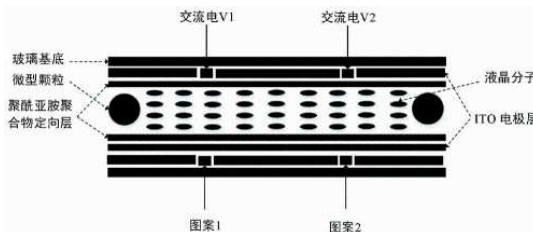
CN117608140

WUCHANG UNIVERSITY OF TECHNOLOGY

Priority Date: 13/07/2023

ANTI-COUNTERFEITING METHOD BASED ON LIQUID CRYSTAL MICROLENS ARRAY

The invention relates to an anti-counterfeiting method based on a liquid crystal micro lens array, which comprises the following specific steps: manufacturing a liquid crystal micro lens array of a visible light wave band; step two: moire imaging principle based on fixed point theorem realizes the dynamic anti-counterfeiting function of the product, and further, the preparation process of the liquid crystal micro lens array comprises the following specific steps: s1, micropattern preparation and cleaning: firstly preparing a piece of single-sided ITO-plated glass, then sequentially placing the single-sided ITO-plated glass into glassware filled with a proper amount of anhydrous acetone solution, anhydrous ethanol solution and deionized water, then placing the glassware into an ultrasonic cleaning machine to be respectively cleaned for 6min, and then drying the glassware for 8min by using an electric plate with the surface temperature of 110 °C to clean organic impurities on the surface of the single-sided ITO-plated glass. The beneficial effects of the invention are as follows: by adjusting the alternating voltage 1 and the alternating voltage 2, the human eyes can move along the x axis and the y axis, different moire patterns can be obtained, and thus, the anti-counterfeiting of valuables is realized.



CLAIM 1. An anti-counterfeiting method based on a liquid crystal micro lens array is characterized by comprising the following specific steps of: step one: manufacturing a liquid crystal micro lens array of a visible light wave band; step two: moire imaging principle based on fixed point theorem realizes dynamic anti-fake function of product.

P37515

LABEL – RELIEF – MICROPRISM

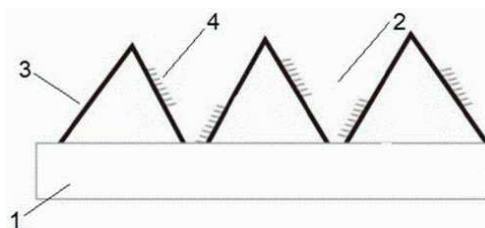
CN117636734

Priority Date: 27/12/2023

FEICHENG AGRICULTURAL MACHINERY DEVELOPMENT SERVICE CENTER | SHANDONG TAIBAO INFORMATION TECHNOLOGY GROUP

HIDDEN PATTERN INFORMATION ANTI-COUNTERFEITING LABEL, MANUFACTURING METHOD AND IDENTIFICATION METHOD

The application belongs to the technical field of anti-counterfeiting, and particularly relates to a hidden pattern information anti-counterfeiting label, a manufacturing method and an identification method, wherein the anti-counterfeiting label comprises an information layer, the information layer comprises a plurality of microstructures which are arranged, one surface of each microstructure is provided with a flat reflecting unit, the other surface of each microstructure is provided with a secondary overlay laser encryption information unit, the secondary overlay laser encryption information units are arranged on the reflecting surface of each flat reflecting unit, each flat reflecting unit forms a micro-relief texture, each secondary overlay laser encryption information unit forms a hidden information texture, hidden information is presented through the hidden information texture, so that the anti-counterfeiting label can carry hidden information, meanwhile, any other holographic technology can be presented in the same area, the effect presentation of other holographic technology is not influenced, the anti-counterfeiting label disclosed by the application can be manufactured by means of the manufacturing method of the hidden pattern information anti-counterfeiting label, and the anti-counterfeiting label can be identified by means of a laser pen.



CLAIM 1. The anti-counterfeiting label with the hidden pattern information is characterized by comprising an information layer (2), wherein a PET layer (1) is arranged at the upper end of the information layer (2), and an aluminized layer is arranged at the lower end of the information layer (2); the information layer (2) comprises a plurality of microstructures which are arranged, one surface of each microstructure is provided with a flat reflecting unit (3), the other surface of each microstructure is provided with a secondary overlay laser encryption information unit (4), and the secondary overlay laser encryption information units (4) are arranged on the reflecting surface of the flat reflecting units (3); the flat reflecting unit (3) forms micro-relief textures, the secondary overlay laser encryption information unit (4) forms hidden information textures, and hidden information is presented through the hidden information textures.

P37517

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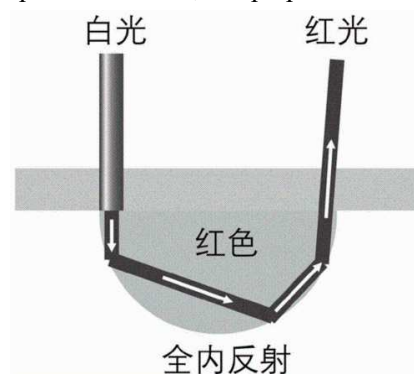
Priority Date: 10/08/2022

INSTITUTE OF CHEMISTRY - CHINESE ACADEMY OF SCIENCE

MICROSTRUCTURE CAPABLE OF ENHANCING REFLECTION COLOR AND PREPARATION METHOD AND APPLICATION THEREOF

The invention discloses a microstructure capable of enhancing reflection color, a preparation method and application thereof, wherein the method comprises the following steps: (1) Preparing a transparent hydrophobic substrate or performing hydrophobic treatment on the transparent hydrophobic substrate; (2) Preparing a high molecular polymer solution containing a color-generating substance; (3) Depositing the high molecular polymer solution containing the color-generating substances on a transparent hydrophobic substrate by adopting a micro-droplet deposition technology to obtain a high molecular droplet microstructure; (4) And (3) curing and forming the microstructure of the polymer liquid drop in the step (3) by adopting an ultraviolet irradiation or heating method to obtain the microstructure capable of enhancing the reflection color. The microstructure capable of enhancing the reflection color has the advantages of simple preparation method, low preparation cost, convenience for mass production and capability of enhancing the reflection color.

CLAIM 1. A method for preparing a microstructure capable of enhancing a reflected color, the method comprising the steps of: (1) Preparing a transparent hydrophobic substrate or performing hydrophobic treatment on the transparent hydrophobic substrate; (2) Preparing a high molecular polymer solution containing a color-generating substance; (3) Depositing the high molecular polymer solution containing the color-generating substances on a transparent hydrophobic substrate by adopting a micro-droplet deposition technology to obtain a high molecular droplet microstructure; (4) And (3) curing and forming the microstructure of the polymer liquid drop in the step (3) by adopting an ultraviolet irradiation or heating method to obtain the microstructure capable of enhancing the reflection color.



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

N10036

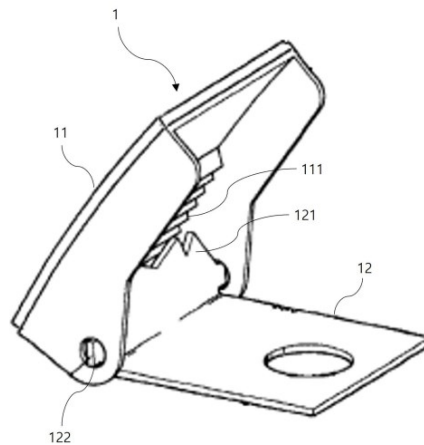
KR102642455

Priority Date: 18/07/2023

TMSI

CLOTHING ACCESSORIES TO WHICH HOLOGRAM IS APPLIED AND METHOD FOR MANUFACTURING SAME

According to an embodiment of the present invention, the hologram-applied clothing miscellaneous material comprises: a main body unit which includes a rotating member having a plate shape on the front and a plurality of holding grooves of a waveform formed on the rear side, and a plate shape, and includes holding protrusions formed on one side thereof to protrude therefrom in order to be held and fixed to the holding grooves according to the rotation of the rotating member, and a fixed member pivotally installed on one end portion of the rotating member by a rotating shaft formed to protrude from both ends of the holding protrusions; a hologram unit in the form of a sheet or a pad provided on the front side of the rotating member and having a predetermined logo and a hologram pattern formed from a user; and a light emitting unit provided on the front side of the rotating member and made of a luminous material to emit light using a phosphorescent phenomenon.



CLAIM 1. Disclosed is a clothing accessories including a hologram, the clothing accessories including: a body unit including a rotating member having a plate shape and a plurality of hanging grooves having a waveform formed on a rear surface thereof, and a fixing member having a plate shape, and having a hanging protrusion formed on one surface thereof so as to be hung and fixed on the hanging grooves according to rotation of the rotating member, and rotatably installed on one end portion of the rotating member by a rotating shaft formed on both ends of the hanging protrusion; a sheet or pad-shaped hologram unit provided on a front surface of the rotating member and having a predetermined logo and hologram pattern formed by a user so as to express a hologram pattern having a color changing scheme according to a direction of light; and a light emitting unit provided on a front surface of the rotating member and made of a luminous material so as to emit light by using a phosphorescence phenomenon, wherein the hologram unit is detachably coupled to the rotating member by a slide coupling scheme, the body unit includes a lighting unit provided on a front surface of the rotating member and configured of a plurality of LED modules which convert electromagnetic waves or radio frequencies into available power through electromagnetic induction, and emit light by using converted energy sources, and the body unit includes a control unit electrically connected to control a light emitting operation of the lighting unit, the control unit is configured to be linked to a smartphone by using a network, the lighting unit is controlled according to a control of the control unit, and a reception communication unit is provided on the front surface of the rotating member Clothing accessories to which a hologram is applied, characterized by comprising a battery unit in the form of a connected battery.

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

N10026

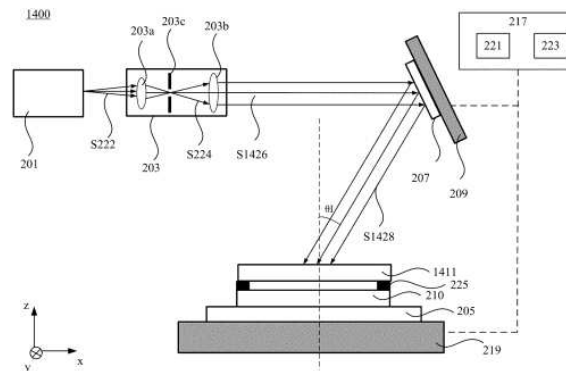
US20240085602

Priority Date: 24/11/2020

META PLATFORMS TECHNOLOGIES

SYSTEM AND METHOD FOR FABRICATING POLARIZATION HOLOGRAMS

A system is provided for generating a polarization interference pattern. The system includes a light source configured to output a first beam having a predetermined wavelength. The system includes a transmissive polarization volume hologram ("PVH") mask configured to provide a predetermined diffraction efficiency to a second beam having the predetermined wavelength, a circular polarization, and a non-zero incident angle at the transmissive PVH mask. The system includes a light deflecting element disposed between the light source and the transmissive PVH mask, and configured to deflect the first beam as the second beam toward the transmissive PVH mask. The transmissive PVH mask is configured to forwardly diffract the second beam incident thereon as a third beam and a fourth beam having orthogonal circular polarizations, a substantially same light intensity, and symmetric propagation directions. The third beam and the fourth beam interfere with one another to generate the polarization interference pattern.



CLAIM 1. A system for generating a polarization interference pattern, comprising: a light source configured to output a first beam having a predetermined wavelength; a transmissive polarization volume hologram ("PVH") mask configured to provide a predetermined diffraction efficiency to a second beam having the predetermined wavelength, a predetermined circular polarization, and a predetermined non-zero incident angle at the transmissive PVH mask; and a light deflecting element disposed between the light source and the transmissive PVH mask, and configured to deflect the first beam as the second beam toward the transmissive PVH mask, wherein the transmissive PVH mask is configured to forwardly diffract the second beam incident thereon as a third beam and a fourth beam having orthogonal circular polarizations, a substantially same light intensity, and symmetric propagation directions with respect to a surface normal of the transmissive PVH mask, and wherein the third beam and the fourth beam interfere with one another to generate the polarization interference pattern.

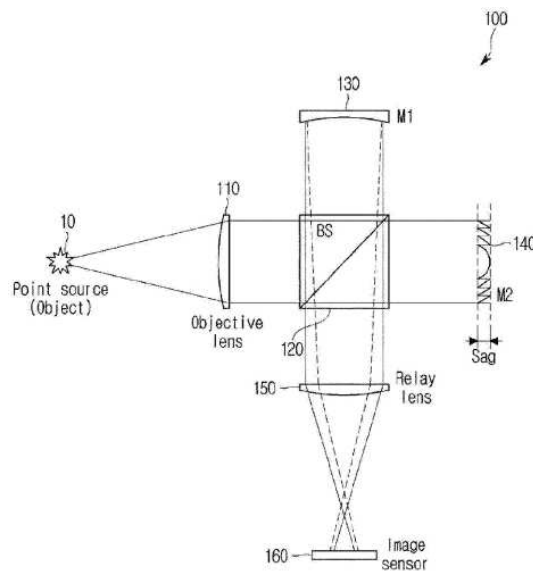
N10029

US20240069491
Priority Date: 23/08/2022

ELECTRONICS & TELECOMMUNICATIONS RESEARCH INSTITUTE

APPARATUS FOR ACQUIRING HOLOGRAM AND SYSTEM INCLUDING THE SAME

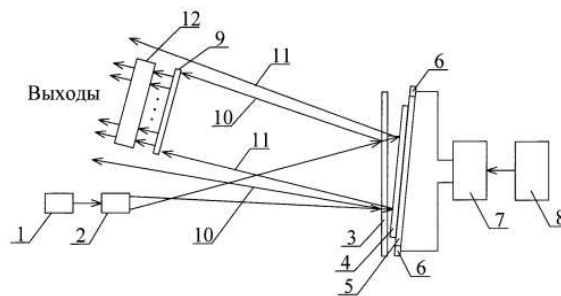
A hologram acquisition apparatus and a hologram acquisition system are disclosed. A hologram acquisition apparatus includes a beam splitter configured to split light emitted from an object into a first beam and a second beam, a first reflective optical element configured to receive and emit the first beam to the beam splitter, and a second reflective optical element configured to receive and emit the second beam to the beam splitter and formed as an annular spherical array having discontinuous surfaces, wherein the second reflective optical element has a plurality of segment regions that are concentric and divided to have the discontinuous surfaces and, the plurality of segment regions are formed to have the same focal point.



CLAIM 1. A hologram acquisition apparatus, comprising: a beam splitter configured to split light emitted from an object into a first beam and a second beam; a first reflective optical element configured to receive and emit the first beam to the beam splitter; and a second reflective optical element configured to receive and emit the second beam to the beam splitter and formed as an annular spherical array having discontinuous surfaces, wherein the second reflective optical element has a plurality of segment regions that are concentric and divided to have the discontinuous surfaces, and the plurality of segment regions are formed to have a same focal point.

HOLOGRAPHIC METHOD FOR GENERATING RADIO FREQUENCY ELECTRICAL OSCILLATIONS AT DISCRETE FREQUENCIES

FIELD: telecommunications; radio electronics. SUBSTANCE: used in equipment for these fields of application. In the claimed holographic method for generating radio frequency electrical oscillations at discrete frequencies, a laser light flux with a spherical wavefront is formed. A holographic interferometer with a reflective-transmitting Fourier hologram is used. The generated laser light flux with a spherical wavefront is directed into the plane of the reflective-transmitting Fourier hologram of the holographic interferometer, where it partially diffracts from the reflective-transmitting Fourier hologram, and partially passes through it, is reflected by the flat mirror of the holographic interferometer and partially re-passes in the opposite direction through the Fourier hologram. In the plane of the photodetector, laser light fluxes are combined and form a ring-shaped interferogram. The method uses a flat mirror mounted on the side face of a piezomaterial structure, the electrodes of which are supplied with amplitude-stabilized alternating electrical voltage. In this case, the side face of the structure made of piezomaterial with a flat mirror of a holographic interferometer with a reflective-transmitting Fourier hologram mounted on it is moved with the oscillation frequency of an amplitude-stabilized alternating electrical voltage. Vibrations of a flat mirror of a holographic interferometer cause oscillations of the optical field intensity level in the interference fringes of the interferogram formed by the holographic interferometer, varying in discrete frequencies. As a photodetector, a device consisting of individual photodetectors, which are placed in interference fringes of various orders of the generated interferogram, and with the help of which fluctuations in the intensity levels of the optical field in the interference fringes of the interferogram are converted into radio frequency electrical oscillations at discrete frequencies. To change the values of a set of discrete frequencies of radio frequency electrical oscillations at the outputs of individual photodetectors of the photodetector device, the level or frequency of oscillations of the amplitude-stabilized alternating electrical voltage supplied to the electrodes of the piezomaterial structure is changed. EFFECT: possibility of a structurally simpler technical implementation of the proposed holographic method for generating radio frequency electrical oscillations at discrete frequencies.



CLAIM 1. A holographic method for generating radiofrequency electrical oscillations at discrete frequencies, in which two laser light streams are formed, directed into the plane of a photoreceiving device and coincide with one another in this plane, oscillations of the level of intensity of an optical field are formed in the plane of the photoreceiving device, and with the aid of a photoreceiving device for oscillating the level of intensity of an optical field in the plane thereof are converted into radiofrequency electrical oscillations at discrete frequencies, characterized in that a laser light stream with a spherical wave front is formed, a holographic interferometer with a reflective-transmitting Fourier hologram and a laser light flux formed with the spherical wave front, said method also comprises directing to the plane of a reflective-transmissive Fourier-hologram of a holographic interferometer, which forms two laser light flows, ensuring the coherence of two laser light flows which are compatible in the plane of the photoreceiving device, forming an annular interferogram, and using a flat mirror which is fixed to the side face of a piezomaterial structure and to the electrodes of which an amplitude-stable alternating electric voltage is supplied for forming oscillations of the level of intensity of an optical field in the form of a flat mirror of a holographic interferometer with a reflective-transmissive Fourier-hologram the side face of the structure made of a piezo material and provided with a flat mirror of a holographic interferometer which is fastened thereto and has a reflective-transmissive Fourier hologram is moved with the oscillation frequency of an amplitude-stabilized alternating electric voltage supplied to the electrodes of said structure, a photoreceiving device consisting of individual photodetectors arranged in interference bands of different orders of the interferogram formed is used for changing the oscillation frequency values of the discrete frequencies of the radiofrequency electrical oscillations at the outputs of the individual photoreceiving device, wherein the level or frequency of oscillations of the amplitude-stabilized alternating device is changed electric voltage supplied to the structural electrodes made of piezoelectric material.

