

IHMA PATENT NEWSLETTER

Limited circulation patent news bulletin for the Holography Industry

JANUARY 2024 – 102 PATENTS

Published and granted patents

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TABLE OF CONTENTS

Please click on the links (titles) to go to

| | | | |
|--|---------------------|------|----------------|
| ABOUT IHMA PATENT NEWSLETTER | | page | 3 |
| APPLICANTS OF THE MONTH | | p. | 4 |
| PATENT OF THE MONTH | | p. | 5 – 6 |
| <u>SECURITY HOLOGRAMS</u> | (12 patents) | p. | 7 – 13 |
| <u>SECURITY & OPTICAL EFFECTS</u> | (18 patents) | p. | 14 – 25 |
| Various optical effects in Security | | | |
| <u>DECORATIVE HOLOGRAMS</u> | (2 patents) | p. | 26 |
| <u>HOLOGRAPHY TECHNIQUE</u> | (9 patents) | p. | 27 – 33 |
| <u>RECORDING & MEMORY</u> | (9 patents) | p. | 34 – 41 |
| Recording material – Storage medium – Optical disk & process | | | |
| <u>DISPLAYS</u> | (32 patents) | p. | 42 – 59 |
| Displays devices – Digital holography – TV – Video | | | |
| <u>HOLOGRAPHY & MICROSCOPY</u> | (5 patents) | p. | 60 – 63 |
| <u>VARIOUS</u> | (15 patents) | p. | 64 – 74 |
| TABLES WITH REFERENCES | | p. | 75 – 79 |

Click on the title to return to table of contents

Please note that:

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

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Click on the title to return to table of contents

1. AIR FORCE ENGINEERING UNIVERSITY OF PLA
2. ANHUI CHENGPIN DECORATION ENGINEERING
3. BASF
4. BEIHANG UNIVERSITY OF AERONAUTICS & ASTRONAUTICS
5. BEIJING BOE TECHNOLOGY DEVELOPMENT | BOE TECHNOLOGY GROUP | HEFEI BOE JOINT TECHNOLOGY
6. BEIJING TIANDI MYTHOLOGY INTERNATIONAL CULTURAL DEVELOPMENT
7. BEIJING UNIVERSITY OF TECHNOLOGY
8. BIOASTER | BIOMERIEUX | CNRS - CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE | UJM - UNIVERSITE JEAN MONNET
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12. DAI NIPPON PRINTING
13. ENVISICS
14. FUJIAN NORMAL UNIVERSITY
15. GIER, OLIVER | GOMER, ANDREAS | HAGEN, JAN
16. GIER, OLIVER | HAGEN, JAN | GOMER, ANDREAS
17. GIESECKE & DEVRIENT CURRENCY TECHNOLOGY
18. GM GLOBAL TECHNOLOGY OPERATIONS
19. GOOLTON TECHNOLOGY
20. GUANGDONG UNIVERSITY OF TECHNOLOGY
21. HANGZHOU CHENJING PHOTOELECTRIC TECHNOLOGY
22. HANGZHOU QIUGUO PLANNING TECHNOLOGY
23. HARBIN UNIVERSITY OF SCIENCE & TECHNOLOGY
24. HEBEI BOXIA PHOTOELECTRIC INFORMATION TECHNOLOGY
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26. HELLA & CO
27. HENAN PROVINCE WELLKING TECHNOLOGY DEVELOPMENT
28. HID GLOBAL CID
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53. SAIC VOLKSWAGEN AUTOMOTIVE
54. SAVEETHA INSTITUTE OF MEDICAL & TECHNICAL SCIENCES
55. SHANDONG TAIBAO INFORMATION TECHNOLOGY GROUP
56. SHANDONG TAIBAO PACKAGING PRODUCT
57. SHANGHAI CHENGYI PACKAGE TECHNOLOGY
58. SHANGHAI HUIXIONG PACKING
59. SHANGHAI INSTITUTE OF OPTICS & FINE MECHANICS - CHINESE ACADEMY OF SCIENCES
60. SHANGHAI TECHSUN PACKING MATERIALS | SHANGHAI TIANCHEN MICRO NANO TECHNOLOGY
61. SHENZHEN EUCLIDEON TECHNOLOGY
62. SHENZHEN JINJIA
63. SHIBUYA
64. SICHUAN UNIVERSITY
65. SICPA
66. SINGULAR CONTROL ENERGY
67. SONY GROUP
68. SUNNY OPTICAL ZHEJIANG RESEARCH INSTITUTE
69. TOPPAN HOLDINGS
70. TRANSIENT OULAI SEMICONDUCTOR PHOTOELECTRIC SHANGHAI
71. UNIVERSITY OF ENGINEERING & MANAGEMENT
72. VARROC TYC AUTO LAMPS
73. VR INTELLIGENT TECHNOLOGY
74. WESTLAKE UNIVERSITY
75. WUHAN HUAGONG IMAGE TECHNOLOGY & DEVELOPMENT
76. ZHANGJIAGANG KANGDE XIN PHOTOELECTRIC MATERIAL
77. ZHEJIANG UNIVERSITY HANGZHOU GLOBAL SCIENTIFIC & TECHNOLOGICAL INNOVATION CENTER

Click on the title to return to table of contents

P37256 **SECURITY & OPTICAL EFFECTS' COLUMN
PRINTING – PLASTIC BANKNOTE – CARD – THREAD – RELIEF –
MICROLENS**

US20240012181 **LUMENCO**

Inventor(s): RAYMOND MARK A | PORRAS SOTO HECTOR ANDRES

Application Nber / Date: US17/887,666 2022-08-15

Priority Nber / Date / Country: US17/887,666 2022-08-15

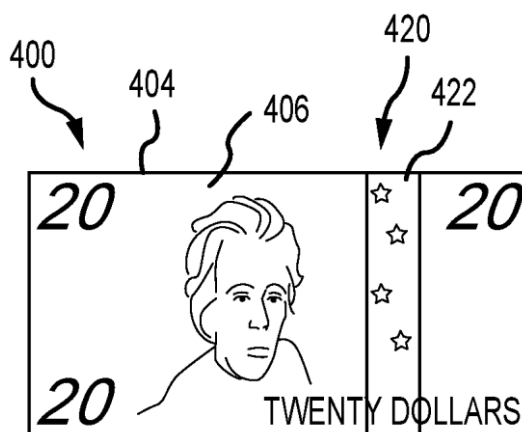
MICRO-OPTIC ANTICOUNTERFEITING ELEMENTS FOR CURRENCY AND OTHER ITEMS USING VIRTUAL LENS SYSTEMS

An optical security element to limit counterfeiting. The element includes a lens array with a first side and a second planar side opposite the first side. A plurality of lenses are formed on the first side of the lens array, and an ink layer is provided proximate the second planar side. The ink layer provides an interlaced image, which includes a matrix of frame or image elements under each of a plurality of lens sets or “virtual lenses,” each of which includes at least four lenses arranged in a grouping with an equal or unequal number of lenses on a side (e.g., a 2 by 2 array or a 2 by 3 array). The interlaced element are arranged in non-sequential order in two interlacing axes (e.g., via non-sequential interlacing in both directions) to be distributed throughout an area under the at least four lenses rather than under a single lens.

ÉLÉMENTS MICRO-OPTIQUES ANTI-CONTREFAÇON POUR LA MONNAIE ET D'AUTRES ARTICLES UTILISANT DES SYSTÈMES DE LENTILLES VIRTUELLES

La présente invention concerne un élément de sécurité optique destiné à limiter la contrefaçon. L'élément comprend un réseau de lentilles ayant un premier côté et un second côté plan opposé au premier côté. Une pluralité de lentilles est constituée sur le premier côté du réseau de lentilles, et une couche d'encre est présente à proximité du second côté plan. La couche d'encre présente une image entrelacée, qui comprend une matrice d'éléments de cadre ou d'image sous chacun d'une pluralité de jeux de lentilles ou "lentilles virtuelles", dont chacun comprend au moins quatre lentilles disposées en groupe avec un nombre égal ou inégal de lentilles sur un côté. Les éléments entrelacés sont agencés dans un ordre non successif selon deux axes d'entrelacement afin d'être répartis dans une zone située sous les au moins quatre lentilles plutôt que sous une seule lentille.

CLAIM 1. An optical security element for application to a product to limit counterfeiting, comprising: a lens array with a first side and a second planar side opposite the first side; a plurality of lenses formed on the first side of the lens array; and an ink layer proximate the second planar side, wherein the ink layer comprises: an interlaced image under a plurality of lens sets within the lenses formed on the first side of the lens array, wherein: each lens set of the plurality of lens sets comprises at least a unit of four lenses; the interlaced image comprises a matrix having an odd number of frames or image elements for each unit of the at least a unit of four lenses of each lens set of the plurality of lens sets, wherein the matrix comprises at least five by five matrix; the odd number of frames or image elements in the matrix are arranged according to a ray tracing program in two interlacing axes; and the arrangement of the odd number of frames or image elements in the matrix is configured to provide a pre-determined mismatch, whereby at least one frame or image element of the odd number of frames or image elements is located between adjacent lens sets of the plurality of lens sets.



Equivalents : WO2024/010868 A1

Status: Pending

Research Report:

| INTERNATIONAL SEARCH REPORT | | International application No. PCT/US2023/027028 | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|-----------|--|-----------------------|----------|---|-------------------|---|--|-------------|---|---|------|---|--|-------|---|---|----|---|---|------|---|---|------|
| <p>A. CLASSIFICATION OF SUBJECT MATTER</p> <p>IPC(B) - INV. - B42D 25/29, 25/309, 25/351, 25/378, 25/45; G03G 21/04; H04N 1/00 (2023.01) ADD. - B42D 25/342, 25/42, 25/485 (2023.01)</p> <p>CPC - INV. - B42D 25/29, 25/309, 25/351, 25/378, 25/45; G03G 21/046; H04N 1/00856 (2023.08) ADD. - B42D 25/342, 25/42, 25/485 (2023.08)</p> <p>According to International Patent Classification (IPC) or to both national classification and IPC</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>B. FIELDS SEARCHED</p> <p>Minimum documentation searched (classification system followed by classification symbols) See Search History document</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched See Search History document</p> <p>Electronic database consulted during the international search (name of database and, where practicable, search terms used) See Search History document</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1"> <thead> <tr> <th style="text-align: center;">Category*</th> <th style="text-align: center;">Citation of document, with indication, where appropriate, of the relevant passages</th> <th style="text-align: center;">Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X ---</td> <td>US 2018/0264866 A1 (LUMENCO LLC) 20 September 2018 (20.09.2018) entire document</td> <td>1, 2, 7, 8, 11-14</td> </tr> <tr> <td>Y</td> <td></td> <td>3, 5, 9, 10</td> </tr> <tr> <td>Y</td> <td>US 7,480,100 B1 (RAYMOND et al.) 20 January 2009 (20.01.2009) entire document</td> <td>3, 5</td> </tr> <tr> <td>Y</td> <td>US 2017/0310907 A1 (MICROSOFT TECHNOLOGY LICENSING LLC) 26 October 2017 (26.10.2017) entire document</td> <td>9, 10</td> </tr> <tr> <td>Y</td> <td>US 2017/0129272 A1 (WAVEFRONT TECHNOLOGY INC.) 11 May 2017 (11.05.2017) entire document</td> <td>10</td> </tr> <tr> <td>A</td> <td>US 2014/0063611 A1 (LUMENCO LLC) 06 March 2014 (06.03.2014) entire document</td> <td>1-14</td> </tr> <tr> <td>A</td> <td>US 8,027,093 B2 (COMMANDER et al.) 27 September 2011 (27.09.2011) entire document</td> <td>1-14</td> </tr> </tbody> </table> | | | Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. | X --- | US 2018/0264866 A1 (LUMENCO LLC) 20 September 2018 (20.09.2018) entire document | 1, 2, 7, 8, 11-14 | Y | | 3, 5, 9, 10 | Y | US 7,480,100 B1 (RAYMOND et al.) 20 January 2009 (20.01.2009) entire document | 3, 5 | Y | US 2017/0310907 A1 (MICROSOFT TECHNOLOGY LICENSING LLC) 26 October 2017 (26.10.2017) entire document | 9, 10 | Y | US 2017/0129272 A1 (WAVEFRONT TECHNOLOGY INC.) 11 May 2017 (11.05.2017) entire document | 10 | A | US 2014/0063611 A1 (LUMENCO LLC) 06 March 2014 (06.03.2014) entire document | 1-14 | A | US 8,027,093 B2 (COMMANDER et al.) 27 September 2011 (27.09.2011) entire document | 1-14 |
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. | | | | | | | | | | | | | | | | | | | | | | | | |
| X --- | US 2018/0264866 A1 (LUMENCO LLC) 20 September 2018 (20.09.2018) entire document | 1, 2, 7, 8, 11-14 | | | | | | | | | | | | | | | | | | | | | | | | |
| Y | | 3, 5, 9, 10 | | | | | | | | | | | | | | | | | | | | | | | | |
| Y | US 7,480,100 B1 (RAYMOND et al.) 20 January 2009 (20.01.2009) entire document | 3, 5 | | | | | | | | | | | | | | | | | | | | | | | | |
| Y | US 2017/0310907 A1 (MICROSOFT TECHNOLOGY LICENSING LLC) 26 October 2017 (26.10.2017) entire document | 9, 10 | | | | | | | | | | | | | | | | | | | | | | | | |
| Y | US 2017/0129272 A1 (WAVEFRONT TECHNOLOGY INC.) 11 May 2017 (11.05.2017) entire document | 10 | | | | | | | | | | | | | | | | | | | | | | | | |
| A | US 2014/0063611 A1 (LUMENCO LLC) 06 March 2014 (06.03.2014) entire document | 1-14 | | | | | | | | | | | | | | | | | | | | | | | | |
| A | US 8,027,093 B2 (COMMANDER et al.) 27 September 2011 (27.09.2011) entire document | 1-14 | | | | | | | | | | | | | | | | | | | | | | | | |

Click on the title to return to table of contents



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

P37238

PRINTING – BANKNOTE – CARD – THREAD – RELIEF

WO202412962

BASF

Priority Date: 11/07/2022

UV-CURABLE COATINGS HAVING HIGH REFRACTIVE INDEX

The present invention relates to coating compositions, comprising i) single or mixed metal oxide nanoparticles, wherein the volume average diameter (Dv50) of the metal oxide nanoparticles is in the range of 1 to 20 nm; ii) one or more monomers having at least three thiol groups (-SH) at the terminal end (the first monomer), iii) optional one or more monomers having at least two functional groups at the terminal end being capable of reacting with the thiol groups and a spacer group between the at least two functional groups (the second monomer), iv) one, or more solvents; coatings obtained therefrom and the use of the compositions for coating surface relief micro- and nanostructures (e.g. holograms), manufacturing of optical waveguides, solar panels, light outcoupling layers for display and lighting devices and anti-reflection coatings. Coatings obtained from the coating composition have a high refractive index and holograms are bright and visible from any angle, when the coating compositions are applied to them.

REVÊTEMENTS DURCISSABLES AUX UV AYANT UN INDICE DE RÉFRACTION ÉLEVÉ

La présente invention concerne des compositions de revêtement, comprenant i) des nanoparticules d'oxyde métallique simple ou mixte, le diamètre moyen en volume (Dv50) des nanoparticules d'oxyde métallique se situant dans la plage de 1 à 20 nm ; ii) un ou plusieurs monomères comportant au moins trois groupes thiol (-SH) au niveau de leur extrémité terminale (le premier monomère), iii) éventuellement un ou plusieurs monomères comportant au moins deux groupes fonctionnels au niveau de leur extrémité terminale pouvant réagir avec les groupes thiol et un groupe espaceur entre les au moins deux groupes fonctionnels (le second monomère), iv) un ou plusieurs solvants ; des revêtements obtenus à partir de celles-ci et l'utilisation des compositions pour revêtir des micro- et nanostructures de surface en relief (par exemple des hologrammes), pour fabriquer des guides d'ondes optiques, des panneaux solaires, des couches de découplage de la lumière pour dispositifs d'affichage et d'éclairage et des revêtements antireflet. Les revêtements obtenus à partir de la composition de revêtement ont un indice de réfraction élevé et les hologrammes sont brillants et visibles sous n'importe quel angle, lorsque les compositions de revêtement sont appliquées sur eux.

CLAIM 1. A coating composition, especially a UV-Vis curable coating composition, comprising i) single or mixed metal oxide nanoparticles, wherein the volume average diameter (Dv50) of the metal oxide nanoparticles is in the range of 1 to 20 nm, ii) one or more monomers having at least three thiol groups (-SH) at the terminal end (the first monomer), iii) optional one or more monomers having at least two functional groups at the terminal end being capable of reacting with the thiol groups and a spacer group between the at least two functional groups (the second monomer), iv) one, or more solvents.

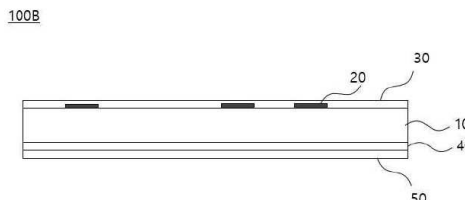
PRINTED MATTER WITH SECURITY FUNCTION OF INFORMATION

The present invention relates to a printed matter having a security function and, more specifically, to a printed matter having an eco-friendly characteristic and a security function of enhancing security characteristics by using a corresponding printed matter based on an NFT-encoded blockchain only by a user having a specific authority when the printed matter is used for a security label or a security sticker.

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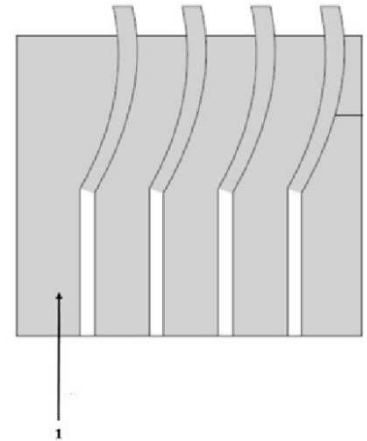
도면3



CLAIM 1. A first region of the first printed layer, comprising: a base layer; an adhesive layer formed on the base layer; a layer to be printed formed on the adhesive layer; a printing layer formed on the layer to be printed; and a coating layer formed on the layer to be printed and the printing layer, wherein the printing layer is formed by applying an ink composition to the layer to be printed through any one of inkjet printing, intaglio printing, flat panel printing, and screen printing, and drying the ink composition, the ink composition includes a pigment, varnish, an antistatic agent, an antifoaming agent, a filler, a solvent, a wetting agent, and a thickener, the pigment includes a dye, the dye includes a red dye, a yellow dye, a blue dye, a green dye, an orange dye, and a black dye, the varnish includes any one or two or more selected from acrylic resins, malein-modified phenol resins, and polyurethane resins, the solvent includes any one or two or more selected from ethanol, methanol, isopropyl alcohol, butanol, and acetone, the filler includes any one or two or more selected from calcium carbonate, barium sulfate, talc, and silicon dioxide, the printing layer includes a hologram layer prepared by mixing a pigment prepared by stamping a resin, light scattering particles, and a thermoplastic resin, the light scattering particles are at least one of sphere-shaped and irregular particles, and a biodegradable polylactic acid resin is formed in the adhesive layer A printed matter having an information security function, the printed matter comprising: a second cutting line separating a region of interest into a region of interest-1 and a region of interest-1-2; and a cutting line, wherein , when the lengths of the cutting lines are the same, a gap between neighboring cutting lines of the first cutting line is shorter than a gap between neighboring cutting lines of the second cutting line, the ink composition further comprises a light-absorbing ink compound represented by Formula 1 below having absorption and reflection characteristics in a wavelength range of 780nm~1600nm, and the antistatic agent is a compound represented by Formula 2 below.

A TAMPER EVIDENT LABEL WITH MULTI-LAYERED SUBSTRATE FEATURE

A tamper evident label (100) with multi-layered substrate feature, comprising of a paper layer (1), a metalized hologram layer (2), a release liner layer (3), wherein said paper layer (1) and said metalized hologram layer (2) are divided a plurality of strips, said plurality of strips of metalized hologram layer (2) and said paper layer (1) are arranged alternatively to a combination layer (4), said combination layer (4) is applied with an adhesive layer on back of said combination layer (4), release liner layer (3) is provided at back of said combination layer (4) of metalized hologram layer (2) and paper layer (1) to protect adhesive layer and combination layer (4) along with release liner layer (3) is slit into single pieces to tamper evident label (1) providing security and anti-counterfeiting feature through said combination layer (4) of metalized hologram layer (2) and paper layer (1).

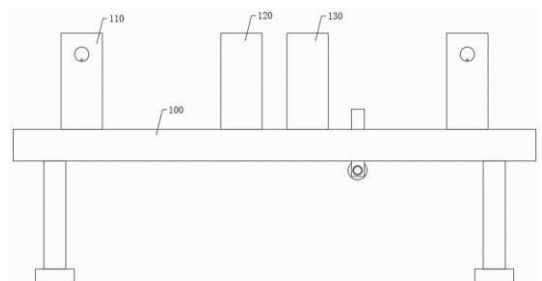


CLAIM 1. A tamper evident label (100) with multi-layered substrate feature, comprising: a paper layer (1); a metalized hologram layer (2); a release liner layer (3); wherein: said paper layer (1) and said metalized hologram layer (2) are divided into a plurality of strips; said plurality of strips of metalized hologram layer (2) and said paper layer (1) are arranged alternatively to form a combination layer (4); said combination layer (4) is applied with an adhesive layer on back of said combination layer (4); said release liner layer (3) is provided at back of said combination layer (4) of said metalized hologram layer (2) and said paper layer (1) to protect said adhesive layer; and said combination layer (4) along with said release liner layer (3) is slit into single pieces to form said tamper evident label (1) which provides security and anti-counterfeiting feature through said combination layer (4) of said metalized hologram layer (2) and said paper layer (1).

LASER HOLOGRAPHIC ANTI-COUNTERFEIT LABEL PRINTING DEVICE

The utility model discloses a laser holographic anti-counterfeit label printing device, which relates to the technical field of anti-counterfeit labels and comprises a workbench, wherein two groups of supporting frames are fixed on two sides of the top end of the workbench, a printing device is fixed on one side of the center of the upper surface of the workbench, and a drying device is fixed on the other side of the center of the upper surface of the workbench; the inner wall of the support frame is transversely rotated and provided with a screw rod. According to the anti-counterfeit label flattening device, the two groups of driven bars on the outer wall of the screw rod are firstly close to each other by rotating the screw rod, and then the inner rod is dragged by the cable to rise, and then the connecting plate and the pressing roller are driven to rise together, so that gaps are formed between the pressing roller and the workbench for the anti-counterfeit label to pass through after printing, and then the screw rod is reversed to reset the pressing roller, so that the printed anti-counterfeit label can be flattened, the gap between the pressing roller and the workbench can be changed by continuing to reverse the screw rod, and further different pressures are applied to the anti-counterfeit label, and the flattening effect for diversification of the anti-counterfeit label is realized.

CLAIM 1. The utility model provides a radium-shine holographic anti-fake label printing device, includes workstation (100), its characterized in that: two groups of supporting frames (110) are fixed on two sides of the top end of the workbench (100), a printing device (120) is fixed on one side of the upper surface of the workbench (100) positioned at the center, and a drying device (130) is fixed on the other side of the upper surface of the workbench (100) positioned at the center; the inner wall transverse rotation of support frame (110) is equipped with lead screw (111), the outer wall of lead screw (111) has cup jointed two sets of driven strip (112), the below of driven strip (112) is equipped with crossbeam (113) fixed with support frame (110) inner wall, urceolus (117) that extend crossbeam (113) bottom have been cup jointed at the both ends of crossbeam (113), the inner wall cover of urceolus (117) has interior pole (116) that extend urceolus (117) bottom, the bottom of interior pole (116) is fixed with connecting plate (115), two sets of be equipped with compression roller (114) between connecting plate (115), the top of interior pole (116) is fixed with hawser (119) with the lateral wall of driven strip (112).



P37296

PRINTING – LABEL

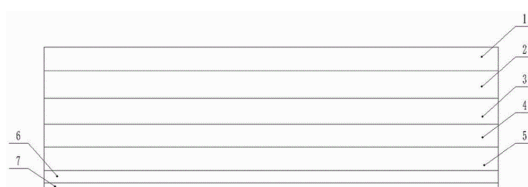
CN220340843U

Priority Date: 04/07/2023

SHANDONG TAIBAO INFORMATION TECHNOLOGY GROUP

POSITIONING HOLOGRAPHIC ANTI-FAKE SEALING LABEL

The application belongs to anti-fake sealing and signing technical field, especially, relate to location holographic anti-fake sealing and signing, including the substrate layer, have the holographic information layer of microstructure on the substrate layer, have hollow out construction's coating film layer on the holographic information layer of microstructure on the substrate layer, location cover position printing anti-fake picture and text information in the hollow out construction of coating film layer, set gradually from type layer and adhesive layer on the coating film layer, this application uses BOPP membrane as substrate layer complex to take the PET membrane to carry out location mould pressing as the supporting layer, the deflection of BOPP membrane can be controlled in the mould pressing process, the cover position deviation of the holographic information layer of microstructure that variable anti-fake information of overprinting and mould pressing process formed in the follow-up process is less than 0.3mm, obtain the holographic anti-fake sealing and signing of accurate location chromatography, make sealing sign deflection in the production process little, use the nickel version to mould pressing to form the holographic information layer of microstructure, the microstructure line of this application is more clear, brightness, anti-fake effect is better.



CLAIM 1. The positioning holographic anti-counterfeiting sealing label is characterized by comprising a substrate layer (1), wherein the substrate layer (1) is provided with a microstructure holographic information layer (2), the microstructure holographic information layer (2) of the substrate layer (1) is provided with a coating layer (3) with a hollowed-out structure, the hollowed-out structure of the coating layer (3) is internally provided with positioning sleeve position printing anti-counterfeiting image-text information (4), and the coating layer (3) and the anti-counterfeiting image-text information (4) are sequentially provided with a release layer (5) and an adhesive layer (6).

P37302

LABEL – TAMPER EVIDENCE

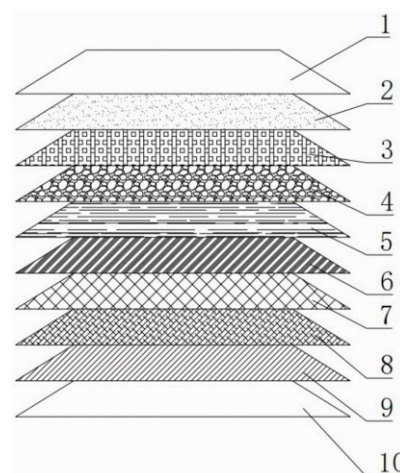
CN220290367U

Priority Date: 28/02/2023

HENAN PROVINCE WELLKING TECHNOLOGY DEVELOPMENT

HOLOGRAPHIC POSITIONING UNCOVERING COLOR-CHANGING VOID ANTI-COUNTERFEIT LABEL

The utility model discloses a holographic positioning and lifting color-changing VOID anti-counterfeit label, which relates to the technical field of anti-counterfeit labels and aims to solve the problem that whether the existing anti-counterfeit label is used or not is difficult to distinguish, and the anti-counterfeit label comprises a invisible color layer, wherein a VOID separating layer is arranged above the invisible color layer, and a transparent substrate is arranged above the VOID separating layer; a separation layer is arranged below the invisible color layer; and an overlapping color layer is arranged below the separation layer. The label presents a positioning laser holographic thermoprinting visual effect through the combination of the innovative technology of mould pressing, printing and aluminum washing, and realizes the color changing effect of the label destroyed by uncovering the label by using the multilayer separation and full separation color-overlapping printing technology, thereby preventing the follow-up embezzlement of the anti-counterfeit label and solving the problem that the anti-counterfeit label is easy to be embezzled and imitated after being uncovered in the prior art.



CLAIM 1. The utility model provides a holographic location is revealed and is discoloured VOID anti-counterfeit label, includes stealthy colour layer (6), stealthy colour layer (6) top is equipped with VOID separating layer (5), its characterized in that: a transparent substrate (4) is arranged above the VOID separation layer (5); a separation layer (7) is arranged below the invisible color layer (6); an overlapping color layer (8) is arranged below the separation layer (7).

P37306

LABEL – TAMPER EVIDENCE

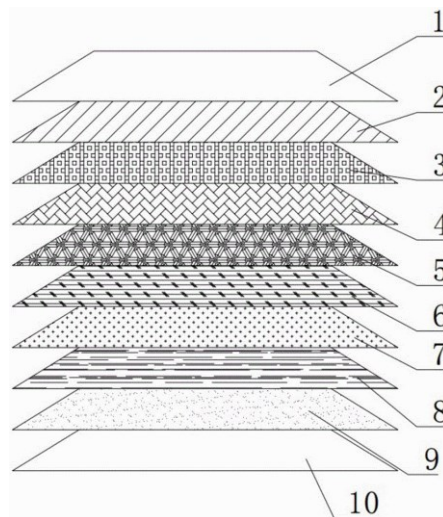
CN220272055U

Priority Date: 28/02/2023

HENAN PROVINCE WELLKING TECHNOLOGY DEVELOPMENT

DOUBLE-DISPLAY DIGITAL ANTI-COUNTERFEIT LABEL WITH VOID POSITIONING

The utility model discloses a double-display digital anti-counterfeit label with a lifting VOID positioning function, which relates to the technical field of anti-counterfeit labels and aims to solve the problem that the existing anti-counterfeit label is easy to imitate; a metal layer is arranged below the holographic color layer, and nondestructive VOID characters are arranged below the metal layer. After the label is uncovered, the double-uncovering effect of the uncovered display VOID word pattern and the uncovered display positioning non-destroyed VOID word pattern is presented, and the double VOID effect of the label surface and the function of verifying the surface digital variable data image-text and the scratch layer display secret code are realized by using the uncovered label VOID to destroy and only display the VOID word pattern but not to destroy the display effect.



CLAIM 1. The utility model provides an uncover VOID location double-display digital anti-counterfeit label, includes VOID release layer (5), its characterized in that: a transparent base material (4) is arranged above the VOID release layer (5), and a holographic color layer (6) is arranged below the VOID release layer (5); a metal layer (7) is arranged below the holographic color layer (6), and a nondestructive VOID word (8) is arranged below the metal layer (7).

P37311

PRINTING – BRAND PROTECTION

CN117429191

Priority Date: 21/12/2023

SHANGHAI TECHSUN PACKING MATERIALS | SHANGHAI TIANCHEN MICRO NANO TECHNOLOGY

LOCAL ALUMINIZED MULTI-MEDIUM POSITIONING HOLOGRAPHIC PAPER AND PREPARATION METHOD THEREOF

The invention belongs to the technical field of holographic positioning packaging paper, and discloses a local aluminized multi-medium positioning holographic paper and a preparation method thereof; the method comprises the steps of coating a die pressing information coating on a base film and drying to form a laser die pressing information coating layer; firstly, molding and positioning a laser information pattern by using a molding and printing integrated system on one side of the laser molding information coating layer to form a molding holographic layer, and locally printing water-soluble aluminum washing ink on one side of the molding holographic layer to form a laser printing surface; forming an aluminized holographic layer by aluminizing the reflecting layer on one side of the laser printing surface; washing the water-soluble aluminum washing ink to obtain a local aluminized holographic layer; plating zinc sulfide medium on one side of the local aluminized holographic layer to form a zinc sulfide medium surface; and compounding one side of the zinc sulfide medium surface with paper to prepare the positioning holographic paper. The die pressing and the printing of the water-soluble aluminum washing ink are finished in one step, and off-line secondary overprinting is not needed. The process of printing and then aluminizing can use water-soluble aluminium-washing ink, and the aim of washing aluminium can be achieved through ordinary water washing instead of alkaline solution.

CLAIM 1. The preparation method of the local aluminized multi-medium positioning holographic paper is characterized by comprising the following steps of: s1, preparing a laser coating layer: coating the die pressing information paint on a base film, and drying to form a laser die pressing information paint layer; the thickness of the laser mould pressing information paint layer is 0.5-8 um; s2, adopting a mould pressing and printing integrated system to mould-press and position the laser information pattern on one side of the laser mould pressing information coating layer to form a mould pressing holographic layer, and then locally printing water-soluble aluminum washing ink on one side of the mould pressing holographic layer to form a laser printing surface, wherein the mould pressing and the printing of the water-soluble aluminum washing ink are completed in one step; s3, plating an aluminum reflecting layer on one side of the laser printing surface to form an aluminum plating holographic layer; s4, washing the aluminum-plated holographic layer obtained in the step S3 to remove water-soluble aluminum-washing ink, and drying to obtain a local aluminum-plated holographic layer; s5, plating a zinc sulfide medium layer on one side of the local aluminized holographic layer to form a zinc sulfide medium surface; the thickness of the zinc sulfide dielectric surface is 400-600A; s6, compounding one side of the zinc sulfide medium surface with paper through a compounding process, and drying to obtain the local aluminized multi-medium positioning holographic paper.

P37313

LABEL

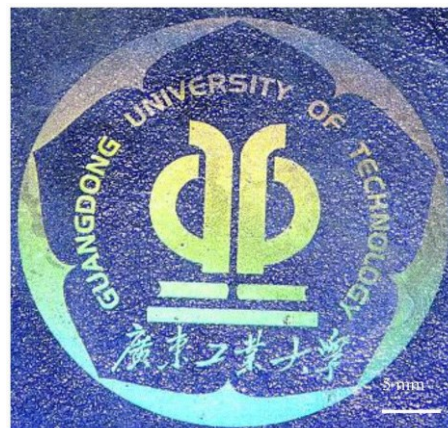
CN117417510

Priority Date: 19/10/2023

GUANGDONG UNIVERSITY OF TECHNOLOGY

SIDE CHAIN TYPE HOLOGRAPHIC RECORDING MATERIAL, HOLOGRAPHIC POLYMER MATERIAL AND PREPARATION METHOD

The application discloses a side chain type holographic recording material, a holographic polymer material and a preparation method thereof, belonging to the technical field of functional materials. The side chain type holographic recording material has the structure that: wherein A, B, C is a structural unit; unit a and unit C, the same or different, are alkyl or aryl; unit B is tertiary amino; x and y are integers of 1-50 respectively; n is an integer of 1 to 20; ar is a photosensitive monomer, and has the structure: the side chain type holographic recording material has the advantages of simple preparation, high controllability, low cost, green environmental protection, good film forming performance, high transparency and good adsorptivity, can directly generate color holograms with extremely high resolution and angle dependence under coherent light, and effectively avoids imitation of holographic anti-counterfeiting graphic information while improving the display effect of the holograms.



CLAIM 1. A side chain type hologram recording material characterized by having a structure of [i]: wherein A, B, C is a structural unit; unit a and unit C, the same or different, are alkyl or aryl; unit B is tertiary amino; x and y are integers of 1-50 respectively; n is an integer of 1 to 20; ar is a photoactive monomer having the structure of [ii]:

P37314

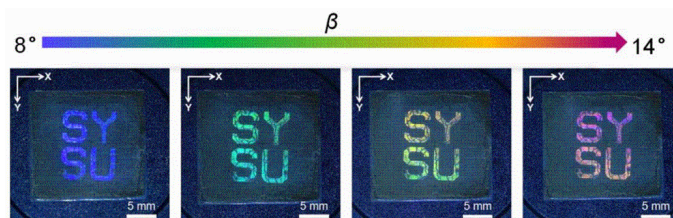
CN117417509

Priority Date: 19/10/2023

GUANGDONG UNIVERSITY OF TECHNOLOGY

POLYMER TYPE HOLOGRAPHIC RECORDING MATERIAL, HOLOGRAPHIC POLYMER MATERIAL AND PREPARATION METHOD THEREOF

The application discloses a polymer type holographic recording material, a holographic polymer material and a preparation method thereof, belonging to the technical field of holographic materials. The polymer type holographic recording material has the structure that: wherein A and E are each alkyl or aryl; b and C are each a compound containing more than two-OH/-NH₂ Alkyl or aryl of (a); d is a catalyst containing more than two-OH/-NH₂ One of alkyl, aryl, polyether structure, polyester structure; ar is a photosensitive structure, and the structure is as follows: wherein R is 1 And R is 2 Each being an electron donating group; r is R 3 Is H or-NO₂ ; R 4 And R is 5 Each is an electron withdrawing group; r is R 6 And R is 7 Each is H or alkyl; x, y and z are integers greater than or equal to 1; n is an integer not less than 1. The polymer holographic recording material can form ordered plane grating structure on the surface, can display angle dependent iridescent pattern, and can be used in fields of optical anti-fake, decoration and the like.



CLAIM 1. A polymer type hologram recording material characterized by comprising the structure of (i): (i) In the formula, A, B, C, D, E are all structural units; wherein A and E are each alkyl or aryl; b and C are each a compound containing more than two-OH/-NH₂ Alkyl or aryl of (2)A base; d is a catalyst containing more than two-OH/-NH₂ One of alkyl, aryl, polyether structure, polyester structure; x, y and z are integers greater than or equal to 1; n is an integer greater than or equal to 1; ar is a photosensitive structure having the structure of (ii): (ii) Wherein R is 1 And R is 2 Each being an electron donating group; r is R 3 Is H or-NO₂ ;R 4 And R is 5 Each is an electron withdrawing group; r is R 6 And R is 7 Each is H or alkyl.

