IHMA
PATENT NEWSLETTER

Limited circulation patent news bulletin for the Holography Industry

JANUARY 2023 – 95 PATENTS

Published and granted patents

The IHMA PATENT NEWSLETTER
is exclusively dedicated to IHMA MEMBERS.

Marie-Laure Lebreton
23 route de Chaunu - Lieudit Les Vorges
74 150 MARCELLAZ-ALBANAIS - FRANCE
Mobile: 33 6 61 19 14 24 - E-mail: mll74patents@outlook.fr

TABLE OF CONTENTS

Please click on the links (titles) to go to

ABOUT IHMA PATENT NEWSLETTER

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.

Even though the greatest care is taken in the preparation of this patent surveillance newsletter, some errors or oversights could have occurred. We are committed to making all reasonable efforts to ensure the reliability and a content of information as complete as possible without nevertheless being able to guarantee the exactitude or exhaustive character of the data used. We collect data from official or private sources of the best quality which themselves do not guarantee that the information provided is complete, up-to-date, pertinent, well-referenced … Please also accept our apologies for the poor quality translations of Asian abstracts which are machine translation.

APPLICANTS OF THE MONTH

Click on the title to return to table of contents

1. ANHUI SHUNTONG PACKAGING MATERIAL
2. ANHUI ZIJIANG METALLIZATION ENVIRONMENTAL PROTECTION MATERIAL | SHANGHAI ZIJIANG METALLIZATION ENVIRONMENTAL PROTECTION MATERIAL
3. APPOTRONICS
4. AUDI
5. BEIJING KESIYUAN TECHNOLOGY
6. BEIJING SHUIMU QINGMEI DECORATION ENGINEERING
7. BOE TECHNOLOGY GROUP
8. BUNDESDRUCKEREI
9. CARL ZEISS JENA
10. CARL ZEISS SMT
11. CHANGSHA YAGUAN NEW MATERIAL TECHNOLOGY
12. CHINESE PEOPLE S LIBERATION GROUND FORCE ARMORED TROOP ACADEMY
13. CHONGQING SHUANGQING INDUSTRY GROUP
14. CNRS - CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE | PSA AUTOMOBILES | UNIVERSITE PARIS SACLAY
15. COAL SCIENTIFIC RESEARCH GENERAL INSTITUTE
16. CONDUENT BUSINESS SERVICES
17. DONGGUAN JIAYI INDUSTRY | LIJIA PACKAGING
18. FUJIAN NORMAL UNIVERSITY
19. FUTURE OPTICAL SHANGRAO RESEARCH INSTITUTE
20. GIESECKE & DEVRIENT CURRENCY TECHNOLOGY
21. GIESECKE & DEVRIENT MOBILE SECURITY
22. GUANGDONG GREEN COLOR TECHNOLOGY
23. GUANGDONG ZIJING INFORMATION STORAGE TECHNOLOGY
24. GUANGZHOU HUADU LIANHUA PACKING MATERIAL
25. GUANGZHOU LEAFUN CULTURE TECHNOLOGY
26. HAIER SMART HOME | QINGDAO HAIER AIR CONDITIONING ELECTRONICS | QINGDAO HAIER AIRCONDITIONER
27. HANGZHOU GUANGLI TECHNOLOGY
28. HARBIN ENGINEERING UNIVERSITY
29. HARBIN YINENG COMMUNICATION TECHNOLOGY DEVELOPMENT
30. HELLA
31. HENAN NORMAL UNIVERSITY
32. HOLOLAB
33. HOLOTEK TECHNOLOGY | SHENZHEN JINJIA
34. HUBEI GEDIAN DEVELOPMENT REGION CHENGUANG INDUSTRIAL
35. HUBEI YIMEITE QUANXI TECHNOLOGY
36. HUECK FOLIEN
37. IMPRIMERIE NATIONAL
38. INNOV8TIF SOLUTIONS
39. JAPAN BROADCASTING
40. JIANGNAN UNIVERSITY
41. JITONG TECHNOLOGY BEIJING
42. KDDI
43. KOCHI UNIVERSITY
44. KOREA SECURITY PRINTING & MINTING
45. KUNMING UNIVERSITY OF SCIENCE & TECHNOLOGY
46. KWANGWOON UNIVERSITY INDUSTRY ACADEMIC COLLABORATION FOUNDATION
47. LG CHEM
48. META PLATFORMS TECHNOLOGIES
49. METROLASER
50. NAUCHNO PROIZVODSTVENNOE OBEDINENIE GOSUDARSTVENNYJ INSTITUT PRIKLADNOJ OPTIKI
51. QR ME
52. RANKOR INDUSTRIAL
53. REGENTS OF THE UNIVERSITY OF CALIFORNIA
54. REN GUANGZHAO | REN BINGQIN
55. RONGWEIYUAN SHENZHEN TECHNOLOGY
56. SEELIG JERALD | TOWNSEND TARA
57. SHANDONG NORMAL UNIVERSITY
58. SHANDONG TAIBAO PACKAGING PRODUCT
59. SHANGHAI GENYAN NETWORK TECHNOLOGY
60. SHANGHAI TECHSUN PACKING MATERIALS | SHANGHAI TECHSUN RFID TECHNOLGOY | SHANGHAI TIANCHEN MICRO NANO TECHNOLOGY
61. SHANGHAI YAOMAO NEW MATERIAL TECHNOLOGY
62. SHANTOU JIAXIN PACKING MAT
63. SHENZHEN HAIYUN XINSHENG TECHNOLOGY
64. SHENZHEN LOCHN OPTICS HI TECHNOLOGY
65. SHENZHEN TIANCHI INNOVATION RESEARCH & DEVELOPMENT
66. SHEORAN GYANENDRA | KUMARI VINEETA | BARAK NEELAM | SHARMA AJAY KUMAR
67. SOUTHEAST UNIVERSITY
68. SURYS
69. SVG YANCHENG OPTRONICS
70. TOPPAN PRINTING
71. TROY
72. UNIVERSITY OF SCIENCE & TECHNOLOGY OF CHINA
73. VIVIDQ
74. XI AN CHENGLI AVIATION MANUFACTURING
75. XIANG CHENGLIN
76. YEOM, KYEONG SEOK
77. ZEON
78. ZHEJIANG INTERNATIONAL MARITIME COLLEGE
79. ZHEJIANG YUSHI PACKAGE MATERIAL