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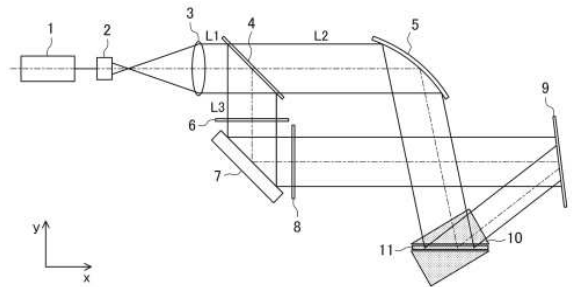
Priority Date: 26/08/2022

PANASONIC INTELLECTUAL PROPERTY MANAGEMENT

TO PROVIDE A DEVICE FOR MANUFACTURING A HOLOGRAM OPTICAL ELEMENT, A METHOD FOR MANUFACTURING A HOLOGRAM OPTICAL ELEMENT, AND A HOLOGRAM OPTICAL ELEMENT

TOPIC: To create a hologram optical element having a desired luminance distribution. INVENTION: The device for manufacturing the hologram optical element includes: a laser light source 1 (a first light source and a second light source) for irradiating a laser beam L2 (a first light source) and a laser beam L3 (a second light source); a mirror 5 which is formed in a shape of a product using a volume hologram 11 (a hologram optical element) and reflects the laser beam L2 to the volume hologram 11; and an illumination distribution to be recorded on the volume hologram 11 to the laser beam L3 irradiated to the volume hologram 11 The optical element includes a phase modulation element 7 (optical intensity modulation part).

CLAIM 1. A device for manufacturing a hologram optical element is provided with: a first light source for irradiating first light; a second light source for irradiating second light; a mirror, which is formed in the shape of a product in which a hologram optical element is used, and which reflects the first light to the hologram optical element; and a light intensity modulation unit which provides an illuminance distribution to be recorded in the hologram optical element to the second light irradiated to the hologram optical element.



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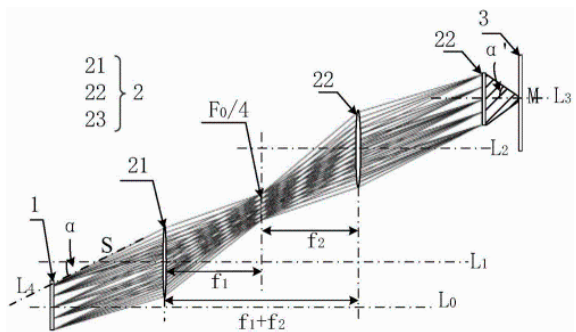
Priority Date: 23/08/2023

BEIJING KANGTEMAN ELECTRONIC SYSTEMS

OBJECT BEAM IMAGING SYSTEM

The utility model discloses an object beam imaging system, which comprises an image source, an optical path modulation device and a holographic dry plate, wherein the optical path modulation device comprises a first lens group, a second lens group and a holographic optical element which are sequentially positioned on an object beam propagation path emitted by the image source; the holographic optical element further comprises a photopolymer layer for converging object beams at one pixel, the holographic dry plate is used for bearing the point pixels converged by the holographic optical element, the holographic dry plate is imaged for the second time, and a continuous hologram can be obtained in an observation view field by adopting a mode of imaging by combining the two lens groups and the holographic optical element, so that the energy utilization rate of the holographic imaging mode is improved, the observation view field angle of the hologram is improved, and the display effect of holographic imaging is improved.

CLAIM 1. An object beam imaging system, comprising: the image source is used for emitting an object beam carrying image information; the optical path modulation device comprises a first lens group, a second lens group and a holographic optical element which are sequentially positioned on the object beam propagation path; the focal plane of one side of the first lens group, which is close to the second lens group, is coincident with the focal plane of one side of the second lens group, which is close to the first lens group, and the center of the second lens group is deviated from the center axis of the first lens group; the holographic optical element comprises a photopolymer layer for converging the object beam at a point pixel; the focal power of the first lens group and the focal power of the second lens group are both larger than zero, and the size of the dot pixel is the same as that of a single holographic printing sub-pixel; and the holographic dry plate is used for bearing the point pixels converged by the holographic optical element to obtain a hologram.



N10067

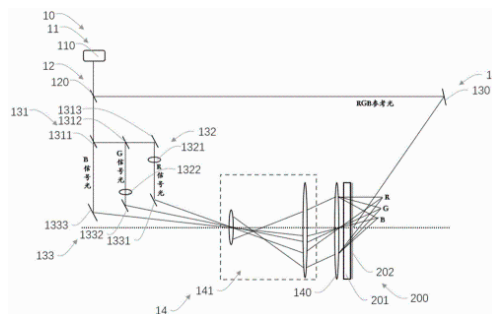
CN117631123

Priority Date: 19/08/2022

SUNNY OPTICAL ZHEJIANG RESEARCH INSTITUTE

COLOR HOLOGRAPHIC OPTICAL ELEMENT, MANUFACTURING METHOD, MANUFACTURING SYSTEM AND CORRECTION METHOD THEREOF

The invention relates to a color holographic optical element, a manufacturing method, a manufacturing system and a correction method thereof, which can solve the focus offset problem caused by inconsistent wavelengths and help to improve the quality of reproduced images. The correction method of the color holographic optical element comprises the following steps: according to the wavelength of the color recording light and the wavelength of the color reproduction light, the incidence angles of the central rays of the color recording light are respectively adjusted to correct the transverse focus offset of the color holographic optical element in the image reproduction process; and adjusting the incidence angles of the edge rays of the color recording light according to the wavelength of the color recording light and the wavelength of the color reproduction light respectively so as to correct the axial defocusing of the color holographic optical element in the image reproduction process.



CLAIM 1. A method of correcting a color holographic optical element, comprising the steps of: according to the wavelength of the color recording light and the wavelength of the color reproduction light, the incidence angles of the central rays of the color recording light are respectively adjusted to correct the transverse focus offset of the color holographic optical element in the image reproduction process; and according to the wavelength of the color recording light and the wavelength of the color reproduction light, the incidence angles of the edge rays of the color recording light are respectively adjusted to correct the axial defocus of the color holographic optical element in the image reproduction process.

N10068

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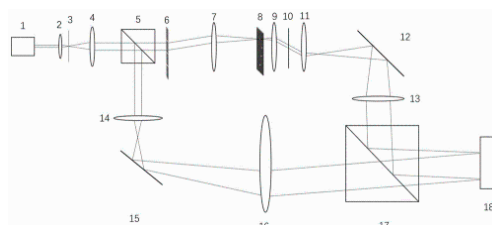
Priority Date: 28/11/2023

CHINA JILIANG UNIVERSITY

SUPER-RESOLUTION DIGITAL HOLOGRAPHIC IMAGING SYSTEM AND METHOD BASED ON MULTIPLE GRATINGS

The invention discloses a super-resolution digital holographic imaging system and an imaging method based on multiple gratings, wherein the imaging system is characterized in that a window integrated by multiple gratings is added in an object light path of a traditional Mach-Zehnder holographic light path, and light irradiation to be-detected samples with different inclination angles is generated by moving the window to interfere with reference light, so that multiple digital holograms are acquired in an image sensor. The imaging method carries out algorithm reconstruction phase distribution on a plurality of acquired digital holograms to realize super-resolution imaging. The invention adopts a multi-grating diffraction mode to realize object light with different inclination angles, has low cost, is convenient and stable, has no fixed requirement on parameters of core devices in the system, such as a microscope objective, an image sensor and the like, can flexibly apply the existing system according to the imaging method, realizes super-resolution imaging, and has strong commercial value.

CLAIM 1. A super-resolution digital holographic imaging system based on multiple gratings is characterized in that: the sample to be measured is placed in a sample area (10) to be measured, light emitted by a laser (1) is focused through a first lens (2), filtered through a pinhole (3), collimated into parallel light through a second lens (4), and split into two beams of light with the same energy through a first unpolarized beam splitting prism (5); the light beam is normally incident into different windows in the multi-grating window (6) and is transmitted or diffracted, is focused at the diaphragm (8) through the third lens (7), is collimated into parallel light through the diaphragm (8) through the fourth lens (9), is incident into the sample area (10) to be tested and carries sample information to be tested, passes through the objective lens (11), the first reflecting mirror (12) and the imaging lens (13), and then reaches the image sensor (18) through the second unpolarized beam splitting prism (17) to serve as object light; the other beam of light passes through a fifth lens (14), is reflected by a second reflecting mirror (15) and then passes through a sixth lens (16) to form a parallel beam, and passes through a second unpolarized beam splitter prism (17) to reach an image sensor (18) as reference light; the multi-grating window (6) is arranged on an object focal plane of the third lens (7), the diaphragm (8) is arranged on an image focal plane of the third lens (7) and an object focal plane of the fourth lens (9), holograms formed by interference of object light and reference light are collected by the image sensor (18), the multi-grating window (6) is moved, the object light enters the image sensor (18) at different angles, phase distribution of a plurality of pairs of digital holograms is reconstructed by an algorithm, and super-resolution imaging is achieved.



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

N10021**WO202452497***Priority Date: 08/09/2022***CARL ZEISS JENA****CONFIGURATION OF A REPLICATION PROCESS OF A MASTER HOLOGRAPHIC OPTICAL ELEMENT FOR VARIABLE INTENSITY OR POLARISATION**

The invention relates to techniques for producing a holographic optical element (HOE) by replication of a master HOE. In particular, the invention relates to techniques for flexibly adjusting the diffraction efficiency of the HOE. An adjustable optical element (54) can be used to modify the intensity and/or the polarisation of light during the exposure process.

CONFIGURATION DE PROCESSUS DE REPRODUCTION D'ÉLÉMENT OPTIQUE HOLOGRAPHIQUE MAÎTRE POUR UNE INTENSITÉ OU UNE POLARISATION VARIABLES

L'invention concerne des techniques permettant de produire un élément optique holographique (HOE) par la reproduction d'un HOE maître. En particulier, l'invention concerne des techniques permettant d'ajuster de manière flexible l'efficacité de diffraction du HOE. Un élément optique réglable (54) peut être utilisé pour modifier l'intensité et/ou la polarisation de la lumière pendant le processus d'exposition.

CLAIM 1. Method for configuring a manufacturing process for manufacturing a holographic optical element, HOE, by replicating a master HOE (92) within the framework of an exposure process carried out by an exposure device (59), wherein during the exposure process a carrier layer of the master HOE (92) is arranged along a carrier layer of the HOE (96), the method comprising the following step: - generating (3810) control data (401) for at least one adjustable optical element (54) of the exposure device (59), which is arranged in a beam path (41) of light used for replication, wherein the at least one adjustable optical element (54) can be driven by means of the control data (401) so that during the exposure process it changes at least one of an intensity and a polarization of the light over time.

N10022**WO202452495***Priority Date: 08/09/2022***CARL ZEISS JENA****CONTROL OF A REPLICATION PROCESS OF A MASTER HOLOGRAPHIC OPTICAL ELEMENT FOR VARIABLE INTENSITY OR POLARISATION**

The invention relates to techniques for producing a holographic optical element, HOE, by replication of a master HOE. More particularly, the invention relates to techniques for flexibly adjusting the diffraction efficiency of the HOE. An adjustable settable optical element (54) can be used to change the intensity and/or polarisation of light during an illumination process.

The invention relates to techniques for producing a holographic optical element, HOE, by replicating a master HOE. In particular, techniques are described for flexibly adjusting the diffraction efficiency of the HOE. An adjustable optical element (54) can be used to change the intensity and/or polarization of light during an exposure process.

COMMANDE D'UN PROCESSUS DE RÉPLICATION D'UN ÉLÉMENT OPTIQUE HOLOGRAPHIQUE MAÎTRE POUR POLARISATION OU INTENSITÉ VARIABLE

L'invention concerne des techniques de production d'un élément optique holographique (EOH) par réplique d'un EOH maître. Plus particulièrement, l'invention concerne des techniques permettant d'ajuster de manière flexible l'efficacité de diffraction de l'EOH. Un élément optique ajustable (54) peut être utilisé pour modifier l'intensité et/ou la polarisation de la lumière pendant un processus d'exposition.

N10052

CN117700744

Priority Date: 22/12/2023

**TECHNICAL INSTITUTE OF PHYSICS & CHEMISTRY – CHINESE
ACADEMY OF SCIENCES**

POLYSILSESQUIOXANE AND PHOTOPOLYMER HOLOGRAPHIC RECORDING MEDIUM CONTAINING SAME

The invention discloses polysilsesquioxane and a photopolymer type holographic recording medium containing the same. The polysilsesquioxane is selected from one of general structures shown in T1 -T4, wherein the polysilsesquioxane with a structure shown in a formula T1 or a formula T2 can be connected to an epoxy resin-amine film-forming resin through an epoxy group or an amino group in a covalent bond manner to prepare the photopolymer type holographic recording medium, and the polysilsesquioxane with a structure shown in a formula T3 or a formula T4 can be connected to an isocyanate-alcohol film-forming resin through an isocyanate group or a hydroxyl group in a covalent bond manner to prepare the photopolymer type holographic recording medium, so that the volume shrinkage of the photopolymer type holographic recording medium in the holographic exposure process can be reduced, the sensitivity and the dynamic range of the photopolymer type holographic recording medium can be improved, and the rapid and high-capacity high-density holographic optical storage can be effectively realized.

CLAIM 1. A polysilsesquioxane, wherein said polysilsesquioxane is selected from one of the following general structures: wherein the R is 1 ~R 7 And may be the same or different, each independently selected from one of the following structures: the R is 8 ~R 14 And may be the same or different, each independently selected from one of the following structures: the A is 1 ,A 2 ,A 3 May be the same or different and are each independently selected from hydrogen, methyl, ethylAny one of methoxy, ethoxy and amino; the A is 4 ,A 5 ,A 6 Can be the same or different, and are each independently selected from any one of hydrogen, methyl, ethyl, methoxy, ethoxy and hydroxy; the X is selected from C 1 ~C 8 Alkyl of C number of carbon atoms 1 ~C 8 Alkoxy, alkyl substituted or unsubstituted C 6 ~C 14 Any one of the phenyl groups of (a); the n represents an integer of 1 to 8, and the m represents an integer of 1 to 4.

N10060

CN117666282

Priority Date: 27/11/2023

SHENZHEN HUANZHEN TECHNOLOGY

NON-FILM-FORMING MATRIX, PHOTOPOLYMER, FILM, PREPARATION METHOD AND PRINTING STOCK

The invention relates to the technical field of volume holographic display materials, in particular to a non-film-forming matrix, a photopolymer, a film, a preparation method and a printing stock. A method of preparing a photopolymer film comprising the steps of: weighing methyl methacrylate, a low Tg acrylic monomer, a cross-linked acrylic monomer, a rigid side group monomer, a fluorine-containing or silicon-containing acrylic monomer and a free radical thermal initiator according to mass percent as a matrix; wherein, according to mass percentage, methyl methacrylate is 40-85%, low Tg acrylic monomer is 0-50%, crosslinking acrylic monomer is 0-20%, rigid side group monomer is 5-20%, fluorine-containing or silicon-containing acrylic monomer is 4-20%, free radical thermal initiator is 0.5-5%; heating and refluxing the substrate in the solvent 1 for 1-8 hours to obtain a non-film-forming substrate; weighing a non-film-forming matrix, a high refractive index monomer, a visible light capturing agent and a photoinitiator according to a proportion to obtain a first raw material; wherein, according to mass percentage, the film is not formed into 40-80% of matrix, the high refractive index monomer is 10-45%, the visible light capturing agent is 0.01-5%, and the photoinitiator is 1-10%.

CLAIM 1. A method of preparing a photopolymer film comprising the steps of: weighing methyl methacrylate, a low Tg acrylic monomer, a cross-linked acrylic monomer, a rigid side group monomer, a fluorine-containing or silicon-containing acrylic monomer and a free radical thermal initiator according to mass percent as a matrix; wherein, according to mass percentage, methyl methacrylate is 40-85%, low Tg acrylic monomer is 0-50%, crosslinking acrylic monomer is 0-20%, rigid side group monomer is 5-20%, fluorine-containing or silicon-containing acrylic monomer is 4-20%, free radical thermal initiator is 0.5-5%; Heating and refluxing the substrate in the solvent 1 for 1-8 hours to obtain a non-film-forming substrate; weighing a non-film-forming matrix, a high refractive index monomer, a visible light capturing agent and a photoinitiator according to a proportion to obtain a first raw material; wherein, according to mass percentage, the film-forming matrix is not 40-80%, the high refractive index monomer is 10-45%, the visible light capturing agent is 0.01-5%, and the photoinitiator is 1-10%; stirring and dissolving the first raw material in a solvent 2 to obtain a photopolymer solution; manufacturing a volume holographic grating master plate with a positioning mark; coating the photopolymer solution on a protective film, drying to form a photopolymer coating, and covering the protective film on the photopolymer coating to obtain a photopolymer intermediate product; copying the volume holographic grating on the volume holographic grating mother plate to a photopolymer intermediate product to obtain a photopolymer film with the volume holographic grating; UV irradiation, heating the photopolymer film.

N10064

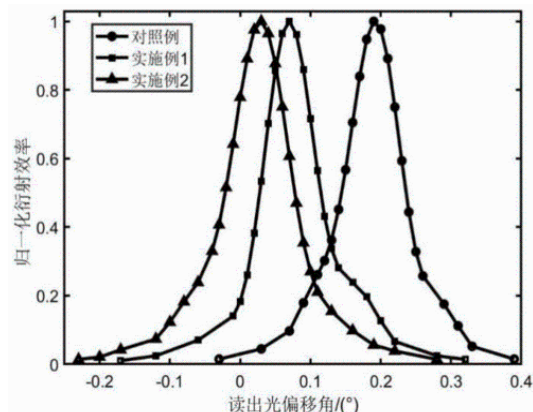
CN117649863

Priority Date: 06/12/2023

SICHUAN UNIVERSITY

PHOTOPOLYMER HOLOGRAPHIC STORAGE MATERIAL CONTAINING POSS NANO MATERIAL, PREPARATION METHOD AND APPLICATION

The invention discloses a photopolymer holographic storage material containing POSS nano materials, a preparation method and application thereof, wherein the material comprises the following components in parts by mass: 25-50 parts of film forming agent, 5-25 parts of monomer acrylamide, 1-10 parts of methylene bisacrylamide, 0.1-1 part of polyhedral oligomeric silsesquioxane (POSS), 0.01-0.1 part of photosensitizer, 1-10 parts of monomer acrylic acid and 0.1-2 parts of triethanolamine. By doping POSS nano materials in a polyvinyl alcohol/acrylamide system and proportioning, the volume shrinkage rate of the materials is obviously improved, and meanwhile, the performance indexes of high diffraction efficiency, high photosensitivity, high spatial resolution and the like of a raw material system are maintained, so that the method has good application value in the fields of holographic display, holographic storage, interferometry and the like.



CLAIM 1. The photopolymer holographic storage material containing the POSS nano material is characterized by comprising the following components in parts by mass: 25-50 parts of film forming agent, 5-25 parts of monomer acrylamide, 1-10 parts of methylene bisacrylamide, 0.1-1 part of polyhedral oligomeric silsesquioxane (POSS), 0.01-0.1 part of photosensitizer, 1-10 parts of monomer acrylic acid and 0.1-2 parts of triethanolamine.