P37320

PRINTING – LABEL

CN117351832

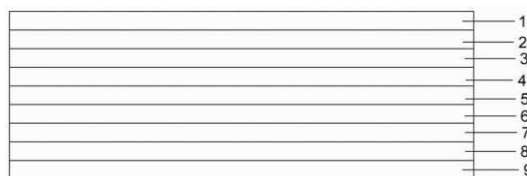
Priority Date: 19/09/2023

HENAN PROVINCE WELLKING TECHNOLOGY DEVELOPMENT

LASER HOLOGRAPHIC UNCOVERED CHARACTER-DISPLAYING DAMAGE NON-RESIDUAL PATTERN ANTI-COUNTERFEIT LABEL AND PREPARATION METHOD THEREOF

The utility model relates to an anti-counterfeit label, in particular to a laser holographic uncovering character-displaying damage non-residual pattern anti-counterfeit label and a preparation method thereof. The anti-counterfeiting label sequentially comprises the following components from top to bottom: transparent base material, typeface release area, laser holographic image layer, digital printing picture and text, coating film layer, elastic coating, superimposed color layer, removable adhesive layer and release paper. The anti-counterfeit label realizes that characters are displayed on the surface when the label is uncovered, and the laser holographic layer is destroyed and can not be reused, so that the anti-counterfeit label has a good anti-counterfeit function, and the anti-counterfeit label can generate tearing resilience force in the uncovering process and ensure that the adhesive substance is not remained on the back of the label, thereby achieving the effect that the adhesive substance is not remained on the back of the label after the label is uncovered.

CLAIM 1. The utility model provides a laser holography is uncovered and is shown word destruction and does not remain anti-fake label of pattern which characterized in that includes from top to bottom in proper order: transparent base material, typeface release area, laser holographic image layer, digital printing picture and text, coating film layer, elastic coating, superimposed color layer, removable adhesive layer and release paper.



P37322

PRINTING – BRAND PROTECTION

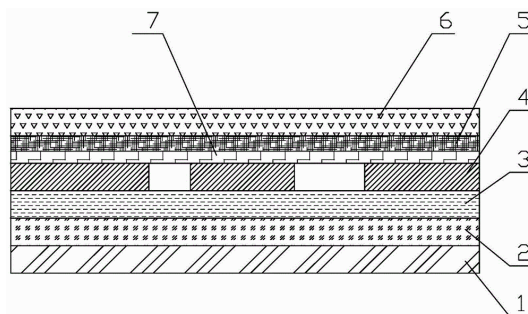
CN117343651

Priority Date: 25/09/2023

SHANDONG TAIBAO PACKAGING PRODUCT

COLOR HOLOGRAPHIC ADHESIVE TAPE AND PREPARATION METHOD THEREOF

The invention particularly relates to a color holographic adhesive tape and a preparation method thereof, wherein the adhesive tape is sequentially provided with a BOPP composite light film layer, an alcohol-soluble double-component composite adhesive layer, a color printing gloss oil layer, a compact aluminized coating, a die-pressing holographic layer, a solvent type transfer coating layer and an acrylic pressure-sensitive adhesive layer from bottom to top. The preparation method comprises the following steps: 1) Coating a solvent mold pressing transfer coating layer on the non-corona PET transfer film; 2) Carrying out mould pressing holographic treatment on the PET film coated with the solvent-type mould pressing transfer coating layer; 3) Plating aluminum; 4) Printing a color printing gloss oil layer on a partial area on the compact aluminized coating; 5) Washing aluminum; 6) Carrying out single-sided corona treatment on the RCPP film layer; 7) Dry compounding; 8) Coating acrylic pressure-sensitive adhesive by using a reverse kiss coating mode; 9) And (5) separating the adhesive tape into discs. The invention has the advantages of high product grade and good anti-counterfeiting effect.



CLAIM 1. A color holographic adhesive tape is characterized in that a BOPP composite light film layer, an alcohol-soluble double-component composite adhesive layer, a color printing light oil layer, a compact aluminized coating, a mould pressing holographic layer, a solvent type transfer coating layer and an acrylic pressure-sensitive adhesive layer are sequentially arranged from bottom to top.

Click on the title to return to table of contents

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

P37239

BANKNOTE

WO202412634

GIESECKE & DEVRIENT CURRENCY TECHNOLOGY

Priority Date: 14/07/2022

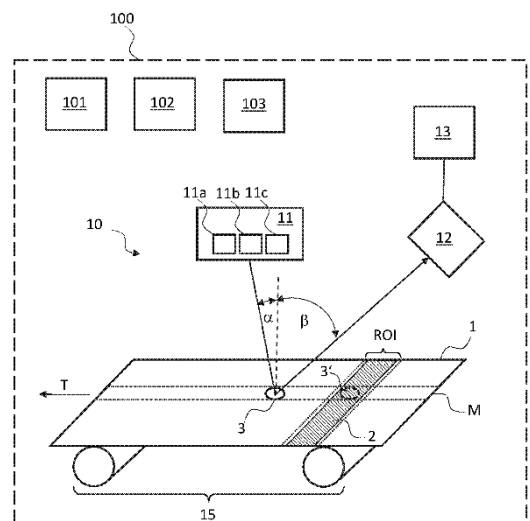
SENSOR AND METHOD FOR CHECKING VALUABLE DOCUMENTS HAVING AT LEAST ONE REFLECTIVE SECURITY ELEMENT

The invention relates to a sensor (10) and to a method for checking valuable documents (1) which have at least one reflective security element (2) which, in the visible spectral range, has an appearance that depends on a viewing angle. The sensor (10) has: an irradiation device (11) which is designed to irradiate one or more different locations (3, 3') on a valuable document (1) with infrared radiation; a detection device (12) which is designed to detect the infrared radiation reflected from the different locations (3, 3') on the valuable document (1) in each case, the sensor recording a reflectance spectrum from each location; and a checking device (13) which is designed to determine, on the basis of each reflectance spectrum, whether there is a reflective security element having an appearance that depends on the viewing angle at each location in order to determine one or more of the locations (3') at which such a reflective security element (2) is located on the valuable document (1) and to check the valuable document (1) on the basis of the location or locations (3') determined.

CAPTEUR ET PROCÉDÉ DE VÉRIFICATION DE DOCUMENTS DE VALEUR COMPRENANT AU MOINS UN ÉLÉMENT DE SÉCURITÉ RÉFLÉCHISSANT

L'invention concerne un capteur (10) et un procédé de vérification de documents de valeur (1) qui comportent au moins un élément de sécurité réfléchissant (2) qui présente, dans la plage spectrale visible, un aspect qui dépend d'un angle de visualisation. Le capteur (10) comprend : un dispositif d'irradiation (11) qui est conçu pour irradier un ou plusieurs emplacements différents (3, 3') sur un document de valeur (1) avec un rayonnement infrarouge ; un dispositif de détection (12) qui est conçu pour détecter le rayonnement infrarouge réfléchi par les différents emplacements (3, 3') sur le document de valeur (1) dans chaque cas, le capteur enregistrant un spectre de réflectance à partir de chaque emplacement ; et un dispositif de vérification (13) qui est conçu pour déterminer, sur la base de chaque spectre de réflectance, s'il existe un élément de sécurité réfléchissant ayant un aspect qui dépend de l'angle de visualisation à chaque emplacement afin de déterminer un ou plusieurs des emplacements (3') auxquels un tel élément de sécurité réfléchissant (2) est situé sur le document de valeur (1) et de vérifier le document de valeur (1) sur la base de l'emplacement ou des emplacements (3') déterminés.

CLAIM 1. Sensor (10) for examining documents of value (1) which have at least one reflective security element (2) which has an appearance dependent on a viewing angle in the visible spectral range, having: - an irradiation device (11) which is set up to irradiate one or more different locations (3, 3') on a document of value (1) with infrared radiation, - a detection device (12) which is set up to detect the infrared radiation reflected from the respective location (3, 3') on the document of value (1), the sensor being set up to detect the reflected infrared radiation in a spectrally resolved manner in order to obtain a remission spectrum at the respective measurement location, and - an examination device (13) for examining the document of value with respect to a reflective security element (2) which has an appearance dependent on the viewing angle, which is set up to to determine, on the basis of the reflectance spectrum obtained for the respective location (3, 3'), whether a reflective security element (2) with an appearance dependent on the viewing angle is located on the value document (1) at the respective location (3, 3'), in order to determine one or more locations at which such a reflective security element (2) is located on the value document (1), and to check the value document (1) on the basis of the determined location or locations (3').

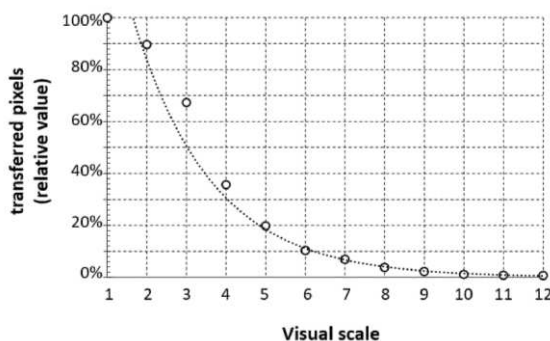


INTAGLIO PRINTING PROCESSES FOR PRODUCING SECURITY FEATURES MADE OF OXIDATIVE DRYING INTAGLIO INKS

The present invention relates to the field of processes for producing a security feature on a substrate by an intaglio printing process comprising a step a) of inking an intaglio engraved printing plate with an oxidative drying intaglio ink, said intaglio engraved printing plate being at a printing plate temperature between about 45°C and about 85°C; a step b) of wiping off any excess the oxidative drying intaglio ink using a paper of a tissue wiping system or using a polymeric wiping cylinder and cleaning said polymeric wiping cylinder with an alkaline aqueous wiping solution in combination with one or more mechanical means; a step c) of transferring said oxidative drying intaglio ink in the form of the security feature on the substrate; and a step d) of drying the oxidative drying intaglio ink in the presence of air so as to form the security feature.

PROCÉDÉS D'IMPRESSION EN CREUX POUR PRODUIRE DES ÉLÉMENTS DE SÉCURITÉ CONSTITUÉS D'ENCRE HÉLIOGRAPHIQUES À SÉCHAGE OXYDATIF

La présente invention concerne le domaine des procédés de production d'un élément de sécurité sur un substrat par un procédé d'impression en creux comprenant une étape a) d'encre d'une plaque d'impression gravée en creux avec une encre héliographique à séchage oxydatif, ladite plaque d'impression gravée en creux étant à une température de plaque d'impression comprise entre environ 45 °C et environ 85 °C ; une étape b) d'essuyage d'un excès éventuel de l'encre héliographique à séchage oxydatif au moyen d'un papier d'un système d'essuyage de tissu ou au moyen d'un cylindre d'essuyage polymère et nettoyage dudit cylindre d'essuyage polymère avec une solution d'essuyage aqueuse alcaline en combinaison avec un ou plusieurs moyens mécaniques ; une étape c) de transfert de ladite encre héliographique à séchage oxydatif sous la forme de l'élément de sécurité sur le substrat ; et une étape d) de séchage de l'encre héliographique à séchage oxydatif en présence d'air de façon à former l'élément de sécurité.



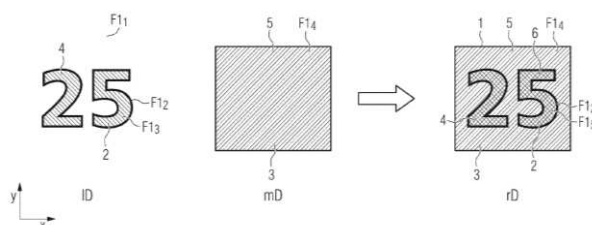
CLAIM 1. A process for producing a security feature on a substrate by an intaglio printing process comprising a step a) of inking an intaglio engraved printing plate with an oxidative drying intaglio ink, said intaglio engraved printing plate being at a printing plate temperature between about 45°C and about 85°C, said oxidative drying intaglio ink comprising: i) at least one oxidative drying varnish, ii) one or more driers in a total amount from about 0.01 wt-% to about 10 wt-%, iii) one or more polythiol compounds present in a total amount larger than 0.5 wt-%, preferably in a total amount from about 0.75 wt-% and 2 wt-%, and iv) one or more fusible waxes present in a total amount from about 1 wt-% to about 10 wt-%, the weight percents being based on the total weight of the oxidative drying intaglio ink; a step b) of wiping off any excess the oxidative drying intaglio ink using a paper or a tissue wiping system or using a polymeric wiping cylinder and cleaning said polymeric wiping cylinder with an alkaline aqueous wiping solution in combination with one or more mechanical means; a step c) of transferring said oxidative drying intaglio ink in the form of the security feature on the substrate; and a step d) of drying the oxidative drying intaglio ink in the presence of air so as to form the security feature.

OPTICALLY VARIABLE SURFACE PATTERN, VALUE DOCUMENT HAVING OPTICALLY VARIABLE SURFACE PATTERN AND METHOD FOR PRODUCING AN OPTICALLY VARIABLE SURFACE PATTERN

The invention relates to an optically variable surface pattern. The surface pattern comprises a first sub-wavelength structure which defines a first surface region and is designed to create at least a first colour impression for the viewer from at least one first viewing perspective. The surface pattern also comprises a translucent, coloured layer which defines a second surface region and is designed to create a second colour impression. The first surface region overlaps at least partly with the second surface region and forms a first overlap region so that the first sub-wavelength structure in the first overlap region is covered by the translucent, coloured layer. The first overlap region is designed to create at least a third colour impression for the viewer from the at least one first viewing perspective. The first sub-wavelength structure has a distance from the translucent, coloured layer in the first overlap region. The invention also relates to a value document having such an optically variable surface pattern and to a method for producing an optically variable surface pattern.

MOTIF DE SURFACE OPTIQUEMENT VARIABLE, DOCUMENT DE VALEUR AYANT UN MOTIF DE SURFACE OPTIQUEMENT VARIABLE ET PROCÉDÉ DE PRODUCTION D'UN MOTIF DE SURFACE OPTIQUEMENT VARIABLE

L'invention concerne un motif de surface optiquement variable. Le motif de surface comprend une première structure de sous-longueur d'onde qui définit une première région de surface et est conçue pour créer au moins une première impression de couleur pour l'observateur à partir d'au moins une première perspective de visualisation. Le motif de surface comprend également une couche colorée translucide qui définit une seconde région de surface et est conçue pour créer une deuxième impression de couleur. La première région de surface chevauche au moins partiellement la seconde région de surface et forme une première région de chevauchement de telle sorte que la première structure de sous-longueur d'onde dans la première région de chevauchement est recouverte par la couche colorée translucide. La première région de chevauchement est conçue pour créer au moins une troisième impression de couleur pour l'observateur à partir de l'au moins une première perspective de visualisation. La première structure de sous-longueur d'onde comprend une distance à partir de la couche colorée translucide dans la première région de chevauchement. L'invention concerne également un document de valeur comprenant ledit motif de surface optiquement variable et un procédé de production d'un motif de surface optiquement variable.



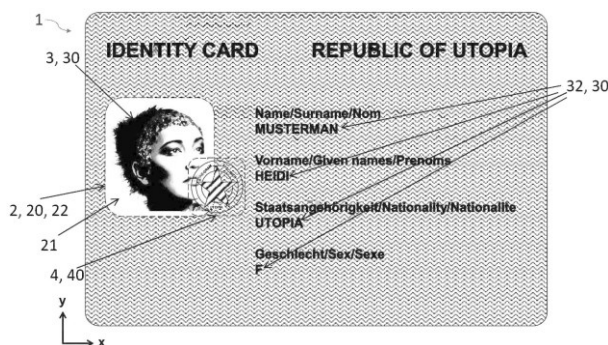
CLAIM 1. Optically variable surface pattern (1) comprising: a first sub-wavelength structure (2) which defines a first surface region (4) and is designed to produce at least one first color impression in the observer from at least one first viewing perspective; and a transparent colored layer (3) which defines a second surface region (5) and is designed to produce a second color impression, the first surface region (4) at least partially overlapping the second surface region (5) and forming a first overlap region (6), so that the first sub-wavelength structure (2) is covered by the transparent colored layer (3) in the first overlap region (6) and the first overlap region (6) is designed to produce at least one third color impression in the observer from the at least one first viewing perspective, the first sub-wavelength structure (2) being at a distance (d) from the transparent colored layer (3) in the first overlap region (6).

SECURITY DOCUMENT, SYSTEM FOR PRODUCING A SECURITY DOCUMENT AND METHOD FOR PRODUCING A SECURITY DOCUMENT

The invention relates to a security document, a method for producing a security document and a system for producing a security document. The security document (1) comprises an absorption region (30) for forming at least one piece of personalized information (3), wherein the security document (1) is processed and/or can be processed in the absorption region (30) in such a way that the at least one piece of personalized information (3) is visible by absorbing light incident on a first side. The security document further comprises a first security element (2) having an optically variable effect, wherein, when viewing the first side, the first security element (2) is arranged behind the absorption layer (52, 31) and the first security element (2) is arranged in a first region (20), wherein the first region (20) partially or completely overlaps the absorption region (30) and the first region (20) does not overlap the absorption region (30) in a background region (21) directly adjoining the absorption region (30), such that the at least one piece of personalized information (3) has a contrast, in particular brightness contrast, which is dependent on the viewing angle in a second region (22) which is formed by at least one subregion of the absorption region (30) and a subregion of the background region (21) directly adjoining the latter.

DOCUMENT DE SÉCURITÉ, SYSTÈME DE FABRICATION D'UN DOCUMENT DE SÉCURITÉ ET PROCÉDÉ DE FABRICATION D'UN DOCUMENT DE SÉCURITÉ

L'invention concerne un document de sécurité, un procédé de fabrication d'un document de sécurité et un système de fabrication d'un document de sécurité. Le document de sécurité (1) comprend une zone d'absorption (30) pour former au moins une information personnalisée (3), le document de sécurité (1) étant traité et/ou pouvant être traité dans la zone d'absorption (30) de sorte que l'absorption de lumière incidente sur une première face rende visible la ou les informations personnalisées (3). Le document de sécurité comprend en outre un premier élément de sécurité (2) ayant un effet optiquement variable; si l'on regarde le premier côté, le premier élément de sécurité (2) se trouve derrière la couche d'absorption (52, 31) et le premier élément de sécurité (2) est disposé dans une première zone (20), la première zone (20) chevauchant partiellement ou totalement la zone d'absorption (30) et, dans une zone de fond (21) directement adjacente à la zone d'absorption (30), la première zone (20) ne chevauchant pas la zone d'absorption (30) de sorte que, dans une seconde zone (22) qui est formée au moins par une zone partielle de la zone d'absorption (30) et une zone partielle directement adjacente de la zone de fond (21), la ou les informations personnalisées (3) présentent un contraste dépendant de l'angle de vision, en particulier un contraste de luminosité.



CLAIM 1. Security document (1) comprising - a first side and a second side opposite the first side, - at least one absorption layer (52, 31) having an absorption region (30) for forming at least one personalized piece of information (3), wherein the security document (1) is processed and/or can be processed in the absorption region (30) in such a way that the at least one personalized piece of information (3) is visible, in particular visible to the human eye, by absorption of light incident on the first side; - a first security element (2) having an optically variable effect, wherein, when viewing the first side, the first security element (2) is arranged behind the absorption layer (52, 31) and the first security element (2) is arranged in a first region (20), wherein the first region (20) partially or completely overlaps the absorption region (30) and the first region (20) does not overlap the absorption region (30) in a background region (21) directly adjoining the absorption region (30). In such a way that the at least one piece of personalized information (3) has a contrast, in particular brightness contrast, which is dependent on the viewing angle in a second region (22) which is formed at least by a subregion of the absorption region (30) and a subregion of the background region (21) which is directly adjacent thereto.

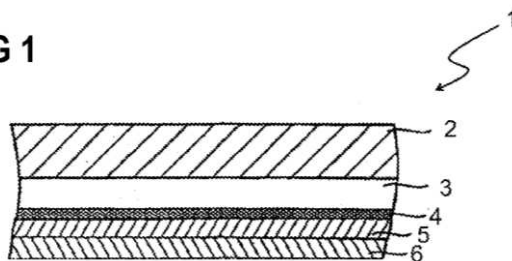
SECURITY ELEMENT, VALUE DOCUMENT, AND METHOD FOR PRODUCING SAME

The invention relates to a security element for protecting a value document, comprising a support substrate, a coating which is provided with an optical surface marking, and a heat-sealable adhesive layer which is suitable for adhering the security element to a value document substrate. The invention is characterized in that the surface of the adhesive layer is provided with a coating which can be washed off upon being contacted by a cleaning liquid.

ÉLÉMENT DE SÉCURITÉ, DOCUMENT DE VALEUR ET LEUR PROCÉDÉ DE FABRICATION

L'invention concerne un élément de sécurité pour protéger un document de valeur, comprenant un substrat de support, un revêtement qui est pourvu d'un marquage de surface optique, et une couche adhésive thermoscellable qui est appropriée pour faire adhérer l'élément de sécurité à un substrat de document de valeur. L'invention est caractérisée en ce que la surface de la couche adhésive est pourvue d'un revêtement qui peut être éliminé par lavage lorsqu'il est mis en contact avec un liquide de nettoyage.

FIG 1



CLAIM 1. Security element for securing a document of value, comprising a carrier substrate, a coating provided with an optical surface marking and a heat-sealable adhesive layer suitable for bonding the security element to a document of value substrate, characterized in that the surface of the adhesive layer is provided with a coating which can be washed off on contact with washing liquid.

P37256

PATENT OF THE MONTH

PRINTING – PLASTIC BANKNOTE – CARD – THREAD – RELIEF – MICROLENS

US20240012181

LUMENCO

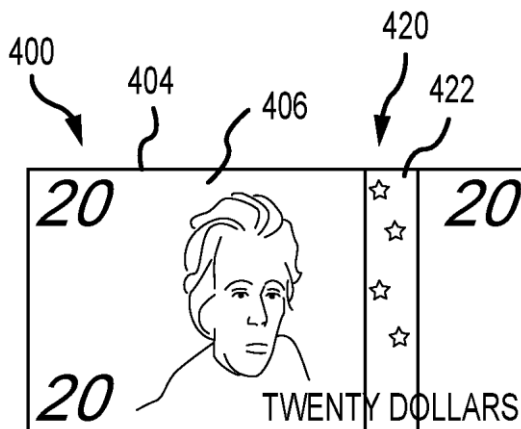
Priority Date: 06/07/2022

MICRO-OPTIC ANTICOUNTERFEITING ELEMENTS FOR CURRENCY AND OTHER ITEMS USING VIRTUAL LENS SYSTEMS

An optical security element to limit counterfeiting. The element includes a lens array with a first side and a second planar side opposite the first side. A plurality of lenses are formed on the first side of the lens array, and an ink layer is provided proximate the second planar side. The ink layer provides an interlaced image, which includes a matrix of frame or image elements under each of a plurality of lens sets or “virtual lenses,” each of which includes at least four lenses arranged in a grouping with an equal or unequal number of lenses on a side (e.g., a 2 by 2 array or a 2 by 3 array). The interlaced element are arranged in non-sequential order in two interlacing axes (e.g., via non-sequential interlacing in both directions) to be distributed throughout an area under the at least four lenses rather than under a single lens.

ÉLÉMENTS MICRO-OPTIQUES ANTI-CONTREFAÇON POUR LA MONNAIE ET D'AUTRES ARTICLES UTILISANT DES SYSTÈMES DE LENTILLES VIRTUELLES

La présente invention concerne un élément de sécurité optique destiné à limiter la contrefaçon. L'élément comprend un réseau de lentilles ayant un premier côté et un second côté plan opposé au premier côté. Une pluralité de lentilles est constituée sur le premier côté du réseau de lentilles, et une couche d'encre est présente à proximité du second côté plan. La couche d'encre présente une image entrelacée, qui comprend une matrice d'éléments de cadre ou d'image sous chacun d'une pluralité de jeux de lentilles ou "lentilles virtuelles", dont chacun comprend au moins quatre lentilles disposées en groupe avec un nombre égal ou inégal de lentilles sur un côté. Les éléments entrelacés sont agencés dans un ordre non successif selon deux axes d'entrelacement afin d'être répartis dans une zone située sous les au moins quatre lentilles plutôt que sous une seule lentille.



CLAIM 1. An optical security element for application to a product to limit counterfeiting, comprising: a lens array with a first side and a second planar side opposite the first side; a plurality of lenses formed on the first side of the lens array; and an ink layer proximate the second planar side, wherein the ink layer comprises: an interlaced image under a plurality of lens sets within the lenses formed on the first side of the lens array, wherein: each lens set of the plurality of lens sets comprises at least a unit of four lenses; the interlaced image comprises a matrix having an odd number of frames or image elements for each unit of the at least a unit of four lenses of each lens set of the plurality of lens sets, wherein the matrix comprises at least five by five matrix; the odd number of frames or image elements in the matrix are arranged according to a ray tracing program in two interlacing axes; and the arrangement of the odd number of frames or image elements in the matrix is configured to provide a pre-determined mismatch, whereby at least one frame or image element of the odd number of frames or image elements is located between adjacent lens sets of the plurality of lens sets.

P37261

PRINTING – BRAND PROTECTION – LIQUID CRYSTALS

KR20240003569

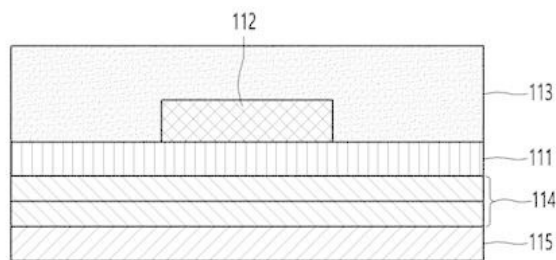
NBST

Priority Date: 01/07/2022

FORGERY AND FALSIFICATION PREVENTION MEANS APPLYING THREE-STAGE AUTHENTICATION METHOD AND FORGERY AND FALSIFICATION AUTHENTICATION METHOD USING SAME

The present invention relates to a forgery and falsification prevention means to which a three-stage authentication method is applied and a forgery and falsification prevention device using the same, and more specifically, to a forgery and falsification prevention means capable of general QR authentication as well as bending authentication and polarization authentication, and a forgery and falsification prevention device using the same.

CLAIM 1. A falsification prevention means according to claim 1, comprising: a first layer formed of a flexible material and including a high wrinkle region and a low wrinkle region; a second layer patterned on the high wrinkle region, formed of a material having a Young's modulus greater than that of the first layer, and adhered to the first layer; a third layer adhered to the low wrinkle region and the second layer so as to cover the low wrinkle region and the second layer, and formed of a material having a Young's modulus greater than that of the first layer and less than that of the second layer; a plurality of fourth layers adhered to a lower portion of the first layer; and a fifth layer adhered to a lower portion of the fourth layer and printed with cholesteric liquid crystal ink to have a hidden pattern therein, wherein the plurality of fourth layers are formed of a pair of design printing layers having different colors from each other, the falsification prevention means according to claim 2, wherein one design printing layer of the fourth layer is formed of a printing layer having a specific pattern printed with general ink and the other design printing layer is formed of a printing layer having a specific pattern printed with liquid crystal ink including a complementary dye, and the sixth layer is formed of the same material as the fifth layer and is formed of the same material as the first layer, and the sixth layer has a polarization orientation angle different from that of the first to fifth layers, and the sixth layer, the first and the fourth layer, the sixth layer have an orientation angle from each other



P37269

PRINTING – LUMINESCENCE

JP2023178857

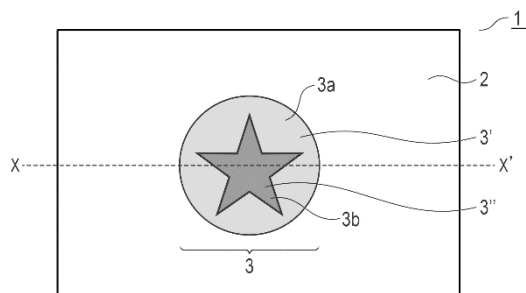
TOPPAN HOLDINGS

Priority Date: 06/06/2022

ANTI-COUNTERFEITING MEDIUM AND METHOD OF VERIFYING SAME

TOPIC: Provided is a forgery prevention medium that is inexpensive, has high accuracy, and can easily perform authenticity determination. INVENTION: According to an embodiment of the present invention, a forgery prevention medium has a base material and an ink layer that is disposed on the base material and contains at least either a dye or pigment having a perylene skeleton. The ink layer contains a first site containing a pigment of a first concentration per unit area on the base material and a second site containing a pigment of a second concentration higher than the first concentration per unit area on the base material. When the first observation light is reflected in the ink layer, the ink layer is observed in the first color. When the second observation light passes through the ink layer, the first portion is observed in the second color, and the second portion is observed in a third color which can be distinguished from the second color.

CLAIM 1. The ink composition comprises a base and an ink layer arranged on the base and containing at least either a dye or a pigment having a perylene skeleton. The ink layer contains a first portion containing a pigment of a first concentration per unit area on the base and a second portion containing a pigment of a second concentration higher than the first concentration per unit area on the base. When the first observation light is reflected in the ink layer, the ink layer is observed in the first color and the second observation light is observed in the second color. In the forgery prevention medium, when the medium has passed through the ink layer, the first portion is observed in a second color, and the second portion is observed in a third color which can be distinguished from the second color.



P37284

BANKNOTE – CARD – RELIEF

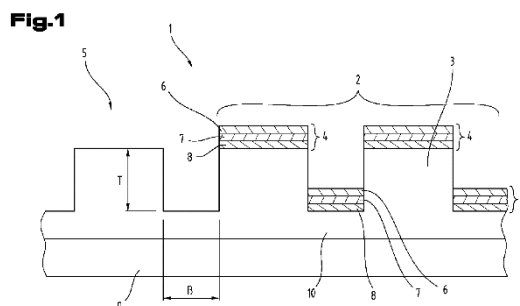
EP4306330

HUECK FOLIEN

Priority Date: 15/07/2022

SAFETY ELEMENT

The invention relates to a security element (1), in particular for securities, security paper or security objects, such as bank notes, identity cards, credit cards, wherein the security element (1) has at least one region (2) with structures (3), wherein at least one color-tilting optical effect layer (4), which produces a color-tilting effect when viewed from a first side of the security element in the at least one first region (2), is provided, and the structures (3) are covered over the entire area or partially by the at least one optical effect layer (4), wherein the structures (3) have a depth (T) of greater than 500 nm, in particular between 500 nm - 4 μm.



ÉLÉMENT DE SÉCURITÉ

L'invention concerne un élément de sécurité (1), en particulier pour des papiers-valeurs, du papier de sécurité ou des objets de sécurité tels que des billets de banque, des pièces d'identité, des cartes de crédit, l'élément de sécurité (1) comportant au moins une zone (2) dotée de structures (3), au moins une couche à effet (4) optique à effet interférentiel induisant un effet interférentiel étant prévue dans ladite au moins première zone (2) en cas d'observation d'une première face de l'élément de sécurité et les structures (3) étant entièrement ou partiellement recouvertes par ladite au moins une couche à effet (4) optique, les structures (3) présentant une profondeur (T) supérieure à 500 nm, en particulier comprise entre 500 nm et 4 μm.

CLAIM 1. Security element (1), in particular for securities, security paper or security objects, such as bank notes, identity cards, credit cards, the security element (1) having at least one region (2) with structures (3), at least one color-tilting optical effect layer (4) which produces a color-tilting effect when viewed from a first side of the security element being provided in the at least one first region (2), and the structures (3) being covered over the entire area or partially by the at least one optical effect layer (4), characterized in that the structures (3) have a depth (T) of greater than 500 nm, in particular between 500 nm - 4 μm.

P37285

BANKNOTE – CARD – RELIEF

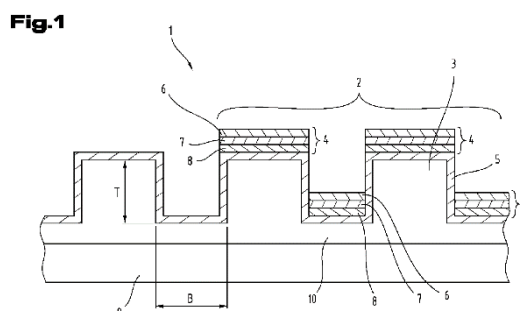
EP4306329

HUECK FOLIEN

Priority Date: 15/07/2022

SAFETY ELEMENT

The invention relates to a security element, in particular for securities, security paper or security objects, such as bank notes, identity cards, credit cards, wherein the security element (1) has at least one region (2) with structures (3), wherein at least one color-tilting optical effect layer (4) which produces a color-tilting effect when viewed from a first side of the security element is provided in the at least one first region (2), and the structures (3) are covered over the entire area or partially by the at least one optical effect layer (4), wherein the structures (3) are coated with at least one layer (5) of at least one metal, wherein the at least one layer (5) of the at least one metal is arranged between the structures (3) and the optical effect layer (4) as an adhesion promoter layer.



ÉLÉMENT DE SÉCURITÉ

L'invention concerne un élément de sécurité (1), en particulier pour des papiers-valeurs, du papier de sécurité ou des objets de sécurité tels que des billets de banque, des pièces d'identité, des cartes de crédit, l'élément de sécurité (1) comportant au moins une zone (2) dotée de structures (3), au moins une couche à effet (4) optique à effet interférentiel induisant un effet interférentiel étant prévue dans ladite au moins première zone (2) en cas d'observation d'une première face de l'élément de sécurité et les structures (3) étant recouvertes sur toute la surface ou partiellement par ladite au moins une couche à effet (4) optique, les structures (3) étant revêtues d'au moins une couche (5) composée d'au moins un métal, ladite au moins une couche (5) en métal étant agencée en tant que couche de promoteur d'adhérence entre les structures (3) et la couche à effet (4) optique.

P37286

BANKNOTE – CARD – RELIEF – MICROLENS

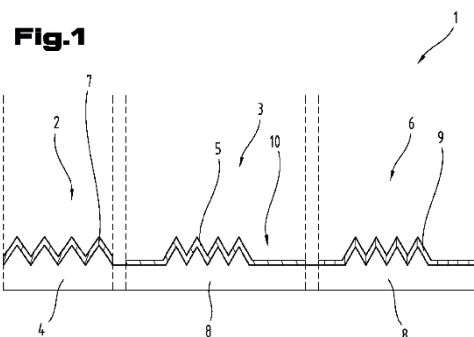
EP4306328

HUECK FOLIEN

Priority Date: 15/07/2022

SAFETY ELEMENT

The invention relates to a security element (1), in particular for securities, security paper or security objects, such as bank notes, identity cards, credit cards, wherein the security element (1) has at least one first region (2) with structures (4), wherein at least one color-tilting optical effect layer (7) which produces a color-tilting effect when viewed from a first side of the security element is provided in the at least one first region, and the structures (4) are covered over the entire area or partially by the at least one optical effect layer (7), wherein the security element (1) has at least one second region without a visible color-tilting effect when viewed from the first side, wherein at least one metal layer and/or metal effect layer is applied over the entire area or partially in the second region.



CLAIM 1. Security element (1), in particular for securities, security paper or security objects, such as banknotes, ID cards, credit cards, the security element (1) having at least a first area (2) with structures (4), at least one when viewed from a first side of the security element in which at least a first region is provided with a color-shifting optical effect layer (7) and the structures (4) are completely or partially covered by the at least one optical effect layer (7), characterized in that there is at least a second region without has a visible color shift effect when viewed from the first side, at least one metal layer (5) and / or metal effect layer being applied over the entire surface or partially in the second area (3).

P37287

PRINTING – CARD – PASSPORT – LUMINESCENCE

EP4303028

HID GLOBAL CID

Priority Date: 06/07/2022

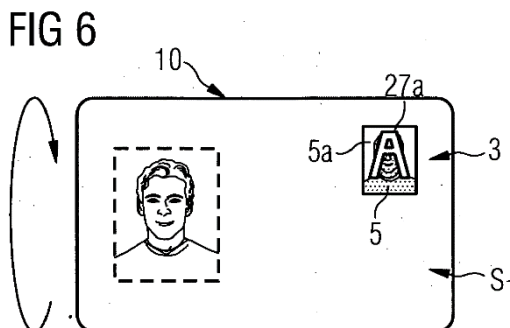
PERSONALIZABLE SECURITY DOCUMENT AND METHOD OF PERSONALIZING THE SAME

A personalizable security document (10) includes a laser-engravable portion (5a) that exhibits a color-change effect when viewed under white light. This color-change effect is used to selectively mask a further security feature provided as a first pattern (27a) in a layer that is below the layer including the laser-engravable portion (5a). This is achieved by appropriately matching the color of the laser-engravable portion (5a) to the color of the first pattern (27a).

DOCUMENT DE SÉCURITÉ PERSONNALISABLE ET SON PROCÉDÉ DE PERSONNALISATION

Un document de sécurité personnalisable (10) comprend une partie pouvant être gravée au laser (5a) qui présente un effet de changement de couleur lorsqu'elle est vue sous une lumière blanche. Cet effet de changement de couleur est utilisé pour masquer sélectivement un autre élément de sécurité fourni sous la forme d'un premier motif (27a) dans une couche située au-dessous de la couche comprenant la partie pouvant être gravée au laser (5a). Ceci est obtenu par mise en correspondance appropriée de la couleur de la partie pouvant être gravée au laser (5a) avec la couleur du premier motif (27a).

CLAIM 1. A personalizable security document (10) comprising: a substrate (1) having a first side (S1) and a second side (S2) opposite to the first side in a thickness direction (d) of the substrate (1); and a security feature (3) formed in the substrate (1) and extending through at least part of the substrate along the thickness direction (d), wherein the security feature (3) includes: a first layer (16) including a laser-engravable portion (5a) configured to have an image (5) laser engraved in the same, the laser-engravable portion (5a) including a first material that exhibits a color-change effect when viewed from the first side (S1) under white light at different observation angles; and a second layer (17a) arranged below the first layer (16), the second layer (17a) including a first pattern (27a) overlapping at least in part the laser-engravable portion (5a) when viewed along the thickness direction, wherein the first pattern (27a) has a color that is adapted to the first material of the laser-engravable portion such that the first pattern is not visible when the substrate (1) is viewed from the first side (S1) under white light at a first observation angle, and the first pattern is visible when the substrate (1) is viewed from the first side (S1) under white light at a second observation angle that is different from the first observation angle.