N10065

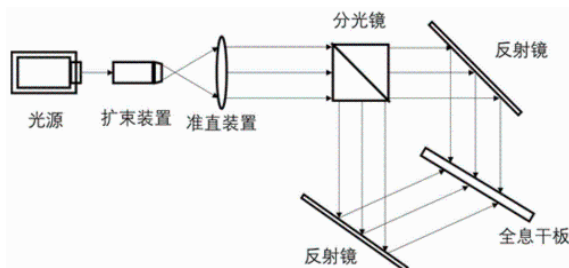
CN117631447

Priority Date: 30/11/2023

ALTIZAN OPTO CRYSTAL SHANGHAI DISPLAY TECHNOLOGY

PHOTOPOLYMER WITH STRONG ADHESIVE FORCE AND GRATING

The application provides a photopolymer with strong adhesive force and a grating, and relates to the technical field of holographic optical display materials. The photopolymers include matrix polymers, writing monomers, photoinitiating systems, adhesion promoters, and solvents; wherein the adhesion promoter is selected from small molecule compounds containing silicate, phosphate and titanate or polymers containing the structure. The grating is made from the above-mentioned photopolymer by exposure process. The photopolymer has better adhesive force with glass, PET, PMMA, PC and other base materials, and can prolong the service life of the photopolymer used as a grating, a hologram, holographic storage and other using modes; the selective universality of the adhesive between the protective film and the photopolymer in the preparation of the grating application is also improved; in addition, the adhesion promoter can react with other specific components in the photopolymer, such as matrix polymer, and can be connected with the photopolymer after reaction, so that the adhesion promoter can not migrate and has long-acting effect.



CLAIM 1. A photo-induced polymer with strong adhesive force is prepared from matrix polymer, writing monomer, photoinitiating system, adhesion promoter and solvent.

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

WO202458438

Priority Date: 15/09/2022

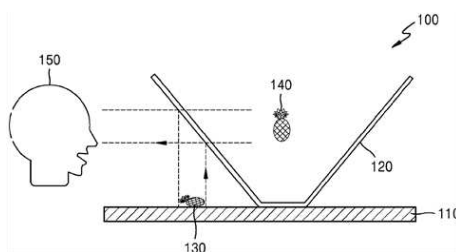
SAMSUNG ELECTRONICS

ELECTRONIC DEVICE PROVIDING HOLOGRAPHIC IMAGE AND OPERATING METHOD OF ELECTRONIC DEVICE

The present disclosure includes an electronic device (100) and an operation method of the electronic device (100). The electronic device (100) includes a display (110), a memory, and at least one processor (340) for executing instructions stored in the memory, wherein the at least one processor (340) is configured to: acquire an input image; in order to provide, by a holographic guide (120), a holographic image implemented by reflecting a base image based on the input image, acquire information about a guide area including a plurality of sub-guide areas having a plurality of respectively different weight values in implementing the holographic image; determine a display area in the guide area capable of allowing displaying of a base image to have weight values greater than a preset threshold value on the basis of the input image and the information about the guide area; and, on the basis of the determined display area, control the display (110) to convert the input image into the base image to be displayed on the display area.

DISPOSITIF ÉLECTRONIQUE PRODUISANT UNE IMAGE HOLOGRAPHIQUE ET PROCÉDÉ DE FONCTIONNEMENT DE DISPOSITIF ÉLECTRONIQUE

La présente invention comprend un dispositif électronique (100) et un procédé de fonctionnement du dispositif électronique (100). Le dispositif électronique (100) comprend un dispositif d'affichage (110), une mémoire et au moins un processeur (340) servant à exécuter des instructions stockées dans la mémoire, le ou les processeurs (340) étant configurés pour : acquérir une image d'entrée ; afin d'utiliser un guide holographique (120) pour fournir une image holographique mise en œuvre en réfléchissant une image de base sur la base de l'image d'entrée, acquérir des informations concernant une zone de guide comprenant une pluralité de sous-zones de guide ayant une pluralité de valeurs de poids qui sont respectivement différentes dans la mise en œuvre de l'image holographique ; déterminer une zone d'affichage dans la zone de guide qui est capable de permettre que l'affichage d'une image de base ait des valeurs de poids supérieures à une valeur de seuil prédéfinie sur la base de l'image d'entrée et des informations concernant la zone de guide ; et, sur la base de la zone d'affichage déterminée, commander le dispositif d'affichage (110) de façon à convertir l'image d'entrée en l'image de base devant être affichée sur la zone d'affichage.



CLAIM 1. display 110;

a memory 330 that stores at least one instruction; and

At least one processor 340 that executes the at least one instruction stored in the memory 330,

The at least one processor 340,

Acquire the input image,

In order to provide a holographic image implemented by reflecting the base image based on the input image by the holographic guide 120, a guide including a plurality of sub-guide areas with a plurality of different weights in implementing the holographic image. Obtain information about the area,

Based on the input image and information about the guide area, determine a display area among the guide areas in which the base image can be displayed with a weight greater than a preset threshold,

The electronic device 100 controls the display 110 to convert the input image into the base image based on the determined display area and display it in the display area.

N10024

WO202448914

SAMSUNG ELECTRONICS

Priority Date: 31/08/2022

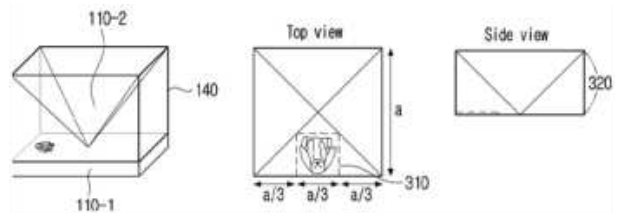
DISPLAY DEVICE FOR ACQUIRING HOLOGRAPHIC RESOURCE AND CONTROL METHOD THEREOF

A display device is disclosed. The display device may comprise: a display including a display panel and a plurality of reflectors which are arranged in an inverted pyramidal shape at the front surface of the display panel and reflect an image output from the display panel; a sensor; and at least one processor which identifies objects from an input image, acquires an output image including multiple objects on the basis of the plurality of reflectors, and controls the display panel to display the output image, wherein if a user is identified through the sensor, the processor updates the output image on the basis of the identified user and controls the display panel to display the updated output image.

DISPOSITIF D’AFFICHAGE POUR ACQUÉRIR UNE RESSOURCE HOLOGRAPHIQUE ET PROCÉDÉ DE COMMANDE ASSOCIÉ

L'invention concerne un dispositif d'affichage. Le dispositif d'affichage peut comprendre : un écran comprenant un panneau d'affichage et une pluralité de réflecteurs qui sont agencés selon une forme pyramidale inversée au niveau de la surface avant du panneau d'affichage et qui réfléchissent une image produite par le panneau d'affichage ; un capteur ; et au moins un processeur qui identifie des objets à partir d'une image d'entrée, qui acquiert une image de sortie comprenant de multiples objets sur la base de la pluralité de réflecteurs, et qui commande le panneau d'affichage pour qu'il affiche l'image de sortie. Si un utilisateur est identifié par l'intermédiaire du capteur, le processeur met à jour l'image de sortie sur la base de l'utilisateur identifié et commande le panneau d'affichage pour qu'il affiche l'image de sortie mise à jour.

CLAIM 1. In the display device,
display panel;
a plurality of reflectors forming an inverted pyramid in front of the display panel, the plurality of reflectors reflecting images output from the display panel;
sensor;
at least one memory storing at least one instruction; and
By executing the at least one command,
Identify objects from input images,
Obtaining an output image including a plurality of objects based on the plurality of reflectors,
Control the display panel to display the output image,
When a user is identified through the sensor, update the output image,
At least one processor controlling the display panel to display the updated output image.



N10025

US20240087490

IBM

Priority Date: 12/09/2022

DYNAMIC CORRECTION OF HOLOGRAPHIC CONTENT TO BE DISPLAYED ON A FOLDABLE MOBILE DEVICE

A method, computer program, and computer system are provided for correcting holographic content to be displayed on a foldable mobile device. The method, computer program, and computer system may include identifying holographic content to be displayed on two display regions of a foldable mobile device. An angle between the two display regions of the foldable mobile device is calculated, and a determination is made as to whether the holographic content on each of the two display regions overlaps based on the calculated angle. The holographic content to be displayed is updated based on applying one or more geometric transformations to the holographic content corresponding to determining the holographic content overlaps, and the updated holographic content is displayed as a three-dimensional holographic image.

CLAIM 1. A method of correcting holographic content to be displayed on a foldable mobile device, executable by a processor, comprising: identifying holographic content to be displayed on two display regions of a foldable mobile device; calculating an angle between the two display regions of the foldable mobile device; determining whether the holographic content on each of the two display regions overlaps based on the calculated angle; and updating the holographic content to be displayed based on applying one or more geometric transformations to the holographic content corresponding to determining the holographic content overlaps.

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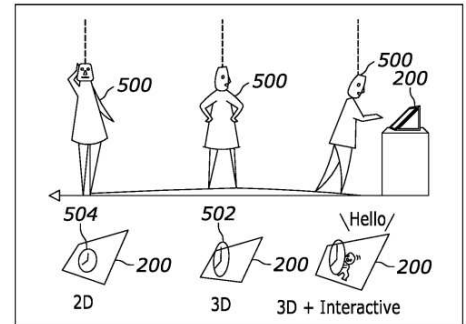
Priority Date: 05/12/2022

SONY INTERACTIVE ENTERTAINMENT

3D USER INTERFACE WITH SLIDING CYLINDRICAL VOLUMES

A UI for a 3D display is presented in stand by style as a home UI system for a holographic display. The UI provides a live view of a current application and computer game. The behavior of the UI may change according to the distance between an imaged viewer and the display. The UI provides some minimal interaction with the characters in the live view. The UI can be used to control interaction of the holographic display.

CLAIM 1. An apparatus comprising: at least one processor configured to: present a user interface (UI) on a holographic display; present, as part of the UI, a live view of at least one computer simulation being executed by at least one simulation engine that does not control the UI; establish a first behavior of the UI responsive to a viewer of the holographic display being at a first distance from the holographic display, the first behavior comprising presenting at least one 3D character that reacts to viewer behavior, presenting live app/game views, and presenting reactions to user speech and gestures; establish a second behavior of the UI responsive to the viewer of the holographic display being at a second distance from the holographic display, the second behavior comprising presenting a time indication in 3D on the display and animating at least one 3D object on the display that does not react to viewer behavior; and establish a third behavior of the UI responsive to the viewer of the holographic display being at a third distance from the holographic display, wherein at least at a first time the UI comprises plural cylinders of content translationally movable across the holographic display, a first cylinder representing content of a first type and a second cylinder representing content of a second type.



N10031

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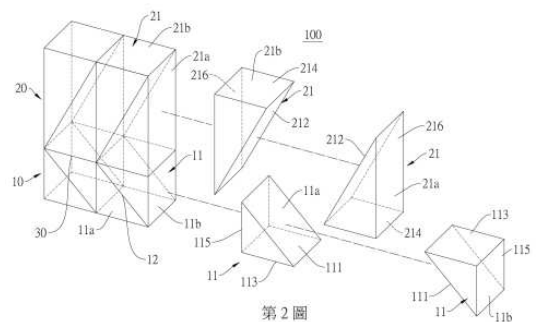
Priority Date: 28/03/2022

WEI SHENG INTERNATIONAL TECHNOLOGY

HOLOGRAPHIC PROJECTION OPERATING DEVICE, HOLOGRAPHIC PROJECTION DEVICE AND HOLOGRAPHIC OPTICAL MODULE THEREOF

A holographic projection operating device, a holographic projection device and a holographic optical module thereof. The holographic optical module includes a first prism array and a second prism array. The first prism array includes a plurality of first prisms, and first surfaces of the two first prisms are overlapped opposite to each other to form a first optical interface. The second prism array includes a plurality of second prisms, the second surfaces of the two second prism are overlapped with each other to form a second optical interface. The light incident on the first optical interface at a first incident angle is totally reflected to generate a first reflected light, or incident on the first optical interface at a second incident angle and is totally reflected to generate a second reflected light. The first reflected light or the second reflected light enters the second prism array and is totally reflected by the second optical interface at the third incident angle to generate the third reflected light.

CLAIM 1. An all-image optical module for a floating projection device (1000, 1000'). The all-image optical module (100) comprises: a first prism array (10), comprising a plurality of first prisms (11, 11a, 11b). Each of the first prisms (11, 11a, 11b) has a first surface (111), the first surfaces (111) of the two first prisms (11, 11a, 11b) being superposed on each other to form a first optical interface (12); and a second prism array (20) comprising a plurality of second prisms (21, 21a, 21b), each of the second prisms (21, 21a, 21b) having a second surface (212), The second surfaces (212) of the two second prisms (21, 21a, 21b) are superposed on each other to form a second optical interface (22); one of the light rays (L2) enters the first prism array (10), and enters the first optical interface (12) at a first incident angle, and a first reflected light ray (L21) is generated by total reflection of the first surface (111) of one of the first prisms (11a) of the first optical interface (12); Another light (L11) enters the first prism array (10), and the first optical interface (12) is incident at a second incident angle, and a second reflected light (L12) is generated by total reflection of the first surface (111) of the first prism (11b) of the other first optical interface (12); The second reflected light (L12) enters the second prism array (20), and the second optical interface (22) is incident at a third incident angle, and a third reflected light (L13) is generated by total reflection of the second surface (212) of one of the second prisms (21a) of the second optical interface (22).



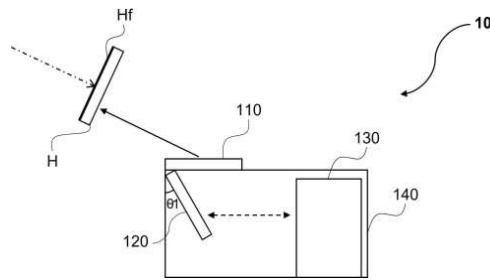
N10034

KR20240029422
Priority Date: 26/08/2022

KOREA ELEVATOR SAFETY AGENCY | MARKETON

HOLOGRAM PROJECTOR

The present disclosure discloses a hologram projector. The hologram projector can display information at a desired position in the air without enlarging the information such as images or having a medium such as a screen or smoke in the same size, and can control a TV remote control function or a device for rehabilitation treatment through touching and information floating in the air. More specifically, the hologram projector includes: a content mounting unit which emits content; a first mirror which reflects the emitted content upward; and a hologram plate which projects the reflected content to the air in the form of a hologram, and the distance between the hologram plate and the content can be adjusted by adjusting the distance between the content mounting unit and the first mirror.



CLAIM 1. A hologram projector comprising: a content mounting unit configured to emit content; a first mirror configured to reflect the emitted content upward; and a hologram plate configured to project the reflected content in the air in the form of a hologram, wherein a distance between the content mounting unit and the first mirror is adjusted to adjust the distance between the hologram plate and the content.

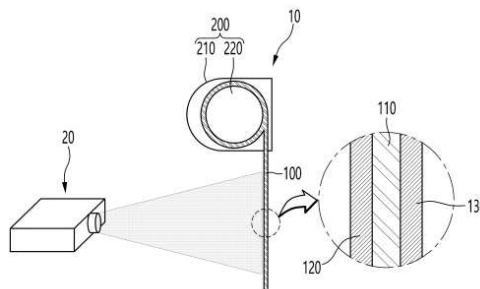
N10035

KR20240024384
Priority Date: 16/08/2022

HEESUNG ELECTRONICS

TRANSPARENT SCREEN USING HOLOGRAM OPTICAL DEVICE AND ELECTRIC TRANSPARENT SCREEN APPARATUS FOR PROJECTOR HAVING THE SAME

The present invention relates to a transparent screen using a hologram optical device and an electric transparent screen apparatus for a projector having the same, wherein the transparent screen of the present embodiment comprises: a hologram film in which an optical layer reflecting light of Red, Green, and Blue areas is formed on a base substrate made of a transparent material; a front protective film which is made of a transparent material and is coupled to a front surface of the hologram film; and a rear protective film which is made of a transparent material and is coupled to a rear surface of the hologram film.



CLAIM 1. A transparent screen using a hologram optical device, the transparent screen comprising: a hologram film including an optical layer formed on a base substrate of a transparent material to reflect light of Red, Green, and Blue regions; a front protective film formed of a transparent material and coupled to a front surface of the hologram film; and a rear protective film formed of a transparent material and coupled to a rear surface of the hologram film.

N10038

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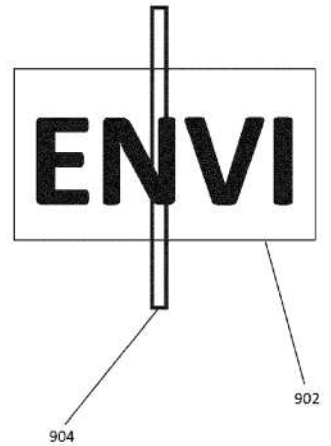
Priority Date: 15/09/2022

ENVISICS

OPTIMISED HOLOGRAM UPDATING

A method comprising determining, from a first hologram of an image, a second hologram of a portion of the image. The method comprises providing or receiving the first hologram of the image. The method further comprises propagating a complex field corresponding to the first hologram from a hologram plane to an image plane. The method further comprises modifying amplitudes of the complex field in the image plane by setting amplitude components of the complex field that correspond to regions of the image that are outside of the portion of the image to be zero. The method further comprises propagating the modified complex field back from the image plane to the hologram plane thereby obtaining the second hologram of the portion of the image.

CLAIM 1. A method of determining, from a first hologram of an image, a second hologram of a portion of the image, the method comprising: providing the first hologram of the image; propagating a complex light field corresponding to the first hologram from a hologram plane to an image plane; modifying amplitudes of the complex light field in the image plane by setting amplitude components of the complex light field that correspond to regions of the image that are outside of the portion of the image to be zero; and propagating the modified complex light field back from the image plane to the hologram plane thereby obtaining the second hologram of the portion of the image.



N10040

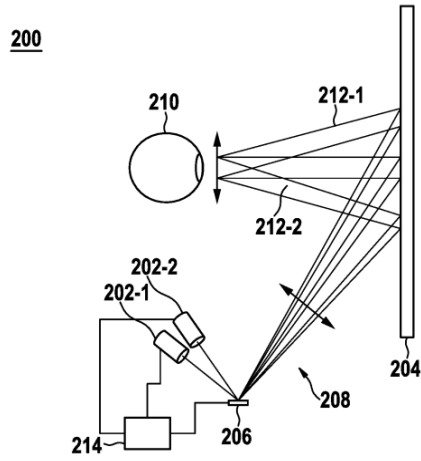
DE102022208746

Priority Date: 24/08/2022

ROBERT BOSCH

METHOD FOR OPERATING DATA GOGGLES AND DEVICE FOR DATA GOGGLES

The invention relates to a method for operating a pair of data goggles and to a device (200) for a pair of data goggles. Said device (200) comprises a device (202-1, 202-2) for generating a light beam having a predetermined wavelength, a photosensitive material (204), especially in a lens of the pair of data goggles, for generating a hologram, an optical device (206) for influencing an angle at which the light beam impinges on the photosensitive material (204), and a controller (214) for predetermining the wavelength depending on the angle.



CLAIM 1. Device (200, 300) for data spectacles, characterized in that the device (200, 300) comprises a device (202-1, 202-2; 302) for generating a light beam with a prescribable wavelength, a photosensitive material (204, 304), in particular in a spectacle lens of the data spectacles, for generating a hologram, an optical device (206; 306, 308) for influencing an angle at which the light beam impinges on the photosensitive material (204, 304), and a controller (214, 316) for prescribing the wavelength as a function of the angle.

N10041

CN220623281U

Priority Date: 27/06/2023

QINGHAI SHAMBHALINKA CULTURAL TOURISM RESOURCES DEVELOPMENT

HOLOGRAPHIC PHANTOM IMAGING DEVICE

The utility model relates to the technical field of holographic phantom imaging, in particular to a holographic phantom imaging device which comprises a base, wherein a movable frame is inserted above the base, a transmission mechanism comprises a rotating rod, the rotating rod is inserted at one side of the movable frame, one end of the rotating rod is fixedly connected with a rotating handle, one side of the rotating handle is attached to the movable frame, one end of the rotating handle is fixedly connected with a first bevel gear, a second bevel gear is meshed with the outer part of the first bevel gear, the second bevel gear is rotatably connected to the top of the movable frame, and the second bevel gear is in threaded connection with the bottom end of a clamping mechanism. According to the utility model, the rotating handle is rotated to drive the rotating rod and the first bevel gear to rotate, so that the second bevel gear is driven to rotate, and the threaded rod can be driven to move, and the clamping mechanism can be driven to move up and down, so that the video transmitter is convenient to detach and install.

CLAIM 1. Holographic phantom imaging device, comprising a base (1), characterized in that: the mobile video camera is characterized in that a mobile frame (101) is inserted above the base (1), a transmission mechanism (2) is rotationally connected inside the mobile frame (101), a switching mechanism (3) is rotationally connected to the top of the mobile frame (101), a clamping mechanism (4) is slidingly connected inside the mobile frame (101), a spectroscope (102) is fixedly connected above the mobile frame (101), and a video transmitter (5) is clamped inside the clamping mechanism (4); the transmission mechanism (2) comprises a rotating rod (202), the rotating rod (202) is inserted into one side of the movable frame (101), one end of the rotating rod (202) is fixedly connected with a rotating handle (201), one side of the rotating handle (201) is attached to the movable frame (101), one end of the rotating handle (201) is fixedly connected with a first bevel gear (203), a second bevel gear (204) is meshed with the outer portion of the first bevel gear (203), the second bevel gear (204) is rotatably connected to the top of the movable frame (101), and the second bevel gear (204) is connected to the bottom end of the clamping mechanism (4) in a threaded mode.

N10042

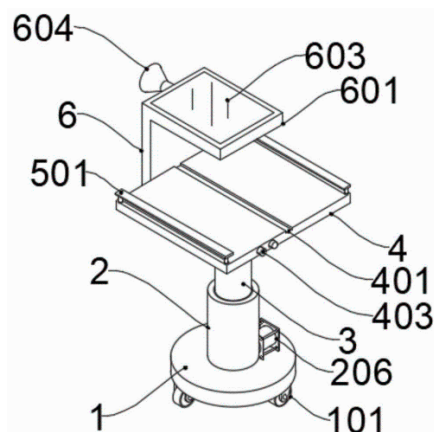
CN220556476U

Priority Date: 21/08/2023

WUHAN POLYTECHNIC UNIVERSITY

AR DYNAMIC BOOK INTERACTION DEVICE BASED ON HOLOGRAPHIC PROJECTION TECHNOLOGY

The utility model provides an AR dynamic book interaction device based on a holographic projection technology, which comprises a base, wherein a fixed column is vertically arranged at the top end of the base, a sliding groove is formed in the top end of the fixed column, a sliding block is connected inside the sliding groove in a sliding manner, a lifting column is fixedly connected to the top end of the sliding block, a book placing table is fixedly connected to the top end of the lifting column, a spine clamping groove is formed in the center of the top end of the book placing table, a pair of mounting grooves are respectively formed in two sides of the top end of the book placing table, clamping plates are respectively arranged on two sides of the top end of the book placing table through the pair of mounting grooves, and a controller is arranged on one side, adjacent to the pair of clamping plates, of the book placing table. The AR dynamic book interaction device based on the holographic projection technology is simple and reasonable in structure, novel in design, simple to operate, high in practicality and convenient to popularize and use widely.



CLAIM 1. The utility model provides an AR developments books interactive installation based on holographic projection technique, includes base (1), its characterized in that, fixed column (2) are vertically installed on the top of base (1), spout (201) have been seted up on the top of fixed column (2), the inside sliding connection of spout (201) has slider (202), the top fixedly connected with elevating column (3) of slider (202), the top fixedly connected with books of elevating column (3) place platform (4), books are placed the top central point of platform (4) put and have been offered spine draw-in groove (401), books are placed the top both sides of platform (4) and have been seted up a pair of mounting groove (5) respectively, just books are placed the top both sides of platform (4) and are installed splint (501) through a pair of mounting groove (5) respectively, books are placed the platform (4) and are being located a pair of splint (501) adjacent one side position is installed controller (402), bo oks are placed platform (4) and are being located a pair of splint (501) adjacent opposite side position fixedly connected with mounting panel (6), AR system is installed on one side of installing cabinet (601).

N10044

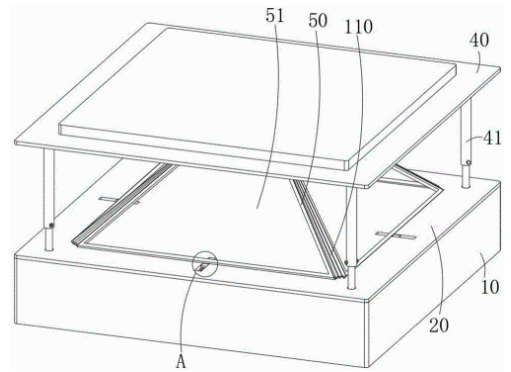
CN220543573U
Priority Date: 16/08/2023

NANJING YOUBEILI TECHNOLOGY

SCENE DISPLAY DEVICE BASED ON HOLOGRAPHIC DATA

The utility model belongs to the technical field of the scene show, concretely relates to scene display device based on holographic data, including the cabinet body, the inside of the cabinet body is equipped with a set of electric telescopic handle, still includes: the bottom of the top plate is hinged with four holographic edge racks through hinges, holographic films are fixedly arranged in the holographic edge racks, and a holographic video playing screen is arranged above the holographic edge racks; after the electric telescopic rod works, the top plate ascends or descends, and the inclination angle of the holographic prism rack is increased or decreased. The utility model discloses can expand or fold holographic arris rack, and then adjust projection position, the spectator of being convenient for watches holographic data's scene show from the viewing position of difference, improves the suitability, and the gap between the holographic arris rack can be sheltered from to the hundred pleat fender cloth, avoids spectator to see to the inside of tetrahedron from the space and leads to not seeing holographic projection.

CLAIM 1. A scene showing device based on holographic data is characterized in that, including the cabinet body (10), the top fixed mounting of the cabinet body (10) has mesa dull and stereotyped (20), the inside of the cabinet body (10) is equipped with a set of electric telescopic handle (30), electric telescopic handle (30) fixed mounting is on the cabinet body (10), the output sliding connection of electric telescopic handle (30) is in the inside of mesa dull and stereotyped (20), still includes: the top plate (40), the top plate (40) is arranged above the table top flat plate (20), a group of connecting columns (41) are fixedly arranged at the bottom of the top plate (40), the connecting columns (41) are connected to the output end of the electric telescopic rod (30) through bolts, four holographic edge platforms (50) are hinged to the bottom of the top plate (40) through hinges, a quadrangular platform shape is formed between the holographic edge platforms (50), a holographic film (51) is fixedly arranged in the holographic edge platforms (50), a holographic video playing screen (60) is arranged above the holographic edge platforms (50), and the holographic video playing screen (60) is fixedly arranged on the top plate (40); after the electric telescopic rod (30) works, the top plate (40) is lifted or lowered, and the inclination angle of the holographic prism stand (50) is increased or decreased.



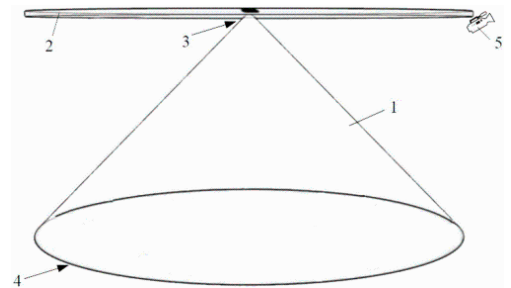
N10045

CN220526196U
Priority Date: 16/08/2023

BEIJING YUECHANG TECHNOLOGY

HOLOGRAPHIC THREE-DIMENSIONAL PROJECTION DEVICE

The utility model relates to a holographic three-dimensional projection device, comprising: the imaging main body is conical or truncated conical, and adopts a holographic display special film material; a screen disposed directly above the imaging body; a tip tension assembly connecting the top of the imaging body with the screen; and a post end tensioning assembly connecting the bottom of the imaging body with the ground or other load bearing platform. The holographic three-dimensional projection device has the advantages of simple structure, short construction period and low construction cost, adopts a conical or truncated conical structure with a smooth curved surface as an imaging main body, solves the problems of imaging fracture, poor stereoscopic impression, incapability of surrounding view and the like of the traditional prismatic imaging body, and simultaneously, has high optical imaging quality by being matched with a screen for projecting a light source right above, and solves the common problems of difficult brightness adjustment, easiness in generating halation, unclear and the like of the traditional imaging device.



CLAIM 1. A holographic three-dimensional projection device, comprising: the imaging main body (1) is conical or truncated conical, and the imaging main body (1) adopts a holographic display special film material; a screen (2) provided directly above the imaging body (1); a tip tension assembly (3) connecting the top of the imaging body (1) with the screen (2); and the column end tensioning assembly (4) is connected with the bottom of the imaging main body (1) and the ground or other bearing platforms.

N10046

CN220526165U
Priority Date: 03/08/2023

LIMITED COMPANY OF FORCE PARTY DIGITAL SCIENCE & TECHNOLOGY GROUP

HOLOGRAPHIC DINING TABLE PROJECTION SYSTEM

The utility model belongs to the technical field of projection devices, and particularly relates to a holographic dining table projection system which comprises a communication unit, a control unit, a driving unit, a light source unit and a dodging unit; the light source unit is arranged above the dining table; the light homogenizing unit is arranged at one side of the light source unit; the communication unit, the control unit, the driving unit and the light source unit are sequentially in communication connection. The holographic dining table projection system generates a plurality of beams of light through the light source unit, and feeds back and receives the light through the control unit and the driving unit, so that the formed plurality of beams of light are homogenized and projected to the dining table, a desktop image can be vividly displayed, and the user experience is improved.

CLAIM 1. A holographic dining table projection system, characterized in that: comprises a communication unit, a control unit, a driving unit, a light source unit and a dodging unit; the light source unit is arranged above the dining table; the light homogenizing unit is arranged at one side of the light source unit; the communication unit, the control unit, the driving unit and the light source unit are sequentially in communication connection.

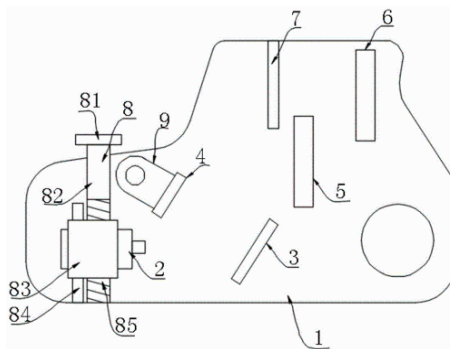
N10047

CN220524767U
Priority Date: 28/07/2023

BEIJING JIUZHOU OPTICS

HOLOGRAPHIC DIFFRACTION SIGHTING DEVICE

The utility model discloses a holographic diffraction sighting device which comprises a shell, a laser and an optical lens group, wherein the laser is positioned at one side of the interior of the shell, the optical lens group is positioned in the interior of the shell and far away from the laser, and a lifting structure capable of driving the laser to lift is arranged in the interior of the shell. The lifting structure comprises a rotating shaft rotatably arranged in the shell, a threaded part arranged at the lower part of the rotating shaft, a nut in threaded connection with the circumference of the threaded part and a knob which is positioned outside the shell and can drive the rotating shaft to rotate, and the laser is fixed at one side of the nut; when the position required by the visual field needs to be adjusted, the rotary shaft can be rotated by rotating the knob, so that the screw force is generated between the nut and the screw thread part, the nut can move up and down, the laser is driven to lift, and the adjustment is convenient.



CLAIM 1. The utility model provides a holographic diffraction sight, includes shell (1), is located laser instrument (2) of shell (1) inside one side and is located the inside optical lens piece group who keeps away from laser instrument (2) of shell (1), its characterized in that: the laser device is characterized in that a lifting structure (8) capable of driving the laser device (2) to lift is arranged in the shell (1).

N10048

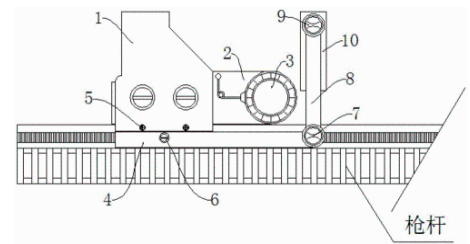
CN220524766U
Priority Date: 07/07/2023

BEIJING JIUZHOU OPTICS

HOLOGRAPHIC ELECTRONIC SIGHTING TELESCOPE

The utility model discloses a holographic electronic sighting telescope, which comprises a holographic electronic sighting telescope main body, wherein a display screen is arranged above the front end in the holographic electronic sighting telescope main body, a protective cover is arranged outside the display screen, a battery compartment is arranged at the rear end in the holographic electronic sighting telescope main body, an assembly frame is arranged at the bottom end of the protective cover, an installation clamping groove is formed in the front end of the interior of the assembly frame, a locking bolt is arranged in the middle position of the outer side of the installation clamping groove, adjustable brackets are arranged on two sides of the rear end of the assembly frame, and an amplifying glasses frame is arranged above the interior of the adjustable brackets. According to the utility model, the high-definition amplifying lens is arranged at the rear end of the display screen, when the aiming distance is too far, the small red point in the display screen can be amplified through the high-definition amplifying lens, and the observing position of the red point is clearer and more reliable, so that the holographic electronic aiming lens is suitable for being used under various conditions.

CLAIM 1. Holographic electronic sighting telescope, including holographic electronic sighting telescope main body (2), its characterized in that: the utility model discloses a holographic electronic sighting telescope, including holographic electronic sighting telescope main part (2), display screen (12) are equipped with in the top of front end in the holographic electronic sighting telescope main part (2), the outside of display screen (12) is equipped with protection casing (1), the rear end in the holographic electronic sighting telescope main part (2) is equipped with battery compartment (3), the bottom of protection casing (1) is equipped with equipment frame (4), the front end of the inside of equipment frame (4) is equipped with installation draw-in groove (13), the intermediate position in the outside of installation draw-in groove (13) is equipped with locking bolt (6), the both sides of the rear end of equipment frame (4) are equipped with adjustable support (8), the top of the inside of adjustable support (8) is equipped with magnifier frame (10), the inside of magnifier frame (10) is equipped with high definition and magnifies lens (11).



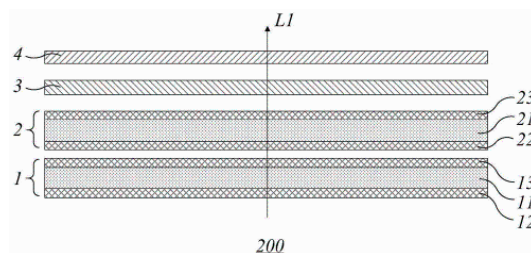
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CN117724272
Priority Date: 29/12/2023

TIANMA

SPATIAL LIGHT MODULATOR AND HOLOGRAPHIC THREE-DIMENSIONAL DISPLAY DEVICE

The application discloses a spatial light modulator and holographic three-dimensional display device. The spatial light modulator includes: the first liquid crystal panel is used for adjusting the phase of the first light and comprises a first liquid crystal layer; the second liquid crystal panel is used for adjusting the amplitude of the first light and is positioned at one side of the first liquid crystal panel; the second liquid crystal panel comprises a second liquid crystal layer, and the second liquid crystal layer comprises second liquid crystal molecules with liquid crystal optical axes; the quarter wave plate is positioned on one side of the second liquid crystal panel, which is away from the first liquid crystal panel; the polaroid is positioned at one side of the quarter wave plate, which is away from the first liquid crystal panel; the second liquid crystal panel comprises a first optical axis direction, the difference value of the refractive index of the second liquid crystal molecules along the optical axis direction of the liquid crystal and the refractive index of the second liquid crystal molecules perpendicular to the optical axis direction of the liquid crystal is Δn , the thickness of the second liquid crystal layer is d , the wavelength of the first light is λ_1 , and $\Delta n \cdot d$ is more than or equal to $0.5 \lambda_1$ and less than or equal to $0.75 \lambda_1$. The spatial light modulator and the holographic three-dimensional display device can enlarge the brightness range of emergent light.



N10050

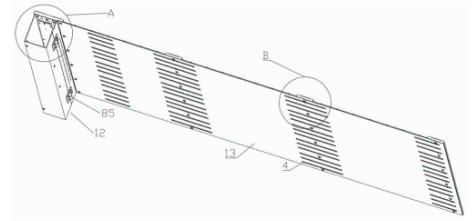
CN117711279

Priority Date: 27/12/2023

JIANGSU HONGGUANG DISPLAY TECHNOLOGY

NOVEL HOLOGRAPHIC TRANSPARENT SCREEN

The invention relates to the technical field of display screens, in particular to a novel holographic transparent screen, which comprises a PCBA main board, wherein the PCBA main board comprises a plurality of groups of PCBA support boards, a power box is arranged at the lower end of one side of the PCBA main board, a protection board is arranged at one side of the PCBA main board, a first PC injection molding board is arranged above the power box on the PCBA main board, a plurality of second PC injection molding boards are arranged at one side of the



PCBA main board, which is far away from the PCBA main board, and double faced adhesive tapes are arranged at one sides of the first PC injection molding boards and the second PC injection molding boards. According to the invention, the PCBA support plates are assembled into the PCBA master plate through the first PC injection molding plate and the plurality of second PC injection molding plates, gaps exist between the PCBA support plates and glass, and the problems that the existing film pasting screen is generally in a mode of adopting a PC+ film pasting closed structure, the film pasting screen is heavy in whole, difficult to install and disassemble, and the whole needs to be disassembled after the LED chips or the driving circuits in the film pasting screen are damaged, and the disassembly and the assembly are troublesome are solved.

CLAIM 1. Novel holographic transparent screen, a serial communication port, including PCBA master board (1), PCBA master board (1) is including a plurality of groups PCBA extension board (11), PCBA master board (1) one side lower extreme is provided with power pack (12), PCBA master board (1) lower extreme is located power pack (12) one side is provided with guard plate (13), lie in on PCBA master board (1) power pack (12) top is provided with first PC injection molding board (14), lie in on PCBA master board (1) first PC injection molding board (14) one side is provided with a plurality of second PC injection molding boards (15), first PC injection molding board (14) with second PC injection molding board (15) are kept away from on one side of PCBA master board (1) all be provided with double faced adhesive tape (16).