P37288

PRINTING – CARD – PASSPORT – RELIEF

EP4303027

BUNDESDRUCKEREI

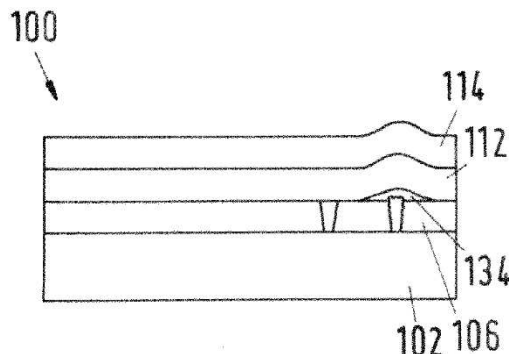
Priority Date: 07/07/2022

VALUABLE OR SECURITY PRODUCT AND METHOD FOR THE PRODUCTION THEREOF

The invention relates to a method for producing a value or security product (100), comprising the following steps: - providing a core layer (102) of the value or security product (100), - applying at least one laser-capable film layer (106) to the core layer (102) or to one or more polymer layers (104) applied to the core layer (102), - introducing person-specific and/or product-specific tactilely undetectable information (108) into the laser-capable film layer (106) using a low-intensity laser beam, and - forming person-specific and/or product-specific information in the form of at least one tactilely detectable Braille character (110) using a high-intensity laser beam which is higher than the low intensity.

The invention also relates to a value or security product (100).

CLAIM 1. Method for producing a value or security product (100), comprising the steps of: - providing a core layer (102) of the value or security product (100) , - applying at least one laser-capable film layer (106) to the core layer (102) or to one or more polymer layers (104) applied to the core layer (102), - introducing person-specific and/or product-specific tactilely undetectable information (108) into the laser-capable film layer (106) using a low-intensity laser beam, and - forming person-specific and/or product-specific information in the form of at least one tactilely detectable Braille character (110) using a high-intensity laser beam which is higher than the low intensity.



P37294

BRAND PROTECTION

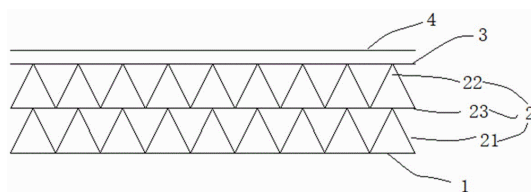
CN220352510U

SHANGHAI HUIXIONG PACKING

Priority Date: 18/04/2023

ANTI-FAKE CORRUGATED BOARD AND PAPER BOX

The utility model discloses an anti-counterfeiting corrugated board, which comprises an inner paper layer, a corrugated layer and a surface paper layer, wherein the corrugated layer comprises a first corrugated medium layer and a second corrugated medium layer, the first corrugated medium layer and the second corrugated medium layer are respectively in a plurality of first triangle shapes and second triangle shapes in the section plane of the corrugated layer, the middle paper layer is arranged between the first corrugated medium layer and the second corrugated medium layer, and an anti-counterfeiting film is arranged on the outer side of the surface paper layer. By adding the anti-counterfeiting film on the corrugated board and the manufactured packaging paper box, the authenticity of the paper box can be directly identified according to the color-changing effect of the paper box under the irradiation of light, and the paper box can not be sold for a second time after unpacking, so that the anti-counterfeiting effect can be achieved. The method solves the defects of large investment cost and unsatisfactory effect of the prior anti-counterfeiting technology, has uniqueness and uniqueness, is low in processing cost, is easy to master and operate, improves the smoothness and flatness of the corrugated board, ensures better touch feeling of a user, and does not prevent printing of appearance patterns.



CLAIM 1. The utility model provides an anti-fake corrugated board, its characterized in that contains lining ply, flute layer, face ply, the flute layer is located lining ply with between the face ply, the flute layer contains first flute refill and second flute refill in the cross-section plane of flute layer, first, second flute refill is a plurality of first, second triangle-shaped shape respectively, be equipped with the well ply between first, the second flute refill, the face ply outside is equipped with anti-fake membrane, anti-fake membrane is optical interference discolour film.

P37303

LABEL

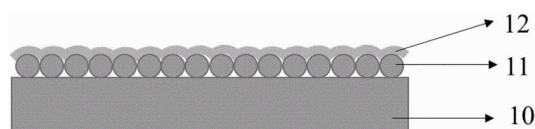
CN220290366U

Priority Date: 15/10/2021

NANJING NANOTECH INSTITUTE

ANTI-FAKE LABEL

The utility model provides an anti-counterfeiting label which comprises a substrate and a first film for generating structural colors, wherein the first film is positioned on the substrate and contains microparticles. The anti-counterfeit label has unclonability and physical unclonability, and because the optical structure of the first film is disordered, the anti-counterfeit label further has different optical images and optical information corresponding to the optical images at different angles, and compared with the traditional two-dimensional code and other technical means, the anti-counterfeit label provided by the utility model can effectively avoid risks of being shot and copied, and the security of the anti-counterfeit label is improved.



CLAIM 1. An anti-counterfeit label comprising a substrate and a first film formed of a micro-particulate structure laid on the substrate, the first film for producing a structural color; the microparticles are formed by self-assembly of primary particles, and the arrangement state of the microparticles in the first film comprises ordered arrangement and disordered arrangement; the anti-counterfeiting label also comprises a second film; the whole area of the surface of the substrate is covered with the first film; the second film covers part of the area of the surface of the first film and forms a pattern; the raw materials of the second film are one of gold, silver, aluminum, polydimethylsiloxane and polyethylene terephthalate; or the first film covers part of the area of the surface of the substrate and forms a pattern, and the rest area of the surface of the substrate forms a concave area; the second film completely covers the patterned first film and the recessed region.

P37307

PRINTING – LABEL

CN220272054U

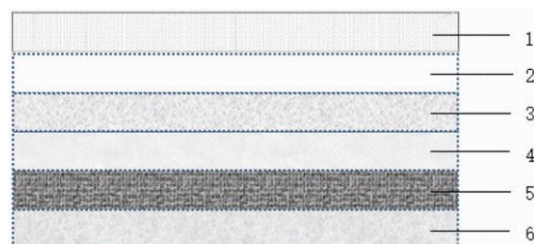
Priority Date: 07/02/2023

WUHAN HUAGONG IMAGE TECHNOLOGY & DEVELOPMENT

CHANGEABLE INFORMATION IDENTIFICATION FILM

The utility model discloses a changeable information identification film, which belongs to the technical field of anti-counterfeiting devices and comprises a first image layer, a first plating layer, a base film layer, a second image layer, a second plating layer and a glue layer which are sequentially laminated; the first image layer and the second image layer present a first image and a second image under the action of plating layers with different absorbances, and the first image and the second image are overlapped, so that the multiple-change information mark presents different images before and after the base film layer is uncovered. After the label is uncovered, the second image layer is destroyed, different images are displayed, the diversity of the images is increased, the aesthetic property and the anti-uncovering property are integrated, the label is difficult to be attached again after the label is uncovered, the secondary use of the label is effectively prevented, even if the label and the label are attached again, a consumer can easily distinguish the label from the surface of the label, and the authenticity of the product is further distinguished, so that the anti-counterfeiting level is improved.

CLAIM 1. The variable information identification film is characterized by comprising a first image layer (1), a first plating layer (2), a base film layer (3), a second image layer (4), a second plating layer (5) and a glue layer (6) which are sequentially stacked; wherein the method comprises the steps of The first image layer (1) is provided with a first image; -said second image layer (4) providing a second image; the absorbance OD value of the first coating (2) is 0.5-0.6, and/or the absorbance OD value of the second coating (5) is 1.8-2.0; the first image and the second image are overlapped, so that the changeable information identification film presents different images before and after the base film layer (3) is uncovered.



P37328

INFRARED

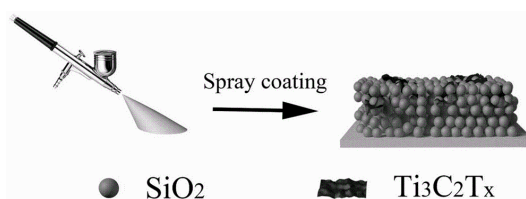
CN117301749

JIANGSU UNIVERSITY

Priority Date: 12/09/2023

PREPARATION METHOD OF NON-IRIDESCENT STRUCTURAL COLOR FILM WITH INFRARED ANTI-COUNTERFEITING CHARACTERISTIC

The invention relates to a preparation method of a non-iridescent structural color film with an infrared anti-counterfeiting characteristic. Firstly preparing an aqueous phase solution of monodisperse microspheres, and then doping trace amount of MXene and carbon black substances to obtain a mixed colloidal particle suspension. And forming a three-dimensional amorphous photonic crystal film on the surface of the substrate by using a spray coating, spin coating or roll coating mode by using a rapid evaporation solvent. The black material is used as an absorbing substance to absorb light to multiply scatter the amorphous photon structure, so that the color quality of the amorphous photon crystal film is improved, and the better color display of the non-iridescent structure is shown. The thermal anti-counterfeiting characteristic of the structural color film is realized by utilizing the better absorption in the solar spectrum of the MXene material, the extremely low emissivity of the middle infrared band and the optical characteristic difference between the MXene material and the carbon black and other materials. After micro-heating, the structural color film can read hidden information by means of an infrared camera.



CLAIM 1. The preparation method of the non-iridescent structural color film with the infrared anti-counterfeiting characteristic is characterized by comprising the following specific steps of: step 1, dispersing monodisperse colloidal particles in an aqueous phase solution to obtain a colloidal particle suspension with a mass fraction of 1-40%; step 2, adding MXene nano-sheet powder into the colloidal particle suspension in the step 1 for ultrasonic treatment to obtain a mixed suspension A containing 0.1-5% of MXene nano-sheets by mass fraction; step 3; adding the black material into the colloidal particle suspension in the step 1 for ultrasonic treatment to obtain a mixed suspension B containing the black material with the mass fraction of 0.1-5%; step 4; through spin coating, spray coating or roll coating, a patterned structural color film prepared by rapid assembly of colloidal particles of suspension A is firstly formed in a partial area of the surface of a substrate by means of a mask, and then a patterned structural color film prepared by rapid assembly of colloidal particles of suspension B is formed in other areas of the surface of the substrate, so that a non-iridescent structural color film with an infrared anti-counterfeiting characteristic is obtained; and 5, carrying out micro-heating treatment on the film, and reading hidden information by using an infrared camera.

P37330

LABEL

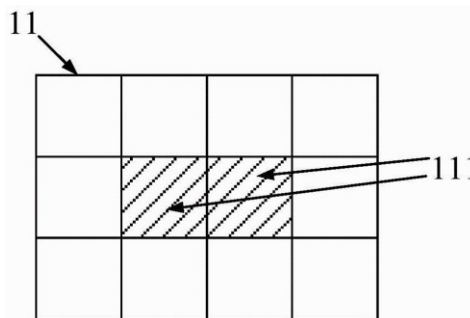
CN117275336

BEIJING BOE TECHNOLOGY DEVELOPMENT | BOE TECHNOLOGY GROUP | HEFEI BOE JOINT TECHNOLOGY

Priority Date: 25/09/2023

ANTI-FAKE LABEL

The present disclosure provides an anti-counterfeit label, and relates to the technical field of anti-counterfeit. The anti-counterfeit label comprises: an OLED display including at least one color change region, the OLED display having a color conversion layer or a color filter layer at each color change region; the color conversion layer comprises a color conversion area and a first blank area, wherein the color conversion area and the first blank area cover pixels with different color types, and the color of light excited to be emitted by the color conversion area is different from the color of light emitted by the covered pixels; the color film filter layer comprises a color film area and a second blank area, wherein the color film area and the second blank area cover pixels with different color types, and the color of light allowed to pass through the color film area is different from the color of light emitted by the covered pixels. By the mode, the color-changing area can display patterns with different colors under the front view angle and the side view angle, and the anti-counterfeiting effect is achieved. And the imitation difficulty of the anti-counterfeiting label based on the OLED display is high.



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

N9943

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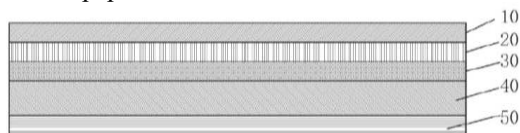
Priority Date: 28/08/2023

SHENZHEN JINJIA

HOLOGRAPHIC PATTERN EFFECT BUILDING WALL DECORATION PAPER AND PREPARATION METHOD THEREOF

The invention discloses a holographic pattern effect building wall decoration paper and a preparation method thereof. The preparation method comprises the steps of manufacturing a BOPP laser film with laser holographic graphics and texts, printing the decorative graphics and texts on decorative base paper, coating an SA20 surface melamine glue layer on the decorative graphics and texts surface of the decorative base paper, enabling the laser holographic graphics and texts on the BOPP laser film to be transferred onto the SA20 surface melamine glue layer, and coating a back glue layer on the back surface of the decorative base paper to prepare building wall decoration paper, so that the laser effect is increased on the building wall decoration paper, and the SA20 surface melamine glue layer can be well combined with the laser holographic graphics and texts on the BOPP laser film, so that the function of increasing the laser effect on the building wall decoration paper is realized.

CLAIM 1. The preparation method of the holographic pattern effect building wall decorative paper is characterized by comprising the following steps of: manufacturing a BOPP laser film with laser holographic graphics and texts; printing decorative graphics and texts on the decorative base paper; coating SA20 on the decorative picture and text surface of the decorative base paper to coat a melamine glue layer; transferring the laser holographic image-text on the BOPP laser film to the SA20 surface-coated melamine glue layer; and coating a back gluing water layer on the back of the decorative base paper to prepare the building wall decorative paper.



N9957

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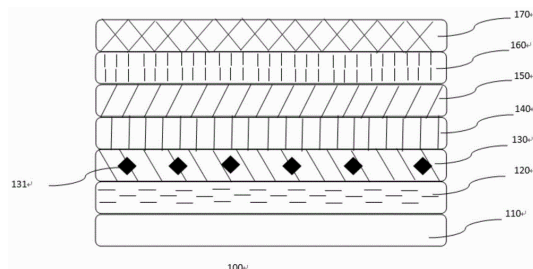
Priority Date: 30/10/2023

WUHAN HUAGONG IMAGE TECHNOLOGY & DEVELOPMENT

UV (ULTRAVIOLET) LIGHT-CURED RESIN FOR HOLOGRAPHIC IN-MOLD TRANSFER PRINTING FILM AND TRANSFER PRINTING FILM PREPARED FROM UV LIGHT-CURED RESIN

The invention provides a UV light-cured resin for a holographic in-mold transfer film and a transfer film prepared by using the same. The UV light-cured resin comprises the following components in parts by weight: 10-20 parts of modified polyether acrylate, 15-10 parts of amine modified polyether acrylate, 15-20 parts of polysiloxane PUA, 15-20 parts of organosilicon polyether acrylate, 10-20 parts of aromatic PUA, 10-15 parts of tertiary amine acrylate, 3-7 parts of ultraviolet absorbent and 3-7 parts of photoinitiator; the holographic in-mold transfer film comprises a base film, a release layer, a holographic layer, a connecting layer, a plating layer, an ink layer and a back adhesive layer from bottom to top in sequence; wherein the holographic layer is prepared from the UV light-cured resin through UV imprinting. The transfer film prepared by the invention can provide holographic patterns, improves the attractiveness of household appliances, has good wear resistance, hardness, solvent resistance and weather resistance, can protect the coating below the holographic layer and the household appliances from being damaged, and improves the service life of the household appliances.

CLAIM 1. The UV light-cured resin for the holographic in-mold transfer film is characterized by comprising the following components in parts by weight: 10-20 parts of modified polyether acrylate, 15-10 parts of amine modified polyether acrylate, 15-20 parts of polysiloxane PUA, 15-20 parts of organosilicon polyether acrylate, 10-20 parts of aromatic PUA, 10-15 parts of tertiary amine acrylate, 3-7 parts of ultraviolet absorbent and 3-7 parts of photoinitiator.



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

N9902

WO202412939

HELLA & CO

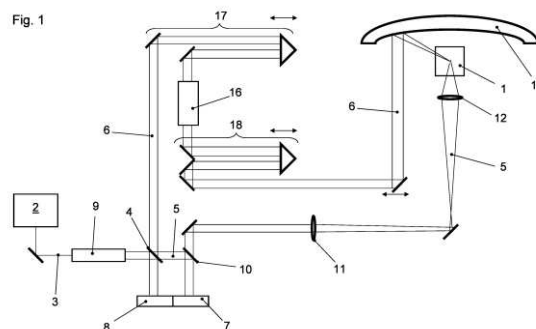
Priority Date: 14/07/2022

METHOD AND DEVICE FOR PRODUCING A COMPUTER-GENERATED HOLOGRAM, HOLOGRAM, AND LIGHTING DEVICE FOR A VEHICLE

The invention relates to a method for producing a computer-generated hologram, comprising the following method steps: generating a reference beam (6), generating an object beam (5), imposing computer-generated information concerning the hologram on the object beam (5), causing the object beam (5) and the reference beam (6) to overlap on or in a light-sensitive recording material (1) for the exposure of the hologram, wherein a plurality of portions of the light-sensitive recording material (1) are successively impinged on simultaneously in each case by the object beam (5) and the reference beam (6) in order to generate a plurality of sub-holograms, and wherein computer-generated information simulating a light source with a predefined divergence is imposed on the reference beam (6).

PROCÉDÉ ET DISPOSITIF DE FABRICATION D'HOLOGRAMME GÉNÉRÉ PAR ORDINATEUR, HOLOGRAMME ET DISPOSITIF D'ÉCLAIRAGE POUR VÉHICULE

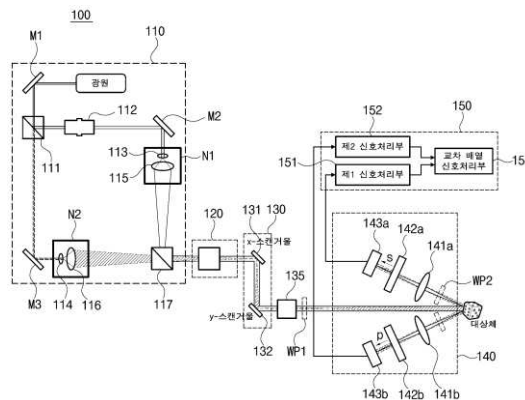
L'invention concerne un procédé de fabrication d'hologramme généré par ordinateur qui comprend les étapes de procédé suivantes : générer un faisceau de référence (6), générer un faisceau d'objet (5), imposer des informations générées par ordinateur concernant l'hologramme sur le faisceau d'objet (5), amener le faisceau d'objet (5) et le faisceau de référence (6) à se chevaucher sur ou dans un matériau d'enregistrement sensible à la lumière (1) destiné à l'exposition de l'hologramme, une pluralité de parties du matériau d'enregistrement sensible à la lumière (1) étant successivement et simultanément frappées par le faisceau d'objet (5) et le faisceau de référence (6) afin de générer une pluralité de sous-hologrammes, et des informations générées par ordinateur simulant une source de lumière ayant une divergence prédéfinie étant imposées sur le faisceau de référence (6).



CLAIM 1. Method for producing a computer-generated hologram, comprising the following method steps: - generating a reference beam (6, 6', 6''), - generating an object beam (5), - impressing computer-generated information relating to the hologram onto the object beam (5), - overlapping the object beam (5) and the reference beam (6, 6', 6'') on or in a photosensitive recording material (1) in order to expose the hologram, wherein a plurality of sections of the photosensitive recording material (1) are successively subjected to the object beam (5) and the reference beam (6, 6', 6'') in each case simultaneously in order to generate a plurality of subholograms, characterized in that computer-generated information which simulates a light source with a predetermined divergence is impressed onto the reference beam (6, 6', 6'').

POLARIZATION DIVISION DOUBLE SCANNING HOLOGRAPHY SYSTEM USING ANGLE TILT WITH RESPECT TO REFLECTOR

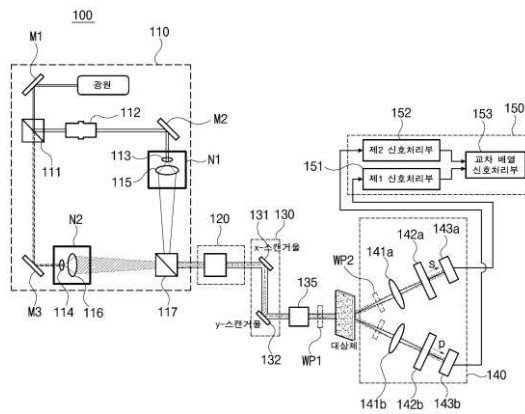
The present invention relates to a polarization division double scanning holography system using an angle tilt for a reflector. The polarization division double scanning holography system according to the present invention comprises: a scan beam generating unit for modulating the phase of a first beam divided from a light source, converting the first beam into a first curvature beam through a first beam curvature generating unit, converting a second beam into a second curvature beam through a second beam curvature generating unit, and interfering the first and second curvature beams to form a scan beam; a scan beam dividing unit for dividing the scan beam into an s-polarized beam and a p-polarized beam and emitting the beams at different angles; a scan unit for receiving the scan beam consisting of two polarized beams emitted at different angles from the scan beam dividing unit, projecting the scan beam onto an object, and controlling the scanning position of the scan beam with respect to the object in horizontal and vertical directions; a scan beam transmitting unit consisting of at least one lens, disposed between the scan unit and the object, and transmitting the scan beam consisting of two polarized beams emitted at different angles to the object; an optical detecting unit for separating and detecting the s-polarized beam and the p-polarized beam from the beams reflected or fluorescent from the object; and a signal processing unit for processing signals of the separated and detected s-polarized beam and p-polarized beam to generate holograms for the object. According to the present invention, the hologram of the object can be acquired at an ultra-high speed faster than the scanning speed of the scan mirror.



CLAIM 1. A holographic signal processing apparatus comprising: a scan beam generation unit for forming a scan beam by modulating a phase of a first beam divided from a light source, converting the first beam into a first curvature beam through a first beam curvature generation unit, converting a second beam into a second curvature beam through a second beam curvature generation unit, and interfering the first and second curvature beams; a scan beam division unit for dividing the scan beam into an s-polarized beam and a p-polarized beam and emitting the divided two polarized beams at different angles; a scan unit for receiving the scan beam consisting of the two polarized beams emitted at the different angles from the scan beam division unit, projecting the received scan beam onto an object, and controlling a scanning position of the scan beam on the object in horizontal and vertical directions to transfer the controlled scan beam to the object; a scan beam transfer unit consisting of at least one lens, disposed between the scan unit and the object, and transferring the scan beam consisting of the two polarized beams emitted at the different angles to the object; an optical detection unit comprising a first optical detector for detecting the s-polarized beam from the beam reflected or fluorescent from the object, and a second optical detector for detecting the p-polarized beam; and a signal processing unit for processing signals of the s-polarized beam and the p-polarized beam detected from the first optical detector to generate a hologram for the object, wherein the signal processing unit comprises: a first signal processing unit for processing the signals of the s-polarized beam and the p-polarized beam detected from the second signal processed signal processed by a first signal processing unit.

POLARIZATION DIVISION DOUBLE SCANNING HOLOGRAPHY SYSTEM USING ANGLE TILT WITH RESPECT TO TRANSMISSIVE BODY

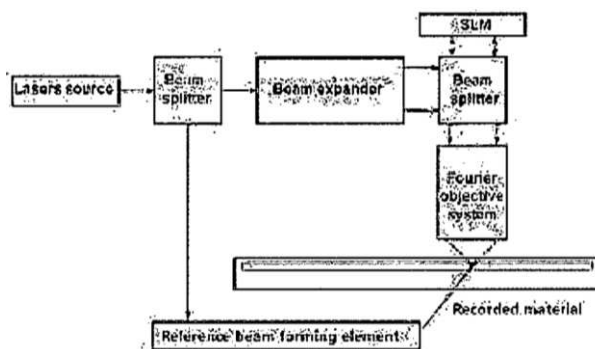
The present invention relates to a polarization division double scanning holography system using an angle tilt for a transmitting body. The polarization division double scanning holography system for a transmitting body according to the present invention comprises: a scan beam generating unit for modulating the phase of a first beam divided from a light source, converting the phase into a first curvature beam through a first beam curvature generating unit, converting a second beam into a second curvature beam through a second beam curvature generating unit, and interfering the first and second curvature beams to form a scan beam; a scan beam dividing unit for dividing the scan beam into an s-polarized beam and a p-polarized beam and emitting the beams at different angles; a scan unit for receiving the scan beam consisting of two polarized beams emitted at different angles from each other from the scan beam dividing unit, projecting the scan beam onto the transmitting body, and controlling the scanning position of the scan beam with respect to the transmitting body in horizontal and vertical directions; a scan beam transmitting unit consisting of at least one lens, disposed between the scan unit and the transmitting body, and transmitting the scan beam consisting of two polarized beams emitted at different angles to the transmitting body; an optical detecting unit for separating and detecting an s-polarized beam and a p-polarized beam from the beam transmitted through the transmitting body; and a signal processing unit for processing the signals of the separated and detected s-polarized beams and p-polarized beams to generate a hologram for the transmitting body. According to the present invention, a hologram for a transmissive object, which is a transmissive object, can be acquired at an ultra-high speed faster than the scanning speed of a scan mirror.



CLAIM 1. $\theta/2 \lambda/4$ A holographic signal processing apparatus comprising: a scan beam generation unit for forming a scan beam by modulating a phase of a first beam divided from a light source, converting the first beam into a first curvature beam through a first beam curvature generation unit, converting a second beam into a second curvature beam through a second beam curvature generation unit, and interfering the first and second curvature beams; a scan beam division unit for dividing the scan beam into an s-polarized beam and a p-polarized beam and outputting the divided two polarized beams at different angles; a scan unit for receiving the scan beam consisting of the two polarized beams emitted at the different angles from the scan beam division unit, projecting the received scan beam onto a transmitting body, and controlling a scanning position of the scan beam on the transmitting body in horizontal and vertical directions to transmit the controlled scan beam to the transmitting body; a scan beam transmission unit consisting of at least one lens, disposed between the scan unit and the transmitting body, and transmitting the scan beam consisting of the two polarized beams emitted at the different angles to the transmitting body; an optical detection unit comprising a first photodetector for detecting separation of the s-polarized beam from the beam transmitted through the transmitting body and a second photodetector for detecting separation of the p-polarized beam from the beam transmitted through the transmitting body; and a signal processing unit for processing signals of the s-polarized beam and the p-polarized beam detected from the first photodetector to generate a hologram for the transmitting body.

HOLOGRAPHIC : UNVEILING THE WORLD IN 3D

Holography is a cutting-edge technology that enables the creation of three-dimensional images using laser light. This abstract highlights its fundamental principles and diverse applications. Holography relies on the interference patterns formed by laser beams, capturing both amplitude and phase information of an object, resulting in a hologram. Unlike conventional photography, holograms offer depth, parallax, and a lifelike quality to the reproduced image. Holography has far-reaching applications, from security features on banknotes to medical imaging, data storage, and immersive displays in augmented and virtual reality. It has revolutionized fields such as microscopy, allowing for the visualization of intricate biological structures. Additionally, the entertainment industry leverages holography for captivating live performances of deceased artists. The ongoing development of holographic technology promises even more groundbreaking applications, making it a crucial component of modern science and industry.



CLAIM 1. Holography is known for producing true three-dimensional images. Unlike stereoscopic 3D, which presents separate views to each eye, holography captures and reproduces an object's full 3D structure, offering depth and parallax, creating lifelike visual experiences.

N9924

FR3137979

Priority Date: 12/07/2022

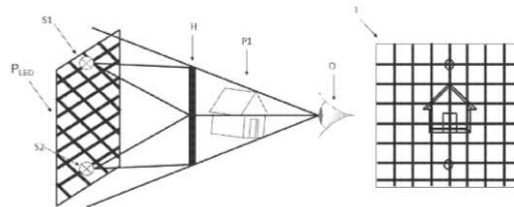
PSA AUTOMOBILES | STELLANTIS AUTO

HOLOGRAM INTEGRATING THE LIGHT SOURCES OF A MULTI-SOURCE HOLOGRAPHIC DEVICE

A holographic device comprises a plurality of light sources (S1, S2) producing off-center divergent spherical waves and a physical hologram (H) to be illuminated by the plurality of light sources. The physical hologram (H) is manufactured from a digital hologram calculated from, in particular, at least one object plane (PLED) carrying a geometric pattern adapted to mask the plurality of light sources in each floating image (I) perceived by the observer (O) when the physical hologram is illuminated by the plurality of light sources.

HOLOGRAMME INTÉGRANT LES SOURCES LUMINEUSES D'UN DISPOSITIF HOLOGRAPHIQUE MULTI-SOURCES

La présente invention concerne un dispositif holographique qui comprend une pluralité de sources lumineuses (S1, S2) produisant des ondes sphériques divergentes décentrées et un hologramme physique (H) destiné à être illuminé par la pluralité de sources lumineuses. L'hologramme physique (H) est fabriqué à partir d'un hologramme numérique calculé à partir, notamment, d'au moins un plan objet (PLED) porteur d'un motif géométrique adapté pour masquer la pluralité des sources lumineuses dans chaque image flottante (I) perçue par l'observateur (O) lorsque que l'hologramme physique est illuminé par la pluralité de source lumineuses.



CLAIM 1. A method of manufacturing a physical hologram from a digital hologram representing objects of a 3D scene, said method comprising: a step (110) of obtaining a 2D image per object of the 3D scene and per viewing angle of the 3D scene, each 2D image being intended to be perceived by an observer according to a viewing angle of the 3D scene on an image plane positioned between a plane of the physical hologram and an observer when the physical hologram is illuminated by a plurality of light sources; and a step (120) of obtaining the physical hologram at least one 2D image representing a geometrical pattern adapted to mask the light sources in each floating image perceived by the observer, said at least one 2D image being carried by at least one object plane positioned at the same location as a plane (PLED) carrying the light sources; a step (130) of calculating, per 2D image, an elementary angular spectrum propagated on the plane of the physical hologram by application of a Fourier transform on a 2D image obtained; a step (140) of determining an angular spectrum per viewing angle of the 3D scene by summing the elementary angular spectra obtained corresponding to the same viewing angle of the 3D scene; a step (150) of determining a total angular spectrum by combining the angular spectra obtained by viewing angle of the 3D scene; a step (160) of determining a digital hologram in the spatial domain of the plane of the physical hologram by applying an inverse Fourier transform on the total angular spectrum obtained; a step (170) of multiplication of the digital hologram calculated by a conjugate of an incident wavefront on the plane of the hologram physical, said incident wavefront being formed from divergent off-center spherical waves produced by the plurality of light sources; and a step (180) of manufacturing the physical hologram from a hologram resulting from said multiplication.

N9925

FR3137978

Priority Date: 12/07/2022

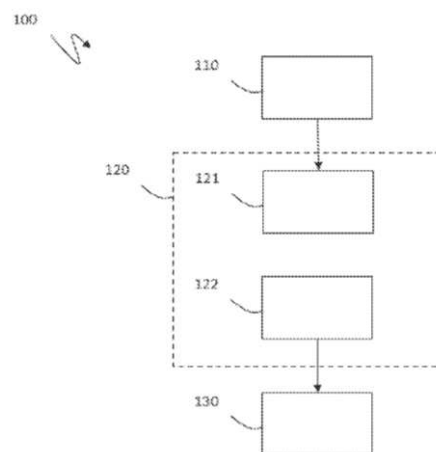
PSA AUTOMOBILES | STELLANTIS AUTO

HOLOGRAM ADAPTED FOR A MULTI-SOURCE HOLOGRAPHIC DEVICE

A holographic device includes a plurality of light sources producing off-center divergent spherical waves and a physical hologram to be illuminated by the plurality of light sources. The physical hologram is fabricated (130) from a computed digital hologram (110) by Fourier-domain segmentation of a series of 2D views of a 3D object. The computed digital hologram is adapted (120) to the shape of the incident wavefront on the plane of the physical hologram to avoid any distortion of the images provided by the physical hologram when illuminated by these light sources.

HOLOGRAMME ADAPTÉ À UN DISPOSITIF HOLOGRAPHIQUE MULTI-SOURCES

La présente invention concerne un dispositif holographique qui comprend une pluralité de sources lumineuses produisant des ondes sphériques divergentes décentrées et un hologramme physique destiné à être illuminé par la pluralité de sources lumineuses. L'hologramme physique est fabriqué (130) à partir d'un hologramme numérique calculé (110) par segmentation dans le domaine de Fourier d'une série de vues 2D d'un objet 3D. L'hologramme numérique calculé est adapté (120) à la forme du front d'onde incident sur le plan de l'hologramme physique pour éviter toute déformation des images fournies par l'hologramme physique lorsqu'il est illuminé par ces sources lumineuses.



CLAIM 1. A method of manufacturing a physical hologram comprising a step (110) of calculating a digital hologram by segmentation in the Fourier domain of a series of 2D views of a 3D scene, said digital hologram being intended to be illuminated by a plane wave front, characterized in that it further comprises: a step (120) of multiplication of the digital hologram calculated by a conjugate of an incident wave front on a plane of the physical hologram, said incident wave front being formed from divergent off-center spherical waves produced by an incident wave front plurality of light sources; step (130) of manufacturing the physical hologram from a digital hologram resulting from said multiplication;

N9941

CN117420746

Priority Date: 09/11/2023

BEIHANG UNIVERSITY OF AERONAUTICS & ASTRONAUTICS

RAPID HOLOGRAM GENERATION METHOD BASED ON HIGH-FREQUENCY INFORMATION EXTRACTION

The invention provides a rapid hologram generating method based on high-frequency information extraction, which comprises the following three steps: firstly, preprocessing an object based on a Gaussian filter, separating high-frequency information and low-frequency information of the object, and obtaining a corresponding high-frequency image and low-frequency image; calculating the high-frequency image by using a novel lookup table method to obtain a corresponding high-frequency hologram, and simultaneously calculating the low-frequency image by using an angular spectrum method to obtain a corresponding low-frequency hologram; and thirdly, overlapping the complex amplitude information of the high-frequency hologram and the low-frequency hologram to obtain the complex amplitude information of the final hologram, and extracting the phase information to obtain the phase-only hologram. And loading the final phase-only hologram on a spatial light modulator for optical reconstruction, and reconstructing a holographic image of the object when the spatial light modulator is irradiated by coherent parallel light. The method provided by the invention reduces the number of object points participating in the calculation of the novel lookup table method, and greatly improves the calculation time of the hologram.

CLAIM 1. A rapid hologram generating method based on high frequency information extraction, characterized in that the method comprises the following three steps: firstly, preprocessing an object based on a Gaussian filter, separating high-frequency information and low-frequency information of the object, and obtaining a corresponding high-frequency image and low-frequency image; calculating the high-frequency image by using a novel lookup table method, generating a sub-hologram corresponding to each pixel point according to a diffraction theory, superposing the sub-holograms to obtain the high-frequency hologram, and simultaneously calculating the low-frequency image by using an angular spectrum method to obtain a corresponding low-frequency hologram; and thirdly, overlapping the complex amplitude information of the high-frequency hologram and the low-frequency hologram to obtain the complex amplitude information of the final hologram, and extracting the phase information to obtain the phase-only hologram.

N9945

CN117369234

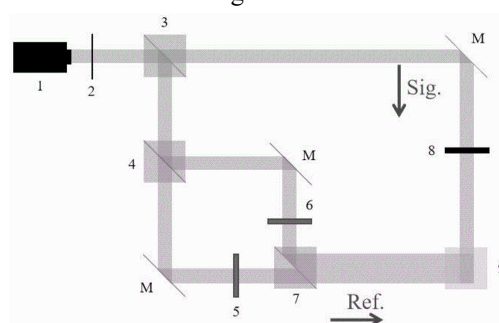
Priority Date: 18/09/2023

FUJIAN NORMAL UNIVERSITY

POLARIZATION HOLOGRAPHIC MULTIPLEXING SYSTEM AND METHOD BASED ON ORTHOGONAL POLARIZATION MATRIX

The invention relates to a polarization holographic multiplexing system and a method based on an orthogonal polarization matrix, wherein the system comprises the following steps: a laser light source for generating laser light; the first polarization beam splitter is used for splitting laser passing through the diaphragm into signal light and reference light; the reference light beam splitting module is used for splitting the reference light beam into m reference light beams; the polarization state adjusting module comprises m half wave plates; the beam combiner is used for combining the m paths of reference light in a non-overlapping parallel manner; a spatial light modulator for modulating signal light; and the polarization sensitive material is used for recording interference between the signal light and the reference light. The dimension of the multidimensional orthogonal polarization matrix can be widened in a wireless mode, therefore, hologram multiplexing of any channel number can be achieved, and huge potential is shown in the aspect of greatly enhancing multiplexing capability of the multichannel holograms.

CLAIM 1. A polarization holographic multiplexing system based on orthogonal polarization matrix, comprising: a laser light source for generating laser light; the diaphragm is arranged on the light path of the laser; the first polarization beam splitter is arranged on the light path of the laser and is used for splitting the laser passing through the diaphragm into signal light and reference light; the reference light beam splitting module is arranged on the light path of the reference light obtained by the beam splitting of the first polarization beam splitter and is used for splitting the reference light obtained by the beam splitting of the first polarization beam splitter into m beams of reference light, m is the k power of 2, and k is 1, 2 and 3.; the polarization state adjusting module comprises m half-wave plates which are respectively arranged on the light paths of the m reference lights obtained by the beam splitting of the reference light beam splitting module and used for adjusting the polarization states of the corresponding reference lights; the beam combiner is used for carrying out non-overlapping parallel beam combination on m paths of reference light obtained by beam splitting of the reference light beam splitting module; a spatial light modulator disposed on an optical path of the signal light, the spatial light modulator being configured to modulate the signal light; the polarization sensitive material is arranged at the interference position of the reference light and the signal light and is used for recording the interference between the signal light and the reference light.