N10055

CN117687204

Priority Date: 29/01/2024

NANJING PARALLEL VISION TECHNOLOGY

TWO-DIMENSIONAL PUPIL EXPANDING DEVICE BASED ON HOLOGRAPHIC WAVEGUIDE AND PUPIL EXPANDING METHOD THEREOF

The invention discloses a two-dimensional pupil expanding device and a pupil expanding method thereof based on holographic waveguides, wherein the two-dimensional pupil expanding device comprises waveguide media, and coupling-in composite elements and coupling-out composite elements are arranged on the waveguide media; the coupling-in composite element comprises a coupling-in element I and a coupling-in element II, wherein the coupling-in element I and the coupling-in element II are partially overlapped in the orthographic projection direction and are respectively arranged on a group of opposite surfaces of the waveguide medium; the coupling-out composite element comprises a coupling-out element I and a coupling-out element II which are completely overlapped in the orthographic projection direction and are respectively arranged on a group of opposite surfaces of the waveguide medium; the grating vectors of the first coupling-in element and the first coupling-out element are consistent, and the grating vectors of the second coupling-in element and the second coupling-out element are consistent. On the premise of not increasing the volume and the quality of the system, the preparation difficulty and the process cost are reduced, the waveguide display imaging effect with large exit pupil and high uniformity is obtained, the structure is compact, the brightness is uniform, and the dispersion phenomenon is eliminated.

CLAIM 1. A two-dimensional pupil expanding device based on holographic waveguide is characterized in that: the device comprises a waveguide medium (1), wherein the waveguide medium (1) is provided with a coupling-in composite element (2) and a coupling-out composite element (3); the coupling-in composite element (2) comprises a coupling-in element I (201) and a coupling-in element II (202), wherein the coupling-in element I (201) and the coupling-in element II (202) are partially overlapped in the orthographic projection direction and are respectively arranged on a group of opposite surfaces of the waveguide medium (1); the coupling-out composite element (3) comprises a coupling-out element I (301) and a coupling-out element II (302), wherein the coupling-out element I (301) and the coupling-out element II (302) are completely overlapped in the orthographic projection direction and are respectively arranged on a group of opposite surfaces of the waveguide medium (1); the grating vectors of the first coupling-in element (201) and the first coupling-out element (301) are consistent, and the grating vectors of the second coupling-in element (202) and the second coupling-out element (302) are consistent.

N10056

CN117685459

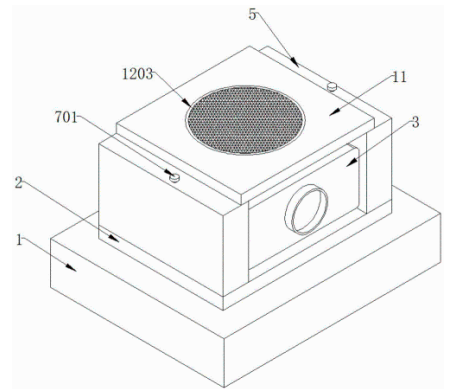
Priority Date: 05/01/2024

GUONENG SHUZHTECHNOLOGY DEVELOPMENT BEIJING

HOLOGRAPHIC PROJECTION DISPLAY DEVICE

The invention relates to the technical field of holographic projection and discloses a holographic projection display device which comprises a base, a mounting plate and a projection display body, wherein a movable groove is formed in the middle of the top surface of the base, the mounting plate is movably arranged in the movable groove, supporting plates are fixedly arranged on two sides of the top surface of the mounting plate, and a groove body is formed in the supporting plates. According to the invention, the knob is screwed to drive the bidirectional screw rod to rotate, so that the first fixing rod and the second fixing rod are driven to move in opposite directions, the first fixing rod and the second fixing rod are inserted into the fixing holes to preliminarily fix the projection display body, and the fixing block is magnetically fixed through the electromagnetic seat because the electromagnetic seat can be magnetically connected with the fixing block, so that the fixing effect on the projection display body is further improved.

CLAIM 1. The utility model provides a holographic projection display device, includes base (1), mounting panel (2), projection display body (3), movable groove (4) have been seted up in the middle of the top surface of base (1), mounting panel (2) activity sets up in the inside of movable groove (4), a serial communication port, mounting panel (2)'s top surface both sides all fixed mounting have backup pad (5), cell body (6) have been seted up to the inside of backup pad (5), the relative one side surface of backup pad (5) is the opening design, the inside of cell body (6) all is provided with fixed subassembly (7), fixed subassembly (7) include knob (701), two-way lead screw (702), first dead lever (703), second dead lever (704), electromagnetism seat (705), fixed orifices (9) have all been seted up in the middle of the inside top and the bottom surface of fixed block (8), the inside bottom surface of movable groove (4) is provided with multiunit damper (10), damper (1001), damper (1002) are connected with damper (1004) including knob (1003), the utility model discloses a heat radiation device, including mounting panel (2), backup pad (5) top of mounting panel (2) top surface one side is provided with guard plate (11) through the hinge rotation, the bottom surface opposite side of guard plate (11) is provided with the joint piece, the joint groove that uses with the joint piece cooperation is seted up on the top surface of backup pad (5) of mounting panel (2) top surface opposite side, the inside of guard plate (11) is provided with radiator unit (12), radiator unit (12) include mounting groove (1201), radiator fan (1202), dust screen (1203).



N10057

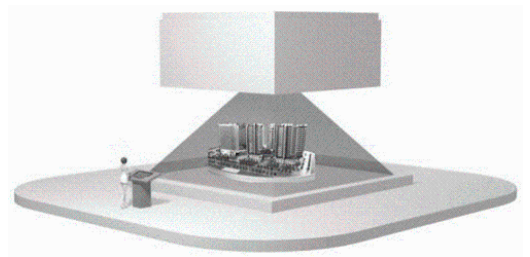
CN117676105

Priority Date: 27/11/2023

SICHUAN UNIVERSITY

HOLOGRAPHIC PROJECTION INTERACTION CONTROL METHOD BASED ON MONOCULAR CAMERA AND RELATED EQUIPMENT

The application discloses a holographic projection interactive control method based on a monocular camera and related equipment, relating to the field of interactive control, wherein the method comprises the following steps: acquiring video stream information of the monocular camera; identifying gesture characteristic information according to the video stream information and the gesture identification model; acquiring gesture categories based on the gesture feature information; determining element transformation operation corresponding to the gesture category; and controlling the display effect of the holographic projection based on the element change operation.



CLAIM 1. A holographic projection interaction control method based on a monocular camera is characterized by comprising the following steps: acquiring video stream information of the monocular camera; identifying gesture characteristic information according to the video stream information and the gesture identification model; acquiring gesture categories based on the gesture feature information; determining element transformation operation corresponding to the gesture category; and controlling the display effect of the holographic projection based on the element change operation.

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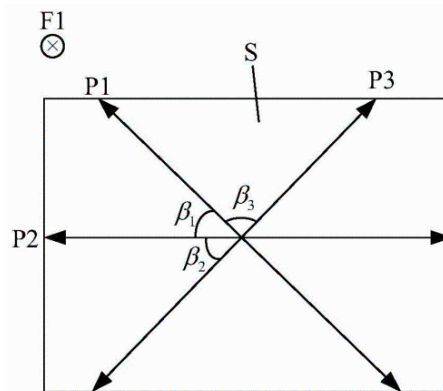
CN117666313

Priority Date: 26/12/2023

TIANMA

HOLOGRAPHIC DISPLAY SYSTEM AND ELECTRONIC EQUIPMENT

The application discloses holographic display system and electronic equipment, holographic display system includes: a backlight module; the plurality of optical components arranged on the light emitting side of the backlight module at least comprises: a first optical component, a second optical component and a third optical component which are arranged in succession in a first direction; the first optical component can transmit light rays in a first polarization direction, the second optical component can transmit light rays in a second polarization direction, and the third optical component can transmit light rays in a third polarization direction; an optical rotation device for rotating a polarization direction of the light; optical rotation devices are respectively arranged between the first optical assembly and the second optical assembly and between the second optical assembly and the third optical assembly; straight line where the first polarization direction is located and secondThe included angle beta is formed between the straight line where the polarization directions are 1 An included angle beta is formed between the straight line where the second polarization direction is located and the straight line where the third polarization direction is located 2 An included angle beta is formed between the straight line where the first polarization direction is located and the straight line where the third polarization direction is located 3 , $\beta_3 > \beta_1$ And/or $\beta_3 > \beta_2$.



CLAIM 1. A holographic display system, comprising: the backlight module is used for emitting backlight; the optical components are arranged on the light emitting side of the backlight module, and at least comprise: the first optical assembly, the second optical assembly and the third optical assembly are arranged in succession in a first direction, wherein the first direction is the emergent direction of the backlight; the first optical component can transmit light rays with a first polarization direction, the second optical component can transmit light rays with a second polarization direction, and the third optical component can transmit light rays with a third polarization direction; the first polarization direction, the second polarization direction and the third polarization direction are not parallel to each other; An optical rotation device for rotating a polarization direction of the light; the optical rotation devices are respectively arranged between the first optical assembly and the second optical assembly and between the second optical assembly and the third optical assembly; wherein an included angle beta is formed between the straight line where the first polarization direction is located and the straight line where the second polarization direction is located 1 An included angle beta is formed between the straight line where the second polarization direction is located and the straight line where the third polarization direction is located 2 An included angle beta is formed between the straight line where the first polarization direction is located and the straight line where the third polarization direction is located 3 , $\beta_3 > \beta_1$ And/or $\beta_3 > \beta_2$.

N10059

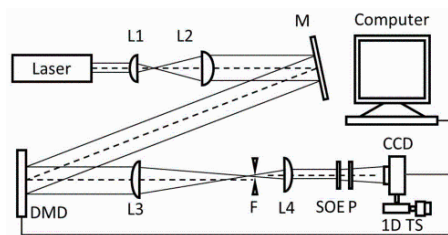
CN117666312

Priority Date: 17/11/2023

UNIVERSITY OF SCIENCE & TECHNOLOGY OF CHINA

HOLOGRAPHIC PROJECTION METHOD AND DEVICE

The application discloses a holographic projection method and device, and relates to the technical field of holographic projection, wherein the method comprises the following steps: utilizing a photon scattering device to enable incident light to pass through a scattering medium to carry out optical scattering, so as to obtain an initial transmission matrix; updating the initial transmission matrix to obtain an updated transmission matrix, wherein the updated transmission matrix is a transmission matrix after crosstalk information among projection light fields is removed; generating a three-dimensional scattering hologram according to the updated transmission matrix; and performing three-dimensional holographic projection according to the three-dimensional scattering hologram to generate a light field with crosstalk information among projection light fields removed. Therefore, a photon scattering device with known scattering characteristics is introduced, the optical scattering characteristics of the photon scattering device are fully developed, the projection crosstalk in the initial transmission matrix is eliminated, the updated transmission matrix is obtained, a high-density multi-plane cross-talk-free three-dimensional scattering hologram is generated, and a clear light field of any projection plane after cross-talk information among projection light fields is removed is generated.



CLAIM 1. A holographic projection method, the method comprising: utilizing a photon scattering device to enable incident light to pass through a scattering medium to carry out optical scattering, so as to obtain an initial transmission matrix; updating the initial transmission matrix to obtain an updated transmission matrix, wherein the updated transmission matrix is a transmission matrix after crosstalk information among projection light fields is removed; generating a three-dimensional scattering hologram according to the updated transmission matrix; and executing three-dimensional holographic projection according to the three-dimensional scattering hologram to generate a light field with crosstalk information among projection light fields removed.

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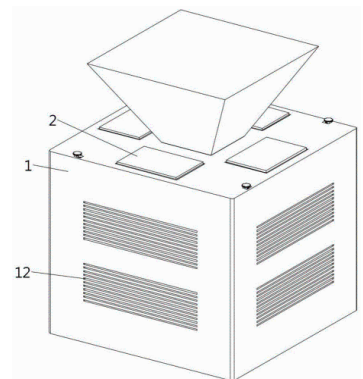
CN117608177

Priority Date: 26/12/2023

HANGZHOU JINCAI DIGITAL TECHNOLOGY

HOLOGRAPHIC IMAGING PROCESSING METHOD AND SYSTEM

The invention discloses a holographic imaging processing method and a holographic imaging processing system, and relates to the technical field of holographic imaging; the invention comprises a holographic imaging system, wherein the holographic imaging system comprises a light source system, a picture imaging system and an external system, the light source system comprises a light source emitting module and an image sensing module, the picture imaging system comprises a picture processing module, a driving module and a picture monitoring module, and the external system comprises a picture interface module and a picture display module; in the invention, the generated holographic image is processed through the holographic imaging system consisting of the light source system, the picture imaging system and the external system, the processed holographic image is projected and displayed, the resolution is improved, the holographic image is displayed in rotation, and meanwhile, the rotating holographic image is monitored, so that three hundred and sixty degrees of holographic image display is realized, and the display effect is improved.



CLAIM 1. A holographic imaging processing system comprising a holographic imaging system (100), characterized in that: the holographic imaging system (100) comprises a light source system (200), a picture imaging system (300) and an external system (400); the light source system (200) comprises a light source emitting module (210) and an image sensing module (220); the picture imaging system (300) comprises a picture processing module (310), a driving module (320) and a picture monitoring module (330).

N10071

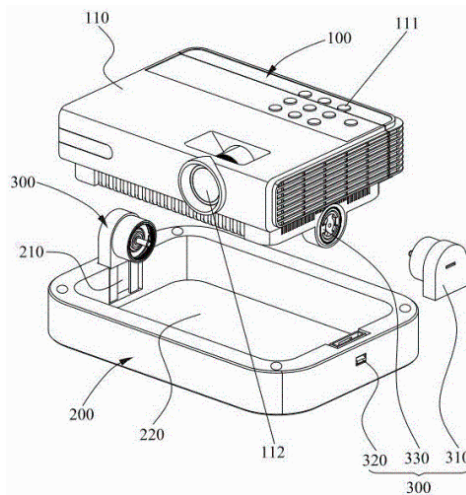
CN117608156

Priority Date: 10/01/2024

SHENZHEN HAIQI DISPLAY CULTUAL

PORTABLE HOLOGRAPHIC IMAGE EQUIPMENT AND HOLOGRAPHIC IMAGE SYSTEM THEREOF

The utility model discloses portable holographic image equipment and a holographic image system thereof. The portable hologram apparatus includes: projector body, base and connecting device. The projector body is arranged on the base through the connecting device. The projector body is provided with a protective shell and a projection lens. Wherein, connecting device includes: the connecting piece, locking swinging block and limit the subassembly of changing, offered the spout on the base, the connecting piece goes up and down to locate in the spout, and locking swinging block passes through the torsional spring to be located on the base. The connecting piece is provided with an extension sleeve, the protective shell is provided with an inner sleeve, and the extension sleeve is sleeved on the inner sleeve; the inner sleeve is provided with a boss, the rotation limiting assembly is arranged in the boss and comprises a telescopic block and an unlocking block, the telescopic block is propped against the inner wall of the extension sleeve through a spring, and the protective shell is provided with a rotatable driving turntable. The portable holographic imaging equipment can be conveniently carried and carried, and the projection angle of the portable holographic imaging equipment can be kept stable after erection, so that the portable holographic imaging equipment is convenient for exhibition to be arranged on the site.



CLAIM 1. A portable holographic imaging device, comprising: the projector comprises a projector body, a base and a connecting device, wherein the projector body is arranged on the base in a lifting or rotating manner through the connecting device; the projector body is provided with a protective shell and a projection lens arranged on the protective shell; the connecting device comprises: the device comprises a base, a connecting piece, a locking swing block and a rotation limiting assembly, wherein the base is provided with a chute, the connecting piece is arranged in the chute in a lifting manner, the locking swing block is arranged on the base through a torsion spring, and the locking swing block is used for limiting lifting and sliding of the connecting piece; the rotation limiting assembly is used for limiting the relative rotation between the protective shell and the connecting piece; an extension sleeve is arranged on the connecting piece, an inner sleeve is arranged on the protective shell, and the extension sleeve is sleeved on the inner sleeve; the inner sleeve is provided with a boss, the rotation limiting assembly is arranged in the boss, the rotation limiting assembly comprises a telescopic block and an unlocking block, the telescopic block is propped against the inner wall of the extension sleeve through a spring, and the unlocking block drives the telescopic block to be separated from the inner wall of the extension sleeve; the boss of the protective shell is internally provided with a rotatable driving turntable, and the driving turntable is used for pushing the unlocking block.

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

N10027

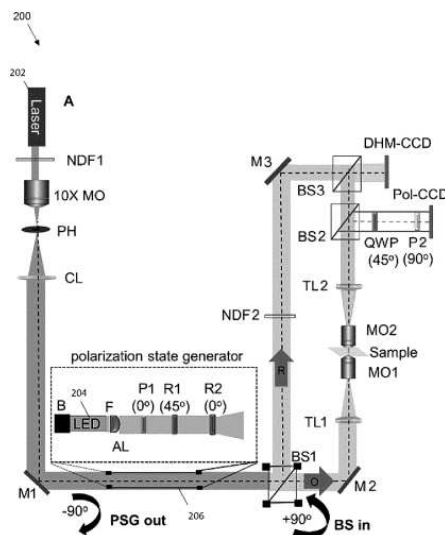
US20240077711

Priority Date: 22/12/2021

RAUB CHRISTOPHER B. | LAM VAN KHA | NEHMETALLAH GEORGE

APPARATUS, OPTICAL SYSTEM, AND METHOD FOR DIGITAL HOLOGRAPHIC AND POLARIZATION MICROSCOPY

A microscope, a method, and a system are provided. A system includes a first optical system, a second optical system, and one or more processors. The first optical system is configured to generate an optical phase signal associated with a first image of a sample in a first field of view. The second optical system is configured to generate a polarized signal associated with a second image of the sample in a second field of view. The one or more processors is configured to generate a co-registered phase and polarization information map based on the optical phase signal and the polarized signal. The first field of view is the same as the second field of view. The first image and the second image are captured sequentially.



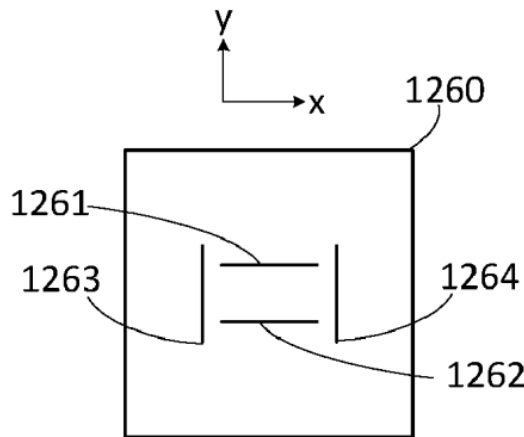
CLAIM 1. A system comprising: a first optical system configured to generate an optical phase signal associated with a first image of a sample in a first field of view; a second optical system configured to generate a polarized signal associated with a second image of the sample in a second field of view; and one or more processors configured to generate a co-registered phase and polarization information map based on the optical phase signal and the polarized signal, wherein the first field of view is the same as the second field of view and wherein the first image and the second image are captured sequentially.

HOLOGRAPHIC METROLOGY APPARATUS AND METHOD

A method of determining a parameter of interest of a structure comprising at least one first feature oriented along a first axis of a structure coordinate system and at least one second feature oriented along a second axis of the structure coordinate system. The method comprising: illuminating the first feature and the second feature with first illumination from a first direction oblique to said first axis and second axis, so as to generate first scattered radiation from the first feature and second scattered radiation from the second feature, detecting a first interference pattern formed by interference between a portion of the first scattered radiation and first reference illumination; detecting a second interference pattern formed by interference between a portion of the second scattered radiation and the first reference illumination; and determining the parameter of interest of the structure using the first interference pattern and the second interference pattern.

APPAREIL ET PROCÉDÉ DE MÉTROLOGIE HOLOGRAPHIQUE

Un procédé permettant de déterminer un paramètre d'intérêt d'une structure comprenant au moins une première caractéristique orientée le long d'un premier axe d'un système de coordonnées de structure et au moins une seconde caractéristique orientée le long d'un second axe du système de coordonnées de structure. Le procédé consiste à : éclairer la première caractéristique et la seconde caractéristique avec un premier éclairage à partir d'une première direction oblique par rapport audit premier axe et audit second axe, de façon à générer un premier rayonnement diffusé à partir de la première caractéristique et un second rayonnement diffusé à partir de la seconde caractéristique ; détecter un premier motif d'interférence formé par une interférence entre une partie du premier rayonnement diffusé et un premier éclairage de référence ; détecter un second motif d'interférence formé par une interférence entre une partie du second rayonnement diffusé et le premier éclairage de référence ; et déterminer le paramètre d'intérêt de la structure à l'aide du premier motif d'interférence et du second motif d'interférence.



CLAIM 1. A holographic metrology apparatus comprising: a sensor module; a substrate support for supporting a substrate comprising a structure, the structure comprising at least one first feature oriented along a first axis of a structure coordinate system and at least one second feature oriented along a second axis of the structure coordinate system; and a reference illumination device for generating first reference illumination; wherein the sensor module comprises: an illumination device comprising at least one illuminator being operable to illuminate the structure with a first illumination from a first direction oblique to said first axis and second axis, so as to generate first scattered radiation from the first feature and second scattered radiation from the second feature; an optical system being operable to capture said first scattered radiation and second scattered radiation; and a detector operable to detect a first interference pattern formed by interference between a portion of the first scattered radiation and first reference illumination and a second interference pattern formed by interference between a portion of the second scattered radiation and the first reference illumination.

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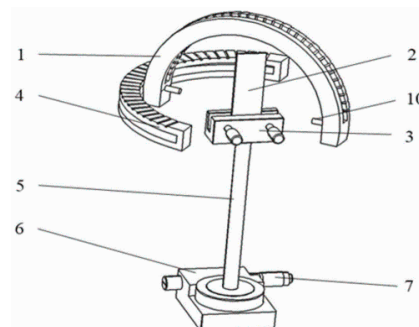
CN117666111

Priority Date: 30/11/2023

CHINA UNIVERSITY OF GEOSCIENCES WUHAN

MAGNETIC FIELD THREE-DIMENSIONAL VISUALIZATION DEVICE AND METHOD BASED ON COAXIAL HOLOGRAPHIC MICROSCOPE

The invention provides a magnetic field three-dimensional visualization device and method based on a coaxial holographic microscope, comprising a loading table, a magnetic field adjusting frame, a microfluidic chip and a coaxial holographic microscope system; the microfluidic chip is fixed on the loading table; the magnetic field adjusting frame is provided with symmetrically arranged magnets; the microfluidic chip is provided with a micro-channel structure, and a magnetic fluid sample loaded on the microfluidic chip is in a suspension state; the laser of the coaxial holographic microscopic system emits laser beams which pass through the microfluidic chip and the magnetic fluid to interfere and then pass through the microscopic objective lens, the laser beams are collimated by the collimating lens and are gathered by the gathering ocular lens, and the laser beams are received by the CCD camera and are subjected to imaging record so as to obtain holographic images. The beneficial effects of the invention are as follows: the device provided by the invention is based on the coaxial holographic microscope technology, can effectively measure the magnetic field distribution in the chip, and improves the flexibility and accuracy of magnetic force control. Meanwhile, the accuracy of magnetic field measurement and the convenience of operation are obviously improved through a digital reconstruction technology.



CLAIM 1. A magnetic field three-dimensional visualization device based on a coaxial holographic microscope is characterized in that: comprises a loading table, a magnetic field adjusting frame, a microfluidic chip and a coaxial holographic microscopic system; the microfluidic chip is fixed on the loading table; the magnetic field adjusting frame is provided with symmetrically arranged magnets, and is used for adjusting the space pose of the magnets so as to adjust the direction of a magnetic field passing through the microfluidic chip; the micro-fluidic chip is provided with a micro-channel structure which allows the magnetic fluid sample loaded on the micro-fluidic chip to be in a suspension state; the coaxial holographic microscopic system is arranged relative to the microfluidic chip and comprises a CCD camera, a laser, a microobjective lens, a collimating lens and a focusing eyepiece, wherein laser beams emitted by the laser pass through the microfluidic chip and interfere with magnetic fluid and then pass through the microobjective lens, and the light beams are collimated by the collimating lens and focused by the focusing eyepiece and then received by the CCD camera for imaging recording so as to obtain holographic images.

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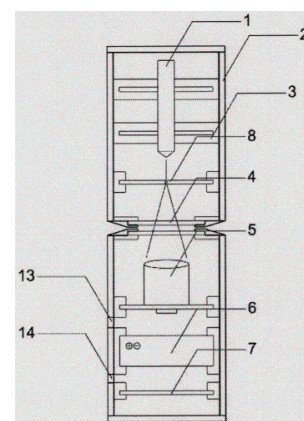
CN117664808

Priority Date: 15/08/2022

WANG YETIAN | SUN TIANXING | TAN HUAJIE

UNDERWATER LASER HOLOGRAPHIC MICROSCOPE

The disclosure is applicable to the technical field of laser detection, and provides an underwater laser holographic microscope, which comprises a laser control system, a micro-pore plate, a CMOS camera, a glass slide, a shell, a circuit board, a singlechip and a power supply device. The laser control system comprises a laser, a steering engine, a nut bolt and a fastening ring, wherein the steering engine is connected with the shell through the fastening ring, the joint part of the steering engine and the fastening ring is connected with the shell through the nut bolt, a part of hollow parts are arranged on the side face of the shell, liquid can pass through the hollow parts, the laser and the CMOS camera are respectively fixed at the bottoms of the two ends of the shell, the single chip microcomputer is arranged outside the shell and connected with the CMOS camera through a circuit, the circuit board, the laser and the CMOS camera are all connected with a power supply device, and when the device is started, the single chip microcomputer restores images according to a preset program through diffraction signals received by the CMOS camera, so that the purpose of microscopic observation is achieved. The device amplifies microscopic substances according to the holographic microscopic imaging principle, and can realize high-definition observation.



CLAIM 1. An underwater laser holographic microscope, wherein the underwater laser holographic microscope comprises: the device comprises a shell, a laser control system, a micro-pore plate, a CMOS camera, a glass slide, a shell, a circuit board, a singlechip, a power supply device and a waterproof system, wherein the shell is divided into an element area and a liquid area, and the device is characterized in that the shell is completely sealed.

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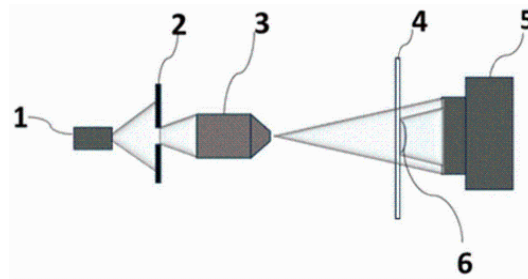
CN117631245

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 MICRO-LED MICROARRAY LIGHT SOURCE

The invention relates to the technical field of optical microscopic imaging, and provides a multispectral digital holographic microscopy system and a multispectral digital holographic microscopy method based on a Micro-LED microarray light source. The adjustable aperture diaphragm receives and limits an illumination LED light source sent by the Micro-LED microarray 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, and the scattered light and the unscattered light interfere to generate a multispectral digital hologram. 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 application realizes the color digital holographic Micro reconstruction through the Micro-LED Micro array light source.



CLAIM 1. A multispectral digital holographic microscopy system based on a Micro-LED microarray light source, comprising: the Micro-LED Micro-array light source is used for providing illumination LED light sources with different wave bands; the adjustable aperture diaphragm is used for receiving the illumination LED light source sent by the Micro-LED microarray light source and limiting the light beam of the illumination LED light source; the Micro objective lens is used for receiving the limited illumination LED light source, wherein the adjustable aperture diaphragm and the Micro objective lens are arranged next to the Micro-LED Micro array 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 Micro-LED Micro array 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 generated scattered light and the unscattered light to generate a corresponding multispectral digital hologram; 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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PATENT REFERENCE – See the table at the end of this document

N10020

WO202454731

Priority Date: 09/09/2022

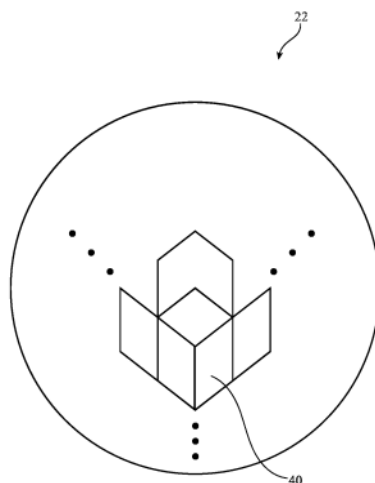
APPLE

REFLECTIVE STRUCTURES

A holographic reflective structure, such as a holographic retroreflector, may be incorporated into a system. The holographic retroreflector may include a hologram film on a body or other portion of the system, and a physical retroreflector may be recorded onto the hologram film. As a result, the holographic retroreflector may appear reflective when viewed on-axis, while appearing transparent when viewed off-axis. In this way, when an observer views the holographic retroreflector off-axis, the observer may see the underlying portions of the system without seeing the retroreflector. The holographic retroreflector may be applied over a metal, glass, or plastic portion of the system, and a protective layer may be applied over the holographic retroreflector to protect the holographic retroreflector from damage and degradation.

STRUCTURES RÉFLÉCHISSANTES

L'invention concerne une structure réfléchissante holographique, telle qu'un rétroreflecteur holographique, qui peut être incorporée dans un système. Le rétroreflecteur holographique peut comprendre un film d'hologramme sur un corps ou une autre partie du système, et un rétroreflecteur physique peut être enregistré sur le film d'hologramme. Par conséquent, le rétroreflecteur holographique peut apparaître de manière réfléchissante lorsqu'il est vu sur l'axe, tout en apparaissant transparent lorsqu'il est vu hors axe. De cette manière, lorsqu'un observateur regarde le rétroreflecteur holographique hors de l'axe, l'observateur peut voir les parties sous-jacentes du système sans voir le rétroreflecteur. Le rétroreflecteur holographique peut être appliqué sur un métal, un verre ou une partie en plastique du système, et une couche de protection peut être appliquée sur le rétroreflecteur holographique pour protéger le rétroreflecteur holographique des dommages et de la dégradation.



CLAIM 1. A holographic retroreflector for a vehicle, comprising: a base layer; a hologram film on the base layer, wherein a retroreflector is recorded onto the hologram film, the hologram film reflects incident light when an observer views the hologram film on-axis, and the hologram film is transparent when the observer views the hologram film off-axis; and a protective coating that overlaps the hologram film.

N10023

WO202450321

Priority Date: 29/08/2022

REGENTS OF THE UNIVERSITY OF CALIFORNIA

VIRTUAL IMPACTOR-BASED LABEL-FREE PARTICULATE MATTER DETECTION USING HOLOGRAPHY AND DEEP LEARNING

A particulate matter detection device takes holographic images of flowing particulate matter concentrated by a virtual impactor, which selectively slows down and guides larger particles to fly through an imaging window. The flowing particles are illuminated by a pulsed laser diode, casting their inline holograms on a CMOS image sensor in a lens-free mobile imaging device. The illumination contains three short pulses with a negligible shift of the flowing particle within one pulse and triplicate holograms of the same particle are recorded at a single frame revealing different perspectives of each particle. A deep neural network classifies the particles based on the acquired holographic images. The device was tested using different types of pollen and achieved a blind classification accuracy of 92.91%. This mobile and cost-effective device weighs ~700 g and can be used for label-free sensing and quantification of various bio-aerosols over extended periods.

DÉTECTION DE MATIÈRE PARTICULAIRE SANS ÉTIQUETTE BASÉE SUR UN IMPACTEUR VIRTUEL À L'AIDE D'UNE HOLOGRAPHIE ET D'UN APPRENTISSAGE PROFOND

Un dispositif de détection de matière particulaire prend des images holographiques de matière particulaire en écoulement concentrée par un impacteur virtuel, qui ralentit et guide sélectivement des particules plus grandes pour voler à travers une fenêtre d'imagerie. Les particules en écoulement sont éclairées par une diode laser pulsée, en coulant leurs hologrammes en ligne sur un capteur d'image CMOS dans un dispositif d'imagerie mobile sans lentille. L'éclairage contient trois impulsions courtes avec un décalage négligeable de la particule en écoulement à l'intérieur d'une impulsion et des hologrammes en triple de la même particule sont enregistrés au niveau d'une seule trame révélant différentes perspectives de chaque particule. Un réseau de neurones artificiels classe les particules sur la base des images holographiques acquises. Le dispositif a été testé à l'aide de différents types de pollen et a atteint une précision de classification aveugle de 92,91 %. Le présent dispositif mobile et rentable pèse environ 700 g et peut être utilisé pour la détection et la quantification sans étiquette de divers bio-aérosols sur des périodes prolongées.

CLAIM 1. A particulate matter detection device comprising: an air sampler having an inlet for receiving air having particles therein and comprising a virtual impactor comprising a main channel intersecting with one or more bypass channels, wherein the main channel comprises an optically transparent imaging window; a pulsed light source disposed on a first side of the imaging window; an image sensor disposed on a second, opposing side of the imaging window; wherein the image sensor captures holographic image(s) of the particles passing through the imaging window, wherein each holographic image contains one or more holograms cast by the particles at different times in response to one or more pulse(s) of the light source.

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US20240070255

Priority Date: 26/08/2022

IBM

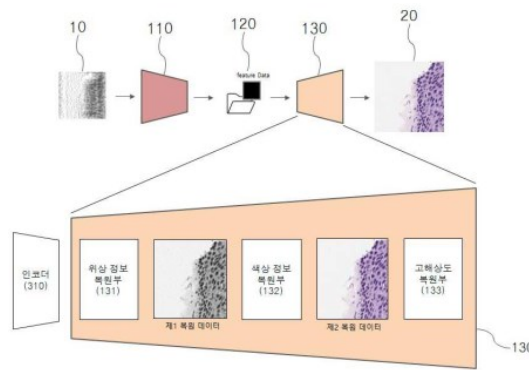
CONTINUOUS AUTHENTICATION FOR A REAL TIME HOLOGRAM

Provided are techniques for continuous authentication for a real time hologram. A request and a hologram are received, where the hologram is embedded with a first key phrase in accordance with a first sequence, and where the first sequence indicates which portions of the first key phrase are embedded in specific locations of the hologram. A first seed and a second seed are retrieved. A second key phrase is generated using the first seed. A second sequence is generated using the second seed. It is determined whether portions of the second key phrase are embedded in specific locations of the hologram in accordance with the second sequence. In response to determining that the portions of the second key phrase are embedded in specific locations of the hologram in accordance with the second sequence, the hologram is displayed, and the request is processed. Otherwise, the request is rejected.

CLAIM 1. A computer-implemented method, comprising operations for: receiving a request and a hologram, wherein the hologram is embedded with a first key phrase in accordance with a first sequence, and wherein the first sequence indicates which portions of the first key phrase are embedded in specific locations of the hologram; retrieving a first seed and a second seed; generating a second key phrase using the first seed; generating a second sequence using the second seed; determining whether portions of the second key phrase are embedded in specific locations of the hologram in accordance with the second sequence; in response to determining that the portions of the second key phrase are embedded in specific locations of the hologram in accordance with the second sequence, displaying the hologram; and processing the request; and in response to determining that the portions of the second key phrase are not embedded in specific locations of the hologram in accordance with the second sequence, rejecting the request.

GAN-BASED ARTIFICIAL INTELLIGENCE HOLOGRAM IMAGE RESTORATION METHOD AND SYSTEM THEREOF

Disclosed are a system and a method for reconstructing an artificial intelligence hologram image based on a GAN. A system for reconstructing a GAN-based artificial intelligence holographic image according to an embodiment of the present invention comprises: a compression unit for receiving a single holographic image in which optical field information is omitted, extracting feature information by analyzing a data distribution of the holographic image, and compressing the single holographic image into feature map data based on the extracted feature information; a storage unit for storing the feature map data in a predetermined DB; a reconstruction unit for generating a reconstructed image for the feature map image stored in the storage unit; and a learning unit for subjecting the compression unit and the reconstruction unit to unsupervised learning based on a GAN algorithm.



CLAIM 1. A system for reconstructing a hologram image based on a GAN, the system comprising: a compression unit configured to receive a single hologram image from which optical field information is omitted, extract feature information by analyzing a data distribution of the single hologram image, and compress the single hologram image into feature map data based on the extracted feature information; a storage unit configured to store the feature map data in a predetermined database; a reconstruction unit configured to generate a reconstructed image with respect to the feature map image stored in the storage unit; and a learning unit configured to perform unsupervised learning of the compression unit and the reconstruction unit based on a GAN algorithm, wherein the reconstruction unit comprises: a phase information reconstruction unit configured to perform pre-learning of a process of reconstructing phase information, color information, and resolution of the feature map data, based on a preset initial weight, and reconstruct phase information of the feature map data; a color information reconstruction unit configured to reconstruct color information of the first reconstructed data reconstructed from the phase information reconstruction unit; and a resolution reconstruction unit configured to reconstruct a resolution of the second reconstructed data reconstructed from the color information reconstruction unit, wherein an optimal weight value for reconstructing the phase information, the color information, and the resolution is determined in the pre-learning process, wherein, when the pre-learning is completed, the reconstruction process of the feature map data is performed by the network engine by connecting the phase information, the color information, and the resolution of the reconstruction unit, wherein the phase information reconstruction unit receives at least one network engine to generate the phase map data, wherein the phase information of the phase information and the image reconstruction unit is performed by receiving the learning image data

A system for reconstructing a hologram image based on a GAN, the system comprising: a pre-learning unit configured to pre-learn a process of reconstructing phase information based on learning feature map data generated from the pre-learning unit, wherein the learning unit comprises: a generation unit configured to compress an input original image into feature map data and generate a reconstructed image from the feature map data; and a determination unit configured to compare the reconstructed image generated by the generation unit with the original image to determine whether the reconstructed image is genuine, wherein the unsupervised learning is terminated when it is determined by the determination unit that the reconstructed image is not genuine, wherein the system for reconstructing a hologram image based on a GAN comprises: a first step of pre-learning the process of reconstructing phase information, color information, and resolution of at least one feature map data based on a preset initial weight; a second step of determining an optimal weight and forming a network engine when the pre-learning is terminated in the first step; a third step of unsupervised learning the process of extracting and compressing feature map data from at least one hologram image and the process of reconstructing the hologram image from the feature map data; and a fourth step of receiving the hologram image based on the compression and reconstruction process in which the unsupervised learning is completed, compressing the hologram image into the feature map data, and reconstructing the compressed feature map data based on a predetermined user control signal.