N9956

CN117311120

Priority Date: 27/09/2023

SICHUAN UNIVERSITY

REAL-TIME HOLOGRAM GENERATION METHOD BASED ON ASYMMETRIC NETWORK

The invention relates to a real-time hologram generating method based on an asymmetric network, and provides an asymmetric network based on a non-end-to-end architecture to improve the quality of real-time hologram generation. In the process of generating the hologram, the target picture firstly passes through the phase prediction network to obtain an initial phase, and then passes through the holographic coding network to obtain a corresponding hologram. Compared with other real-time hologram generating methods, the hologram obtained by the method has higher quality and better optical effect in accordance with the observation characteristics of human eyes. The method is favorable for the development of future holographic naked eye 3D display.

CLAIM 1. A real-time hologram generating method based on an asymmetric network is characterized by comprising the following steps: step 1, inputting a target image into a phase prediction network to obtain a corresponding prediction phase; step 2, taking the target image as amplitude information, taking the predicted phase as phase information, and performing complex valued operation to obtain a fusion complex value; step 3, diffracting the fusion complex value to a specified depth by using a diffraction algorithm to obtain corresponding diffraction information; step 4, inputting the diffraction information into a holographic coding network to obtain a corresponding hologram; step 5, reconstructing the hologram by using an inverse diffraction algorithm to obtain amplitude information of a reconstruction plane; and 6, calculating the amplitude loss of the amplitude of the reconstruction plane and the amplitude of the target image by using the MSE loss function, and training a phase prediction network and a holographic coding network by using a loss function minimization method.

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

N9895

WO2023248661

SONY GROUP

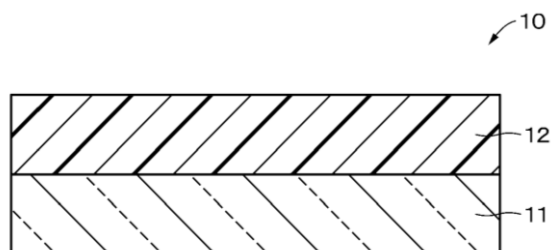
Priority Date: 21/06/2022

PHOTOSENSITIVE COMPOSITION, HOLOGRAPHIC RECORDING MEDIUM, HOLOGRAPHIC OPTICAL ELEMENT, OPTICAL APPARATUS AND ELECTRONIC DEVICE

The present invention provides a photosensitive composition which is capable of suppressing decoloring of a sensitizing dye during the storage in an unexposed state. A photosensitive composition according to the present invention contains: a polymerizable compound; an electron-donating initiator; a dye, a decoloring reaction of which is accelerated in the presence of an epoxy group; and a cationically polymerizable compound that has at least one structure, which is selected from the group consisting of a cyclic ester structure and a three-membered ring ether structure that is adjacent to an alicyclic skeleton, in each molecule.

COMPOSITION PHOTOSENSIBLE, SUPPORT D'ENREGISTREMENT HOLOGRAPHIQUE, ÉLÉMENT OPTIQUE HOLOGRAPHIQUE, APPAREIL OPTIQUE ET DISPOSITIF ÉLECTRONIQUE

La présente invention concerne une composition photosensible qui est capable de supprimer la décoloration d'un colorant sensibilisateur pendant le stockage dans un état non exposé. Une composition photosensible selon la présente invention contient : un composé polymérisable ; un amorceur donneur d'électrons ; un colorant, dont une réaction de décoloration est accélérée en présence d'un groupe époxy ; et un composé polymérisable par voie cationique qui a au moins une structure, qui est choisie dans le groupe constitué par une structure d'ester cyclique et une structure d'éther cyclique à trois chaînons qui est adjacente à un squelette alicyclique, dans chaque molécule.



CLAIM 1. Disclosed is a photosensitive composition containing a polymerizable compound, an electron-donating initiator, a dye whose decoloring reaction is promoted in the presence of an epoxy group, and a cationically polymerizable compound having in the molecule at least one structure selected from the group consisting of a cyclic ester structure and a three-membered cyclic ether structure adjacent to a cyclic aliphatic skeleton.

N9896

WO2023247702

Priority Date: 22/06/2022

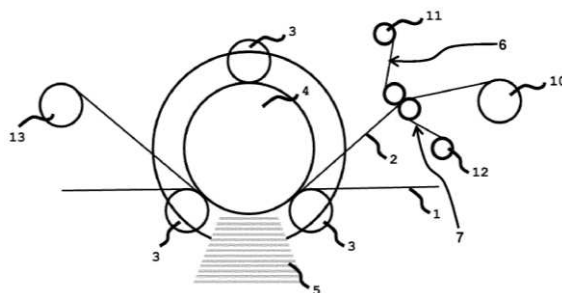
CARL ZEISS JENA

METHOD FOR THE REPLICATION OF A HOLOGRAM BY MEANS OF AN OPTICAL ADHESIVE FILM

The invention relates to a method for the replication of a hologram into a light-sensitive composite web. The method according to the invention preferably comprises providing a master element comprising a substrate body and at least one master hologram, applying a light-sensitive composite web to a surface of the master element, exposing the master element in order to replicate the at least one master hologram into the light-sensitive composite web, and detaching the exposed composite web from the master element. The method furthermore comprises temporarily applying an optical adhesive film between the light-sensitive composite web and the surface of the master element. The optical adhesive film mediates an optical contact between the master element and the light-sensitive composite web during the exposure. In a further aspect, the invention relates to a method for the replication of a hologram into a light-sensitive composite web using a coupling-in element, wherein an optical adhesive film is introduced between composite web and coupling-in element.

PROCÉDÉ DE RÉPLICATION D'HOLOGRAMME AU MOYEN D'UN FILM ADHÉSIF OPTIQUE

L'invention concerne un procédé de réplique d'hologramme dans une bande composite photosensible. Selon l'invention, le procédé consiste de préférence à fournir un élément maître comprenant un corps de substrat et au moins un hologramme maître, à appliquer une bande composite photosensible à une surface de l'élément maître, à exposer l'élément maître afin de répliquer le ou les hologrammes maîtres dans la bande composite photosensible, et à détacher la bande composite exposée de l'élément maître. Le procédé consiste en outre à appliquer temporairement un film adhésif optique entre la bande composite photosensible et la surface de l'élément maître. Le film adhésif optique sert de médiateur à un contact optique entre l'élément maître et la bande composite photosensible pendant l'exposition. Selon un autre aspect, l'invention concerne un procédé de réplique d'hologramme dans une bande composite photosensible à l'aide d'un élément de couplage, un film adhésif optique étant introduit entre la bande composite et l'élément de couplage.



CLAIM 1. A method for replicating a hologram into a photosensitive composite sheet (1), comprising the steps of: a. providing a master element (4) comprising a substrate body and at least one master hologram, b. applying a photosensitive composite sheet (1) to a surface of the master element (4), c. exposing the master element (4) to light to replicate the at least one master hologram into the photosensitive composite sheet (1), and d. detaching the exposed composite sheet (1) from the master element (4), characterized in that the method further comprises temporarily applying an optical adhesive sheet (2) between the photosensitive composite sheet (1) and the surface of the master element (4), which provides optical contact between the master element (4) and the photosensitive composite sheet (1) during exposure of the master element (4).

N9897

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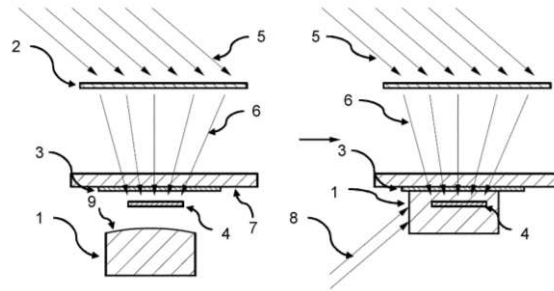
CARL ZEISS JENA

REPLICATION METHOD WITH A CONTACT BODY

In one aspect, the invention relates to a replication method for producing a hologram copy by simultaneous exposure of a master hologram and a copy carrier comprising a photosensitive material. The contact body is brought into contact with the copy carrier during the exposure, the contact body and the copy carrier directly touching one another in a part through which exposure light is radiated during the exposure. The contact body is transparent to the exposure light, and the refractive index of the contact body is matched to the refractive index of the copy carrier. In a further aspect, the invention relates to a device for realizing the replication method.

PROCÉDÉ DE RÉPLICATION AVEC UN CORPS DE CONTACT

Selon un aspect, l'invention concerne un procédé de réplique servant à produire une copie d'hologramme en exposant simultanément un hologramme maître et un support de copie comprenant un matériau photosensible. Le corps de contact est mis en contact avec le support de copie pendant l'exposition, le corps de contact et le support de copie se touchant directement au niveau d'une partie à travers laquelle la lumière d'exposition est rayonnée pendant l'exposition. Le corps de contact laisse passer la lumière d'exposition, et l'indice de réfraction du corps de contact correspond à l'indice de réfraction du support de copie. Dans un autre aspect, l'invention concerne un dispositif permettant de réaliser le procédé de réplique.



CLAIM 1. A replication method for a production of a hologram copy by a simultaneous exposure of a master hologram (2) and a copy carrier (3), which comprises a photosensitive material, wherein a contact body (1) is brought into contact with the copy carrier (3) during the exposure, wherein the contact body (1) and the copy carrier (3) are in direct contact with one another in a part through which an exposure light passes during the exposure, wherein the contact body (1) is transparent to the exposure light and wherein the refractive index of the contact body (1) is matched to the refractive index of the copy carrier (3) in order to avoid reflections of the exposure light.

N9898

WO2023247554

CARL ZEISS JENA

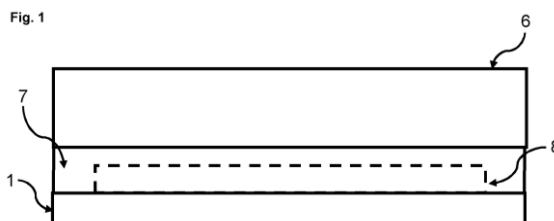
Priority Date: 22/06/2022

MASTER PLATE FOR HOLOGRAM REPLICATION

The invention relates in a first aspect to a master plate for industrial hologram replication, comprising a flat and planar composite pane having a thick glass pane as a carrier for minimizing the deflection of the master plate and a thin glass pane for protecting a master hologram layer from mechanical influences, and at least one master hologram layer extending between the glass panes which has the optical function of a hologram, wherein the thick glass pane has a thickness perpendicular to the planar extent of greater than 2 millimeters, wherein the thin glass pane has a thickness perpendicular to the planar extent of between 2 millimeters and 0.1 millimeters, and wherein an unevenness of the composite pane is preferably less than 0.03% of a length of a direction of extent of the surface of the planar composite pane. In a second aspect, the invention relates to a method for producing a master plate.

PLAQUE MAÎTRESSE POUR RÉPLICATION D'HOLOGRAMME

Selon un premier aspect, l'invention concerne une plaque maîtresse pour la réplique industrielle d'hologrammes, celle-ci comprenant une vitre composite plate et plane ayant une vitre épaisse en tant que support pour réduire au minimum la déviation de la plaque maîtresse et une vitre mince pour protéger une couche d'hologramme maître contre des influences mécaniques, et au moins une couche d'hologramme maître s'étendant entre les vitres ayant la fonction optique d'un hologramme, la vitre épaisse ayant une épaisseur perpendiculaire à l'étendue plane supérieure à 2 millimètres, la vitre mince ayant une épaisseur perpendiculaire à l'étendue plane comprise entre 2 millimètres et 0,1 millimètre, et une irrégularité de la vitre composite étant de préférence inférieure à 0,03 % d'une longueur d'une direction d'étendue de la surface de la vitre composite plane. Dans un second aspect, l'invention concerne un procédé de fabrication de plaque maîtresse.



CLAIM 1. A method of manufacturing a master plate comprising a flat and flat laminated sheet, comprising the following steps: applying a first layer of homogeneous thickness (3), which comprises at least one master hologram layer (8), to a first side (2) of a flat thin glass sheet (1), an outer region (4) at the side edges of the thin glass sheet (1) remaining free of the first layer (3), the master hologram layer (8) being suitable for having an optical function of a hologram, applying spacer elements (5) to the first side (2) in the outer region (4), the spacer elements (5) being arranged to keep the outer and/or side edges of a flat thick glass sheet (6) to be applied and of the thin glass sheet (1) at a predefined distance during the manufacturing process, applying the thick glass sheet (6) to the first side of the thin glass sheet (2) in congruent manner with an adhesive layer (7) lying therebetween. The thick glass pane (6) has the same surface dimensions as the thin glass pane (1). The two glass panes (1, 6) are introduced into an arrangement comprising a vacuum module and a vibration module, the arrangement being set up for pressing the glass panes (1, 6) against one another and for uniform distribution of the adhesive in the desired thickness by generating negative pressure and vibrations, and for curing the adhesive.

N9903

WO202405141

Priority Date: 30/06/2022

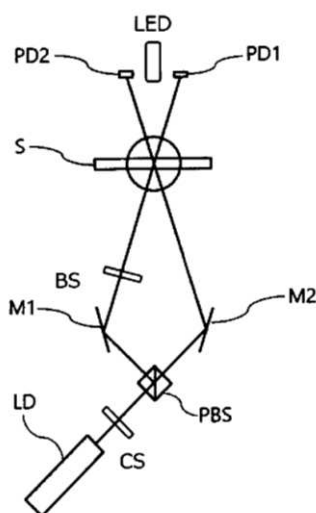
MITSUBISHI CHEMICAL

COMPOSITION FOR HOLOGRAPHIC RECORDING MEDIA

The present invention provides a composition for holographic recording media, the composition being characterized by containing the components (a) to (d) described below, and being also characterized in that the abundance of allophanate bond units contained in the component (a) relative to the total weight of the component (a) and the component (b) is 6.5×10^{-4} mol/g or more. Component (a): a compound which has an isocyanate group Component (b): a compound which has an isocyanate-reactive functional group Component (c): a polymerizable monomer component Component (d): a photopolymerization initiator

COMPOSITION POUR SUPPORTS D'ENREGISTREMENT HOLOGRAPHIQUES

La présente invention concerne une composition pour support d'enregistrement holographique, la composition étant caractérisée en ce qu'elle contient les composants (a) à (d) décrits ci-dessous, et étant également caractérisée en ce que l'abondance d'unités de liaison allophanate contenues dans le composant (a) par rapport au poids total du composant (a) et du composant (b) est de $6,5 \times 10^{-4}$ mol/g ou plus. Composant (a) : un composé qui comprend un groupe isocyanate Composant (b) : un composé qui comprend un groupe fonctionnel réactif à l'isocyanate Composant (c) : un composant monomère polymérisable Composant (d) : un initiateur de photopolymérisation



CLAIM 1. A composition for a hologram recording medium, which is characterized by containing the following components (a) to (d), wherein the amount of allophanate-binding units contained in the component (a) is 6.5×10^{-4} mol/g or more relative to the total weight of the components (a) and (b). The composition for the hologram recording medium is characterized in that the polymerizable monomer of the component (a) is a (meth)acrylic monomer. The component (a) is a compound having an isocyanate group. The component (b) is a compound having an isocyanate-reactive functional group. The component (c) is a polymerizable monomer.

N9904

WO202405140

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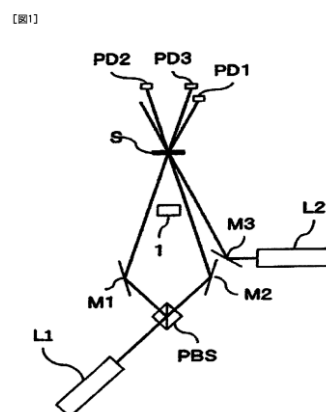
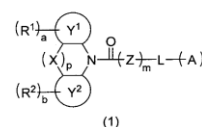
MITSUBISHI CHEMICAL

COMPOUND, POLYMERIZABLE COMPOSITION, POLYMER, HOLOGRAPHIC RECORDING MEDIUM, OPTICAL MATERIAL AND OPTICAL COMPONENT

The present invention provides a compound which is represented by formula (1). (In the formula, A represents a polymerizable group; n represents an integer of 1 to 3; L represents an optionally branched linking group having a valence of (n + 1); Z represents an oxygen atom or an optionally substituted nitrogen atom; m represents 0 or 1; X represents a single bond, an oxygen atom, a sulfur atom, an optionally substituted carbon atom or an optionally substituted nitrogen atom; p represents an integer of 0 to 2; in cases where p is 2, the two X moieties may be the same as or different from each other; each of Y1 and Y2 independently represents a benzene ring, a naphthalene ring or a phenanthrene ring; in cases where Y1 or Y2 is a benzene ring, a or b corresponding to Y1 or Y2 represents an integer of 0 to 4; in cases where Y1 or Y2 is a naphthalene ring, a or b corresponding to Y1 or Y2 represents an integer of 0 to 6; in cases where Y1 or Y2 is a phenanthrene ring, a or b corresponding to Y1 or Y2 represents an integer of 0 to 8; each of R1 and R2 independently represents an optionally substituted aromatic ring group; and in cases where a and b are 2 or more, the plurality of R1 moieties and the plurality of R2 moieties may be the same as or different from each other. Meanwhile, in the formula, Y1 and Y2 cannot be benzene rings at the same time; and a and b cannot be 0 at the same time.)

COMPOSÉ, COMPOSITION POLYMÉRISABLE, POLYMÈRE, SUPPORT D'ENREGISTREMENT HOLOGRAPHIQUE, MATÉRIAU OPTIQUE ET COMPOSANT OPTIQUE

La présente invention concerne un composé qui est représenté par la formule (1). (dans la formule, A représente un groupe polymérisable ; n représente un nombre entier de 1 à 3 ; L représente un groupe de liaison éventuellement ramifié ayant une valence de (n + 1) ; Z représente un atome d'oxygène ou un atome d'azote éventuellement substitué ; m représente 0 ou 1 ; X représente une liaison simple, un atome d'oxygène, un atome de soufre, un atome de carbone éventuellement substitué ou un atome d'azote éventuellement substitué ; p représente un nombre entier de 0 à 2 ; dans les cas où p vaut 2, les deux fractions X peuvent être identiques ou différentes l'une de l'autre ; chacun de Y1 et Y2 représente indépendamment un cycle benzène, un cycle naphthalène ou un cycle phénanthrène ; dans les cas où Y1 ou Y2 est un cycle benzène, a ou b correspondant à Y1 ou Y2 représente un nombre entier de 0 à 4 ; dans les cas où Y1 ou Y2 est un cycle naphthalène, a ou b correspondant à Y1 ou Y2 représente un nombre entier de 0 à 6 ; dans les cas où Y1 ou Y2 est un cycle phénanthrène, a ou b correspondant à Y1 ou Y2 représente un nombre entier de 0 à 8 ; chacun de R1 et R2 représente indépendamment un groupe cyclique aromatique éventuellement substitué ; et dans les cas où a et b valent 2 ou plus, la pluralité de fractions R1 et la pluralité de fractions R2 peuvent être identiques ou différentes les unes des autres, dans la formule, Y1 et Y2 ne peuvent pas être des cycles benzène en même temps ; et a et b ne peuvent pas être 0 en même temps.)



CLAIM 1. A compound represented by formula (1). In the formula, A represents a polymerizable group. n represents an integer from 1 to 3. L represents a linking group having a valence of (n+1), which may be branched. Z represents an oxygen atom or an optionally substituted nitrogen atom. m is 0 or 1. X represents a single bond, an oxygen atom, a sulfur atom, an optionally substituted carbon atom, or an optionally substituted nitrogen atom. p represents an integer from 0 to 2. When p is 2, the two X's may be the same as or different from each other. Y1 and Y2 are each independently a benzene ring, a naphthalene ring or a phenanthrene ring. When Y1 or Y2 is a benzene ring, a or b corresponding to Y1 or Y2 is an integer of 0-4. When Y1 or Y2 is a naphthalene ring, a or b corresponding to Y1 or Y2 is an integer of 0 to 6. When Y1 or Y2 is a phenanthrene ring, a or b corresponding to Y1 or Y2 is an integer of 0-8. R1 and R2 each independently represent an optionally substituted aromatic ring group. When a and b are 2 or more, the plurality of R1 and R2 may be the same as or different from each other. In the formula, Y1 and Y2 are both benzene rings, and a and b are not both 0.

N9905

WO202405139

Priority Date: 30/06/2022

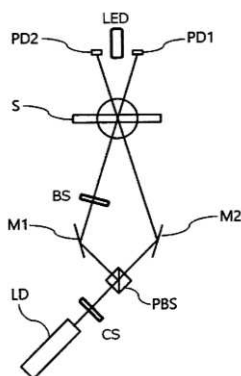
MITSUBISHI CHEMICAL

METHOD FOR PRODUCING OPTICAL ELEMENT

Provided is a method for producing an optical element, wherein a holographic recording medium having a recording layer containing a polymerizable compound and a photopolymerization initiator is subjected to multiple hologram-recording exposure under conditions such that the average exposure intensity based on equation (1) is at least 6 mW/cm². In equation (1): ET_i is a single exposure time, which indicates the exposure time (seconds) per multiple recording exposure; EPW_i is an exposure light intensity, which indicates the total light intensity (mW/cm²) of reference light and object light; EIT_{i-1} is an exposure interval time, which indicates the time (seconds) between one recording exposure and the next recording exposure in multiple recording exposure; m is a natural number and indicates the total number of multiples; and when i=1, EIT_{i-1} is considered to be zero.)

PROCÉDÉ DE PRODUCTION D'ÉLÉMENT OPTIQUE

L'invention concerne un procédé de production d'élément optique dans lequel un support d'enregistrement holographique comportant une couche d'enregistrement contenant un composé polymérisable et un initiateur de photopolymérisation sont soumis à de multiples expositions d'enregistrement d'hologramme dans des conditions qui sont telles que l'intensité d'exposition moyenne sur la base de l'équation (1) est d'au moins 6 mW/cm². Dans l'équation (1) : ET_i représente un temps d'exposition unique qui indique le temps d'exposition (en secondes) par multiple exposition d'enregistrement ; EPW_i représente une intensité de lumière d'exposition qui indique l'intensité lumineuse totale (mW/cm²) de lumière de référence et de lumière d'objet ; EIT_{i-1} représente un temps d'intervalle d'exposition qui indique le temps (en secondes) entre une exposition d'enregistrement et l'exposition d'enregistrement suivante dans de multiples expositions d'enregistrement ; m est un nombre naturel et indique le nombre total de multiples ; et lorsque i = 1, EIT_{i-1} est considéré comme étant nul.)



AA

$$\text{平均露光強度} = \frac{\sum_{i=1}^m (ET_i \times EPW_i)}{\sum_{i=1}^m (ET_i + EIT_{i-1})} \dots (1)$$

AA Average exposure intensity

CLAIM 1. A method for manufacturing an optical element, wherein a hologram recording medium having a recording layer containing a polymerizable compound and a photopolymerization initiator is subjected to multiple recording exposure of a hologram under such conditions that the average exposure intensity based on formula (1) is 6mW/cm² or more.

(In formula (1), ET_i represents the exposure time (in seconds) per time of multiple recording exposure with a single exposure time.) EPW_i indicates the total light intensity of the reference light and the object light (mW/cm²) at the exposure light intensity. EIT_{i-1} indicates the time (in seconds) between one recording exposure and one recording exposure in multiple recording exposure with exposure interval time. m is a natural number representing the total multiplexing number. When h=1, EIT_{i-1} is treated as zero.)

N9913

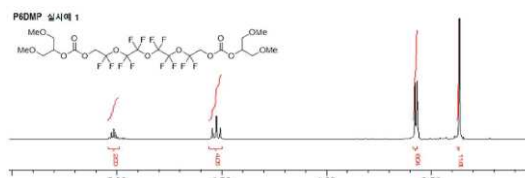
KR20230170468

Priority Date: 10/06/2022

LG CHEM

NON-REACTIVE FLUORINE-BASED COMPOUND AND PHOTOPOLYMER COMPOSITION COMPRISING SAME

The present invention relates to a photopolymer composition for forming a hologram, comprising: a non-reactive fluorine-based compound using a glycerol derivative capable of introducing various substituents; a polymer matrix or a precursor thereof; a photoreactive monomer; the non-reactive fluorine-based compound represented by a specific chemical formula; and a photoinitiator, a hologram recording medium produced from the composition, and a hologram recording method using the composition.



CLAIM 1. A non-reactive fluorine-based compound represented by the following Chemical Formula 1: In Chemical Formula 1, R1 and R2 may be the same as or different from each other, and are each a perfluoroalkylene group having 1 to 5 carbon atoms, p and q may be an integer of 1 to 10, R3 and R4 may be the same as or different from each other, and are each a perfluoroalkylene group having 1 to 10 carbon atoms, X1 and X2 may be the same as or different from each other, and are each independently a linear or branched alkyl group having 1 to 10 carbon atoms, or a functional group having 2 carbon atoms, at least one of X1 and X2 is a functional group having 2 below, and in Chemical Formula 2, Y1 maybe a linear or branched alkylene group having 1 to 10 carbon atoms or a perfluoroalkylene group having 1 to 10 carbon atoms, and R5 and R6 may be the same as or different from each other, and are each independently a linear or branched alkyl group having 1 to 20 carbon atoms, or a linear or branched alkoxy group having 1 to 10 carbon atoms, or branched alkoxy having 1 to 1 carbon atoms, or 1 carbon atoms bonded thereto. a straight-chained or branched alkyl group to which a heterocyclic ring is bonded, a fluoroalkyl group having 1 to 10 carbon atoms, or a fluoroalkoxy group having 1 to 10 carbon atoms.

N9930

CN220373694U

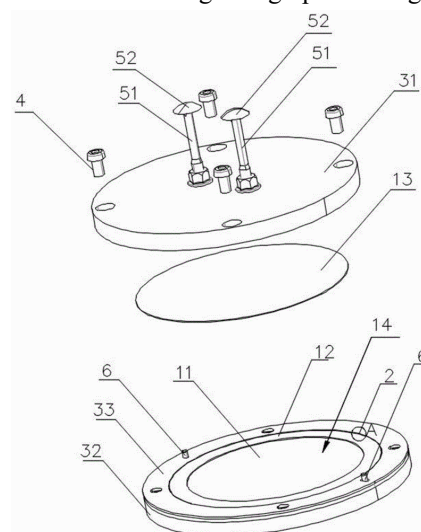
Priority Date: 05/07/2023

FUJIAN NORMAL UNIVERSITY

HOLOGRAPHIC STORAGE MATERIAL MOULD

The utility model relates to a holographic storage material mould, comprising: the container comprises a substrate, a gasket and a cover plate, wherein the gasket is arranged between the substrate and the cover plate, the substrate and the cover plate are of plate-shaped structures, the gasket is of an annular structure, and the upper surface of the substrate, the inner wall of the gasket and the lower surface of the cover plate are enclosed to form a container space; the device comprises a compressing mechanism, wherein a compressing groove for placing a container is arranged in the compressing mechanism, a gap is arranged between the side wall of the compressing groove and the side wall of the container, and the gap is used for receiving holographic storage materials overflowed from the container space or compensating the holographic storage materials into the container space. The edge of the formed holographic storage material is prevented from generating bubbles, the consistency of the holographic storage material is improved, mass production can be realized through the die, and the die has a simple structure and is convenient to use, and has a broad market prospect.

CLAIM 1. A holographic storage material mold, comprising: the container comprises a substrate, a gasket and a cover plate, wherein the cover plate is made of transparent materials, the gasket is arranged between the substrate and the cover plate, the substrate and the cover plate are of plate-shaped structures, the gasket is of an annular structure, and the upper surface of the substrate, the inner wall of the gasket and the lower surface of the cover plate are enclosed to form a container space; the device comprises a compressing mechanism, wherein a compressing groove for placing a container is arranged in the compressing mechanism, the shape of the compressing groove is matched with the shape of the container, a gap is arranged between the side wall of the compressing groove and the side wall of the container, and the gap is used for receiving holographic storage materials overflowed from the container space or compensating the holographic storage materials into the container space.



Click on the title to return to table of contents

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

N9899

WO2023247267

Priority Date: 21/06/2022

GIER, OLIVER | GOMER, ANDREAS | HAGEN, JAN

COMPOSITE PANE WITH HOLOGRAM ELEMENT

The invention relates to a composite pane (100), at least comprising an outer pane (1) with an outer-side surface (I) and an interior-side surface (II), an inner pane (2) with an outer-side surface (III) and an interior-side surface (IV), a first intermediate layer (3) and a hologram element (4) with at least one hologram, wherein the first intermediate layer (3) is arranged between the outer pane (1) and the inner pane (2), the hologram element (4) is arranged between the outer pane (1) and the first intermediate layer (3) or between the inner pane (2) and the first intermediate layer (3), and wherein a UV protection layer (6) is arranged on the interior-side surface (II) of the outer pane (1). The invention also relates to a projection arrangement comprising a composite pane of this type, to a method for producing such a composite pane and to its use.

VITRE COMPOSITE DOTÉE D'UN ÉLÉMENT HOLOGRAMME

L'invention concerne une vitre composite (100), celle-ci comprenant au moins une vitre extérieure (1) dotée d'une surface côté extérieur (I) et d'une surface côté intérieur (II), une vitre intérieure (2) dotée d'une surface côté extérieur (III) et d'une surface côté intérieur (IV), une première couche intermédiaire (3) et un élément hologramme (4) comportant au moins un hologramme, la première couche intermédiaire (3) étant disposée entre la vitre extérieure (1) et la vitre intérieure (2), l'élément hologramme (4) étant disposé entre la vitre extérieure (1) et la première couche intermédiaire (3) ou entre la vitre intérieure (2) et la première couche intermédiaire (3), et une couche de protection contre les rayons UV (6) étant disposée sur la surface côté intérieur (IV) de la vitre extérieure (1). L'invention concerne également un agencement de projection comprenant une telle vitre composite, un procédé de fabrication d'une telle vitre composite, ainsi que son utilisation.

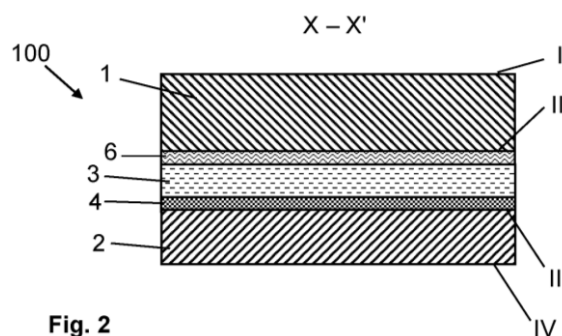


Fig. 2

CLAIM 1. A composite pane (100), at least comprising an outer pane (1) having an outer surface (I) and an inner-space-side surface (II), an inner pane (2) having an outer surface (III) and an inner-space-side surface (IV), a first intermediate layer (3), and a hologram element (4) having at least one hologram, wherein the first intermediate layer (3) is arranged between the outer pane (1) and the inner pane (2), the hologram element (4) is arranged between the outer pane (1) and the first intermediate layer (3) or between the inner pane (2) and the first intermediate layer (3), and wherein a single-layer or multilayer UV protective layer (6) in the form of a coating is applied to the inner-space-side surface (II) of the outer pane (2) at least in the region of the hologram element (4).

N9900

WO2023247264

Priority Date: 21/06/2022

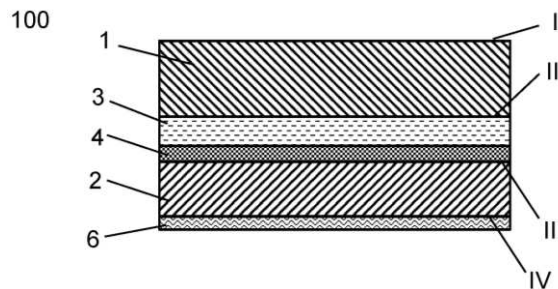
GIER, OLIVER | HAGEN, JAN | GOMER, ANDREAS

COMPOSITE PANE WITH HOLOGRAM ELEMENT AND AN OPTICALLY HIGH-REFRACTIVE LAYER

The invention relates to a composite pane (100), at least comprising an outer pane (1) with an outer-side surface (I) and an interior-side surface (II), an inner pane (2) with an outer-side surface (III) and an interior-side surface (IV), a first intermediate layer (3) and a hologram element (4) with at least one hologram, wherein the first intermediate layer (3) is arranged between the outer pane (1) and the inner pane (2), the hologram element (4) is arranged between the outer pane (1) and the first intermediate layer (3) or between the inner pane (2) and the first intermediate layer (3), and wherein an optically high-refractive layer (6) is arranged on the interior-side surface (IV) of the inner pane (2). The invention also relates to a projection arrangement comprising a composite pane of this type, to a method for producing such a composite pane and to its use.

VITRE COMPOSITE DOTÉE D'UN ÉLÉMENT HOLOGRAMME ET D'UNE COUCHE À FORTE RÉFRACTION OPTIQUE

L'invention concerne une vitre composite (100) qui comprend au moins une vitre extérieure (1) dotée d'une surface côté extérieur (I) et d'une surface côté intérieur (II), une vitre intérieure (2) dotée d'une surface côté extérieur (III) et d'une surface côté intérieur (IV), une première couche intermédiaire (3) et un élément hologramme (4) comportant au moins un hologramme, la première couche intermédiaire (3) étant disposée entre la vitre extérieure (1) et la vitre intérieure (2), l'élément hologramme (4) étant disposé entre la vitre extérieure (1) et la première couche intermédiaire (3) ou entre la vitre intérieure (2) et la première couche intermédiaire (3), et une couche à forte réfraction optique (6) étant disposée sur la surface côté intérieur (IV) de la vitre intérieure (2). L'invention concerne également un agencement de projection comprenant une telle vitre composite, un procédé de fabrication d'une telle vitre composite ainsi que son utilisation.



CLAIM 1. The composite pane (100), at least comprising an outer pane (1) having an outer surface (I) and an inner-space-side surface (II), an inner pane (2) having an outer surface (III) and an inner-space-side surface (IV), a first intermediate layer (3), and a hologram element (4) having at least one hologram, wherein the first intermediate layer (3) is arranged between the outer pane (1) and the inner pane (2), the hologram element (4) is arranged between the outer pane (1) and the first intermediate layer (3) or between the inner pane (2) and the first intermediate layer (3), wherein the composite pane (100) is a vehicle pane, and wherein an optically highly refractive layer (6) having a refractive index of greater than or equal to 2 is arranged on the inner-space-side surface (IV) of the inner pane (2). The composite panel (100) of claim 1, wherein the composite panel (100) is a windshield.

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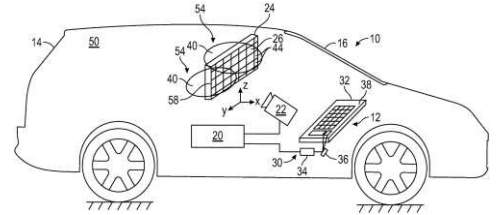
Priority Date: 25/07/2022

GM GLOBAL TECHNOLOGY OPERATIONS

SYSTEM FOR CALIBRATING A WAVEGUIDE-BASED HOLOGRAPHIC HEAD-UP DISPLAY

A system for calibrating a waveguide-based holographic head-up display that projects images upon a windscreen of a vehicle including a light-diffusing panel positioned at a center of an eyellipse to reflect the images projected by the waveguide-based holographic head-up display. An eyebox of the waveguide-based holographic head-up display is positioned at the center of an eyellipse, and the eyebox is divided into a plurality of unit exit pupils. The system also includes a camera positioned to capture the images reflected by the light-diffusing panel and one or more controllers in electronic communication with the waveguide-based holographic head-up display and the camera. The one or more controllers execute instructions to determine a warp map based on a plurality of corrected individual calibration patterns.

CLAIM 1. A system for calibrating a waveguide-based holographic head-up display that projects images upon a windscreen of a vehicle, the system comprising: a light-diffusing panel positioned at a center of an eyellipse to reflect the images projected by the waveguide-based holographic head-up display, wherein an eyebox of the waveguide-based holographic head-up display is positioned at the center of an eyellipse, and wherein the eyebox is divided into a plurality of unit exit pupils; a camera positioned to capture the images reflected by the light-diffusing panel; and one or more controllers in electronic communication with the waveguide-based holographic head-up display and the camera, wherein the one or more controllers execute instructions to: instruct the waveguide-based holographic head-up display to generate a calibration graphic upon the windscreen of the vehicle, wherein the calibration graphic includes a plurality of individual calibration patterns that each coincide with one of the plurality of unit exit pupils of the eyebox; receive image data from the camera, wherein the image data captures the calibration graphic that is reflected upon the light-diffusing panel, and wherein the calibration graphic reflected upon the light-diffusing panel includes a plurality of warped individual calibration patterns; correct distortions in each of the plurality of warped individual calibration patterns of the calibration graphic to create a plurality of corrected individual calibration patterns; and determine a warp map based on the plurality of corrected individual calibration patterns.



N9907

US20240029208

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GM GLOBAL TECHNOLOGY OPERATIONS

HOLOGRAPHIC DISPLAY SYSTEM FOR A MOTOR VEHICLE WITH REAL-TIME REDUCTION OF GRAPHICS SPECKLE NOISE

A holographic display system provides a maximum intensity value of an intermediate image to decrease a graphics speckle noise. The system includes an SLM having a display with a hologram generating unit and a plurality of pixels for modulating a beam of coherent light. The system further includes a beam splitter for splitting the beam into an object beam and an intermediate image beam that is associated with an intermediate image having the noise. The system further includes a camera for capturing the intermediate image, in response to the camera receiving the intermediate image beam. The system further includes a computer having a processor and a CRM. The processor is programmed to generate an actuation signal associated with a corrective holographic phase shift to decrease the noise. The SLM modifies in real-time a holographic phase of the beam per pixel, in response to the SLM receiving the actuation signal.