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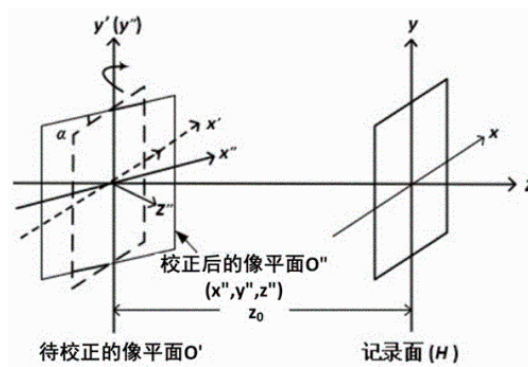
CN117705001

Priority Date: 05/02/2024

SHANXI INSTITUTE OF SCIENCE & TECHNOLOGY

DIGITAL HOLOGRAPHIC OBJECT MORPHOLOGY MEASURING DEVICE AND METHOD BASED ON CONCAVE MIRROR

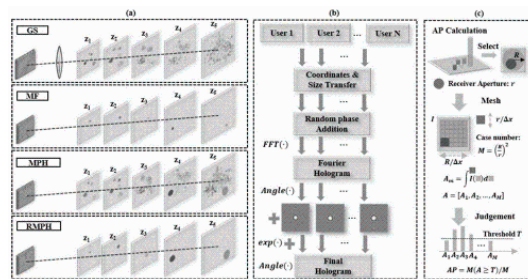
The invention discloses a digital holographic object morphology measuring device and method based on a concave mirror, and belongs to the technical field of photoelectric detection. The method comprises the following steps: the laser emitted by the laser is changed into parallel light after passing through the beam expanding and collimating system, and is divided into two parallel light waves through a beam splitter; one of the parallel light waves is reflected by the sample to be detected to carry object information and become object light waves; the other beam of parallel light waves is reflected by the concave mirror to become spherical reference light waves; after the object light wave and the reference light wave interfere on the target surface of the detector, recording a lens-free Fourier transform off-axis digital hologram through the detector; the phase information of the measured sample is obtained by processing the lens-free Fourier transform off-axis digital hologram through a computer, and the morphology height of the measured sample is obtained through the relation between the phase and the optical path. The system has the advantages of simple structure, high measurement speed and strong environmental noise resistance.



CLAIM 1. The digital holographic object morphology measuring method based on the concave mirror is characterized by comprising the following steps of: parallel light wave acquisition: dividing laser emitted by a laser into two parallel light waves by a beam splitter; and (3) object light wave acquisition: irradiating the measured sample by a beam of parallel light waves to obtain object light waves; a reference light wave acquisition step: the concave mirror is irradiated by another beam of parallel light wave irradiation to obtain a reference light wave; a digital hologram acquisition step: after the object light wave and the reference light wave interfere on the target surface of the detector, recording a lens-free Fourier transform off-axis digital hologram generated by interference through the detector; a step of obtaining morphological characteristics: and obtaining phase information of the measured sample according to the lens-free Fourier transform off-axis digital hologram, and obtaining the morphology height of the measured sample according to the phase information by a relation between phase and optical path.

METHOD FOR REALIZING MULTI-USER VISIBLE LIGHT COMMUNICATION BY USING RANDOM PHASE MULTI-PLANE HOLOGRAPHIC MODE

The invention belongs to the technical field of visible light communication, and particularly relates to a method for realizing high-multiuser visible light communication by using a random phase multi-plane holographic mode. The invention uses the high-dimensional orthogonal random vector to realize the depth multiplexing multi-user hologram, and effectively solves the problem of crosstalk of targets with different depths; and the size and the position of a known target in a source field are calculated based on a holographic image reconstruction process and Fresnel transformation, so that the positions and the receiving ranges of a plurality of users are accurately controlled. Experimental results indicate that the power variation of the inventive method is only about 2dB compared to the power variation of the multiple Fresnel lens method of up to 10.9 dB. Furthermore, the inventive method shows superior positioning and communication capabilities, with an 8.41dB increase in power at the edge of the reception range compared to other methods. The present invention provides high quality communications to users in different 3D locations simultaneously, for the first time when a single transmitter is available.



CLAIM 1. a method for realizing multi-user visible light communication by using a random phase multi-plane holographic mode is characterized in that crosstalk between multi-plane holograms is weakened by using a random phase, multi-user holograms with different depths are realized, and control of different user receiving ranges is realized; the method comprises the following specific steps of (1) Generating an RMPH hologram; knowing the spatial position (x, y, z) and the reception radius range R, the sampling interval Δx of the user plane at the spatial position z is, from the fresnel approximation in Rayleigh-Sommerfield diffraction, known: $\Delta x = z\lambda / (N\Delta x_0)$, (1) where λ is the wavelength of the signal light, N is the number of sampling points of the source field hologram, Δx_0 For the corresponding sampling interval, the user corresponding source field reception radius magnification is calculated therefrom: $\alpha = \Delta x / \Delta x_0$; (2) the abscissa of the source field is as follows: $x_0 = x/\alpha, y_0 = y/\alpha$; (3) for controlling different depths, fresnel zone plates with different focal lengths f need to be overlapped, and the complex amplitude formula of the fresnel zone plate is known as follows: $F(x,y,f) = \exp[-j\pi f/\lambda(x^2 + y^2)]$, (4) the fresnel phase diagram is loaded through the SLM to satisfy the nyquist sampling theorem: $\Delta x_0 \leq 2\max(f_x, f_y)$ And from fourier analysis, the spatial frequency of the fresnel zone plate: $(f_x, f_y) = (x/\lambda f, y/\lambda f)$, then the minimum focal length of the fresnel stripe sheet loaded by the SLM should satisfy: as known from the digital hologram technology, for a single target user, after the calculation of the accurate space position and size is considered, the distribution of the target electric field is $E(x, y)$, the $E(x, y)$ and the corresponding digital hologram $H(\zeta, \eta)$ meet the Fourier transform relation, and the random phase $\phi(x, y)$ is superimposed on the target user electric field before hologram so as to weaken the crosstalk between the multi-plane holograms; loading random phase $\phi_1(x, y)$ and $\phi_2(x, y)$, the random phase is an N-dimensional random vector uniformly distributed in $(0, 2\pi)$, and the inner product of the two is expressed as: as is known from the law of large numbers, when the dimension N of the random phase is sufficiently large, order of (A) According to the central limit theorem \rightarrow Therefore, the inner product P is When N is large enough, the inner product decays rapidly to 0, so that $\phi_1(x, y)$ and $\phi_2(x, y)$ are orthogonalized; thus, to the target electric field $E_1(x, y)$ and $E_2(x, y)$ adding $\phi_1(x, y)$ and $\phi_2(x, y)$ generating a hologram, expressed as: wherein, ξ and η represent the spatial electric field distribution on the SLM respectively, and the orthogonality is verified by conjugate multiplication integral of the two: as N increases, $\phi_1(x, y) \neq \phi_2(x, y)$ The greater the probability of (x, y), $H_1(\zeta, \eta)$ and $H_2(\zeta, \eta)$ orthogonality increases, and thus the crosstalk decreases; depth multiplexing is achieved by superimposing the holograms with fresnel zones $F(\zeta, \eta, z)$ of different focal lengths, the RMPH hologram being represented as follows: wherein $E_i(x, y)$ represents a depth z_i Distribution of target electric field $\phi_i(x, y)$ represents the random phase distribution n at this time; (2) Reconstructing electric field distribution; multiplexing hologram H generated by RMPH method MUX The reconstructed electric field distribution of (ζ, η) at the target position z is expressed as: defining a convolution operator: $E_z(x, y)$ is represented as $H_{RMPH} A$ convolution operation of (ζ, η) and $h(\zeta, \eta)$, a reconstruction electric field distribution is obtained by using a fast Fourier transform algorithm FFT (), and an inverse Fourier transform algorithm IFFT (): $E_z(x, y) = \text{IFFT}\{\text{FFT}[H_{RMPH}(\zeta, \eta)] \cdot \text{FFT}[h(\zeta, \eta)]\}$ (11).

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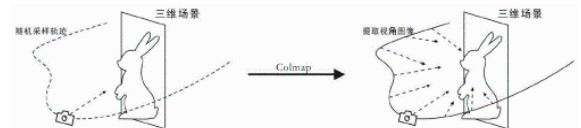
CN117687284

Priority Date: 15/12/2023

CHINESE PEOPLE S LIBERATION GROUND FORCE ARMORED TROOP ACADEMY

HOLOGRAPHIC STEREOGRAM PRINTING METHOD, SYSTEM AND EQUIPMENT

The invention discloses a holographic stereogram printing method, a holographic stereogram printing system and holographic stereogram printing equipment, and relates to the technical field of holographic stereograms. The method comprises the following steps: acquiring a random image of a three-dimensional scene; preprocessing the random image to obtain a visual angle image and camera parameters; based on the visual angle image and camera parameters, learning a three-dimensional scene by adopting a neural network; determining a camera array based on the constraint conditions; rendering parallax images corresponding to the camera arrays through the three-dimensional scenes learned by the neural network; based on the parallax image, a segmentation and recombination algorithm is adopted to obtain a synthesized parallax image; printing of the holographic volume view is accomplished from the composite parallax image. The holographic stereogram printing method, the holographic stereogram printing system and the holographic stereogram printing equipment simplify the sampling flow, can sample a large scene, and can effectively improve the printing efficiency.



CLAIM 1. A holographic stereogram printing method, comprising: acquiring a random image of a three-dimensional scene; preprocessing the random image to obtain a visual angle image and camera parameters; based on the visual angle image and camera parameters, learning a three-dimensional scene by adopting a neural network; determining a camera array based on the constraint conditions; rendering parallax images corresponding to the camera arrays through the three-dimensional scenes learned by the neural network; based on the parallax image, a segmentation and recombination algorithm is adopted to obtain a synthesized parallax image; printing of the holographic volume view is accomplished from the composite parallax image.

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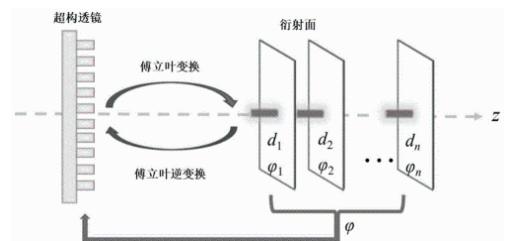
CN117666119

Priority Date: 19/10/2023

SOUTH CHINA NORMAL UNIVERSITY

SUPER-STRUCTURED LENS PHASE OPTIMIZATION METHOD BASED ON LONG FOCAL DEPTH HOLOGRAPHIC ALGORITHM AND SUPER-STRUCTURED LENS

The invention relates to a super-structured lens phase optimization method based on a long focal depth holographic algorithm, which comprises the following steps: dispersing an axial focal plane corresponding to a target working band of the super-structured lens into a plurality of equally-spaced diffraction surfaces with the same focusing light field distribution; and adopting a three-dimensional holographic algorithm based on a GS algorithm to carry out Fresnel diffraction transformation processing on the incident light complex amplitude of each diffraction surface, taking the optimized phase of the previous diffraction surface as the incident initial phase of the next diffraction surface to obtain holographic phases of all diffraction surfaces, and obtaining an optimal phase distribution matrix of the super-structured lens by evaluating whether the light intensity distribution of the diffraction surface corresponding to the holographic phases meets the requirement of cyclic iteration or not so as to expand the focal point of the super-structured lens to a long focal depth. The design method of the long-focal-depth broadband achromatic super-structured lens has the advantages that the focusing range of the maximum wavelength and the minimum wavelength of the working wave band is overlapped, the compensation phase required by broadband achromatism is effectively reduced, and the aspect ratio of the nano-structure unit is further reduced.



CLAIM 1. The super-structure lens phase optimization method based on the long focal depth holographic algorithm is characterized in that an axial focal plane corresponding to a target working wave band of the super-structure lens is discretized into a plurality of equally-spaced diffraction surfaces with the same focusing light field distribution; stacking target images corresponding to different diffraction planes into an ideal three-dimensional holographic image by adopting a three-dimensional holographic algorithm based on a Gerchberg-Saxton algorithm, and taking the optimized phase of the previous diffraction plane as the initial incident phase of the next diffraction plane in the diffraction transformation processing process of the incident light complex amplitude of each diffraction plane to obtain the holographic phase of each diffraction plane; and evaluating whether the intensity distribution of the light of the diffraction surface corresponding to the holographic phase meets the requirement of the amplitude cyclic iteration of the incident light or not, so as to obtain an optimal phase distribution matrix of the super-structured lens, and expanding the focal point of the super-structured lens to a long focal depth.

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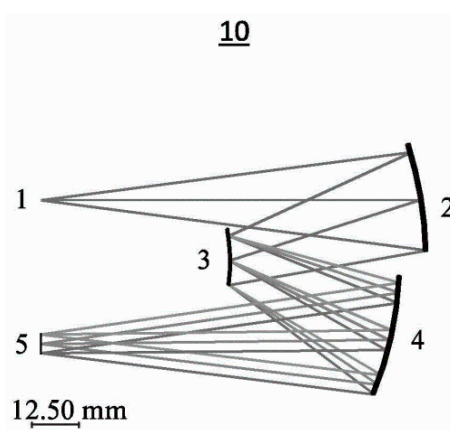
CN117629408

Priority Date: 17/10/2023

FOXCONN TECHNOLOGY | TSINGHUA UNIVERSITY

HOLOGRAPHIC GRATING EXPOSURE SYSTEM, HOLOGRAPHIC GRATING AND HOLOGRAPHIC GRATING IMAGING SPECTROMETER

The invention relates to a holographic grating imaging spectrometer, comprising: the holographic grating exposure system comprises two coherent light sources and at least one free-form surface auxiliary mirror, wherein the free-form surface auxiliary mirror is arranged between one light source and the reflecting mirror. The invention relates to a holographic grating exposure system, which comprises two coherent light sources and at least one free-form surface auxiliary mirror, wherein the free-form surface auxiliary mirror is arranged between one light source and a holographic grating substrate reflector. In addition, the invention also relates to a holographic grating, which is formed by the holographic grating exposure system.



CLAIM 1. A holographic grating imaging spectrometer, comprising: the holographic grating exposure system comprises two coherent light sources and at least one free-form surface auxiliary mirror, wherein the free-form surface auxiliary mirror is arranged between one light source and the reflecting mirror.

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HOLOGRAMS - 11 PATENTS

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P37423	WO	202456131	21/03/2024	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	15/09/2022	DE102022003402	WO202456131 DE102022003402	OPTICAL SECURITY ELEMENT WITH EFFECT REGIONS	OVD
P37424	WO	202456130	21/03/2024	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	15/09/2022	DE102022003401	WO202456130 DE102022003401	OPTICAL SECURITY ELEMENT HAVING EFFECT REGIONS	OVD
P37425	WO	202453794	14/03/2024	KOREA ELECTRONICS TECHNOLOGY INSTITUTE	KR	07/09/2022	KR2022000113649	WO202453794	METHOD AND USER TERMINAL FOR READING HOLOGRAM SECURITY CODE	
P37427	WO	202452256	14/03/2024	COVESTRO DEUTSCHLAND	EP	07/09/2022	EP2219000004271	WO202452256	SPECIFIC BENZOPYRYLIUM SALTS AS DYESTUFFS FOR PHOTOPOLYMER COMPOSITIONS	
P37435	WO	202441708	29/02/2024	BINDER, PAUL	DE	25/08/2022	DE102022121572	WO202441708	METHOD FOR STORING MODIFIABLE INFORMATION IN A SECURE MANNER AGAINST FALSIFICATION, METHOD FOR CHECKING THE ANTI-FALSIFICATION SECURITY OF INFORMATION, AND DEVICE	
P37448	SK	202300010	28/02/2024	LAKATOS JAN	SK	31/01/2023	SK1020000000023	SK202300010U	LICENCE PLATE, WITH APPLIED VALIDATION, MULTIFUNCTIONAL INDICATIVELY-SECURITY ELEMENTS AND A METHOD OF THEIR APPLICATION	
P37471	FR	3139501	15/03/2024	BARTOLI SABINE	FR	14/09/2022	FR22090000000251	FR3139501	SYSTEM FOR DEPOSITING A HOLOGRAPHIC OR THREE-DIMENSIONAL SECURITY ON A ROLL FOR SUPPORTING SECURE TITLES BY MEANS OF A HEATING PUNCH	
P37502	CN	117724318	19/03/2024	HANGZHOU CITY BRAIN	CN	19/12/2023	CN2023011752581	CN117724318	HOLOGRAPHIC ANTI-COUNTERFEITING METHOD AND DEVICE FOR ELECTRONIC IDENTITY CARD BASED ON MOBILE EQUIPMENT STATE	
P37504	CN	117698314	15/03/2024	SHANTOU JIAXIN PACKING MAT	CN	05/02/2024	CN2024010163958	CN117698314	PREPARATION METHOD OF HOLOGRAPHIC POSITIONING MEDIUM TRANSFER PAPER	
P37508	CN	117687283	12/03/2024	BEIJING UNIVERSITY OF TECHNOLOGY	CN	27/12/2023	CN2023011822279	CN117687283	MICROCOLUMN RECONFIGURABLE ANTI-COUNTERFEITING HOLOGRAM PREPARED BASED ON FEMTOSECOND LASER TWO-PHOTON POLYMERIZATION	
P37519	CN	117610600	27/02/2024	SHANGHAI NUO BIAO SECURITY TECHNOLOGY DEVELOPMENT	CN	08/11/2023	CN2023011484295	CN117610600	METHOD FOR MAKING AND VERIFYING FRAGILE ORIENTATION FEATURE IDENTIFICATION OF INTELLIGENT HOLOGRAPHIC RAINBOW RANDOM PARTICLES	