CLAIM 1. A holographic display system of a motor vehicle for providing a maximum intensity value of an intermediate image to decrease in real-time a graphics speckle noise, the holographic display system comprising: a light source for generating a beam of coherent light; a spatial light modulator (SLM) comprising a display with a hologram generating unit and a plurality of pixels for modulating the beam of coherent light in response to the display receiving the beam of coherent light from the light source; a beam splitter for splitting the beam of coherent light into an object beam and an intermediate image beam in response to the beam splitter receiving the beam of coherent light from the SLM, with the intermediate image beam being associated with an intermediate image having the graphics speckle noise; a camera for capturing the intermediate image in response to the camera receiving the intermediate image beam from the beam splitter; a computer comprising at least one processor electronically connected to the light source, the SLM, and the camera, and the computer further comprising a non-transitory computer readable storage medium (CRM) storing instructions such that the processor is programmed to: receive the intermediate image from the camera; compare at least one parameter to at least one threshold value; and generate an actuation signal associated with a corrective holographic phase shift to decrease the graphics speckle noise for each of the pixels based on the intermediate image; where the SLM modifies in real-time a holographic phase of the beam of coherent light per pixel in response to the SLM receiving the actuation signal from the at least one processor.

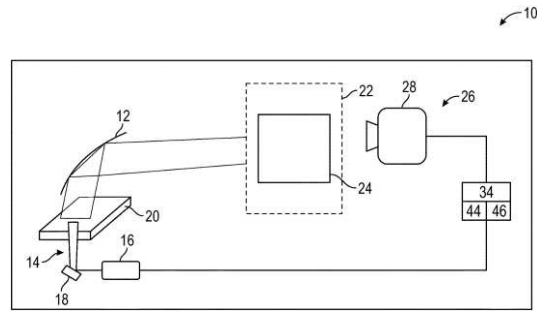
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Priority Date: 25/07/2022

GM GLOBAL TECHNOLOGY OPERATIONS

HOLOGRAPHIC DISPLAY CALIBRATION BY HOLOGRAPHIC PHASE MODULATION

A method for holographic display calibration using phase modulation includes projecting an initial graphic on a windshield of a vehicle, capturing an image of the initial graphic with a camera inside a vehicle, determining a loss function value between the image of the initial graphic captured by the camera and a target graphic, modulating a phase of a light beam generating the initial graphic using the loss function value to generate an updated graphic, and displaying the updated graphic on the windshield of the vehicle.



CLAIM 1. A method for holographic display calibration using phase modulation, comprising: projecting an initial graphic on a windshield of a vehicle; capturing an image of the initial graphic in an eyellipse with a camera inside the vehicle; determining a loss function value between the image of the initial graphic captured by the camera and a target graphic; modulating a phase of a light beam generating the initial graphic using the loss function value to generate an updated graphic; and displaying the updated graphic on the windshield of the vehicle.

N9909

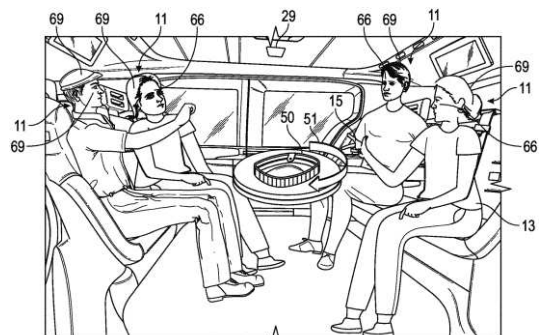
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Priority Date: 14/07/2022

GM GLOBAL TECHNOLOGY OPERATIONS

USER INTERACTION WITH 360 DEGREE 3D HOLOGRAPHIC DISPLAY

A method and a system for user interaction with a hologram includes displaying the hologram inside a passenger compartment of the vehicle, after displaying the hologram inside the passenger compartment of the vehicle, monitoring a vehicle user inside the passenger compartment of the vehicle to determine whether the vehicle user provided a user command, determining that the vehicle user provided the user command, and in response to determining that the vehicle user provided the user command, manipulating the hologram in accordance with the user command.

CLAIM 1. A method for user interaction with a hologram in a vehicle, comprising: displaying the hologram inside a passenger compartment of the vehicle; constructing a three-dimensional model of the passenger compartment to spatially map a location of a vehicle user relative to a location of the hologram, wherein the vehicle user is inside the passenger compartment, and the three-dimensional model of the passenger compartment includes a location of a hand of the vehicle user; after displaying the hologram inside the passenger compartment of the vehicle, monitoring the vehicle user inside the passenger compartment of the vehicle to determine whether the vehicle user provided a user command; determining that the vehicle user provided the user command, wherein determining that the vehicle user provided the user command includes determining that the vehicle user made virtual contact with the hologram, the vehicle user makes virtual contact with the hologram when the hand of the vehicle user is at a location that intersects the hologram; and in response to determining that the vehicle user provided the user command, manipulating the hologram in accordance with the user command.



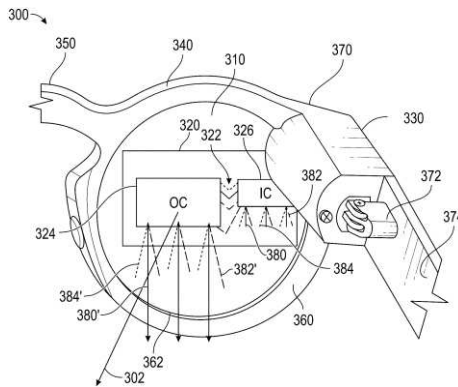
N9910

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Priority Date: 27/06/2022

RUSSO JUAN

MULTIPLEXED VOLUME HOLOGRAM COUPLERS FOR AUGMENTED REALITY WAVEGUIDES

Volume hologram couplers are multiplexed into a same volume to increase the field of view of components in a waveguide assembly such as an augmented reality (AR) waveguide assembly for use in electronic eyewear devices. The multiplexing can be done in any direction perpendicular to the optical axis. Multiplexing of the volume hologram couplers combines different functions of the waveguide assembly into one diffractive optical element (DOE) in the form of an input coupler or an output coupler. For example, each volume holographic grating of input couplers and output couplers has a different refraction angle, a different periodicity, or both relative to any other volume holographic grating in the same volume. The resulting DOEs reduce reinteraction losses, reduce thickness, reduce the amount of DOEs and the number of layers and airgaps, and increase robustness (volume versus surface relief that can scratch or break).



CLAIM 1. A coupler for a waveguide comprising: at least two gratings within a three-dimensional (3D) volume, each grating responsive to input light of different wavelengths to reflect or transmit the input light into or out of the waveguide, each grating within the 3D volume having at least one of a (1) same periodicity but a different orientation or (2) a same orientation but a different periodicity, to provide a different refractive index relative to each other grating within the 3D volume.

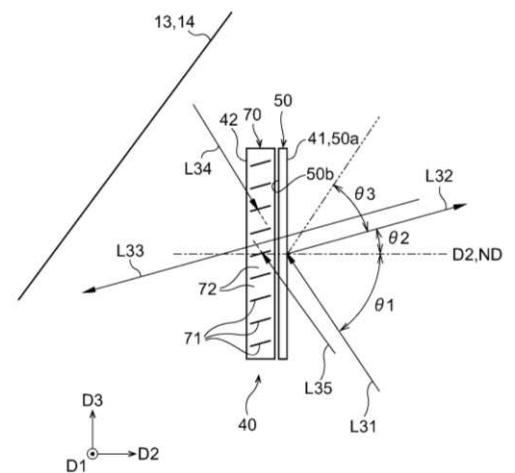
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Priority Date: 08/07/2022

DAI NIPPON PRINTING

HOLOGRAPHIC SCREEN FOR HEAD-UP DISPLAY, HEAD-UP DISPLAY, MOVING BODY, AND AUTOMOBILE

TOPIC: The purpose of the present invention is to suppress a decrease in the display quality of an image displayed by a head-up display. INVENTION: A holographic screen (40) is a holographic screen for a head-up display to which image light is projected. The holographic screen (40) includes a combiner (50) including a hologram element which diffracts the image light, and a light control member (70) arranged behind the combiner. The transmittance (%) of the light control member for light traveling in the light output direction of the image light diffracted by the hologram element is greater than the transmittance (%) of the light control member for light traveling in a certain direction that is not parallel to the light output direction.



CLAIM 1. A holographic screen for head-up display on which image light is projected is provided with a combiner including a hologram element which diffracts the image light, and a light control member arranged behind the combiner. The transmittance (%) of the light control member of light traveling in the light outgoing direction of the image light diffracted by the hologram element is larger than the transmittance (%) of the light control member of light traveling in a certain direction which is not parallel to the outgoing direction.

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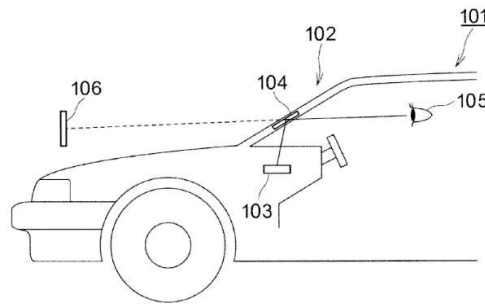
JP2023181000

Priority Date: 10/06/2022

DAI NIPPON PRINTING

COMBINER, HEAD-UP DISPLAY, MOVING BODY, AND PHOTSENSITIVE MATERIAL FOR HOLOGRAM LAYER FORMATION

TOPIC: Provided is a combiner in which a decrease in brightness or color reproducibility due to a temperature change is suppressed. INVENTION: The combiner has a pair of substrates, a bonding material arranged between the substrates so as to bond the substrates to each other, and a hologram layer positioned between the substrates. The combiner has a first peak in a range of 495 nm or more and less than 570 nm in a transmission spectrum measured under 25°C environment, and the first peak of the transmission spectrum measured under 100°C environment with respect to the combiner When the increase in the peak wavelength of is expressed as $\Delta\lambda 1$ (nm), the combiner satisfies formula (1): $\Delta\lambda 1/75 \leq 0.200$ (nm/°C).



CLAIM 1. The combiner has a pair of substrates, a bonding material arranged between the substrates so as to bond the substrates to each other, and a hologram layer positioned between the substrates. The combiner has a first peak in a range of 495 nm or more and less than 570 nm in a transmission spectrum measured in a 25°C environment, and the first transmission spectrum measured in a 100°C environment with respect to the combiner When the increased peak wavelength of the peak is indicated as $\Delta\lambda 1$ (nm), the combiner satisfies formula (1): $\Delta\lambda 1/75 \leq 0.200$ (nm/°C).

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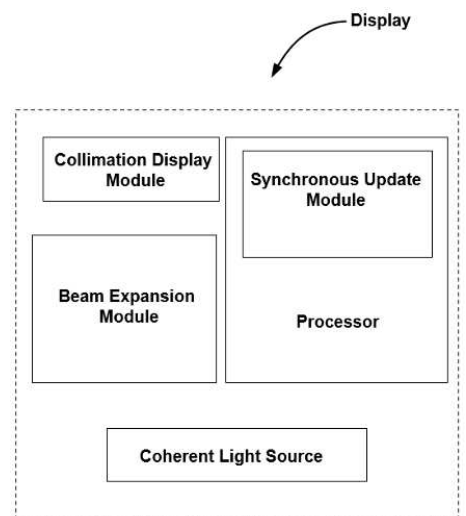
IN202311078112

Priority Date: 17/11/2023

NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY

HOLOGRAPHIC DISPLAYS WITH WIDE VIEWING ANGLES AND HIGH RESOLUTION

The present invention provides a holographic display with wide viewing angles and high resolution that describes holographic display technology with wide viewing angles and high resolution, utilizing advanced optics and holographic projection techniques to create immersive and realistic 3D visualizations. The display includes a coherent light source, a beam expansion module, and collimation display module, and a processor. The coherent light source provides coherent light. The beam expansion module and collimation display module expand, collimate, and filter the coherent light from the coherent light source to obtain a wide parallel beam with uniform brightness, and irradiate a light modulator group as the reference light. The processor calculates a holographic modulation and transmits said holographic modulation and coding image to be loaded on each light modulator to the image transmission module.



CLAIM 1. A holographic display with wide viewing angles and high resolution, the display comprises: - a coherent light source to provide coherent light; - a beam expansion module and collimation display module that expands, collimates, and filters the coherent light from the coherent light source to obtain a wide parallel beam with uniform brightness, and irradiates a light modulator group as the reference light; and - a processor that calculates a holographic modulation and transmits said holographic modulation and coding image to be loaded on each light modulator to the image transmission module.

N9922

IN202311073470

Priority Date: 27/10/2023

UNIVERSITY OF ENGINEERING & MANAGEMENT

A SYSTEM FOR TRANSFORMING EDUCATION WITH HOLOGRAPHIC TECHNOLOGY

The present invention relates to a transforming education with holographic technology: a futuristic approach to learning. Further, the present invention discloses a revolutionary transformation in education through the integration of holographic technology, aimed at providing an immersive 3D display experience at minimal cost. In an increasingly tech-driven world, it is essential to introduce students, even at the primary level, to the wonders of hologram technology. The innovative approach involves creating accessible, cost-effective holographic displays that can captivate young minds and introduce them to the world of technology. By incorporating holograms into the curriculum, students can engage with educational content in a whole new dimension. This not only enhances their understanding of subjects but also nurtures their curiosity and creativity. Furthermore, discusses the practical aspects of implementing holographic displays in educational settings, addressing issues related to affordability and scalability. Primary aim of the present invention to demonstrate that holographic technology is not a distant dream but a feasible and exciting tool that can revolutionize the way we educate our youth. In an era of rapid technological advancements, it is crucial to empower students with the skills and experiences that will prepare them for the future. Holographic technology offers a unique and captivating pathway to achieve this goal, fostering a generation of learners who are not just tech-savvy but also inspired to innovate and explore the limitless possibilities of the digital age.



CLAIM 1. A transforming education with holographic technology: a futuristic approach to learning.

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Priority Date: 12/07/2022

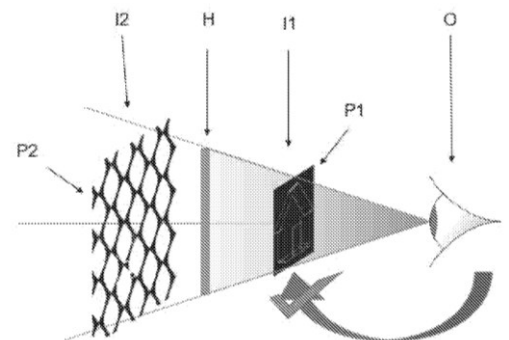
PSA AUTOMOBILES | STELLANTIS AUTO

PHYSICAL HOLOGRAM FABRICATED FROM A DIGITAL HOLOGRAM AND HOLOGRAPHIC DEVICE THEREFOR

The invention relates to the production of a physical hologram (H) from a digital hologram calculated so that two floating images (I1, I2) form on two image planes (P1, P2) when the physical hologram (H) is illuminated by a light source, one of these image planes (P2) is positioned between the light source and the physical hologram (H) and the other image plane (P1) is positioned between the physical hologram (H) and an observer (O).

HOLOGRAMME PHYSIQUE FABRIQUÉ À PARTIR D'UN HOLOGRAMME NUMÉRIQUE ET DISPOSITIF HOLOGRAPHIQUE ASSOCIÉ

La présente invention concerne la fabrication d'un hologramme physique (H) à partir d'un hologramme numérique calculé pour que deux images flottantes (I1, I2) se forment sur deux plans image (P1, P2) lorsque l'hologramme physique (H) est illuminé par une source lumineuse, l'un de ces plans images (P2) est positionnée entre la source lumineuse et l'hologramme physique (H) et l'autre plan image (P1) est positionnée entre l'hologramme physique (H) et un observateur (O).



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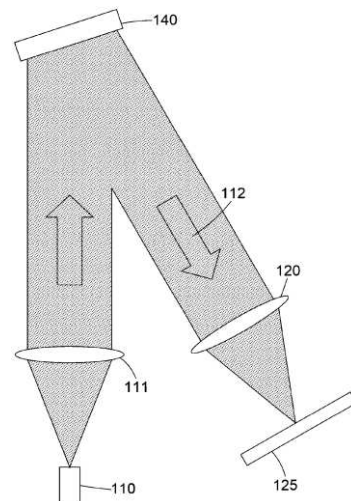
Priority Date: 06/01/2023

ENVISICS

HOLOGRAPHIC PROJECTOR

A holographic projector comprising: an illumination system arranged to illuminate a hologram displayed on the pixel surface of a spatial light modulator (SLM) to form a holographic wavefront; A waveguide comprising an input port arranged to receive the holographic wavefront and a pair of opposed surfaces arranged to waveguide the holographic wavefront therebetween, wherein a first surface of the pair of opposed surfaces is partially reflective-transmissive such that a plurality of replicates of the holographic wavefront are emitted therefrom; wherein the illumination system comprises a light source arranged to emit diverging light and a first collimating lens arranged to collimate the light; and The illumination system is configured such that the pixel region is contained within a region bounded by a width of the intensity profile of the collimated light at half the maximum intensity of the intensity profile in the display plane.

CLAIM 1. A holographic projector comprising: an illumination system arranged to illuminate a hologram displayed on the pixel surface of a spatial light modulator (SLM) to form a holographic wavefront; a waveguide comprising an input port arranged to receive the holographic wavefront and a pair of opposing surfaces arranged to waveguide the holographic wavefront therebetween, wherein a first surface of the pair of opposing surfaces is partially reflective-transmissive such that a plurality of replicas of the holographic wavefront are emitted therefrom; wherein the illumination system comprises a light source arranged to emit diverging light and a first collimating lens arranged to collimate the light; and wherein the illumination system is configured such that the pixel region is contained within a region bounded by a width of the intensity profile of the collimated light at half the maximum intensity of the intensity profile in the display plane.



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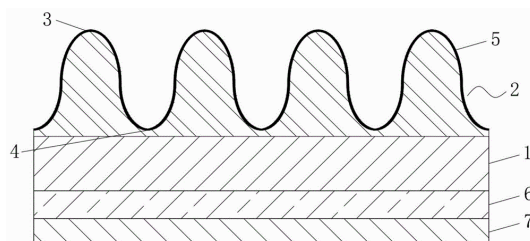
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Priority Date: 17/07/2023

ZHANGJIAGANG KANGDE XIN PHOTOELECTRIC MATERIAL

HOLOGRAPHIC PROJECTION FILM

The utility model discloses a holographic projection film, and relates to the technical field of optical films. Wherein, this holographic projection membrane includes: a substrate layer; the wavy structure is arranged on the substrate layer and is an elliptic wavy structure; the frosted layer is arranged on the upper surface of the wavy structure; the wavy structure is formed by staggered arrangement of a plurality of bulges and grooves. The utility model solves the problems that the prior holographic film requires expensive equipment cost for realizing high-quality holographic projection, and comprises laser, optical elements, cameras and the like, so that the holographic projection technology is difficult to popularize and popularize.



CLAIM 1. Holographic projection film, characterized in that it comprises: a base material layer (1); a corrugated structure (2) which is arranged on the substrate layer (1) and is an elliptic corrugated structure; a kind of electronic device with high-pressure air-conditioning system A sanding layer (5) arranged on the upper surface of the wavy structure (2); the wavy structure (2) is formed by staggered arrangement of a plurality of bulges (3) and grooves (4).

N9931

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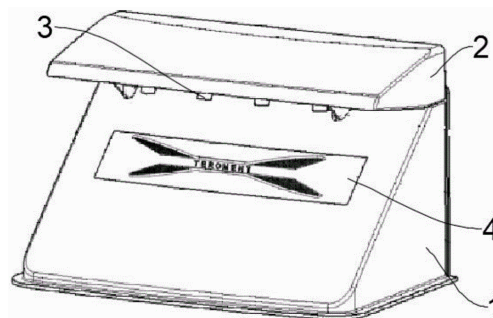
Priority Date: 18/01/2023

VARROC TYC AUTO LAMPS

HOLOGRAPHIC PROJECTION DEVICE FOR CAR LAMP

The utility model discloses a holographic projection device for a car lamp, and particularly relates to the technical field of high-position brake lamps. According to the utility model, the upper cover is arranged on the outer wall of the windshield simulation piece, the first groove is arranged at the bottom end of the upper cover, the light source is arranged in the first groove, and the holographic film is arranged in the interlayer of the windshield simulation piece, so that the light source can irradiate on the holographic film.

CLAIM 1. A holographic projection device for a vehicle lamp, comprising a windscreen simulator (1); the upper cover (2) is fixedly connected to the top of the windshield simulation piece (1); the lamp source (3) is arranged at the bottom end of the upper cover (2); the method is characterized in that: the utility model discloses a windshield simulation piece, which is characterized in that one side of the outer wall of the windshield simulation piece (1) is adhered with a holographic film (4), the bottom end of the upper cover (2) is provided with a first groove (5), the inside of the first groove (5) is rotationally connected with a rotating rod (6), one side of the outer wall of the rotating rod (6) is provided with a threaded rod (7), the outer wall of the threaded rod (7) is rotationally connected with a fixed plate (8), one end of the fixed plate (8) is fixedly connected with the inside of the first groove (5), be equipped with steering gear (9) between threaded rod (7) one end and bull stick (6), threaded rod (7) are kept away from bull stick (6) one end and are rotated with first recess (5) and are connected, the inside connecting block (10) that is equipped with of first recess (5), threaded rod (7) one end runs through inside connecting block (10), threaded rod (7) are connected through the screw thread with connecting block (10), connecting block (10) outer wall and lamp source (3) fixed connection.



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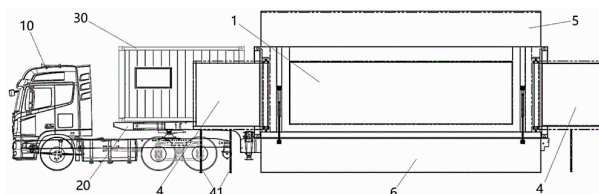
Priority Date: 02/08/2023

BEIJING TIANDI MYTHOLOGY INTERNATIONAL CULTURAL DEVELOPMENT

MOBILE HOLOGRAPHIC DISPLAY WORKSTATION

The utility model discloses a movable holographic display workstation, which mainly comprises a tractor, a trailer connected with the tractor, a working cabin and an imaging cabin which are respectively and detachably arranged on the trailer, wherein the working cabin is used for configuring equipment for controlling the display and broadcasting functions of the workstation, and the imaging cabin is responsible for providing the display functions by a holographic imaging device consisting of a front screen, a ground screen, a reflecting film and a side screen; the front screen is arranged on the back side plate of the imaging cabin box body, the ground screen is arranged on the bottom plate of the box body, the reflecting film is obliquely arranged in the box body, the two side screens are respectively contained at the opposite side end plates of the box body through a sliding mechanism and a hinge mechanism, and the front side plate of the box body is formed by an upper turning plate and a lower turning plate which can be opened and closed. The utility model realizes the holographic display requirements of the on-the-fly and on-the-stop display, is not limited by the display form of the fixed position any more, has a compact structure with high storage property, is more suitable for mobile scenes, and can provide extensible, rich and various display contents in a multi-screen mode.

CLAIM 1. A mobile holographic display workstation comprising: the device comprises a tractor, a trailer connected with the tractor, a working cabin and an imaging cabin, wherein the working cabin and the imaging cabin are respectively detachably arranged on the trailer, and a plurality of compartments are arranged in the working cabin; the imaging cabin comprises a box body, wherein a front screen, a ground screen, a reflecting film and two side screens are arranged in the box body; the front screen is mounted at the back side plate of the box body, the ground screen is mounted at the bottom plate of the box body, the reflecting film is obliquely mounted in the box body, the side screens are respectively arranged at the opposite side end plates of the box body through the sliding mechanism and the hinge mechanism, and the front side plate of the box body comprises an upper turning plate located above and a lower turning plate located below.



N9933

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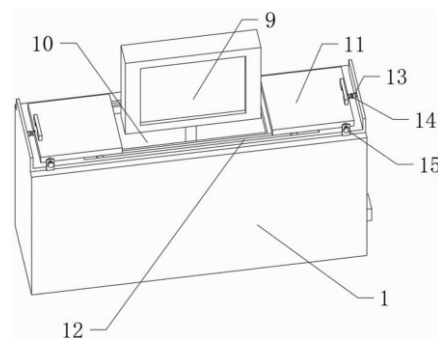
Priority Date: 10/06/2023

SHANGHAI CHENGYI PACKAGE TECHNOLOGY

3D HOLOGRAPHIC IMAGING DEVICE

The utility model discloses a 3D holographic image device, which comprises a protective box and a protective mechanism arranged in the protective box; according to the utility model, the lifting rod is arranged, when the 3D holographic imaging device is not used, in order to prevent the 3D holographic imaging device from being exposed and placed outside and from being knocked or touched by unrelated personnel, the use cost of the 3D holographic imaging device is increased, when the 3D holographic imaging device is not used, the servo motor is opened, the threaded slider is driven to slide along the inner wall of the fixed groove through the rotation of the threaded rod, the lifting rod is driven to slide along the outer wall of the groove rod through the connection of the pulling rod, the lifting rod moves to drive the imaging device main body to descend along the outer wall of the opening, the effect of storing and storing the imaging device main body in the protective box is achieved, and the protective control operation of the 3D holographic imaging device is improved when the 3D holographic imaging device is not used.

CLAIM 1. The utility model provides a 3D holographic image device, includes protective housing (1) and sets up at the inside protection mechanism of protective housing (1), its characterized in that: the protection mechanism comprises a sliding component and a lifting component; the sliding assembly comprises a threaded sliding block (4) and a fixed groove (5), a threaded rod (2) is arranged in the protective box (1), one end of the threaded rod (2) is fixedly connected with a servo motor (3), the threaded sliding block (4) is connected with the outer wall of the threaded rod (2) in a threaded manner, and the fixed groove (5) is formed in the connecting part of the inner wall of the protective box (1) and the threaded sliding block (4); the lifting assembly comprises a pulling rod (6), a lifting rod (7) and an image equipment main body (9), wherein the pulling rod (6) is rotatably connected to the outer wall of the threaded slider (4), one end of the pulling rod (6) is rotatably connected with the lifting rod (7) which is slidably connected with the inner wall of the protective box (1), the outer wall of the lifting rod (7) is slidably connected with a groove rod (8) fixedly connected with the inner wall of the protective box (1), and one end of the lifting rod (7) is fixedly connected with the image equipment main body (9).



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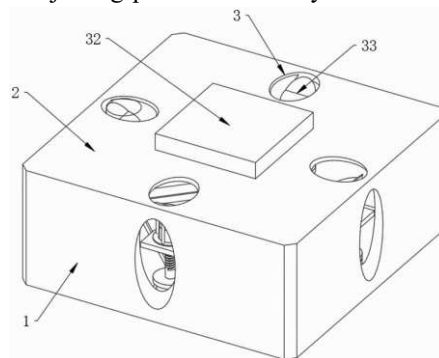
Priority Date: 11/06/2023

SHANGHAI CHENGYI PACKAGE TECHNOLOGY

REAL-TIME INTERACTION DEVICE BASED ON 3D HOLOGRAPHIC IMAGING TECHNOLOGY

The utility model discloses a real-time interaction device based on a 3D holographic imaging technology, which comprises an outer frame and a mounting plate, wherein a plurality of holes are formed in the mounting plate, a transmitting piece and a receiving piece are respectively arranged at the upper end and the lower end of the mounting plate, the outer frame is provided with a plurality of reflecting mirrors with adjustable heights, when the reflecting mirrors are at different heights, the incident angles are different, the transmitting piece, the receiving piece and the reflecting mirrors work together to form a 3D image, the outer frame is fixedly connected with a motor, a plurality of adjusting plates for placing the reflecting mirrors are fixedly arranged on the outer frame, and an adjusting assembly is arranged between the motor and the adjusting plates. The utility model can adjust the positions of the reflectors at one time, and by arranging the adjusting component, the reflectors can be changed in the same amplitude during transmission, and the workload required by adjustment is reduced.

CLAIM 1. Real-time interactive installation based on 3D holographic imaging technique, including frame (1) and mounting panel (2), its characterized in that, a plurality of trompils (3) have been seted up on mounting panel (2), both ends are provided with transmission piece (31) and receiver (32) respectively about mounting panel (2), frame (1) are provided with a plurality of adjustable height's speculum (33), frame (1) fixedly connected with motor (4), fixedly on frame (1) be provided with a plurality of regulating plates (5) that are used for placing speculum (33), be provided with adjusting part between motor (4) and a plurality of regulating plates (5).



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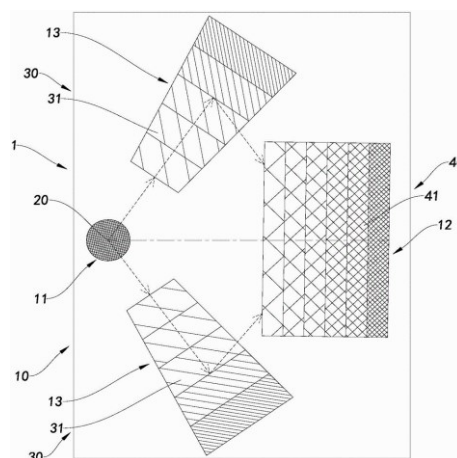
CN220232015U

Priority Date: 10/08/2023

TRANSIENT OULAI SEMICONDUCTOR PHOTOELECTRIC SHANGHAI

VOLUME HOLOGRAPHIC GRATING WAVEGUIDE AND NEAR-EYE DISPLAY DEVICE

The utility model provides a volume holographic grating waveguide and a near-eye display device, which can realize large-field-angle transmission and are beneficial to improving user experience. The volume holographic grating waveguide includes: the waveguide substrate is provided with a coupling-in region, a coupling-out region and a pair of turning regions distributed at two sides of a connecting line between the coupling-in region and the coupling-out region; a pair of volume hologram coupling gratings, which are stacked at intervals in the coupling region, and the grating vectors of the two volume hologram coupling gratings respectively point to the two turning regions at the projection components of the waveguide substrate, for coupling image light from the coupling region into the waveguide substrate to be respectively transmitted to the two turning regions; a pair of turning elements respectively arranged at the two turning areas for respectively turning the image light from the coupling-in area at the two turning areas to be transmitted to the coupling-out area; and a coupling-out element disposed in the coupling-out region for coupling out the image light from the two turning regions from the coupling-out region into the waveguide substrate.



CLAIM 1. A volume holographic grating waveguide, comprising: the waveguide substrate is provided with a coupling-in region, a coupling-out region and a pair of turning regions distributed at two sides of a connecting line between the coupling-in region and the coupling-out region; a pair of volume hologram coupling gratings, two of the volume hologram coupling gratings being stacked at intervals in the coupling region, and grating vectors of the two volume hologram coupling gratings respectively pointing to the two turning regions at projection components of the waveguide substrate, for coupling image light from the coupling region into the waveguide substrate to be transmitted to the two turning regions respectively; a pair of turning elements, wherein the two turning elements are respectively arranged at the two turning areas and are used for respectively turning the image light from the coupling-in area at the two turning areas so as to be transmitted to the coupling-out area; and the coupling-out element is arranged in the coupling-out region and is used for splicing and coupling the image light from the two turning regions out of the waveguide substrate from the coupling-out region.

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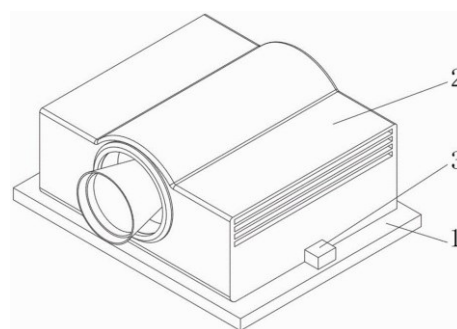
CN220228399U

Priority Date: 05/05/2023

NANJING JUYUZHEN DIGITAL TECHNOLOGY

PROJECTION EQUIPMENT FOR HOLOGRAPHIC IMAGING

The utility model discloses projection equipment for holographic imaging, which comprises a placing plate, a projector and a positioning block, wherein the top of the placing plate is movably connected with the bottom of the projector, the top of the placing plate is fixedly connected with the bottom of the positioning block, the positioning block is matched with the projector for use, a positioning cavity is formed in the positioning block, an adjusting mechanism and a positioning mechanism are arranged in the positioning cavity, and the right side of the adjusting mechanism penetrates through the right side of the positioning block. The utility model is used by matching the placement plate, the projector, the positioning block, the adjusting mechanism and the positioning mechanism, so that the existing equipment is placed on the surface of the placement plate and cannot be fixed, however, the projector is easy to fall off and damage when the angle of the placement plate is adjusted, and the projector can be stably fixed, so that the holographic imaging projection equipment is provided, the position of the projector is stably fixed through the positioning block, and the falling-off effect is prevented when the holographic imaging projection equipment is used.



CLAIM 1. The utility model provides a projection equipment for holographic display, includes places board (1), projecting apparatus (2) and locating piece (3), its characterized in that: the top of placing board (1) and the bottom swing joint of projecting apparatus (2), the top of placing board (1) and the bottom fixed connection of locating piece (3), locating piece (3) and projecting apparatus (2) cooperation use, locating cavity (4) have been seted up to the inside of locating piece (3), the inside of locating cavity (4) is equipped with adjustment mechanism (5) and positioning mechanism (6), the right side of adjustment mechanism (5) runs through to the right side of locating piece (3), positioning mechanism (6) and projecting apparatus (2) cooperation use.

N9938

CN117432968

Priority Date: 27/10/2023

SAIC VOLKSWAGEN AUTOMOTIVE

HIGH-ORDER STOP LAMP SYSTEM WITH HOLOGRAPHIC PROJECTION FUNCTION

The invention provides a high-order stop lamp system with holographic projection function, comprising: rear windshield with holographic film, rear spoiler of vehicle and high-position brake lamp body. The rear spoiler of the vehicle is arranged on the rear windshield, and the high-position brake lamp body is arranged on the rear spoiler of the vehicle. The high-position brake lamp body comprises an outer lens and a shell, wherein a closed space is formed by the outer lens and the shell, and a light-transmitting window is formed on one side of the shell, facing the rear windshield. The inner lens, the circuit board, the lamp band light source group and the holographic light source group are arranged in the closed space. The inner lens is arranged in front of the outer lens, the lamp strip light source group is arranged above the circuit board and in front of the inner lens, the holographic light source group is arranged below the circuit board and faces the light transmission window, and the light distribution angle of the holographic light source group covers the holographic film. The high-position stop lamp system with the holographic projection function provided by the invention is widely applied, can obviously improve the use experience of vehicles, and provides more choices of the effect of the sexual high-position stop lamp for users.

CLAIM 1. A high-order stop lamp system with holographic projection function, comprising: a rear windshield with a holographic film; the vehicle rear spoiler is arranged on the rear windshield; the high-position brake lamp body is arranged on the rear spoiler of the vehicle and comprises an outer lens and a shell, wherein a closed space is formed by the outer lens and the shell in a surrounding mode, a light transmission window is formed in one side, facing the rear windshield, of the shell, an inner lens, a circuit board, a lamp strip light source group and a holographic light source group are arranged in the closed space, the inner lens is arranged in front of the outer lens, the lamp strip light source group is arranged above the circuit board and in front of the inner lens, the holographic light source group is arranged below the circuit board and faces the light transmission window, and a holographic film is covered by a light distribution angle of the holographic light source group; wherein, the front direction of the automobile is taken as the front; the lamp strip light source group emits light to the rear direction of the vehicle through the inner lens and the outer lens to form a luminous lamp strip; the holographic light source group emits light to the holographic film direction in the rear windshield through the light-transmitting window, and a holographic image is formed on the holographic film.

N9946

CN117369233

Priority Date: 11/10/2023

SHENZHEN EUCLIDEON TECHNOLOGY

HOLOGRAPHIC DISPLAY METHOD, DEVICE, EQUIPMENT AND STORAGE MEDIUM

The invention relates to the technical field of holographic display, and discloses a holographic display method, device, equipment and storage medium, which are used for improving the display effect of holographic display and improving the display accuracy of holographic building projection. The method comprises the following steps: building extraction and three-dimensional building model reconstruction are carried out on the image data of the target building area, and position correction and holographic image generation are carried out, so that initialized holographic building projection data are obtained; performing user visual angle position sensing and interactive action recognition to obtain first user visual angle position data and user interactive action data; performing interactive response to obtain first holographic building projection data and dividing light shadow areas to obtain a first visual illumination area and a first visual shadow area; performing view angle movement track tracking to obtain second user view angle position data and performing light shadow area analysis to obtain a second visual illumination area and a second visual shadow area; and carrying out projection preloading to generate second holographic building projection data.

CLAIM 1. A holographic display method, the holographic display method comprising: performing multi-angle scanning on a target building area to obtain initial building area image data, and performing image enhancement processing on the initial building area image data to obtain target building area image data; building extraction and three-dimensional building model reconstruction are carried out on the target building area image data to obtain a discrete three-dimensional building model cluster, and position correction and holographic image generation are carried out on the discrete three-dimensional building model cluster to obtain initialized holographic building projection data; performing user visual angle position sensing and interactive action recognition on a target user to obtain first user visual angle position data and user interactive action data; Performing interactive response on the initialized holographic building projection data according to the user interaction data to obtain first holographic building projection data, and performing light shadow region division on the first holographic building projection data according to the first user visual angle position data to obtain a first visual illumination region and a first visual shadow region; performing view angle movement track tracking on the target user to obtain second user view angle position data, and performing light shadow area analysis on the first visual illumination area and the first visual shadow area according to the second user view angle position data to obtain a second visual illumination area and a second visual shadow area; and carrying out projection preloading on the first holographic building projection data according to the second visual illumination area and the second visual shadow area to generate second holographic building projection data.

N9947

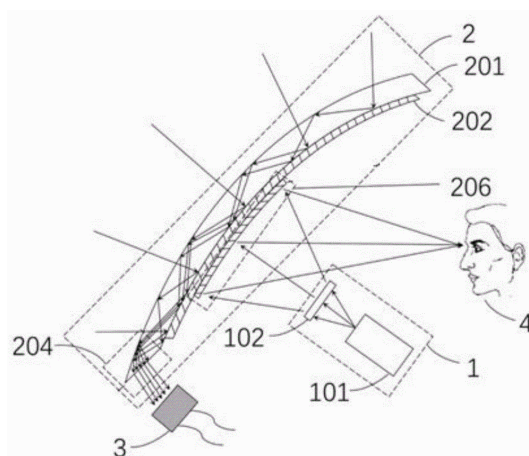
CN117369232

Priority Date: 28/09/2023

BEIJING UNIVERSITY OF TECHNOLOGY

HOLOGRAPHIC MULTIPLEXING CAR WINDOW SYSTEM AND HOLOGRAPHIC MULTIPLEXING METHOD THEREOF

The invention discloses a holographic multiplexing vehicle window system and a holographic multiplexing method, the system comprises an image projection module, a holographic optical element waveguide combiner and a solar cell module, wherein the holographic optical element waveguide combiner comprises an optical waveguide, a light collecting holographic optical element, a coupling-out optical element and an imaging holographic optical element, the light collecting holographic optical element and the imaging holographic optical element are attached to the optical waveguide, the light collecting holographic optical element covers the whole optical waveguide, the imaging holographic optical element covers a partial area of the optical waveguide, and a single-layer multiplexing mode or a multi-layer stacking multiplexing mode is adopted between the light collecting holographic optical element and the imaging holographic optical element. The system and the method can utilize external light energy, reduce the influence of external strong light on driving, convert the light energy of the external light coupled out by the coupling optical element into electric energy to supply power for the image projection module and the electric equipment in the vehicle, and reduce the influence of stray light formed by external light diffraction on a display system, so that the display effect is better.



CLAIM 1. A holographic multiplexing car window system is characterized by comprising an image projection module (1), a holographic optical element waveguide combiner (2) and a solar cell module (3), wherein the holographic optical element waveguide combiner (2) further comprises an optical waveguide (201), a light collecting holographic optical element (202), a coupling-out optical element (204) and an imaging holographic optical element (206), the light collecting holographic optical element (202) and the imaging holographic optical element (206) are attached to the optical waveguide (201), the light collecting holographic optical element (202) covers the whole optical waveguide (201), the imaging holographic optical element (206) covers a partial area of the optical waveguide (201), and a single-layer multiplexing mode or a multi-layer stacking multiplexing mode is adopted between the light collecting holographic optical element (202) and the imaging holographic optical element (206); -the image projection module (1) for generating a target image and projecting the target image to the imaging holographic optical element (206); -the imaging holographic optical element (206) for diffracting the target image to a user (4); the light collecting holographic optical element (202) is used for collecting external light from a plurality of angles outside the vehicle window; the optical waveguide (201) is used for transmitting the external light collected by the light collecting holographic optical element (202); the coupling-out optical element (204) is arranged at the bottom of the optical waveguide (201) and is used for coupling out external light which propagates to the edge of the optical waveguide (201) from the optical waveguide (201); the solar battery module (3) is used for converting light energy of external light coupled out by the coupling optical element (204) into electric energy to supply power for the image projection module (1) and electric equipment in the vehicle.

N9950

CN117348368

Priority Date: 07/10/2023

GOOLTON TECHNOLOGY

HOLOGRAPHIC PROJECTION METHOD AND DEVICE AND ELECTRONIC EQUIPMENT

A holographic projection method, a holographic projection device and electronic equipment relate to the field of data processing. In the method, the memory occupancy rate of holographic projection equipment is obtained; if the memory occupancy rate is larger than the preset first memory occupancy rate, dividing the first holographic image by adopting a preset first mode to obtain a first central area image and a non-first central area image; setting the first central area image to a first resolution, and setting the non-first central area image to a second resolution, wherein the first resolution is higher than the second resolution; a second holographic image is projected onto the holographic grating film, the second holographic image comprising a first central region image of a first resolution and a non-first central region image of a second resolution. By implementing the technical scheme provided by the application, the problems that a large amount of data processing and transmission are needed for real-time holographic projection, the requirement on the data processing performance of holographic projection equipment is high, and a large burden is caused are solved.

CLAIM 1. A holographic projection method, the method comprising: acquiring the memory occupancy rate of the holographic projection equipment; judging the size relation between the memory occupancy rate and a preset first memory occupancy rate; if the memory occupancy rate is larger than the preset first memory occupancy rate, dividing the first holographic image by adopting a preset first mode to obtain a first central area image and a non-first central area image; the first preset mode comprises a mode of dividing the size and the position of the first central area image, and the first holographic image is any image in an initial game picture; setting the first center region image to a first resolution, and setting the non-first center region image to a second resolution, wherein the first resolution is higher than the second resolution; a second holographic image is projected onto the holographic grating film, the second holographic image comprising the first central region image at the first resolution and the non-first central region image at the second resolution.

N9951

CN117336450

Priority Date: 12/09/2023

HANGZHOU QIUGUO PLANNING TECHNOLOGY

3D HOLOGRAPHIC PROJECTION SYSTEM BASED ON ENVIRONMENT INTELLIGENT REGULATION

The invention relates to the technical field of 3D holographic projection, and particularly discloses a 3D holographic projection system based on intelligent environment adjustment, which comprises the following components: the environment light monitoring end comprises a plurality of groups of micro light sensors, wherein the groups of micro light sensors are uniformly distributed at the edges of the four-sided pyramids of the 3D holographic projection and are used for monitoring the real-time illumination intensity of the corresponding positions of the micro light sensors; the processor is used for fitting out an illumination influence model according to the real-time illumination intensity of the corresponding position points of all the miniature light sensors, judging the projection influence state according to the illumination influence model, and outputting a parameter adjustment instruction according to a judgment result; the projection system parameter adjustment module is used for executing parameter adjustment instructions output by the processor to carry out parameter adjustment on the 3D holographic projection system; the system can enable the 3D holographic projection system to be adaptively adjusted under different environmental states, and ensures the projection display effect.

CLAIM 1. A 3D holographic projection system based on intelligent environmental adjustment, the system comprising: the environment light monitoring end comprises a plurality of groups of micro light sensors, wherein the groups of micro light sensors are uniformly distributed at the edges of the four-sided pyramids of the 3D holographic projection and are used for monitoring the real-time illumination intensity of the corresponding positions of the micro light sensors; the processor is used for fitting out an illumination influence model according to the real-time illumination intensity of the corresponding position points of all the miniature light sensors, judging the projection influence state according to the illumination influence model, and outputting a parameter adjustment instruction according to a judgment result; and the projection system parameter adjustment module is used for executing the parameter adjustment instruction output by the processor to carry out parameter adjustment on the 3D holographic projection system.

N9952

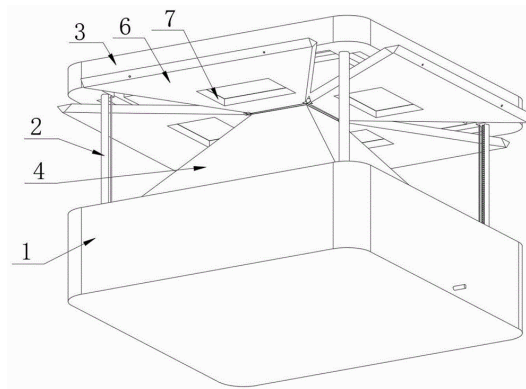
CN117334139

Priority Date: 18/09/2023

ANHUI CHENGPIN DECORATION ENGINEERING

BIM-BASED HOLOGRAPHIC IMAGING EFFECT DISPLAY METHOD AND DEVICE

The invention relates to the technical field of building design, in particular to a holographic imaging effect display method and a demonstration device based on BIM, which comprise bases for mounting and fixing, wherein upright posts are fixedly arranged at four corners of the upper end of each base, top plates are fixedly arranged at the upper ends of four groups of upright posts, optical glass is fixedly arranged at the upper ends of the bases, five groups of projectors are fixedly arranged on the lower side of each top plate, and the five groups of projectors are respectively arranged at the upper end, front, back, left and right of the optical glass; the cover plate is provided with four groups, and the four groups of cover plates are hinged to the lower side of the top plate. According to the invention, the motor drives the first synchronous wheel, the synchronous belt and the second synchronous wheel to rotate, so that the four groups of screws are driven to rotate, the four groups of screws are driven to move on the four groups of optical glass to turn over and open the four groups of cover plates from the optical glass, patterns can be projected on the optical glass through the projector, and the patterns projected on the projector are combined and formed through the optical glass, so that three-dimensional stereo forming can be performed.



CLAIM 1. A BIM-based holographic imaging effect demonstration device, comprising: the device comprises a base (1) used for mounting and fixing, wherein upright posts (2) are fixedly arranged at four corners of the upper end of the base (1), top plates (3) are fixedly arranged at the upper ends of the four groups of upright posts (2), optical glass (4) is fixedly arranged at the upper end of the base (1), five groups of projectors (5) are fixedly arranged on the lower side of the top plates (3), and the five groups of projectors (5) are respectively arranged at the upper ends, front, back, left and right of the optical glass (4); the method is characterized in that: the cover plates (6) are provided with four groups, the four groups of cover plates (6) are hinged to the lower side of the top plate (3), and the four groups of cover plates (6) are respectively attached to the front, rear, left and right surfaces of the optical glass (4); the driving assembly is fixedly arranged in the base (1), the upper end of the driving assembly is rotatably arranged in the four groups of upright posts (2), the upper end of the driving assembly is movably connected with the four groups of cover plates (6) respectively, and the driving assembly is used for unfolding or closing the four groups of cover plates (6); the dust expelling assembly is fixedly arranged in the base (1), the upper end of the dust expelling assembly is positioned at the front, back, left and right parts of the lower end of the optical glass (4), and the dust expelling assembly is used for blowing off dust on the surface of the optical glass (4).

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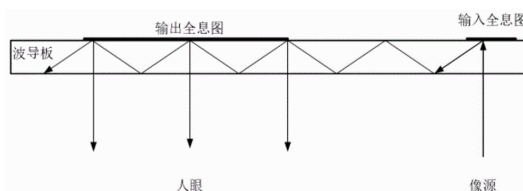
Priority Date: 09/11/2023

LUOYANG ELECTRO OPTICAL EQUIPMENT RESEARCH INSTITUTE
AVIATION INDUSTRY

TWO-DIMENSIONAL HOLOGRAPHIC WAVEGUIDE ELEMENT TURNING HOLOGRAM AND EXPOSURE METHOD

The two-dimensional holographic waveguide element turning hologram and exposure method of the invention needs to use two laser beams for exposure during manufacture, and the laser beams need to be led in and led out by a special prism. Different special prisms are required to be designed and processed according to different transmission angles α , turning angles β and refractive indexes n of the recording medium, so that the cost is high and the flexibility is not enough. The invention provides a two-dimensional holographic waveguide element turning hologram and an exposure method, wherein the plane of the grating of the turning hologram is a vertical plane, and the included angle between the grating and the surface of a recording medium is a right angle. When the turning hologram is manufactured, two laser beams are required to be exposed, the laser beams do not need any prism for leading in and leading out, and the recording medium is directly irradiated in the air. For different transmission angles α , turning angles β and refractive indexes n of the recording medium, only the irradiation angle in the air needs to be adjusted, so that the cost is low and the recording medium is very flexible.

CLAIM 1. A method for turning a hologram and exposing light by a two-dimensional holographic waveguide element, the method comprising: acquiring a transmission angle α , a turning angle β , a recording medium and an input first light ray of the two-dimensional holographic waveguide element; exposing to make a hologram, comprising the steps of simultaneously emitting a first exposure light and a second exposure light which are symmetrical along the Z axis of a substrate to generate the hologram; designing and manufacturing a light path and determining an included angle θ between the light path and a Z axis; determining an included angle δ of the first light ray in the air; and outputting a final hologram according to the included angle δ .



N9954

CN117315164

Priority Date: 28/11/2023

VR INTELLIGENT TECHNOLOGY

OPTICAL WAVEGUIDE HOLOGRAPHIC DISPLAY METHOD, DEVICE, EQUIPMENT AND STORAGE MEDIUM

The invention relates to the technical field of image processing, and discloses an optical waveguide holographic display method, an optical waveguide holographic display device, optical waveguide holographic display equipment and a storage medium, which are used for improving the optical waveguide holographic display accuracy. Comprising the following steps: acquiring preset three-dimensional image data, and performing coding processing on the three-dimensional image data to obtain diffraction fringe distribution data corresponding to the three-dimensional image data; position transmission is carried out on diffraction fringe distribution data through a preset optical waveguide device, so that corresponding optical waveguide projection data are obtained; constructing image stereo information of the optical waveguide projection data to obtain the image stereo information of the optical waveguide projection data; and carrying out holographic image construction on the optical waveguide projection data based on the image stereo information to obtain a corresponding target holographic image, and transmitting the corresponding target holographic image to a preset image display terminal.

CLAIM 1. An optical waveguide holographic display method, characterized in that the optical waveguide holographic display method comprises: acquiring preset three-dimensional image data, and performing coding processing on the three-dimensional image data to obtain diffraction fringe distribution data corresponding to the three-dimensional image data; position transmission is carried out on the diffraction fringe distribution data through a preset optical waveguide device, so that corresponding optical waveguide projection data are obtained; constructing the image stereo information of the optical waveguide projection data to obtain the image stereo information of the optical waveguide projection data; and constructing the holographic image of the optical waveguide projection data based on the image stereo information to obtain a corresponding target holographic image, and transmitting the corresponding target holographic image to a preset image display terminal.

N9955

CN117311565

Priority Date: 07/09/2023

LANGFANG ZHENGUIGU TECHNOLOGY

AR HOLOGRAPHIC AIR PROJECTION SYSTEM

The invention provides an AR holographic air projection system, which relates to the technical field of air projection and comprises the following modules: the information acquisition module is used for acquiring object data of the virtual object and background information data of the target virtual object in different virtual scenes; the data processing module fuses the processing object data and the background information data to generate holographic projection data; virtual reproduction module: the holographic projection data are projected onto the generated air fog wall by using projection equipment, so that a holographic virtual reproduction area is obtained; and the area adjustment module is used for capturing the operation behavior of the target object in the holographic virtual reproduction area, and the control equipment carries out area adjustment on the holographic virtual reproduction area. The invention can realize the projection purpose of projecting projection data onto the air fog wall without using a curtain or a wall, has high efficiency and simple maintenance, and brings brand new three-dimensional visual enjoyment as being in the scene to people.

CLAIM 1. An AR holographic air projection system, comprising: and the information acquisition module is used for: the method comprises the steps of collecting object data of a virtual object and background information data of the target virtual object in different virtual scenes; and a data processing module: the method comprises the steps of receiving object data and background information data, and performing fusion processing to generate holographic projection data; virtual reproduction module: the holographic projection data are projected onto an air fog wall formed based on steam by using projection equipment, so that a holographic virtual reproduction area is generated; and the area adjustment module is used for: the method is used for capturing the operation behavior of the target object in the holographic virtual reproduction area, and controlling the adjustable area equipment to carry out area adjustment on the holographic virtual reproduction area.

N9960

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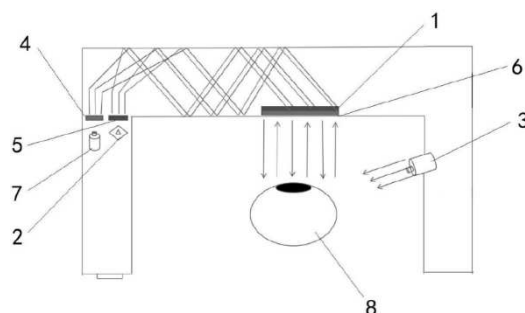
Priority Date: 15/09/2023

NANJING WEIE OPTOELECTRONIC TECHNOLOGY

HOLOGRAPHIC WAVEGUIDE NEAR-TO-EYE IMAGING METHOD BASED ON LINE-OF-SIGHT TRACKING

The invention relates to the technical field of holographic waveguides, in particular to a holographic waveguide near-to-eye imaging method based on line-of-sight tracking; building a system; calculating by adopting a human eye visual axis, and calculating the convergence point coordinates of the binocular visual axis; calculating the focusing distance of human eyes, and adjusting the virtual image distance of holographic waveguide imaging; the system comprises a screen, a first light source, a second light source, a first VHG, a second VHG, an MVHG, a left near infrared camera and a right near infrared camera, wherein the holographic waveguide near-eye imaging system based on line-of-sight tracking utilizes the optical path conduction of the holographic waveguide sheet, and the binocular vision tracking optical path and the position calibration algorithm are well combined and integrated into the holographic waveguide imaging optical system in the mode, so that the volume of the holographic waveguide AR display device is integrated and portable, the virtual picture calibration accuracy is ensured, and meanwhile, the wearing comfort level of a user is greatly improved.

CLAIM 1. A holographic waveguide near-to-eye imaging method based on line-of-sight tracking is characterized by comprising the following steps: constructing a holographic waveguide near-to-eye imaging system based on line-of-sight tracking; calculating by adopting a human eye visual axis, and calculating the convergence point coordinates of the binocular visual axis by combining the human eye visual line focusing with the binocular holographic waveguide; and (3) calculating the focusing distance of human eyes, and adjusting the virtual image distance of the holographic waveguide imaging to be matched with the focusing distance of the human eyes.



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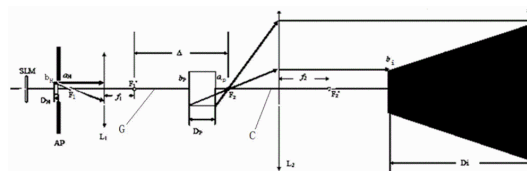
Priority Date: 05/09/2022

HANGZHOU CHENJING PHOTOELECTRIC TECHNOLOGY

HOLOGRAPHIC 3D DISPLAY SYSTEM BASED ON POLYMER LIQUID CRYSTAL SCATTERING FILM

The invention discloses a holographic 3D display system based on a polymer liquid crystal scattering film, which combines a Spatial Light Modulator (SLM) with ML-PDLCs, firstly calculates holograms of different layers of an object to be displayed, then reproduces the holograms through the SLM, places the ML-PDLCs at the position of a reproduced image, and the reproduced images of the different layers correspond to the ML-PDLCs film layers one by one. And using the ML-PDLCs as an SLM projection two-dimensional image receiving screen, starting to enable all film layers of the ML-PDLCs to be in an electrified transparent state, and enabling the corresponding film layers to be in an outage scattering state when a certain layer of image is reproduced, so that the reproduced image is displayed on the film layers. All the fault holograms are displayed one by one, the ML-PDLCs film layers corresponding to the fault holograms are powered on and powered off according to the time sequence, and the reappearance images are sequentially displayed on the corresponding film layers. The object is decomposed into N layers, the ML-PDLCs are used as an SLM projection two-dimensional image receiving screen, different two-dimensional images can be projected to different film layers of the ML-PDLCs for display by controlling the projection frame frequency of the SLM and the power-on time sequence of the film layers of the ML-PDLCs, and a complete three-dimensional image with continuous depth can be seen.

CLAIM 1. a holographic 3D display system based on a polymer liquid crystal scattering film, comprising: the computer is used for creating a Fresnel hologram of n layers of data-coded two-dimensional images, and the n layers of two-dimensional images are in one-to-one correspondence with n layers of equidistant parallel cross sections formed by decomposing a three-dimensional image of a 3D object layer by layer from a rear end plane



to a front end plane thereof; the spatial light modulator modulates illumination light emitted by the light source module, and sequentially reconstructs the reproduction images of the holograms of each layer in a reproduction light field according to a loading time sequence, so that the positions of n layers of reproduction images correspond to the positions of two-dimensional images of the reproduction images in the three-dimensional images, and the reproduction images are consistent with the three-dimensional images of the 3D object in size; the diffusion laminated body consists of M layers of polymer scattering liquid crystal films which are parallel, n is less than or equal to M and less than or equal to 19, the positions of n layers of reproduction images from a rear end plane to a front end plane in the reproduction light field are sequentially overlapped with the positions of n layers of polymer scattering liquid crystal films in the diffusion laminated body one by one, the n layers of polymer scattering liquid crystal films are controlled by a computer, when the reproduction image of an nth layer of hologram is reconstructed, the polymer scattering liquid crystal films overlapped with the positions of the reproduction image are in a scattering state, the reproduction image is scattered into a three-dimensional image, and the rest polymer scattering liquid crystal films are in a transparent state, so that the reproduction image is transmitted without interference; a diaphragm arranged on the end face of the output window of the diffusion lamination body and used for blocking the zero-order item and the conjugate image of the diffracted light; the response time of the polymer scattering liquid crystal film is T, the frequency frame of the spatial light modulator is at least 1/T Hz, and the pixel interval d of the spatial light modulator slm Satisfies the following formula: $d, d_{slm} \leq \lambda Z_0 / 2L_0$, $L_0 \geq T_0$ to reproduce the planar dimensions of the image, λ is the wavelength of the illumination light, Z_0 To reproduce the distance of the image from the spatial light modulator, the planar size of the diffusion laminate is not smaller than L_0 The response time refers to the total time for the polymer scattering liquid crystal film to reach a scattering state from the scattering state when power is off to the transparent state after power is on, and then power is off.

N9966

CA3164834

Priority Date: 22/06/2022

KODEY, BHAVANI KRISHNA

SMART HUMAN CONNECTION HOLOGRAPHIC PROJECTION DEVICE CONFIGURED TO PROJECT AN INTELLIGENT, RESPONSIVE, AI POWERED ANIMATED HOLOGRAPHIC CHARACTER IN A CONTAINER FOR INTERACTION BY A VIEWER

A smart human connection holographic projection device is disclosed. The smart human connection holographic projection device is configured to use artificial intelligence to project, for the benefit of a viewing user, a display of animated holographic imagery or video and audibly output an audio representation of a person, such as a deceased loved one, an imaginary or made-up person, another non-human living being, an actual living person who is inaccessible to the viewing user, or any other character. The viewing user can speak to, view, or otherwise interact peacefully with the projected person to feel connected with the person.

[Click on the title to return to table of contents](#)

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

N9901

WO202413202

Priority Date: 11/07/2022

**BIOASTER | BIOMERIEUX | CNRS - CENTRE NATIONAL DE LA
RECHERCHE SCIENTIFIQUE | UJM - UNIVERSITE JEAN MONNET**

METHOD AND SYSTEM FOR CHARACTERISING MICROORGANISMS BY DIGITAL HOLOGRAPHIC MICROSCOPY

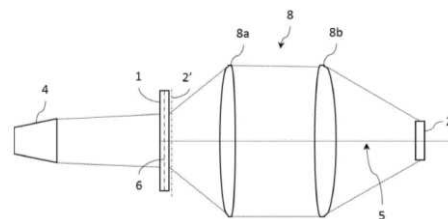
The invention relates to a method for characterising microorganisms present in a biological sample, the method comprising acquiring a live holographic digital image of the sample, generating a focused image by using a digital model for reconstructing the focused image and characterising the bacteria on the basis of the focused image. According to the invention, prior to the holographic image being acquired, a plurality of calibration objects are provided in the acquisition field of view, which objects have a previously characterised dimension and refractive index and a shape chosen so that the interference patterns of the objects can be calculated using an image forming model for incorporating optical aberrations of the acquisition device. Prior to the focused image being computer generated, the optical aberrations are qualified according to the interference patterns of the objects and the calculated interference patterns and the digital model for reconstructing the focused image incorporates the quantified optical aberrations.

PROCEDE ET SYSTEME DE CARACTERISATION DE MICROORGANISMES PAR MICROSCOPIE HOLOGRAPHIQUE NUMERIQUE

Un procédé de caractérisation de microorganismes présents dans un échantillon biologique comprenant l'acquisition d'une image numérique holographique en ligne de l'échantillon, la génération, d'une image focalisée par l'application d'un modèle numérique de reconstruction d'image focalisée et la caractérisation des bactéries à partir de l'image focalisée. Selon l'invention préalablement à l'acquisition de l'image holographique une pluralité d'objets de calibration sont fournis dans le champ de vision de l'acquisition, objets préalablement caractérisés en dimension et en indice de réfraction et une forme choisie à ce que les figures d'interférence des objets sont calculables en utilisant un modèle de formation d'image intégrant des aberrations optiques du dispositif d'acquisition. Préalablement à la génération informatique de l'image focalisée, une quantification des aberrations optiques est obtenue en fonction des figures d'interférence des objets et les figures d'interférence calculées et le modèle numérique de reconstruction de l'image focalisée intègre les aberrations optiques quantifiées.

CLAIM 1. A method of characterizing microorganisms present in a biological sample comprising: a. acquiring a holographic digital image by means of a defocused microscopic imaging acquisition device with a coherent or partially coherent light source, said device being configured to form on a matrix image sensor interference figures between the light source and the light diffracted by the sample; c. the computer generation of a focused image by the application, to the holographic digital image, of a digital model for reconstruction of a focused image;

d. characterizing the microorganisms as a function of the focused image characterized in that: a. 1. the acquisition of the holographic digital image comprises the provision, in the field of vision of the acquisition device corresponding to said image, of a plurality of calibration objects distinct from the microorganisms present in the biological sample, said objects - being previously characterized in terms of dimension and refractive index; - having dimensions chosen so as to produce interference figures on the matrix image sensor; - having a shape chosen so that said interference figures are calculable using a wavefront propagation model integrating optical aberrations of the acquisition device; b. prior to the acquisition computer-generated focused image, the method comprises: - identifying calibration objects in the holographic digital image; - calculating the interference patterns of the calibration objects by applying the wave front propagation model, and quantifying the optical aberrations of the acquisition device as a function of the interference patterns of the calibration objects in the holographic image and the calculated interference patterns; c. 1. the digital model for reconstructing the focused image integrates the quantized optical aberrations, in which the calculation of the aberrations is performed computationally by an inverse parametric approach using the inverse resolution problem according to the following relations in order to obtain an aberration correction function $p(x, y)$: where i is a refocused image, z_6 is a propagator parametric at the distance z_6 between the surface of interest (6) and the plane of the sensor (2), such as the Lorenz-Mie model, and $p(x, y)$ is the aberration correction function.



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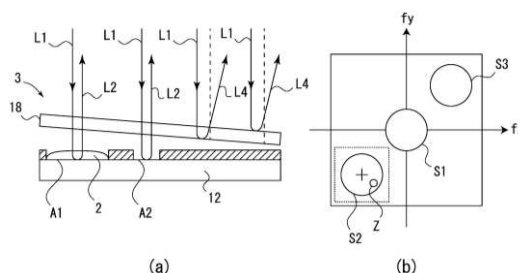
SHIBUYA

Priority Date: 09/06/2022

HOLOGRAPHY OBSERVATION APPARATUS AND SAMPLE HOLDING CONTAINER

TOPIC: To provide a holography observation device 1 capable of clearly observing a sample in a liquid. INVENTION: The holography observation device 1 irradiates illumination light L1 toward cells 2 (samples), images a hologram image formed by interference between object light L2 reflected by the cells 2 and reference light L3 as a reference, and observes the cells 2. The cell holding container (3) has a liquid housing section (12) for housing the cells (2) together with the culture liquid (liquid), and a transparent observation window (18) provided so that the lower surface thereof contacts the culture liquid housed in the liquid housing section (12) and the upper surface thereof is exposed to the atmosphere. The upper surface and the lower surface of the observation window (18) are inclined with respect to the optical axis of the illumination light (L1).

CLAIM 1. A holography observation device is provided with an illumination light irradiation means for irradiating a sample with illumination light; a light guide means for guiding object light generated by irradiating the sample with the illumination light and reference light as a reference light; and an imaging means for imaging a hologram image formed by interference between the object light guided by the light guide means and the reference light. The holography observation device is provided with a liquid storage section for storing the sample together with the liquid, and a transparent section wherein the lower surface is brought into contact with the liquid stored in the liquid storage section and the upper surface is exposed to the atmosphere. A holography observation device is provided with a sample holding container having an observation window. The holography observation device is characterized in that the light guiding means guides the illumination light toward the sample holding container provided below and irradiates the sample housed in the sample holding container, and the upper surface and the lower surface of the observation window in the sample holding container are inclined with respect to the optical axis of the illumination light.



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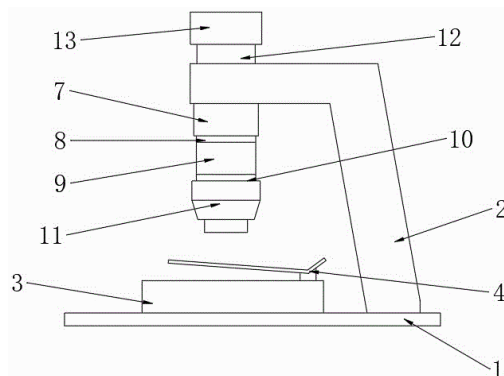
HEBEI BOXIA PHOTOELECTRIC INFORMATION TECHNOLOGY

Priority Date: 13/07/2023

MULTIMODE DIGITAL HOLOGRAPHIC MICROSCOPIC QUANTITATIVE PHASE MEASURING DEVICE

The utility model relates to the technical field of microscopic quantitative phase measurement, and discloses a multimode digital holographic microscopic quantitative phase measurement device, which comprises a base, wherein a stay post is fixedly welded at the middle position of the back side of the upper part of the base, a vertical plate is fixedly welded at the middle position of the upper surface of the base, two fixing clamps are movably arranged at the back positions of two sides of the vertical plate, an object-measuring placing plate is fixedly arranged above the vertical plate, an light outlet port is fixedly arranged at the middle position of the upper surface of the bottom plate, the light outlet port is positioned at the bottom of the object-measuring placing plate, and an object to be measured is fixed through the fixing clamps on the vertical plate after the object to be measured is placed on the object-measuring placing plate, and the multimode digital holographic microscopic quantitative phase measurement device provided by the utility model: the effect of preventing inaccurate measured values caused by the position deviation of the measured object during measurement is achieved.

CLAIM 1. The utility model provides a multimode digital holographic microscopic quantitative phase measurement device, includes base (1), its characterized in that: the upper portion of base (1) is leaned on rear side intermediate position fixed welding to have stay (2), the upper surface intermediate position fixed welding of base (1) has riser (3), riser (3) both sides are leaned on rear position movable mounting to have two fixation clamps (4), the top fixed mounting of riser (3) has survey object to place board (5), the intermediate position fixed mounting of base (1) upper surface has light-emitting port (6), light-emitting port (6) are located the bottom of survey object to place board (5).



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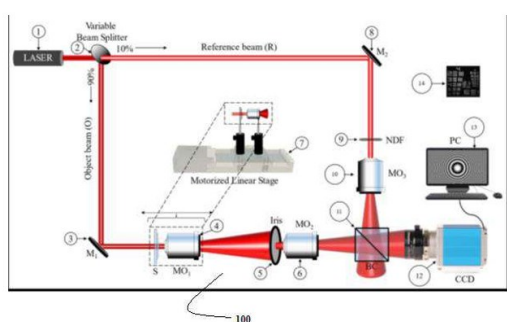
IN202331004043

Priority Date: 20/01/2023

INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES)

A HIGH MAGNIFICATION DIGITAL HOLOGRAPHIC NANOSCOPY (DHN) SYSTEM AND THE APPLICATION THEREOF

The present invention relates to a digital holographic nanoscopy (DHN) system (100) for the magnification and qualitative and quantitative optical analysis of biological cells, nanoparticles, and quantum dots. By aligning two Microscope Objective (MO1, MO2) lenses in the path of the object beam (O) and one MO (MO3) in the path of reference beam (R) of the DHN, the proposed system can detect a quantum dot with a minimum size of 6.8 nanometers with a magnification of 1,53,284X with very high axial and lateral resolution. A digital hologram of the specimen being captured through different combinations of MOs deployed at varied distances from one another. It can characterize the nearly transparent objects from micron to the nanometer scale via controlling its magnification to accommodate the requirements. The data are presented for human erythrocytes (red blood cells) with an average diameter and thickness of 7.17 μm and 2.3 μm , respectively, and various-sized (50 μm -6.8 μm) gold nanoparticles (AuNPs).



CLAIM 1. A digital holographic nanoscopy system (100) for magnification and qualitative and quantitative optical characterization of a specimen (S) through phase measurement, characterized in that said system (100) comprises: a pair of mirrors M_1 (3), M_2 (8), a variable beam splitter (2) to split an unexpanded light beam produced by a He- Ne laser source (1) into an object beam (O) and a reference beam (R), a first MO1 (4) and a second MO2 (6) microscope objective lenses in the path of the object beam (O), wherein the object beam (O) enters the specimen (S) after being reflected by the mirror M_1 (3) and collected by the MO1 (4) to generate a first divergent wavefront to project the same onto the MO2 (6) via an iris (5), a third MO3 (10) microscope objective lens to receive the reflected beam (R) after being reflected from the mirror M_2 (8) and passed through a neutral density filter (9) and to generate a second diverging wavefront, a cubic beam combiner (11) to combine the diverging wavefronts of the object (O) and reference (R) beams and to create an interference pattern, wherein a small angle being introduced between the object (O) and the reference beams (R) to record off-axis holograms from the interference pattern, a CCD camera (12) to capture the image of the hologram and a processor (13) to reconstruct the digital hologram for characterisation, wherein the system (100) being configured to: magnify the object having dimension in micro-meter to nano-meter range, and characterise the red blood cells, Nanoparticles as specimen (S) by providing high-resolution three-dimensional phase contrast magnified image of the specimen (S), wherein the magnification being the factor of the magnifying power of the microscopic objectives MO (4, 6, 10), and the inter distance between said objectives MO (4, 6, 10) and the beam combiner (11) and the CCD (12).

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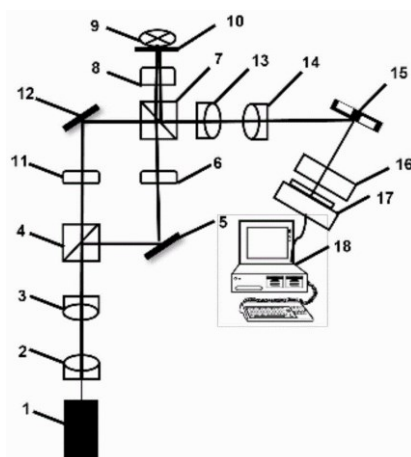
CN117389124

Priority Date: 12/10/2023

WESTLAKE UNIVERSITY

HIGH-SPEED FOUR-DIMENSIONAL COMPRESSION HOLOGRAPHIC MICROSCOPIC IMAGING DEVICE AND METHOD

The invention discloses a high-speed four-dimensional compression holographic microscopic imaging device and method, which specifically comprise the following steps: the device comprises a light source beam expanding module, an object light path forming module, a reference light path forming module and a holographic time domain compression coding decoding module; the light source beam is divided into two light paths under a spectroscop after being expanded, one light path enters a reference light path forming module and then serves as a reference light path, the other light path enters an object light path forming module and then carries object surface information as an object light path, object light interferes with the reference light path to form a hologram, an electric translation table moves perpendicular to the light path to generate a dynamic hologram, and then the dynamic hologram enters a holographic time domain compression encoding and decoding module to carry out time domain encoding, decoding, filtering and unwrapping algorithms on the dynamic hologram, so that high-speed four-dimensional compression holographic microscopic imaging is realized. With the present invention, a large amount of data necessary for reconstructing a high quality hologram can be efficiently managed and stored, capturing a high dynamic range object with a low data bandwidth.



CLAIM 1. The high-speed four-dimensional compression holographic microscopic imaging device is characterized by comprising a light source beam expanding module, an object light path forming module, a reference light path forming module and a holographic time domain compression encoding and decoding module; the light source beam expanding module comprises a helium-neon laser (1), a first plano-convex lens (2) and a second plano-convex lens (3); the light source is a coherent light source obtained by expanding the light source emitted by the helium-neon laser (1) through the first plano-convex lens (2) and the second plano-convex lens (3); the object light path forming module comprises a first beam splitter (4), a first reflector (5), a first attenuation sheet (6), a second beam splitter (7), a microscope objective (8) and an electric translation stage (10); the electric translation stage (10) is used for controlling the object (9) to move; the coherent light source is divided into two beams by a first beam splitter (4), one beam of light enters an object light path forming module to obtain object light carrying object surface information, and the object light is reflected by a second beam splitter (7) and then output; the reference light path forming module comprises a first beam splitter (4), a second attenuation sheet (11), a second reflecting mirror (12) and a second beam splitter (7); the coherent light source is divided into two beams by a first beam splitter (4), wherein the other beam Shu Guangxian is attenuated by a second attenuation sheet (11), reflected by a second reflector (12), and finally transmitted by a second beam splitter (7) to interfere with object light output by an object light path forming module to form a holographic surface; the holographic time domain compression coding decoding module comprises a third plano-convex lens (13), a fourth plano-convex lens (14), a digital micro-mirror device (15), a telecentric lens (16), a camera (17) and a computer (18); the holographic surface is expanded by a third plano-convex lens (13) and a fourth plano-convex lens (14) to obtain an expanded holographic surface; then encoded by a digital micromirror device (15), and received by a camera (17) through a telecentric lens (16); the computer (18) is used for decoding and recovering the holographic video stream, three-dimensional information of the object surface is obtained through filtering and unwrapping algorithm on each hologram, and space-time information of the object is obtained according to the corresponding moment of the video stream, so that high-speed four-dimensional compression holographic microscopic imaging is realized.