VARIOUS OPTICAL EFFECTS - 18 PATENTS

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P37423	WO	202456131	21/03/2024	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	15/09/2022	DE102022003402	WO202456131 DE102022003402	OPTICAL SECURITY ELEMENT WITH EFFECT REGIONS	Hologram
P37424	WO	202456130	21/03/2024	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	15/09/2022	DE102022003401	WO202456130 DE102022003401	OPTICAL SECURITY ELEMENT HAVING EFFECT REGIONS	Hologram
P37429	WO	202447285	07/03/2024	IDEMIA	FR	02/09/2022	FR2022000051660	WO202447285	LAMINATED CARD COMPRISING A THERMOCHROMIC PATTERN AND METHOD FOR MANUFACTURING SUCH A CARD	
P37430	WO	202447258	07/03/2024	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	02/09/2022	DE102022003230	WO202447258 DE102022003230	SECURITY ELEMENT WITH COLOUR-PRODUCING NANOSTRUCTURES AND PRODUCTION METHOD THEREFOR	
P37431	WO	202446529	07/03/2024	GIESECKE DEVRIENT EPAYMENTS	DE	29/08/2022	DE102022003135	WO202446529	CARD-FORM DATA CARRIER HAVING LASER-ACTIVATABLE PIGMENTS, AND METHOD FOR PRODUCING SAME	Microlens
P37436	US	20240092113	21/03/2024	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	21/09/2022	DE102022003473	US20240092113 DE102022003473	SECURITY ELEMENT WITH A MACHINE-READABLE CODE AND METHOD FOR PRODUCING THE SAME	Microlens
P37454	KR	20240023832	23/02/2024	NBST	KR	16/08/2022	KR2022000102023	KR20240023832	FORGERY PREVENTION MEANS APPLICABLE TO BAROMETRIC COLOR AUTHENTICATION AND EXTERNAL STIMULUS AUTHENTICATION AND FORGERY AUTHENTICATION METHOD USING THE SAME	
P37461	JP	2024032319	12/03/2024	TOPPAN HOLDINGS	JP	29/08/2022	JP2022000135911	JP2024032319	ANTI-COPY MEDIUM	
P37464	JP	2024027328	01/03/2024	TOPPAN HOLDINGS	JP	17/08/2022	JP2022000130042	JP2024027328	HOT STAMPING FOIL	
P37474	EP	4338854	20/03/2024	SICPA	EP	20/12/2023	EP2321000008609	EP4338854	PROCESSES FOR PRODUCING OPTICAL EFFECTS LAYERS	

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VARIOUS OPTICAL EFFECTS - 18 PATENTS (continuation)

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P37477	EP	4331856	06/03/2024	THALES DIS	EP	29/08/2022	EP223000006272	WO202446739 EP4331856	COLOR LOCK	Passport
P37485	DE	102022003474	21/03/2024	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	21/09/2022	DE102022003474	DE102022003474	SECURITY ELEMENT WITH A MACHINE-READABLE CODE AND METHOD FOR MANUFACTURING A SECURITY ELEMENT	Microlens
P37487	DE	102022003386	14/03/2024	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	14/09/2022	DE102022003386	DE102022003386	SECURITY ELEMENT WITH NANOSTRUCTURES	
P37499	CN	220520970	23/02/2024	SHANGHAI TECHSUN PACKING MATERIALS	CN	09/01/2024	CN2024020042434	CN220520970U	TRANSFER BASE FILM PAPER AND PREPARATION SYSTEM THEREOF, PACKAGING FILM AND PREPARATION SYSTEM THEREOF	
P37511	CN	117661376	08/03/2024	SHENZHEN JINJIA	CN	03/11/2023	CN2023001145650	CN117661376	PHYSICAL ANTIBACTERIAL TIPPING PAPER FOR CIGARETTES AND PREPARATION METHOD THEREOF	
P37515	CN	117636734	01/03/2024	FEICHENG AGRICULTURAL MACHINERY DEVELOPMENT SERVICE CENTER SHANDONG TAIBAO INFORMATION TECHNOLOGY GROUP	CN	27/12/2023	CN2023011818747	CN117636734	HIDDEN PATTERN INFORMATION ANTI-COUNTERFEITING LABEL, MANUFACTURING METHOD AND IDENTIFICATION METHOD	Microprism
P37517	CN	117624682	01/03/2024	INSTITUTE OF CHEMISTRY - CHINESE ACADEMY OF SCIENCE	CN	10/08/2022	CN2022010957346	CN117624682	MICROSTRUCTURE CAPABLE OF ENHANCING REFLECTION COLOR AND PREPARATION METHOD AND APPLICATION THEREOF	
P37520	CN	117608140	27/02/2024	WUCHANG UNIVERSITY OF TECHNOLOGY	CN	13/07/2023	CN2023010860486	CN117608140	ANTI-COUNTERFEITING METHOD BASED ON LIQUID CRYSTAL MICROLENS ARRAY	Microlens

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N10019	WO	202458438	21/03/2024	SAMSUNG ELECTRONICS	KR	15/09/2022	KR2022000116683	WO202458438	ELECTRONIC DEVICE PROVIDING HOLOGRAPHIC IMAGE AND OPERATING METHOD OF ELECTRONIC DEVICE	
N10020	WO	202454731	14/03/2024	APPLE	US	09/09/2022	US2022063405073	WO202454731	REFLECTIVE STRUCTURES	
N10021	WO	202452497	14/03/2024	CARL ZEISS JENA	DE	08/09/2022	DE102022122856	WO202452497 DE102022122856	CONFIGURATION OF A REPLICATION PROCESS OF A MASTER HOLOGRAPHIC OPTICAL ELEMENT FOR VARIABLE INTENSITY OR POLARISATION	
N10022	WO	202452495	14/03/2024	CARL ZEISS JENA	DE	08/09/2022	DE102022122854	WO202452495 DE102022122854	CONTROL OF A REPLICATION PROCESS OF A MASTER HOLOGRAPHIC OPTICAL ELEMENT FOR VARIABLE INTENSITY OR POLARISATION	
N10023	WO	202450321	07/03/2024	REGENTS OF THE UNIVERSITY OF CALIFORNIA	US	29/08/2022	US2022063373845	WO202450321	VIRTUAL IMPACTOR-BASED LABEL-FREE PARTICULATE MATTER DETECTION USING HOLOGRAPHY AND DEEP LEARNING	
N10024	WO	202448914	07/03/2024	SAMSUNG ELECTRONICS	KR	31/08/2022	KR2022000110034	WO202448914 KR20240030682	DISPLAY DEVICE FOR ACQUIRING HOLOGRAPHIC RESOURCE AND CONTROL METHOD THEREOF	
N10025	US	20240087490	14/03/2024	IBM	US	12/09/2022	US2022017931173	US20240087490	DYNAMIC CORRECTION OF HOLOGRAPHIC CONTENT TO BE DISPLAYED ON A FOLDABLE MOBILE DEVICE	
N10026	US	20240085602	14/03/2024	META PLATFORMS TECHNOLOGIES	US	24/11/2020	US2020017103920	US20240085602	SYSTEM AND METHOD FOR FABRICATING POLARIZATION HOLOGRAMS	
N10027	US	20240077711	07/03/2024	RAUB CHRISTOPHER B. LAM VAN KHA NEHMETALLAH GEORGE	US	22/12/2021	US2021063292575	US20240077711	APPARATUS, OPTICAL SYSTEM, AND METHOD FOR DIGITAL HOLOGRAPHIC AND POLARIZATION MICROSCOPY	
N10028	US	20240070255	29/02/2024	IBM	US	26/08/2022	US2022017822558	US20240070255	CONTINUOUS AUTHENTICATION FOR A REAL TIME HOLOGRAM	
N10029	US	20240069491	29/02/2024	ELECTRONICS & TELECOMMUNICATIONS RESEARCH INSTITUTE	KR	23/08/2022	KR2022000105502	US20240069491	APPARATUS FOR ACQUIRING HOLOGRAM AND SYSTEM INCLUDING THE SAME	
N10030	US	11934627	19/03/2024	SONY INTERACTIVE ENTERTAINMENT	US	05/12/2022	US2022018061921	US11934627	3D USER INTERFACE WITH SLIDING CYLINDRICAL VOLUMES	

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N10031	TW	202407430	16/02/2024	WEI SHENG INTERNATIONAL TECHNOLOGY	TW	28/03/2022	TW2022112126998	TW202407430	HOLOGRAPHIC PROJECTION OPERATING DEVICE, HOLOGRAPHIC PROJECTION DEVICE AND HOLOGRAPHIC OPTICAL MODULE THEREOF	
N10032	RU	2813988	21/02/2024	ROSTOV ON DON SCIENTIFIC RESEARCH INSTITUTE OF RADIO COMMUNICATION	RU	01/06/2023	RU2023000114534	RU2813988	HOLOGRAPHIC METHOD FOR GENERATING RADIO FREQUENCY ELECTRICAL OSCILLATIONS AT DISCRETE FREQUENCIES	
N10033	KR	20240030178	07/03/2024	CYBERNETICS IMAGING SYSTEMS	KR	30/08/2022	KR2022000108876	KR20240030178	GAN-BASED ARTIFICIAL INTELLIGENCE HOLOGRAM IMAGE RESTORATION METHOD AND SYSTEM THEREOF	
N10034	KR	20240029422	05/03/2024	KOREA ELEVATOR SAFETY AGENCY MARKETON	KR	26/08/2022	KR2022000107854	KR20240029422	HOLOGRAM PROJECTOR	
N10035	KR	20240024384	26/02/2024	HEESUNG ELECTRONICS	KR	16/08/2022	KR2022000101875	KR20240024384	TRANSPARENT SCREEN USING HOLOGRAM OPTICAL DEVICE AND ELECTRIC TRANSPARENT SCREEN APPARATUS FOR PROJECTOR HAVING THE SAME	
N10036	KR	102642455	29/02/2024	TMSI	KR	18/07/2023	KR2023000092950	KR102642455	CLOTHING ACCESSORIES TO WHICH HOLOGRAM IS APPLIED AND METHOD FOR MANUFACTURING SAME	
N10037	JP	2024031622	07/03/2024	PANASONIC INTELLECTUAL PROPERTY MANAGEMENT	JP	26/08/2022	JP2022000135284	JP2024031622	TO PROVIDE A DEVICE FOR MANUFACTURING A HOLOGRAM OPTICAL ELEMENT, A METHOD FOR MANUFACTURING A HOLOGRAM OPTICAL ELEMENT, AND A HOLOGRAM OPTICAL ELEMENT	
N10038	EP	4339712	20/03/2024	ENVISICS	GB	15/09/2022	GB2022000013533	US20240094676 CN117706897 EP4339712 GB2622406 GB202213533	OPTIMISED HOLOGRAM UPDATING	
N10039	EP	4332678	06/03/2024	ASML	EP	05/09/2022	EP2219000003868	EP4332678	HOLOGRAPHIC METROLOGY APPARATUS AND METHOD	
N10040	DE	102022208746	29/02/2024	ROBERT BOSCH	DE	24/08/2022	DE102022208746	DE102022208746	METHOD FOR OPERATING DATA GOGGLES AND DEVICE FOR DATA GOGGLES	
N10041	CN	220623281	19/03/2024	QINGHAI SHAMBHALINKA CULTURAL TOURISM RESOURCES DEVELOPMENT	CN	27/06/2023	CN2023021649702	CN220623281U	HOLOGRAPHIC PHANTOM IMAGING DEVICE	
N10042	CN	220556476	05/03/2024	WUHAN POLYTECHNIC UNIVERSITY	CN	21/08/2023	CN2023022247711	CN220556476U	AR DYNAMIC BOOK INTERACTION DEVICE BASED ON HOLOGRAPHIC PROJECTION TECHNOLOGY	
N10043	CN	220553090	01/03/2024	BEIJING KANGTEMAN ELECTRONIC SYSTEMS	CN	23/08/2023	CN2023022277454	CN220553090U	OBJECT BEAM IMAGING SYSTEM	
N10044	CN	220543573	27/02/2024	NANJING YOUBEILI TECHNOLOGY	CN	16/08/2023	CN2023022195133	CN220543573U	SCENE DISPLAY DEVICE BASED ON HOLOGRAPHIC DATA	
N10045	CN	220526196	23/02/2024	BEIJING YUECHANG TECHNOLOGY	CN	16/08/2023	CN2023022203659	CN220526196U	HOLOGRAPHIC THREE-DIMENSIONAL PROJECTION DEVICE	
N10046	CN	220526165	23/02/2024	LIMITED COMPANY OF FORCE PARTY DIGITAL SCIENCE & TECHNOLOGY GROUP	CN	03/08/2023	CN2023022081267	CN220526165U	HOLOGRAPHIC DINING TABLE PROJECTION SYSTEM	
N10047	CN	220524767	23/02/2024	BEIJING JIUZHOU OPTICS	CN	28/07/2023	CN2023022008492	CN220524767U	HOLOGRAPHIC DIFFRACTION SIGHTING DEVICE	
N10048	CN	220524766	23/02/2024	BEIJING JIUZHOU OPTICS	CN	07/07/2023	CN2023021775503	CN220524766U	HOLOGRAPHIC ELECTRONIC SIGHTING TELESCOPE	
N10049	CN	117724272	19/03/2024	TIANMA	CN	29/12/2023	CN2023011872759	CN117724272	SPATIAL LIGHT MODULATOR AND HOLOGRAPHIC THREE-DIMENSIONAL DISPLAY DEVICE	
N10050	CN	117711279	15/03/2024	JIANGSU HONGGUANG DISPLAY TECHNOLOGY	CN	27/12/2023	CN2023011813745	CN117711279	NOVEL HOLOGRAPHIC TRANSPARENT SCREEN	
N10051	CN	117705001	15/03/2024	SHANXI INSTITUTE OF SCIENCE & TECHNOLOGY	CN	05/02/2024	CN2024010163728	CN117705001	DIGITAL HOLOGRAPHIC OBJECT MORPHOLOGY MEASURING DEVICE AND METHOD BASED ON CONCAVE MIRROR	
N10052	CN	117700744	15/03/2024	TECHNICAL INSTITUTE OF PHYSICS & CHEMISTRY - CHINESE ACADEMY OF SCIENCES	CN	22/12/2023	CN2023011785361	CN117700744	POLYSILSESQUOXANE AND PHOTOPOLYMER HOLOGRAPHIC RECORDING MEDIUM CONTAINING SAME	
N10053	CN	117692065	12/03/2024	FUDAN UNIVERSITY	CN	21/11/2023	CN2023011557452	CN117692065	METHOD FOR REALIZING MULTI-USER VISIBLE LIGHT COMMUNICATION BY USING RANDOM PHASE MULTI-PLANE HOLOGRAPHIC MODE	

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N10054	CN	117687284	12/03/2024	CHINESE PEOPLE'S LIBERATION GROUND FORCE ARMORED TROOP ACADEMY	CN	15/12/2023	CN2023011735428	CN117687284	HOLOGRAPHIC STEREOGRAM PRINTING METHOD, SYSTEM AND EQUIPMENT	
N10055	CN	117687204	12/03/2024	NANJING PARALLEL VISION TECHNOLOGY	CN	29/01/2024	CN2024010119510	CN117687204	TWO-DIMENSIONAL PUPIL EXPANDING DEVICE BASED ON HOLOGRAPHIC WAVEGUIDE AND PUPIL EXPANDING METHOD THEREOF	
N10056	CN	117685459	12/03/2024	GUONENG SHUZHONG TECHNOLOGY DEVELOPMENT BEIJING	CN	05/01/2024	CN2024010018351	CN117685459	HOLOGRAPHIC PROJECTION DISPLAY DEVICE	
N10057	CN	117676105	08/03/2024	SICHUAN UNIVERSITY	CN	27/11/2023	CN2023011593820	CN117676105	HOLOGRAPHIC PROJECTION INTERACTION CONTROL METHOD BASED ON MONOCULAR CAMERA AND RELATED EQUIPMENT	
N10058	CN	117666313	08/03/2024	TIANMA	CN	26/12/2023	CN2023011819374	CN117666313	HOLOGRAPHIC DISPLAY SYSTEM AND ELECTRONIC EQUIPMENT	
N10059	CN	117666312	08/03/2024	UNIVERSITY OF SCIENCE & TECHNOLOGY OF CHINA	CN	17/11/2023	CN2023011552891	CN117666312	HOLOGRAPHIC PROJECTION METHOD AND DEVICE	
N10060	CN	117666282	08/03/2024	SHENZHEN HUANZHEN TECHNOLOGY	CN	27/11/2023	CN2023011603806	CN117666282	NON-FILM-FORMING MATRIX, PHOTOPOLYMER, FILM, PREPARATION METHOD AND PRINTING STOCK	
N10061	CN	117666119	08/03/2024	SOUTH CHINA NORMAL UNIVERSITY	CN	19/10/2023	CN2023011363741	CN117666119	SUPER-STRUCTURED LENS PHASE OPTIMIZATION METHOD BASED ON LONG FOCAL DEPTH HOLOGRAPHIC ALGORITHM AND SUPER-STRUCTURED LENS	
N10062	CN	117666111	08/03/2024	CHINA UNIVERSITY OF GEOSCIENCES WUHAN	CN	30/11/2023	CN2023011639361	CN117666111	MAGNETIC FIELD THREE-DIMENSIONAL VISUALIZATION DEVICE AND METHOD BASED ON COAXIAL HOLOGRAPHIC MICROSCOPE	
N10063	CN	117664808	08/03/2024	WANG YETIAN SUN TIANXING TAN HUAJIE	CN	15/08/2022	CN2022010971958	CN117664808	UNDERWATER LASER HOLOGRAPHIC MICROSCOPE	
N10064	CN	117649863	05/03/2024	SICHUAN UNIVERSITY	CN	06/12/2023	CN2023011667403	CN117649863	PHOTOPOLYMER HOLOGRAPHIC STORAGE MATERIAL CONTAINING POSS NANO MATERIAL, PREPARATION METHOD AND APPLICATION	
N10065	CN	117631447	01/03/2024	ALTIZAN OPTO CRYSTAL SHANGHAI DISPLAY TECHNOLOGY	CN	30/11/2023	CN2023011624929	CN117631447	PHOTOPOLYMER WITH STRONG ADHESIVE FORCE AND GRATING	
N10066	CN	117631245	01/03/2024	CHANGCHUN INSTITUTE OF OPTICS FINE MECHANICS & PHYSICS - CHINESE ACADEMY OF SCIENCES	CN	27/11/2023	CN2023011597011	CN117631245	MULTISPECTRAL DIGITAL HOLOGRAPHIC MICROSCOPY SYSTEM AND METHOD BASED ON MICRO-LED MICROARRAY LIGHT SOURCE	
N10067	CN	117631123	01/03/2024	SUNNY OPTICAL ZHEJIANG RESEARCH INSTITUTE	CN	19/08/2022	CN2022010997125	CN117631123	COLOR HOLOGRAPHIC OPTICAL ELEMENT, MANUFACTURING METHOD, MANUFACTURING SYSTEM AND CORRECTION METHOD THEREOF	
N10068	CN	117629889	01/03/2024	CHINA JILIANG UNIVERSITY	CN	28/11/2023	CN2023001160167	CN117629889	SUPER-RESOLUTION DIGITAL HOLOGRAPHIC IMAGING SYSTEM AND METHOD BASED ON MULTIPLE GRATINGS	
N10069	CN	117629408	01/03/2024	FOXCONN TECHNOLOGY TSINGHUA UNIVERSITY	CN	17/10/2023	CN2023011345073	CN117629408	HOLOGRAPHIC GRATING EXPOSURE SYSTEM, HOLOGRAPHIC GRATING AND HOLOGRAPHIC GRATING IMAGING SPECTROMETER	
N10070	CN	117608177	27/02/2024	HANGZHOU JINCAI DIGITAL TECHNOLOGY	CN	26/12/2023	CN2023011803814	CN117608177	HOLOGRAPHIC IMAGING PROCESSING METHOD AND SYSTEM	
N10071	CN	117608156	27/02/2024	SHENZHEN HAIQI DISPLAY CULTUAL	CN	10/01/2024	CN2024010033386	CN117608156	PORTABLE HOLOGRAPHIC IMAGE EQUIPMENT AND HOLOGRAPHIC IMAGE SYSTEM THEREOF	