Click on the title to return to table of contents

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

N9911

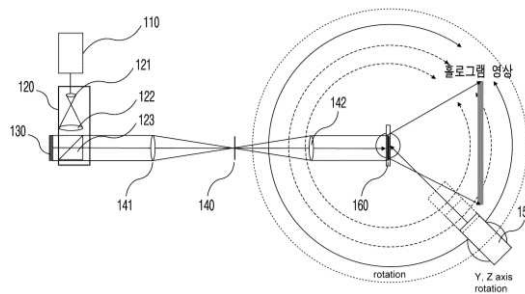
KR20240008116

Priority Date: 11/07/2022

KOREA PHOTONICS TECHNOLOGY INSTITUTE

APPARATUS AND METHOD FOR EVALUATING HOLOGRAPHIC IMAGE USING COMPOSITE APERTURE COMPLEX AMPLITUDE MEASUREMENT TECHNOLOGY

Disclosed are an apparatus and a method for evaluating a hologram image using a composite aperture complex amplitude measuring technique. According to an embodiment of the present invention, provided is an apparatus for evaluating a hologram image comprising: a light source for providing a laser light of a preset wavelength band; an optical system for converting the laser light into a surface light source form and providing the same; a hologram generator for diffracting the laser light of the surface light source form converted by the optical system into a form corresponding to the holographic data to generate a hologram image signal and providing the same to a preset first focal plane; a lens for providing the hologram image signal outputted from the hologram generator to a second focal plane; a phase measurement sensor for sensing a phase and an amplitude of the hologram image signal reproduced at a preset measurement position around the second focal plane; and an image analyser for restoring the hologram image from a sensing value sensed by the phase measurement sensor and evaluating an evaluation item including a resolution, uniformity, a viewing angle, or an image plane distortion state of the restored hologram image.



CLAIM 1. A holographic image evaluation device comprising: a light source configured to provide laser light of a predetermined wavelength band; an optical system configured to convert the laser light into surface light; a hologram generator configured to generate holographic data from 3D information or a holographic signal and diffract the surface light-source light into a form corresponding to the holographic data to generate a holographic image signal and provide the holographic image signal to a predetermined first focal plane; a spatial filter configured to remove optical noise components from the holographic image signal and provide the holographic image signal to a predetermined second focal plane; a first lens disposed on the first focal plane in a front direction of the spatial filter and configured to focus an optical path of the holographic image signal focused by the spatial filter; a second lens disposed on a rear surface of the spatial filter and configured to diffuse an optical path of the holographic image signal focused by the spatial filter into the second focal plane; a phase measurement sensor configured to sense a phase and an amplitude of the holographic image signal reproduced at a predetermined measurement position around the second focal plane; and an image analyser configured to restore the holographic image from a sensing value sensed by the phase measurement sensor and evaluate an evaluation item including a resolution, uniformity, a viewing angle, or an image surface distortion state of the restored holographic image, wherein the optical system comprises: an expander configured to adjust a beam width of the laser light irradiated from the light source; a collimator configured to collimate light incident through the expander; and a first beam expander configured to first beam splitter, wherein the first beam expander outputs the first beam splitter.

N9912

KR20240006852

Priority Date: 07/07/2022

**KWANGWOON UNIVERSITY INDUSTRY ACADEMIC
COLLABORATION FOUNDATION**

COMPRESSION CODING METHOD FOR COMPLEX HOLOGRAM OF AMPLITUDE AND PHASE TYPE

The present invention relates to a compression coding method for amplitude and phase type complex holograms which reconstructs and codes full complex holograms of amplitude and phase into one piece of information using polar coordinate complex planes, divides the polar coordinate complex planes into a plurality of unit regions, and converts hologram pixels of amplitude and phase into exponents of an integer form. The compression coding method comprises the steps of: (b) generating polar coordinate complex planar planes divided into unit regions, and giving an exponent to each unit region of the complex planar planes; (c) considering the complex holograms as amplitude and phase complex vectors, mapping the complex holograms to the complex planar planes so that the amplitudes and phases correspond to the amplitudes and angles, respectively, and assigning the exponent given to the unit region of the mapped complex planar faces as the complex exponent of the complex holograms; and (f) encoding the complex holograms assigned as the complex exponent, and coding the full complex holograms of amplitude and phase using the polar coordinate complex planar planes, reconstructs and codes the full complex holograms of amplitude and phase into one piece of exponent information, thus preserving the relationship between the amplitude and phase holograms well and efficiently compressing the holograms.

CLAIM 1. A method for compression coding an amplitude and phase type complex hologram, comprising: (b) generating a polar coordinate complex plane divided into unit regions, wherein an exponent is provided to each unit region of the complex plane; (c) mapping the complex hologram into the complex plane so that the amplitude and phase thereof correspond to magnitudes and angles by considering the complex hologram as an amplitude and phase complex vector, and allocating the exponent provided to the unit region of the mapped complex vector plane as a complex exponent of the complex hologram; and (f) encoding the complex hologram allocated as the complex exponent.

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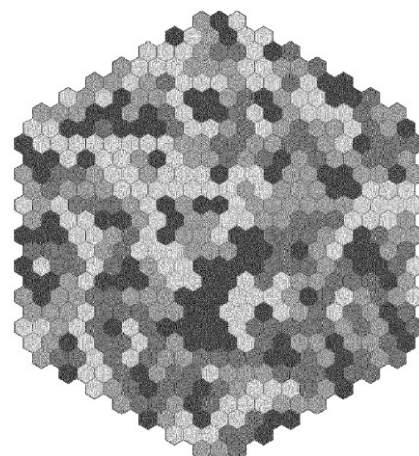
Priority Date: 14/04/2023

SINGULAR CONTROL ENERGY

HOLOGRAPHIC SYSTEM AND METHOD OF CAMOUFLAGE, CONCEALMENT AND DEFENSE

A holographic cloaking or concealment system and method having a meshed structure formed by one or more holographic optical elements configurable according to at least one of the following parameters: (a) the wavelength (λ) or color to be diffracted; (b) the bandwidth ($\Delta\lambda$) or amount of that color to be diffracted; (c) the diffraction efficiency (η) or percentage to be diffracted with respect to the incident light; and (d) the diffraction direction (α); in such a way that said holographic optical elements form one or more diffractive reflection blocks, whose optical properties are selected according to the optical effect required by a predetermined camouflage or concealment pattern in the visible spectrum and/or in the near infrared and/or in the ultraviolet.

CLAIM 1. A holographic camouflage or concealment system with a meshed structure formed by: one or more holographic optical elements configurable according to at least one of the following parameters: (a) the wavelength (λ) or color to be diffracted; (b) the bandwidth ($\Delta\lambda$) or amount of that color to be diffracted; (c) the diffraction efficiency (η) or percentage to be diffracted with respect to incident light; (d) the direction of diffraction (α); and (e) presence or absence of optical magnification (M); in such a way that said holographic optical elements form one or more diffractive reflection blocks, whose optical properties are selected according to the optical effect required by a predetermined camouflage or concealment pattern in the visible spectrum and/or in the near infrared and/or in the ultraviolet.



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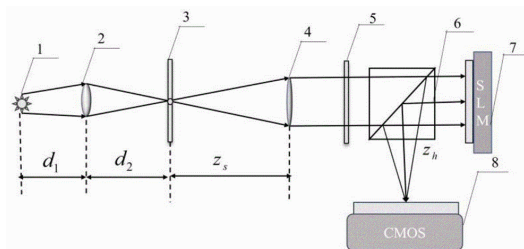
CN117434811

Priority Date: 05/11/2023

HARBIN UNIVERSITY OF SCIENCE & TECHNOLOGY

INTERFERENCE-FREE CODED APERTURE CORRELATION HOLOGRAPHY BASED ON SCATTERING POINT SPREAD FUNCTION

The invention provides an interference-free coded aperture correlation holography based on a scattering point spread function, and belongs to the field of computational optical imaging. Based on the randomness of the code phase mask, it is considered as a thin scattering medium, and a speckle correlation model of scatter imaging is introduced. The experimental cost and tedious operation caused by using pinholes are avoided, the light path structure is simplified, the scattering point spread function is solved in a deconvolution mode, and the recording process can be completed only by using the reference object and all objects on the same plane.



CLAIM 1. The invention provides an interference-free coded aperture related holography based on a scattering point spread function, which is characterized in that the interference-free coded aperture related holography system comprises an LED light source, a resolution plate, a coded phase mask and an image sensor; incoherent light emitted by an LED light source irradiates on a resolution plate through critical illumination, then light waves are modulated through a code phase mask, and finally an intensity diagram is recorded by an image sensor; the method comprises the following four steps: s1, recording a reference object intensity diagram and all object intensity diagrams; s2, recording a reference object speckle pattern and all object speckle patterns; s3, utilizing deconvolution to obtain a scattering point spread function; s4, reconstructing and recovering the unknown object information.

N9939

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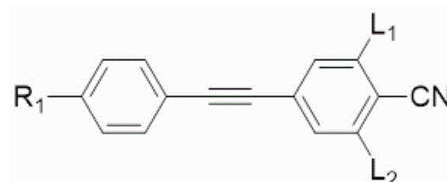
Priority Date: 20/12/2023

JOURNEY TECHNOLOGY

HOLOGRAPHIC POLYMER DISPERSED LIQUID CRYSTAL MATERIAL AND APPLICATION THEREOF

The invention relates to a holographic polymer dispersed liquid crystal material and application thereof, comprising the following steps: nematic liquid crystal composition, acrylic polymerizable monomer, photoinitiator and co-initiator; the nematic liquid crystal composition comprises at least one of the compounds shown in the formula I, at least one of the compounds shown in the formula II and at least one of the compounds shown in the formula III; the acrylic polymerizable monomer comprises at least one of compounds shown in a formula IV and at least one of trifunctional polymerizable monomers. The polymer dispersed liquid crystal material provided by the invention has excellent performance, so that the prepared volume holographic grating has high diffraction efficiency and low haze, can be switched between a holographic state and a transparent state, meets the application requirements of the volume holographic optical waveguide, and can better control the phase separation rate of liquid crystal and polymer during green laser irradiation, so that the prepared holographic grating has the diffraction efficiency of more than 70% and the haze of less than 1.5%.

CLAIM 1. A holographic polymer dispersed liquid crystal material, comprising: nematic liquid crystal composition, acrylic polymerizable monomer, photoinitiator and co-initiator; the nematic liquid crystal composition comprises at least one of compounds shown in a formula I, at least one of compounds shown in a formula II and at least one of compounds shown in a formula III: a compound of formula i: ; a compound of formula ii: ; a compound of formula iii: ; wherein R is 1 ,R 2 ,R 3 ,R 4 Each independently represents ,/> ,/> ,/> C, linear or branched 1 ~C 7 Alkyl, C 1 ~C 7 Alkoxy, wherein at least one hydrogen atom may be substituted with a fluorine atom, the at least one hydrogen atom may be substituted with a fluorine atom means that the hydrogen atom is not substituted with a fluorine atom or that the at least one hydrogen atom is substituted with a fluorine atom; L 1 ~L 2 each independently represents a hydrogen atom or a fluorine atom; l (L) 3 Represents a fluorine atom or a chlorine atom; l (L) 4 ~L 7 Each independently represents a fluorine atom or a hydrogen atom; m represents 0 or 1; representation-> Or-> .



wherein R is 1 ,R 2 ,R 3 ,R 4 Each independently represents ,/> ,/> ,/> C, linear or branched 1 ~C 7 Alkyl, C 1 ~C 7 Alkoxy, wherein at least one hydrogen atom may be substituted with a fluorine atom, the at least one hydrogen atom may be substituted with a fluorine atom means that the hydrogen atom is not substituted with a fluorine atom or that the at least one hydrogen atom is substituted with a fluorine atom; L 1 ~L 2 each independently represents a hydrogen atom or a fluorine atom; l (L) 3 Represents a fluorine atom or a chlorine atom; l (L) 4 ~L 7 Each independently represents a fluorine atom or a hydrogen atom; m represents 0 or 1; representation-> Or-> .

N9940

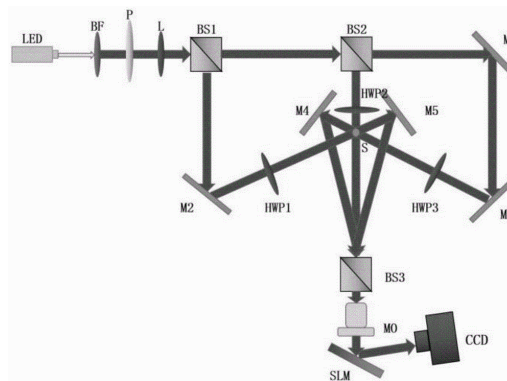
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Priority Date: 08/09/2023

HEFEI UNIVERSITY OF TECHNOLOGY

THREE-DIMENSIONAL RECONSTRUCTION SYSTEM AND METHOD

The invention relates to the technical field of three-dimensional modeling, in particular to a system and a method for three-dimensional reconstruction. The invention adopts an incoherent multiplexing frequency-selecting holographic method and combines GCN deep learning to realize the reconstruction of a submicron three-dimensional model; three-dimensional reconstruction of the submicron object is rapidly realized through three visual angles, model precision is optimized, and refractive index distribution is obtained. The three-dimensional reconstruction system provided by the invention can quickly and automatically generate three-dimensional modeling for a tiny object by only N target holograms, improves the model precision by combining with the phase, improves the speed of constructing an organ model of medical CT, and improves the three-dimensional mapping efficiency of the surrounding environment in automatic driving.



CLAIM 1. A method of three-dimensional reconstruction comprising the steps of: s1, constructing a three-dimensional reconstruction system, wherein the three-dimensional reconstruction system is provided with a plurality of light paths passing through sample positions, and the propagation light on each light path is the light splitting of the light emitted by the light source; after each beam of light passes through a sample on the sample position, the beam of light carrying sample information is combined, and the combined beam of light is modulated and demodulated by a light modulation module to obtain thickness information of each position of the sample; s2, setting a mask on an incident surface of a light modulation and demodulation module of the three-dimensional reconstruction system; s3, starting a light source, and acquiring a multiplexing hologram of a sample at a sample position through a three-dimensional reconstruction system to be recorded as an in-situ hologram; after $\pi/2$ phase shift occurs before the light beam on one light path enters the sample position, the multiplexing hologram of the sample position sample is obtained through a three-dimensional reconstruction system and is recorded as a phase shift hologram; $\pi/2$ phase shift is applied to each optical path respectively, and N phase shift holograms are obtained; n is the number of light paths in the three-dimensional reconstruction system; s4, after replacing the mask, executing the step S3 again; obtaining two groups of total $2N+2$ multiplexing holograms corresponding to the samples; performing frequency spectrum separation on $2N+2$ Zhang Fuyong holograms to obtain N target holograms, wherein the N target holograms correspond to the light path visual angles one by one; s5, constructing a three-dimensional reconstruction model and a learning sample; the learning samples are thickness data of N target holograms corresponding to the samples and a sample 3D model; the input of the three-dimensional reconstruction model is N target holograms corresponding to the samples, and the 3D model is output as the samples; performing machine learning on the learning sample by the three-dimensional reconstruction model until convergence; s6, when the three-dimensional reconstruction is carried out on the target sample, the target sample is firstly placed at the sample position of the three-dimensional reconstruction system, then the steps S2-S4 are executed, N target holograms of the target sample are obtained, then the N target holograms of the target sample are input into the three-dimensional reconstruction model, and a 3D model output by the three-dimensional reconstruction model is obtained.

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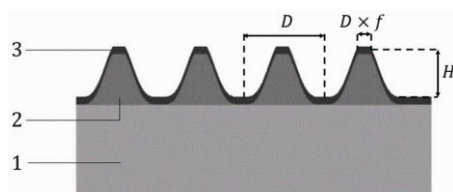
CN117406328

Priority Date: 30/11/2023

SHANGHAI INSTITUTE OF OPTICS & FINE MECHANICS – CHINESE ACADEMY OF SCIENCES

HOLOGRAPHIC DIFFRACTION GRATING OF MIDDLE-LONG WAVE INFRARED BAND AND MANUFACTURING METHOD THEREOF

The volcanic diffraction grating comprises a volcanic grating structure and an external reflecting layer on a grating substrate, wherein the volcanic grating structure is described by a specific structural function and is a novel holographic diffraction grating structure. The structure can provide a diffraction grating with wide spectrum and high efficiency, has universality in the middle-long wave infrared band, and has important research and application values in the fields of middle-long wave infrared pulse compression, spectrum beam combination, spectrograph and the like.



CLAIM 1. The holographic diffraction grating of the middle-long wave infrared band is characterized by sequentially comprising a grating substrate (1), a grating structure (2) and an external reflecting layer (3) from bottom to top; the grating structure is volcanic and satisfies the following structural function $h(x)=\max\{0,H\times[\cos 2[\pi xD]/\sin 2[\pi(1-f)/2]]^\sigma\}$ wherein x is the transverse distance, H is the groove depth of the grating structure, D is the grating linear density, f is the grating occupation ratio, σ is the grating shape factor, H is more than 400 nanometers, D is less than or equal to 1000 lines/millimeter, $0 < f < 1$, and σ is any positive real number.

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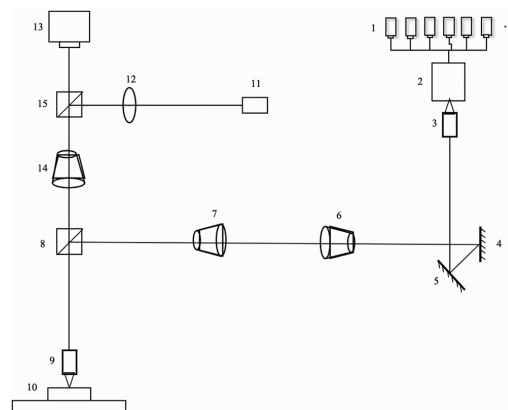
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Priority Date: 07/12/2023

ZHEJIANG UNIVERSITY HANGZHOU GLOBAL SCIENTIFIC & TECHNOLOGICAL INNOVATION CENTER

PREPARATION SYSTEM AND PREPARATION METHOD OF EXTREME ULTRAVIOLET OBJECTIVE LENS-MOUNTED HOLOGRAM

The invention discloses a preparation system and a preparation method of an extreme ultraviolet objective lens adjustment hologram. The preparation system of the extreme ultraviolet objective lens-mounted hologram can realize high flux through the design of the optical fiber array structure, and the flux is multiple times of that of the conventional inscription because a plurality of optical fibers are arranged in the optical fiber array at the same time. The invention can realize high flux inscription by the design of the optical fiber array, improves inscription efficiency, can produce large-area calculation hologram (CGH) with sub-wavelength nano structure, further reduces the characteristic line width of the calculation hologram, can reach nm level, adopts the large-area calculation hologram with sub-wavelength nano structure, and solves the high precision detection requirement of the aspheric surface shape in the existing extreme ultraviolet lithography objective system.



CLAIM 1. The preparation system of the extreme ultraviolet objective lens-mounted hologram comprises a writing subsystem and an imaging illumination subsystem, and is characterized in that the writing subsystem comprises a laser and an optical fiber array, the optical fiber array comprises a plurality of optical fibers arranged in an array, the lasers comprise a plurality of lasers, each laser corresponds to the optical fibers in the optical fiber array one by one, the intensity of the emergent laser switch of the optical fibers which needs light emergent at present is realized by controlling the intensity of the switch of the laser, the writing subsystem further comprises a first objective lens, a field lens, a first dichroic mirror, a second objective lens and a workbench assembly which are arranged from upstream to downstream along a light path, wherein the workbench assembly comprises a workbench used for placing a substrate to be processed, capable of moving in three dimension directions and a deflection table capable of being randomly adjusted by 0-5 degrees in XY directions.

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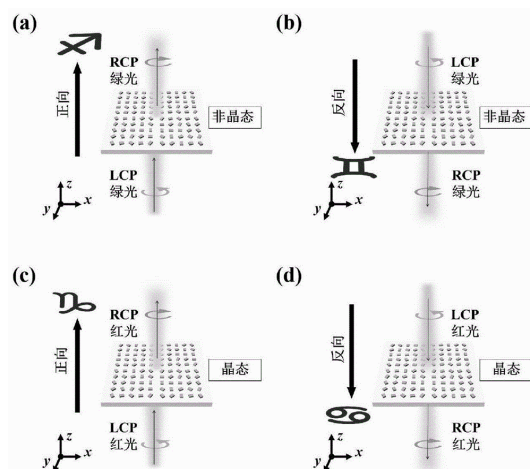
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Priority Date: 11/10/2023

SICHUAN UNIVERSITY

ASYMMETRIC COLOR HOLOGRAPHIC ENCRYPTION METHOD BASED ON RECONFIGURABLE JANUS SUPER SURFACE

The invention belongs to the technical field of optics, and discloses an asymmetric color holographic encryption method based on a reconfigurable Janus super surface, wherein the super surface consists of a quartz substrate and a series of phase change materials Sb etched on the substrate. The nano-pillar array is formed. According to the asymmetric color holographic encryption method based on the reconfigurable Janus super surface, provided by the invention, a plurality of holographic images with different patterns can be respectively stored in independent far-field encryption channels at two sides of the super surface. When the phase change material Sb is in an amorphous state, the circularly polarized green light is respectively incident from the positive direction and the reverse direction of the super surface, and two green holographic images with different patterns can be respectively generated in the far field; when the phase change material Sb is in a crystalline state, left circularly polarized red light is respectively incident from the forward direction and the reverse direction of the super surface, and two red holographic images with different patterns are respectively generated in a far field. The invention has the advantages of miniaturization, reconfigurability, non-volatile property and the like, and is expected to be applied to the next generation optical encryption element.



N9958

CN117289582

Priority Date: 16/10/2023

NANJING UNIVERSITY

CASCADE LIQUID CRYSTAL DEVICE AND HOLOGRAPHIC ENCRYPTION METHOD BASED ON CASCADE LIQUID CRYSTAL DEVICE

A cascade liquid crystal device and a holographic encryption method based on the same belong to the field of optical encryption, and the holographic encryption method based on the same comprises the following steps: step one, preparing two liquid crystal boxes without a liquid crystal layer, wherein the two liquid crystal boxes without the liquid crystal layer are a first liquid crystal box and a second liquid crystal box respectively; step two, respectively carrying out specific patterning orientation on the orientation layers of the first liquid crystal box and the second liquid crystal box prepared in the step one by adopting a multi-step overlapped photo-control orientation technology; step three, filling liquid crystal materials into two liquid crystal boxes without the liquid crystal layer; and fourthly, constructing an optical path device, generating a circularly polarized light incident liquid crystal box by using a polaroid and a 1/4 wave plate, respectively acquiring holographic images formed by the first liquid crystal box and the second liquid crystal box which are independently positioned in an optical path and encrypted holographic images formed in a cascading state of the holographic images, and collecting the encrypted holographic images through a camera shooting screen to realize the encrypted display of holographic information.

CLAIM 1. A holographic encryption method based on a cascade liquid crystal device is characterized by comprising the following steps: step one, preparing two liquid crystal boxes without a liquid crystal layer, wherein the two liquid crystal boxes without the liquid crystal layer are a first liquid crystal box and a second liquid crystal box respectively; step two, respectively carrying out specific patterning orientation on the orientation layers of the first liquid crystal box and the second liquid crystal box prepared in the step one by adopting a multi-step overlapped photo-alignment technology: the alignment layer of the first liquid crystal cell is provided with a liquid crystal director distribution α_1 The alignment layer of the second liquid crystal cell has a liquid crystal director distribution α_2 Control pattern α of (a) 1 And α_2 Calculating by adopting a nested holographic iterative algorithm; step three, filling liquid crystal materials into two liquid crystal boxes without the liquid crystal layer; and fourthly, constructing an optical path device, generating a circularly polarized light incident liquid crystal box by using a polaroid and a 1/4 wave plate, respectively acquiring holographic images formed by the first liquid crystal box and the second liquid crystal box which are independently positioned in an optical path and encrypted holographic images formed in a cascading state of the holographic images, and collecting the encrypted holographic images through a camera shooting screen to realize the encrypted display of holographic information.



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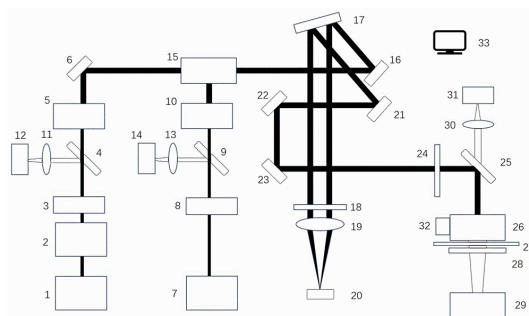
CN117289563

Priority Date: 27/11/2023

ZHEJIANG UNIVERSITY HANGZHOU GLOBAL SCIENTIFIC & TECHNOLOGICAL INNOVATION CENTER

AMPLITUDE TYPE CALCULATION HOLOGRAM REALIZATION DEVICE AND METHOD

The invention discloses an amplitude type calculation hologram realization device and method. The invention uses the super-resolution laser direct writing of edge light inhibition to realize the large-area amplitude type calculation hologram for the adjustment of the extreme ultraviolet lithography objective lens, overcomes the defect of the writing precision of the laser direct writing technology, has higher efficiency compared with the electron beam direct writing, and has the advantages of simple operation, low cost and the like. The compensation module is used for carrying out optical power and phase modulation compensation in real time in the writing process, so that the stability and the writing precision of the writing system in the writing of large-area amplitude type calculated holograms for a long time are ensured.

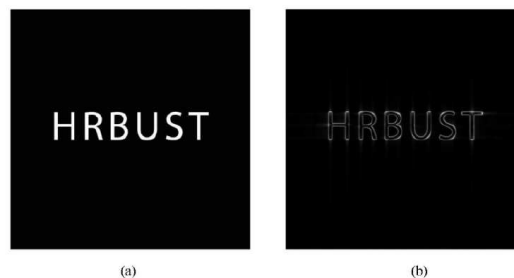


CLAIM 1. An amplitude type calculation hologram realizing device is used for adjusting an extreme ultraviolet lithography objective lens and comprises a photoresist excitation light path for initiating photoresist to generate photopolymerization reaction; a photoresist suppressing light path for suppressing a photopolymerization reaction of the photoresist; and a beam combining optical path of the photoresist excitation optical path and the photoresist suppression optical path, characterized in that, the photoresist excitation light path comprises an excitation light laser, an optical parametric oscillator, a first electro-optical modulator, a first light spot beam splitter and a first beam expander which are sequentially arranged along the light path; one light path of the first light spot beam splitter after beam splitting goes to the first beam expander, the other light path is also provided with a first focusing lens and a first photoelectric detector, the photoresist suppression light path comprises a suppression light laser, a second electro-optical modulator, a second light spot beam splitter and a second beam expander which are sequentially arranged along the light path; one light path of the second light spot beam splitter after beam splitting goes to a second beam expander, the other light path is also provided with a second focusing lens and a second photoelectric detector, the amplitude-type calculation hologram realizing device also comprises a control system, the first photoelectric detector detects the power of the excitation light and compares the power with a set standard value range, if the power exceeds the standard value range, the control system controls the first photoelectric modulator to adjust the power to the standard value range, the second photoelectric detector detects the power of the inhibition light and compares the power with a set standard value range, and if the power exceeds the standard value range, the control system controls the second photoelectric modulator to adjust the power to the standard value range.

EDGE DETECTION METHOD BASED ON INTERFERENCE-FREE CODED APERTURE CORRELATION HOLOGRAPHY

The invention discloses an edge detection method based on interference-free coded aperture correlation holography, and relates to the field of computational optical imaging. Converting the cross-correlation calculation of the point spread function and the reconstruction of the object hologram image into a frequency domain through a nonlinear reconstruction NLR (Non-Linear Reconstruction) algorithm, and respectively taking different powers of the converted point spread function spectrum amplitude and the object hologram spectrum amplitude; and a Laguerre-Gaussian amplitude type overlapped vortex phase filter is introduced, and after the Laguerre-Gaussian amplitude type overlapped vortex phase filter is multiplied by the changed frequency spectrum amplitude of the point spread function and the frequency spectrum of the object hologram, the Laguerre-Gaussian type overlapped vortex phase filter is subjected to inverse Fourier transform to realize edge image reconstruction. The invention introduces Laguerre-Gaussian amplitude-superimposed vortex phase filter in the nonlinear reconstruction NLR algorithm, realizes the edge detection of the non-interference coded aperture-related holographic system, and can obtain the edge enhancement image of isotropy, anisotropy and second-order differentiation by adjusting the frequency spectrum amplitude power, the filter topology factor and the initial phase. Compared with the edge detection method of the traditional incoherent holographic system, the method can realize the anisotropy with controllable direction and the second-order differentiation of the image, and has the advantage of dynamically adjustable parameters.

CLAIM 1. An edge detection method based on non-interference coded aperture related holography is characterized in that the method adopts a device of specific non-interference coded aperture related holography, and the device comprises a monochromatic LED, a first lens, an object, a second lens, a polaroid, a phase space light modulator PSLM (Phase spatial light modulator) and an image sensor, wherein: the monochromatic incoherent light emitted by the monochromatic LED is focused on the object through the first lens, and the object is approximately regarded as an object point on the plane of the object by using a 25 μm pinhole; the distance between the object and the second lens is equal to the focal length of the second lens, and the light beam is collimated after passing through the second lens; the collimated light beam enters the PSLM after passing through the polaroid, the polarization direction of the polaroid is aligned with the modulation polarization axis of the PSLM, and the PSLM is loaded with a coding phase mask CPM (Coded Phase Mask); the light beam reflected by the PSLM enters the image sensor, and the image recorded by the image sensor at the moment is used as a point spread function; only changing a pinhole at the object into a target image, wherein the light beam propagation process is identical to that when the object uses the pinhole, and the image recorded on the image sensor is used as an object hologram; the method comprises the following three steps: s1, recording a point spread function and an object hologram; s2, introducing a Laguerre-Gaussian amplitude-superimposed vortex phase filter into a nonlinear reconstruction NLR (Non-Linear Reconstruction) algorithm to carry out filtering treatment on the recorded point spread function and the object hologram; s3, parameters are adjusted, and isotropic, anisotropic and second order differential edge image reconstruction is achieved; the pixel point coordinates of any one object point on the object plane defining the vertical beam propagation direction are (x_s, y_s) The pixel point coordinates on the CPM plane perpendicular to the beam propagation direction are (x_1, y_1) The pixel point coordinates on the image sensor plane perpendicular to the beam propagation direction are (x_2, y_2) ; S1: recording the point spread function and the object hologram, sequentially placing a pinhole and a target image on the object plane of the non-interference coded aperture related holographic system, wherein the pinhole position and the target image position are positioned on the same plane, and respectively recording the intensity distribution I of the pinhole on the image sensor PSF And intensity distribution I of target image OBJ ; S2: and filtering the recorded point spread function spectrum and the recorded object hologram spectrum by introducing the Laguerre-Gaussian amplitude type overlapped vortex phase filter into the NLR algorithm. In the NLR algorithm, the object hologram spectrum and the point spread function spectrum need to be changed, the amplitude of the object hologram spectrum changes to the power of m , the phase is unchanged, the amplitude of the point spread function spectrum changes to the power of n , and the phase is negative; multiplying the Laguerre-Gaussian amplitude type superimposed vortex phase filter, the changed hologram spectrum and the changed point spread function spectrum, and then reconstructing the image edge by inverse Fourier transform; s3: and selecting the optimal image edge reconstruction point spread function spectrum amplitude power m and object hologram spectrum amplitude power n , and simultaneously adjusting a filter topology factor l , a weight factor c and an initial phase β to obtain the isotropy, the anisotropy and the second order differential edge image of the interference-free coded aperture related holographic system.



(a)

(b)

N9962

CN117270673

Priority Date: 13/06/2022

SUNNY OPTICAL ZHEJIANG RESEARCH INSTITUTE

METHOD FOR DETERMINING INITIAL PHASE COEFFICIENT OF SPHERICAL WAVE, HOLOGRAM GENERATING METHOD AND DEVICE

The application provides a method for determining a spherical wave initial phase coefficient, a hologram generating method and a device. The determining method comprises the following steps: setting a cyclic calculation rule of an initial phase coefficient of the spherical wave; performing cyclic calculation on the initial phase coefficient of the spherical wave according to a cyclic calculation rule; the calculation process comprises the following steps: forming a hologram of the sample image based on the initial phase coefficient in the current calculation process; acquiring a reproduced image of the hologram and a spectrum of the reproduced image; determining a dominant peak position in the spectrum; and after the cyclic calculation is terminated, taking the initial phase coefficient in the corresponding calculation process when the distance between the main peak position and the central frequency spectrum is maximum as the initial phase coefficient of the spherical wave. The initial phase coefficient of the spherical wave determined by the method considers the speckle size and the periodic characteristic of the reproduced image, so that when the hologram is calculated by adding the initial phase of the spherical wave adopting the initial phase coefficient to the input image, the speckle and high-frequency artifact noise phenomenon in the reproduced image can be restrained, and the appearance of the reproduced image is improved.

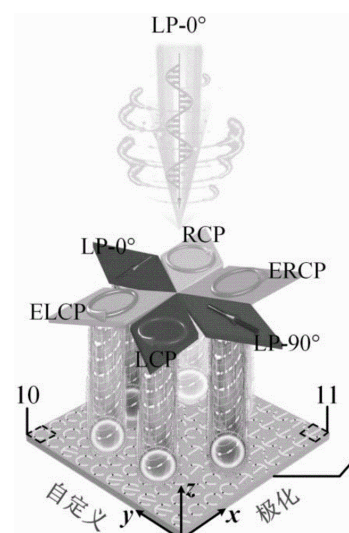


CLAIM 1. A method for determining a spherical wave initial phase coefficient, comprising: setting a cyclic calculation rule of an initial phase coefficient of the spherical wave; performing cyclic calculation on the initial phase coefficient of the spherical wave according to the set cyclic calculation rule; wherein, each calculation process comprises the following steps: forming a hologram of the sample image based on the initial phase coefficient in the current calculation process; acquiring a reproduced image of the hologram and a spectrum of the reproduced image; determining a dominant peak position in the spectrum; and after the cyclic calculation is terminated, taking the initial phase coefficient in the calculation process corresponding to the maximum distance between the main peak position and the central frequency spectrum as the initial phase coefficient of the spherical wave.

HOLOGRAPHIC IMAGING DEVICE AND METHOD FOR ORTHOGONAL CIRCULAR POLARIZATION AMPLITUDE COMBINATION REGULATION AND CONTROL

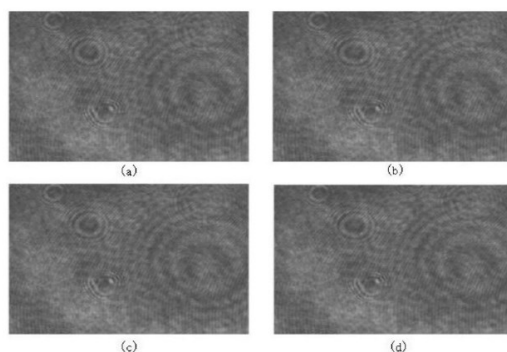
The invention discloses a holographic imaging device and a holographic imaging method for orthogonal circular polarization amplitude-combining regulation and control, which relate to the technical field of microwave frequency band electromagnetic wave regulation and control, and comprise a plurality of two circular polarization amplitude-phase regulation and control units with different structures, wherein the two circular polarization amplitude-phase regulation and control units sequentially comprise an annular or umbrella-shaped structure, a medium substrate and a metal backboard from top to bottom; the arc radius, the arc radius and the half-length radius of the left arm and the right arm of the annular or umbrella-shaped structure are the same, and the left resistor and the right resistor with different resistance values are symmetrically embedded in the left arm and the right arm of the annular or umbrella-shaped structure relative to the central axis. The parameters of the left arm and the right arm of the annular or umbrella-shaped structure are respectively regulated and controlled by the two circular polarization amplitude-phase regulating units to realize simultaneous and independent modulation of amplitude-phase information of left-handed and right-handed incident polarized waves, and six holograms with different polarizations are generated by combining vector decomposition and superposition according to Stokes formulas, so that the integration degree and the utilization rate of the holograms in different polarization channels are improved, and the high fidelity and the definition of each image are ensured.

CLAIM 1. A broadband vector holographic imaging device for cross circular polarization amplitude-combining modulation, comprising: the first circular polarization amplitude-phase regulating units (10) and the second circular polarization amplitude-phase regulating units (11) are arranged in a crossed mode; the first circularly polarized amplitude and phase regulating unit (10) sequentially comprises an annular structure (101), a first dielectric substrate (102) and a first metal backboard (103) from top to bottom; the annular structure (101) is also provided with a first arm (1011) and a second arm (1012), the arc radii of the first arm (1011) and the second arm (1012) are the same, and the arc radii of the first arm (1011) and the second arm (1012) are symmetrical about a central axis distributed along the y axis on the annular structure (101), and the first arm (1011) and the second arm (1012) are symmetrically embedded with a left resistor and a right resistor with different resistance values; the second circular polarization amplitude-phase regulating and controlling unit (11) sequentially comprises an umbrella-shaped structure (111), a second dielectric substrate (112) and a second metal backboard (113) from top to bottom; a third arm (1111) and a fourth arm (1112) are further arranged on the umbrella-shaped structure (111), the arc radii of the third arm (1111) and the fourth arm (1112) are the same, and the arc radii of the third arm (1111) and the fourth arm (1112) and the half length of the middle shaft structure (1113) are the same; the third arm (1111) and the fourth arm (1112) are symmetrical about a central axis distributed along a y axis on the umbrella-shaped structure (111), and left resistors and right resistors with different resistance values are symmetrically embedded in the third arm (1111) and the fourth arm (1112); the method comprises the steps of obtaining the required amplitude and phase distribution corresponding to left-hand and right-hand polarized incident waves in a required polarization state according to polarization decomposition and synthesis; the regulation and control of the amplitude and the phase are realized by changing the resistance values of the left resistor and the right resistor on the two arms of the annular structure and the umbrella-shaped structure, the arc radii of the two arms and the rotation angle, so that the amplitude and the phase are consistent with the required amplitude and phase distribution; when the left-hand circularly polarized wave and the right-hand circularly polarized wave are incident, holograms are realized in a plurality of polarized channels according to the regulated amplitude and phase distribution.



SYNTHETIC APERTURE IMAGING METHOD BASED ON SIFT ALGORITHM

The invention discloses a synthetic aperture imaging method based on a SIFT algorithm, which relates to the technical field of synthetic aperture digital holographic image reconstruction, and provides a method for utilizing the synthetic aperture imaging based on the SIFT algorithm while guaranteeing the resolution, so that the space bandwidth product of a digital holographic imaging system is effectively improved, the imaging view field is enlarged.



CLAIM 1. The synthetic aperture imaging method based on the SIFT algorithm is characterized by comprising the following steps of: step 1, imaging a measured object by using a transmission type off-axis holographic optical path system based on a Mach-Zehnder interferometer principle, acquiring holograms by using a CCD camera, fixing the measured object on a three-dimensional translation stage, keeping a fixed distance between the surface of the CCD camera and the surface of the measured object and keeping the fixed distance parallel to each other, and ensuring that only a two-dimensional translation transformation relation exists between the acquired holograms; step 2, reconstructing the hologram set obtained in the step 1 in a piece-by-piece holographic subgraph manner to obtain a reconstructed image set of the measured object, wherein the image set contains a multiplied by b images, and the images are named as A in sequence $11, A_{12}, \dots, A_{ab}$; Step 3, for the image $A(x, y)$ to be spliced, firstly performing image denoising and image enhancement operations on the image $A(x, y)$, and then extracting feature points of the image to be spliced; and 4, splicing the two images by adopting a SIFT algorithm: extracting characteristic points of two images to be spliced by using the method in the step 3 for matching, calculating a transformation matrix between the two images, performing perspective transformation on the two images to be spliced, projecting the two images to be spliced into an spliced image space, carrying out average weighting on gray values of the two images to be spliced, and then fusing the gray values to realize smooth splicing between the two images to be spliced to obtain a new image; step 5, grouping all the line atlases, wherein two adjacent sub-images in each line are a group, splicing each group of images in the line atlases by adopting the method of step 4 until all the line atlases are spliced, obtaining a spliced image in each line, and rearranging all the spliced images into a new line atlas W in sequence i ($i=1,2,3,\dots,a$); Step 6, the line drawing set W obtained in step 5 i The images in the row image set are grouped, two adjacent sub-images are grouped, and the row image set W is subjected to the method of the step 4 i Each group of images in the image is spliced until the atlas W i And (3) splicing all the images in the model (3) to finally obtain a spliced image, namely a synthetic aperture diagram $W(x, y)$ with a high spatial bandwidth product after the object to be measured is reconstructed.

IHMA - JANUARY 2024 - 102 ISSUED PATENTS - PAGE 1

HOLOGRAMS - 12 PATENTS

| REFERENCE | COUNTRY | PATENT NUMBER | PUBLICATION DATE Day-Month-Year | APPLICANT | PRIORITY | PRIORITY DATE Day-Month-Year | PRIORITY NUMBER | EQUIVALENTS | TITLE | KEY WORDS |
|------------------------|---------|---------------|------------------------------------|--|----------|---------------------------------|-----------------|----------------|--|-----------|
| P37238 | WO | 202412962 | 18/01/2024 | BASF | EP | 11/07/2022 | EP2022000184213 | WO202412962 | UV-CURABLE COATINGS HAVING HIGH REFRACTIVE INDEX | |
| P37262 | KR | 102620111 | 02/01/2024 | LEE, SUNG-JIN | KR | 19/07/2023 | KR2023000094137 | KR102620111 | PRINTED MATTER WITH SECURITY FUNCTION OF INFORMATION | |
| P37280 | IN | 202241031267 | 01/12/2023 | MANIPAL TECHNOLOGIES | IN | 31/05/2022 | IN2022041031267 | IN202241031267 | A TAMPER EVIDENT LABEL WITH MULTI-LAYERED SUBSTRATE FEATURE | |
| P37295 | CN | 220349287 | 16/01/2024 | HUIZHOU SHANGSHI HUA TECHNOLOGY | CN | 29/06/2023 | CN2023001679782 | CN220349287U | LASER HOLOGRAPHIC ANTI-COUNTERFEIT LABEL PRINTING DEVICE | |
| P37296 | CN | 220340843 | 12/01/2024 | SHANDONG TAIBAO INFORMATION TECHNOLOGY GROUP | CN | 04/07/2023 | CN2023001729552 | CN220340843U | POSITIONING HOLOGRAPHIC ANTI-FAKE SEALING LABEL | |
| P37302 | CN | 220290367 | 02/01/2024 | HENAN PROVINCE WELLKING TECHNOLOGY DEVELOPMENT | CN | 28/02/2023 | CN2023000331043 | CN220290367U | HOLOGRAPHIC POSITIONING UNCOVERING COLOR-CHANGING VOID ANTI-COUNTERFEIT LABEL | |
| P37306 | CN | 220272055 | 29/12/2023 | HENAN PROVINCE WELLKING TECHNOLOGY DEVELOPMENT | CN | 28/02/2023 | CN2023000330863 | CN220272055U | DOUBLE-DISPLAY DIGITAL ANTI-COUNTERFEIT LABEL WITH VOID POSITIONING | |
| P37311 | CN | 117429191 | 23/01/2024 | SHANGHAI TECHSUN PACKING MATERIALS SHANGHAI TIANCHEN MICRO NANO TECHNOLOGY | CN | 21/12/2023 | CN2023001764257 | CN117429191 | LOCAL ALUMINIZED MULTI-MEDIUM POSITIONING HOLOGRAPHIC PAPER AND PREPARATION METHOD THEREOF | |
| P37313 | CN | 117417510 | 19/01/2024 | GUANGDONG UNIVERSITY OF TECHNOLOGY | CN | 19/10/2023 | CN2023001356720 | CN117417510 | SIDE CHAIN TYPE HOLOGRAPHIC RECORDING MATERIAL, HOLOGRAPHIC POLYMER MATERIAL AND PREPARATION METHOD | |
| P37314 | CN | 117417509 | 19/01/2024 | GUANGDONG UNIVERSITY OF TECHNOLOGY | CN | 19/10/2023 | CN2023001356651 | CN117417509 | POLYMER TYPE HOLOGRAPHIC RECORDING MATERIAL, HOLOGRAPHIC POLYMER MATERIAL AND PREPARATION METHOD THEREOF | |
| P37320 | CN | 117351832 | 05/01/2024 | HENAN PROVINCE WELLKING TECHNOLOGY DEVELOPMENT | CN | 19/09/2023 | CN2023001210593 | CN117351832 | LASER HOLOGRAPHIC UNCOVERED CHARACTER-DISPLAYING DAMAGE NON-RESIDUAL PATTERN ANTI-COUNTERFEIT LABEL AND PREPARATION METHOD THEREOF | |
| P37322 | CN | 117343651 | 05/01/2024 | SHANDONG TAIBAO PACKAGING PRODUCT | CN | 25/09/2023 | CN2023001249184 | CN117343651 | COLOR HOLOGRAPHIC ADHESIVE TAPE AND PREPARATION METHOD THEREOF | |

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 |
|------------------------|---------|---------------|------------------------------------|---|----------|---------------------------------|-----------------|----------------------------|---|-----------|
| P37239 | WO | 202412634 | 18/01/2024 | GIESECKE & DEVRIENT CURRENCY TECHNOLOGY | DE | 14/07/2022 | DE202210002581 | WO202412634 DE102022002581 | SENSOR AND METHOD FOR CHECKING VALUABLE DOCUMENTS HAVING AT LEAST ONE REFLECTIVE SECURITY ELEMENT | |
| P37242 | WO | 202408632 | 11/01/2024 | SICPA | EP | 06/07/2022 | EP2022000183328 | WO202408632 | INTAGLIO PRINTING PROCESSES FOR PRODUCING SECURITY FEATURES MADE OF OXIDATIVE DRYING INTAGLIO INKS | |
| P37244 | WO | 202408238 | 11/01/2024 | GIESECKE & DEVRIENT CURRENCY TECHNOLOGY | DE | 06/07/2022 | DE202210002470 | WO202408238 DE102022002470 | OPTICALLY VARIABLE SURFACE PATTERN, VALUE DOCUMENT HAVING OPTICALLY VARIABLE SURFACE PATTERN AND METHOD FOR PRODUCING AN OPTICALLY VARIABLE SURFACE PATTERN | Microlens |
| P37250 | WO | 202402680 | 04/01/2024 | OVD KINEGRAM | DE | 27/06/2022 | DE202210115901 | WO202402680 DE102022115901 | SECURITY DOCUMENT, SYSTEM FOR PRODUCING A SECURITY DOCUMENT AND METHOD FOR PRODUCING A SECURITY DOCUMENT | |
| P37252 | WO | 202402415 | 04/01/2024 | GIESECKE & DEVRIENT CURRENCY TECHNOLOGY | DE | 29/06/2022 | DE202210002353 | WO202402415 DE102022002353 | SECURITY ELEMENT, VALUE DOCUMENT, AND METHOD FOR PRODUCING SAME | |
| P37256 | US | 20240012181 | 11/01/2024 | LUMENCO | US | 06/07/2022 | US2022063358747 | US20240012181 WO202410868 | MICRO-OPTIC ANTICOUNTERFEITING ELEMENTS FOR CURRENCY AND OTHER ITEMS USING VIRTUAL LENS SYSTEMS | Microlens |
| P37261 | KR | 20240003569 | 09/01/2024 | NBST | KR | 01/07/2022 | KR2022000081306 | KR20240003569 | FORGERY AND FALSIFICATION PREVENTION MEANS APPLYING THREE-STAGE AUTHENTICATION METHOD AND FORGERY AND FALSIFICATION AUTHENTICATION METHOD USING SAME | |
| P37269 | JP | 2023178857 | 18/12/2023 | TOPPAN HOLDINGS | JP | 06/06/2022 | JP2022000091807 | JP2023178857 | ANTI-COUNTERFEITING MEDIUM AND METHOD OF VERIFYING SAME | |

IHMA - JANUARY 2024 - 102 ISSUED PATENTS - PAGE 2

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 |
|------------------------|---------|---------------|------------------------------------|--|----------|---------------------------------|-----------------|--------------------------|---|-----------|
| P37284 | EP | 4306330 | 17/01/2024 | HUECK FOLIEN | EP | 15/07/2022 | EP2022000185202 | EP4306330 WO202411272 | SAFETY ELEMENT | |
| P37285 | EP | 4306329 | 17/01/2024 | HUECK FOLIEN | EP | 15/07/2022 | EP2022000185201 | EP4306329 WO202411271 | SAFETY ELEMENT | |
| P37286 | EP | 4306328 | 17/01/2024 | HUECK FOLIEN | EP | 15/07/2022 | EP2022000185199 | EP4306328 | SAFETY ELEMENT | Microlens |
| P37287 | EP | 4303028 | 10/01/2024 | HID GLOBAL CID | EP | 06/07/2022 | EP2022000315134 | EP4303028 WO202408364 | PERSONALIZABLE SECURITY DOCUMENT AND METHOD OF PERSONALIZING THE SAME | Passport |
| P37288 | EP | 4303027 | 10/01/2024 | BUNDESDRUCKEREI | DE | 07/07/2022 | DE202210117017 | EP4303027 DE102022117017 | VALUABLE OR SECURITY PRODUCT AND METHOD FOR THE PRODUCTION THEREOF | Passport |
| P37294 | CN | 220352510 | 16/01/2024 | SHANGHAI HUIXIONG PACKING | CN | 18/04/2023 | CN2023000863191 | CN220352510U | ANTI-FAKE CORRUGATED BOARD AND PAPER BOX | |
| P37303 | CN | 220290366 | 02/01/2024 | NANJING NANOTECH INSTITUTE | CN | 15/10/2021 | CN2021002490148 | CN220290366U | ANTI-FAKE LABEL | |
| P37307 | CN | 220272054 | 29/12/2023 | WUHAN HUAGONG IMAGE TECHNOLOGY & DEVELOPMENT | CN | 07/02/2023 | CN2023000208673 | CN220272054U | CHANGEABLE INFORMATION IDENTIFICATION FILM | |
| P37328 | CN | 117301749 | 29/12/2023 | JIANGSU UNIVERSITY | CN | 12/09/2023 | CN2023001176173 | CN117301749 | PREPARATION METHOD OF NON-IRIDESCENT STRUCTURAL COLOR FILM WITH INFRARED ANTI-COUNTERFEITING CHARACTERISTIC | |
| P37330 | CN | 117275336 | 22/12/2023 | BEIJING BOE TECHNOLOGY DEVELOPMENT BOE TECHNOLOGY GROUP HEFEI BOE JOINT TECHNOLOGY | CN | 25/09/2023 | CN2023001244737 | CN117275336 | ANTI-FAKE LABEL | |

NON SECURITY HOLOGRAMS - 72 PATENTS

| REFERENCE | COUNTRY | PATENT NUMBER | PUBLICATION DATE Day-Month-Year | APPLICANT | PRIORITY | PRIORITY DATE Day-Month-Year | PRIORITY NUMBER | EQUIVALENTS | TITLE | KEY WORDS |
|-----------------------|---------|---------------|------------------------------------|--|----------|---------------------------------|-----------------|-----------------------------|--|-----------|
| N9895 | WO | 2023248661 | 28/12/2023 | SONY GROUP | JP | 21/06/2022 | JP2022000099934 | WO2023248661 | PHOTOSENSITIVE COMPOSITION, HOLOGRAPHIC RECORDING MEDIUM, HOLOGRAPHIC OPTICAL ELEMENT, OPTICAL APPARATUS AND ELECTRONIC DEVICE | |
| N9896 | WO | 2023247702 | 28/12/2023 | CARL ZEISS JENA | DE | 22/06/2022 | DE202210115524 | WO2023247702 DE102022115524 | METHOD FOR THE REPLICATION OF A HOLOGRAM BY MEANS OF AN OPTICAL ADHESIVE FILM | |
| N9897 | WO | 2023247555 | 28/12/2023 | CARL ZEISS JENA | DE | 22/06/2022 | DE202210115595 | WO2023247555 DE102022115595 | REPLICATION METHOD WITH A CONTACT BODY | |
| N9898 | WO | 2023247554 | 28/12/2023 | CARL ZEISS JENA | DE | 22/06/2022 | DE202210206277 | WO2023247554 DE10202206277 | MASTER PLATE FOR HOLOGRAM REPLICATION | |
| N9899 | WO | 2023247267 | 28/12/2023 | GIER, OLIVER GOMER, ANDREAS HAGEN, JAN | EP | 21/06/2022 | EP2022000180033 | WO2023247267 | COMPOSITE PANE WITH HOLOGRAM ELEMENT | |
| N9900 | WO | 2023247264 | 28/12/2023 | GIER, OLIVER HAGEN, JAN GOMER, ANDREAS | EP | 21/06/2022 | EP2022000180027 | WO2023247264 | COMPOSITE PANE WITH HOLOGRAM ELEMENT AND AN OPTICALLY HIGH-REFRACTIVE LAYER | |
| N9901 | WO | 202413202 | 18/01/2024 | BIOASTER BIOMERIEUX CNRS - CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE UJM - UNIVERSITE JEAN MONNET | EP | 11/07/2022 | EP2022000184039 | WO202413202 | METHOD AND SYSTEM FOR CHARACTERISING MICROORGANISMS BY DIGITAL HOLOGRAPHIC MICROSCOPY | |
| N9902 | WO | 202412939 | 18/01/2024 | HELLA & CO | DE | 14/07/2022 | DE202210117567 | WO202412939 DE102022117567 | METHOD AND DEVICE FOR PRODUCING A COMPUTER-GENERATED HOLOGRAM, HOLOGRAM, AND LIGHTING DEVICE FOR A VEHICLE | |
| N9903 | WO | 202405141 | 04/01/2024 | MITSUBISHI CHEMICAL | JP | 30/06/2022 | JP2022000106253 | WO202405141 | COMPOSITION FOR HOLOGRAPHIC RECORDING MEDIA | |
| N9904 | WO | 202405140 | 04/01/2024 | MITSUBISHI CHEMICAL | JP | 30/06/2022 | JP2022000106252 | WO202405140 | COMPOUND, POLYMERIZABLE COMPOSITION, POLYMER, HOLOGRAPHIC RECORDING MEDIUM, OPTICAL MATERIAL AND OPTICAL COMPONENT | |

IHMA - JANUARY 2024 - 102 ISSUED PATENTS - PAGE 3

NON SECURITY HOLOGRAMS - 72 PATENTS (continuation)

| REFERENCE | COUNTRY | PATENT NUMBER | PUBLICATION DATE Day-Month-Year | APPLICANT | PRIORITY | PRIORITY DATE Day-Month-Year | PRIORITY NUMBER | EQUIVALENTS | TITLE | KEY WORDS |
|-----------------------|---------|---------------|------------------------------------|---|----------|---------------------------------|-----------------|--|---|-----------|
| N9905 | WO | 202405139 | 04/01/2024 | MITSUBISHI CHEMICAL | JP | 30/06/2022 | JP2022000106251 | WO202405139 | METHOD FOR PRODUCING OPTICAL ELEMENT | |
| N9906 | US | 20240029599 | 25/01/2024 | GM GLOBAL TECHNOLOGY OPERATIONS | US | 25/07/2022 | US2022017814661 | US20240029599 DE102023100411 | SYSTEM FOR CALIBRATING A WAVEGUIDE-BASED HOLOGRAPHIC HEAD-UP DISPLAY | |
| N9907 | US | 20240029208 | 25/01/2024 | GM GLOBAL TECHNOLOGY OPERATIONS | US | 20/07/2022 | US2022017813781 | US20240029208 | HOLOGRAPHIC DISPLAY SYSTEM FOR A MOTOR VEHICLE WITH REAL-TIME REDUCTION OF GRAPHICS SPECKLE NOISE | |
| N9908 | US | 20240025249 | 25/01/2024 | GM GLOBAL TECHNOLOGY OPERATIONS | US | 25/07/2022 | US2022017814598 | US20240025249 DE102023100396 | HOLOGRAPHIC DISPLAY CALIBRATION BY HOLOGRAPHIC PHASE MODULATION | |
| N9909 | US | 20240017612 | 18/01/2024 | GM GLOBAL TECHNOLOGY OPERATIONS | US | 14/07/2022 | US2022017864612 | US20240017612 DE102023100082 CN117406852 | USER INTERACTION WITH 360 DEGREE 3D HOLOGRAPHIC DISPLAY | |
| N9910 | US | 20230418066 | 28/12/2023 | RUSSO JUAN | US | 27/06/2022 | US2022017850983 | US20230418066 WO202406123 | MULTIPLY VOLUME HOLOGRAM COUPLERS FOR AUGMENTED REALITY WAVEGUIDES | |
| N9911 | KR | 20240008116 | 18/01/2024 | KOREA PHOTONICS TECHNOLOGY INSTITUTE | KR | 11/07/2022 | KR2022000085098 | KR20240008116 | APPARATUS AND METHOD FOR EVALUATING HOLOGRAPHIC IMAGE USING COMPOSITE APERTURE COMPLEX AMPLITUDE MEASUREMENT TECHNOLOGY | |
| N9912 | KR | 20240006852 | 16/01/2024 | KWANGWOON UNIVERSITY INDUSTRY ACADEMIC COLLABORATION FOUNDATION | KR | 07/07/2022 | KR2022000083642 | KR20240006852 | COMPRESSION CODING METHOD FOR COMPLEX HOLOGRAM OF AMPLITUDE AND PHASE TYPE | |
| N9913 | KR | 20230170468 | 19/12/2023 | LG CHEM | KR | 10/06/2022 | KR2022000070979 | KR20230170468 | NON-REACTIVE FLUORINE-BASED COMPOUND AND PHOTOPOLYMER COMPOSITION COMPRISING SAME | |
| N9914 | KR | 102625393 | 17/01/2024 | CUBIXEL INDUSTRY ACADEMIA COOPERATION OF SEJONG UNIVERSITY | KR | 17/04/2023 | KR2023000049889 | KR102625393 | POLARIZATION DIVISION DOUBLE SCANNING HOLOGRAPHY SYSTEM USING ANGLE TILT WITH RESPECT TO REFLECTOR | |
| N9915 | KR | 102625392 | 17/01/2024 | CUBIXEL INDUSTRY ACADEMIA COOPERATION OF SEJONG UNIVERSITY | KR | 17/04/2023 | KR2023000049888 | KR102625392 | POLARIZATION DIVISION DOUBLE SCANNING HOLOGRAPHY SYSTEM USING ANGLE TILT WITH RESPECT TO TRANSMISSIVE BODY | |
| N9916 | JP | 2024008790 | 19/01/2024 | DAI NIPPON PRINTING | JP | 08/07/2022 | JP2022000110783 | JP2024008790 | HOLOGRAPHIC SCREEN FOR HEAD-UP DISPLAY, HEAD-UP DISPLAY, MOVING BODY, AND AUTOMOBILE | |
| N9917 | JP | 2023181000 | 21/12/2023 | DAI NIPPON PRINTING | JP | 10/06/2022 | JP2022000094719 | JP2023181000 | COMBINER, HEAD-UP DISPLAY, MOVING BODY, AND PHOTSENSITIVE MATERIAL FOR HOLOGRAM LAYER FORMATION | |
| N9918 | JP | 2023180544 | 21/12/2023 | SHIBUYA | JP | 09/06/2022 | JP2022000093927 | JP2023180544 | HOLOGRAPHY OBSERVATION APPARATUS AND SAMPLE HOLDING CONTAINER | |
| N9919 | IN | 202341086203 | 05/01/2024 | SAVEETHA INSTITUTE OF MEDICAL & TECHNICAL SCIENCES | IN | 18/12/2023 | IN2023041086203 | IN202341086203 | HOLOGRAPHIC : UNVEILING THE WORLD IN 3D | |
| N9920 | IN | 202331004043 | 01/12/2023 | INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES) | IN | 20/01/2023 | IN2023031004043 | IN202331004043 | A HIGH MAGNIFICATION DIGITAL HOLOGRAPHIC NANOSCOPY (DHN) SYSTEM AND THE APPLICATION THEREOF | |
| N9921 | IN | 202311078112 | 29/12/2023 | NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY | IN | 17/11/2023 | IN2023011078112 | IN202311078112 | HOLOGRAPHIC DISPLAYS WITH WIDE VIEWING ANGLES AND HIGH RESOLUTION | |
| N9922 | IN | 202311073470 | 24/11/2023 | UNIVERSITY OF ENGINEERING & MANAGEMENT | IN | 27/10/2023 | IN2023011073470 | IN202311073470 | A SYSTEM FOR TRANSFORMING EDUCATION WITH HOLOGRAPHIC TECHNOLOGY | |
| N9923 | FR | 3137980 | 19/01/2024 | PSA AUTOMOBILES STELLANTIS AUTO | FR | 12/07/2022 | FR2022000007126 | FR3137980 | PHYSICAL HOLOGRAM FABRICATED FROM A DIGITAL HOLOGRAM AND HOLOGRAPHIC DEVICE THEREFOR | |
| N9924 | FR | 3137979 | 19/01/2024 | PSA AUTOMOBILES STELLANTIS AUTO | FR | 12/07/2022 | FR2022000007130 | FR3137979 | HOLOGRAM INTEGRATING THE LIGHT SOURCES OF A MULTI-SOURCE HOLOGRAPHIC DEVICE | |
| N9925 | FR | 3137978 | 19/01/2024 | PSA AUTOMOBILES STELLANTIS AUTO | FR | 12/07/2022 | FR2022000007127 | FR3137978 | HOLOGRAM ADAPTED FOR A MULTI-SOURCE HOLOGRAPHIC DEVICE | |
| N9926 | EP | 4300028 | 03/01/2024 | SINGULAR CONTROL ENERGY | EP | 14/04/2023 | EP2023000382343 | EP4300028 | HOLOGRAPHIC SYSTEM AND METHOD OF CAMOUFLAGE, CONCEALMENT AND DEFENSE | |
| N9927 | DE | 202023105732 | 11/01/2024 | ENVISICS | GB | 06/01/2023 | GB2023000000197 | DE202023105732 | HOLOGRAPHIC PROJECTOR | |

IHMA - JANUARY 2024 - 102 ISSUED PATENTS - PAGE 4

NON SECURITY HOLOGRAMS - 72 PATENTS (continuation)

| REFERENCE | COUNTRY | PATENT NUMBER | PUBLICATION DATE Day-Month-Year | APPLICANT | PRIORITY | PRIORITY DATE Day-Month-Year | PRIORITY NUMBER | EQUIVALENTS | TITLE | KEY WORDS |
|-----------------------|---------|---------------|------------------------------------|--|----------|---------------------------------|-----------------|--------------|--|-----------|
| N9928 | CN | 220381446 | 23/01/2024 | ZHANGJIAGANG KANGDE XIN PHOTOELECTRIC MATERIAL | CN | 17/07/2023 | CN2023001866406 | CN220381446U | HOLOGRAPHIC PROJECTION FILM | |
| N9929 | CN | 220380985 | 23/01/2024 | HEBEI BOXIA PHOTOELECTRIC INFORMATION TECHNOLOGY | CN | 13/07/2023 | CN2023001843578 | CN220380985U | MULTIMODE DIGITAL HOLOGRAPHIC MICROSCOPIC QUANTITATIVE PHASE MEASURING DEVICE | |
| N9930 | CN | 220373694 | 23/01/2024 | FUJIAN NORMAL UNIVERSITY | CN | 05/07/2023 | CN2023001749974 | CN220373694U | HOLOGRAPHIC STORAGE MATERIAL MOULD | |
| N9931 | CN | 220355232 | 16/01/2024 | VARROC TYC AUTO LAMPS | CN | 18/01/2023 | CN2023000114472 | CN220355232U | HOLOGRAPHIC PROJECTION DEVICE FOR CAR LAMP | |
| N9932 | CN | 220298376 | 05/01/2024 | BEIJING TIANDI MYTHOLOGY INTERNATIONAL CULTURAL DEVELOPMENT | CN | 02/08/2023 | CN2023002063198 | CN220298376U | MOBILE HOLOGRAPHIC DISPLAY WORKSTATION | |
| N9933 | CN | 220292323 | 02/01/2024 | SHANGHAI CHENGYI PACKAGE TECHNOLOGY | CN | 10/06/2023 | CN2023001471901 | CN220292323U | 3D HOLOGRAPHIC IMAGING DEVICE | |
| N9934 | CN | 220290045 | 02/01/2024 | SHANGHAI CHENGYI PACKAGE TECHNOLOGY | CN | 11/06/2023 | CN2023001472456 | CN220290045U | REAL-TIME INTERACTION DEVICE BASED ON 3D HOLOGRAPHIC IMAGING TECHNOLOGY | |
| N9935 | CN | 220232015 | 22/12/2023 | TRANSIENT OULAI SEMICONDUCTOR PHOTOELECTRIC SHANGHAI | CN | 10/08/2023 | CN2023002154054 | CN220232015U | VOLUME HOLOGRAPHIC GRATING WAVEGUIDE AND NEAR-EYE DISPLAY DEVICE | |
| N9936 | CN | 220228399 | 22/12/2023 | NANJING JUYUZHEN DIGITAL TECHNOLOGY | CN | 05/05/2023 | CN2023001040518 | CN220228399U | PROJECTION EQUIPMENT FOR HOLOGRAPHIC IMAGING | |
| N9937 | CN | 117434811 | 23/01/2024 | HARBIN UNIVERSITY OF SCIENCE & TECHNOLOGY | CN | 05/11/2023 | CN2023001467799 | CN117434811 | INTERFERENCE-FREE CODED APERTURE CORRELATION HOLOGRAPHY BASED ON SCATTERING POINT SPREAD FUNCTION | |
| N9938 | CN | 117432968 | 23/01/2024 | SAIC VOLKSWAGEN AUTOMOTIVE | CN | 27/10/2023 | CN2023001408980 | CN117432968 | HIGH-ORDER STOP LAMP SYSTEM WITH HOLOGRAPHIC PROJECTION FUNCTION | |
| N9939 | CN | 117431072 | 23/01/2024 | JOURNEY TECHNOLOGY | CN | 20/12/2023 | CN2023001756269 | CN117431072 | HOLOGRAPHIC POLYMER DISPERSED LIQUID CRYSTAL MATERIAL AND APPLICATION THEREOF | |
| N9940 | CN | 117422821 | 19/01/2024 | HEFEI UNIVERSITY OF TECHNOLOGY | CN | 08/09/2023 | CN2023001154821 | CN117422821 | THREE-DIMENSIONAL RECONSTRUCTION SYSTEM AND METHOD | |
| N9941 | CN | 117420746 | 19/01/2024 | BEIHANG UNIVERSITY OF AERONAUTICS & ASTRONAUTICS | CN | 09/11/2023 | CN2023001487094 | CN117420746 | RAPID HOLOGRAM GENERATION METHOD BASED ON HIGH-FREQUENCY INFORMATION EXTRACTION | |
| N9942 | CN | 117406328 | 16/01/2024 | SHANGHAI INSTITUTE OF OPTICS & FINE MECHANICS - CHINESE ACADEMY OF SCIENCES | CN | 30/11/2023 | CN2023001626430 | CN117406328 | HOLOGRAPHIC DIFFRACTION GRATING OF MIDDLE-LONG WAVE INFRARED BAND AND MANUFACTURING METHOD THEREOF | |
| N9943 | CN | 117403837 | 16/01/2024 | SHENZHEN JINJIA | CN | 28/08/2023 | CN2023001089939 | CN117403837 | HOLOGRAPHIC PATTERN EFFECT BUILDING WALL DECORATION PAPER AND PREPARATION METHOD THEREOF | |
| N9944 | CN | 117389124 | 12/01/2024 | WESTLAKE UNIVERSITY | CN | 12/10/2023 | CN2023001317641 | CN117389124 | HIGH-SPEED FOUR-DIMENSIONAL COMPRESSION HOLOGRAPHIC MICROSCOPIC IMAGING DEVICE AND METHOD | |
| N9945 | CN | 117369234 | 09/01/2024 | FUJIAN NORMAL UNIVERSITY | CN | 18/09/2023 | CN2023001197590 | CN117369234 | POLARIZATION HOLOGRAPHIC MULTIPLEXING SYSTEM AND METHOD BASED ON ORTHOGONAL POLARIZATION MATRIX | |
| N9946 | CN | 117369233 | 09/01/2024 | SHENZHEN EUCLIDEON TECHNOLOGY | CN | 11/10/2023 | CN2023001312573 | CN117369233 | HOLOGRAPHIC DISPLAY METHOD, DEVICE, EQUIPMENT AND STORAGE MEDIUM | |
| N9947 | CN | 117369232 | 09/01/2024 | BEIJING UNIVERSITY OF TECHNOLOGY | CN | 28/09/2023 | CN2023001278572 | CN117369232 | HOLOGRAPHIC MULTIPLEXING CAR WINDOW SYSTEM AND HOLOGRAPHIC MULTIPLEXING METHOD THEREOF | |
| N9948 | CN | 117369222 | 09/01/2024 | ZHEJIANG UNIVERSITY HANGZHOU GLOBAL SCIENTIFIC & TECHNOLOGICAL INNOVATION CENTER | CN | 07/12/2023 | CN2023001672579 | CN117369222 | PREPARATION SYSTEM AND PREPARATION METHOD OF EXTREME ULTRAVIOLET OBJECTIVE LENS-MOUNTED HOLOGRAM | |
| N9949 | CN | 117369027 | 09/01/2024 | SICHUAN UNIVERSITY | CN | 11/10/2023 | CN2023001309665 | CN117369027 | ASYMMETRIC COLOR HOLOGRAPHIC ENCRYPTION METHOD BASED ON RECONFIGURABLE JANUS SUPER SURFACE | |
| N9950 | CN | 117348368 | 05/01/2024 | GOOLTON TECHNOLOGY | CN | 07/10/2023 | CN2023001283735 | CN117348368 | HOLOGRAPHIC PROJECTION METHOD AND DEVICE AND ELECTRONIC EQUIPMENT | |

IHMA - JANUARY 2024 - 102 ISSUED PATENTS - PAGE 5

NON SECURITY HOLOGRAMS - 72 PATENTS (continuation)

| REFERENCE | COUNTRY | PATENT NUMBER | PUBLICATION DATE Day-Month-Year | APPLICANT | PRIORITY | PRIORITY DATE Day-Month-Year | PRIORITY NUMBER | EQUIVALENTS | TITLE | KEY WORDS |
|-----------------------|---------|---------------|------------------------------------|--|----------|---------------------------------|-----------------|-------------|---|-----------|
| N9951 | CN | 117336450 | 02/01/2024 | HANGZHOU QIUGUO PLANNING TECHNOLOGY | CN | 12/09/2023 | CN2023001171471 | CN117336450 | 3D HOLOGRAPHIC PROJECTION SYSTEM BASED ON ENVIRONMENT INTELLIGENT REGULATION | |
| N9952 | CN | 117334139 | 02/01/2024 | ANHUI CHENGPIN DECORATION ENGINEERING | CN | 18/09/2023 | CN2023001200586 | CN117334139 | BIM-BASED HOLOGRAPHIC IMAGING EFFECT DISPLAY METHOD AND DEVICE | |
| N9953 | CN | 117331297 | 02/01/2024 | LUOYANG ELECTRO OPTICAL EQUIPMENT RESEARCH INSTITUTE AVIATION INDUSTRY | CN | 09/11/2023 | CN2023001491817 | CN117331297 | TWO-DIMENSIONAL HOLOGRAPHIC WAVEGUIDE ELEMENT TURNING HOLOGRAM AND EXPOSURE METHOD | |
| N9954 | CN | 117315164 | 29/12/2023 | VR INTELLIGENT TECHNOLOGY | CN | 28/11/2023 | CN2023001594693 | CN117315164 | OPTICAL WAVEGUIDE HOLOGRAPHIC DISPLAY METHOD, DEVICE, EQUIPMENT AND STORAGE MEDIUM | |
| N9955 | CN | 117311565 | 29/12/2023 | LANGFANG ZHENGUIGU TECHNOLOGY | CN | 07/09/2023 | CN2023001148655 | CN117311565 | AR HOLOGRAPHIC AIR PROJECTION SYSTEM | |
| N9956 | CN | 117311120 | 29/12/2023 | SICHUAN UNIVERSITY | CN | 27/09/2023 | CN2023001262581 | CN117311120 | REAL-TIME HOLOGRAM GENERATION METHOD BASED ON ASYMMETRIC NETWORK | |
| N9957 | CN | 117304795 | 29/12/2023 | WUHAN HUAGONG IMAGE TECHNOLOGY & DEVELOPMENT | CN | 30/10/2023 | CN2023001424880 | CN117304795 | UV (ULTRAVIOLET) LIGHT-CURED RESIN FOR HOLOGRAPHIC IN-MOLD TRANSFER PRINTING FILM AND TRANSFER PRINTING FILM PREPARED FROM UV LIGHT-CURED RESIN | |
| N9958 | CN | 117289582 | 26/12/2023 | NANJING UNIVERSITY | CN | 16/10/2023 | CN2023001335452 | CN117289582 | CASCADE LIQUID CRYSTAL DEVICE AND HOLOGRAPHIC ENCRYPTION METHOD BASED ON CASCADE LIQUID CRYSTAL DEVICE | |
| N9959 | CN | 117289563 | 26/12/2023 | ZHEJIANG UNIVERSITY HANGZHOU GLOBAL SCIENTIFIC & TECHNOLOGICAL INNOVATION CENTER | CN | 27/11/2023 | CN2023001592943 | CN117289563 | AMPLITUDE TYPE CALCULATION HOLOGRAM REALIZATION DEVICE AND METHOD | |
| N9960 | CN | 117289461 | 26/12/2023 | NANJING WEI OPTOELECTRONIC TECHNOLOGY | CN | 15/09/2023 | CN2023001194512 | CN117289461 | HOLOGRAPHIC WAVEGUIDE NEAR-TO-EYE IMAGING METHOD BASED ON LINE-OF-SIGHT TRACKING | |
| N9961 | CN | 117274287 | 22/12/2023 | HARBIN UNIVERSITY OF SCIENCE & TECHNOLOGY | CN | 31/08/2023 | CN2023001120341 | CN117274287 | EDGE DETECTION METHOD BASED ON INTERFERENCE-FREE CODED APERTURE CORRELATION HOLOGRAPHY | |
| N9962 | CN | 117270673 | 22/12/2023 | SUNNY OPTICAL ZHEJIANG RESEARCH INSTITUTE | CN | 13/06/2022 | CN2022000666886 | CN117270673 | METHOD FOR DETERMINING INITIAL PHASE COEFFICIENT OF SPHERICAL WAVE, HOLOGRAM GENERATING METHOD AND DEVICE | |
| N9963 | CN | 117270362 | 22/12/2023 | AIR FORCE ENGINEERING UNIVERSITY OF PLA | CN | 22/08/2023 | CN2023001060055 | CN117270362 | HOLOGRAPHIC IMAGING DEVICE AND METHOD FOR ORTHOGONAL CIRCULAR POLARIZATION AMPLITUDE COMBINATION REGULATION AND CONTROL | |
| N9964 | CN | 117270361 | 22/12/2023 | HANGZHOU CHENJING PHOTOELECTRIC TECHNOLOGY | CN | 05/09/2022 | CN2022001079689 | CN117270361 | HOLOGRAPHIC 3D DISPLAY SYSTEM BASED ON POLYMER LIQUID CRYSTAL SCATTERING FILM | |
| N9965 | CN | 117270360 | 22/12/2023 | HEFEI UNIVERSITY OF TECHNOLOGY | CN | 04/09/2023 | CN2023001134551 | CN117270360 | SYNTHETIC APERTURE IMAGING METHOD BASED ON SIFT ALGORITHM | |
| N9966 | CA | 3164834 | 22/12/2023 | KODEY, BHAVANI KRISHNA | CA | 22/06/2022 | CA2022003164834 | CA3164834 | SMART HUMAN CONNECTION HOLOGRAPHIC PROJECTION DEVICE CONFIGURED TO PROJECT AN INTELLIGENT, RESPONSIVE, AI POWERED ANIMATED HOLOGRAPHIC CHARACTER IN A CONTAINER FOR INTERACTION BY A VIEWER | |