P36002 SECURITY & OPTICAL EFFECTS' COLUMN
BANKNOTE – CARD – RELIEF – MICROLENS – LIQUID CRYSTALS

EP4108471 **HUECK FOLIEN**

Inventor(s): TRASSL STEFAN

Application Nber / Date: EP21181145 2021-06-23

Priority Nber / Date / Country: EP21181145 2021-06-23

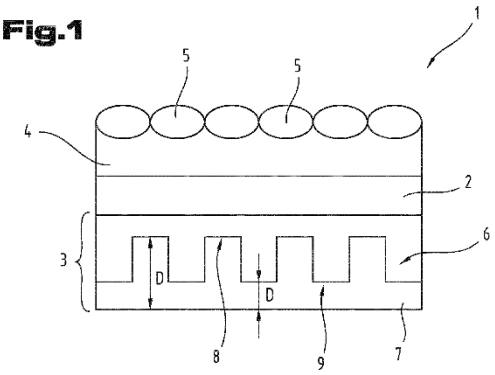
SECURITY ELEMENT WITH A SUBSTRATE AND AT LEAST ONE MICROIMAGE ARRANGEMENT

A security element (1) having a substrate (2), at least one micromicroimage arrangement (3) and at least one focusing layer (4) cooperating with the micromicroimage arrangement (3) and having an arrangement of focusing elements (5), wherein the at least one micromicroimage arrangement (3) comprises at least one relief structure (6), wherein the micromicroimage arrangement (3) generates a visible optical effect when viewed through the focusing layer (4), wherein the at least one micromicroimage arrangement (3) comprises at least one color-shifting layer (7) arranged on the at least one relief structure (6) and having a color-shifting effect recognizable through the focusing layer (4).

ÉLÉMENT DE SÉCURITÉ COMPRENANT UN SUBSTRAT ET AU MOINS UN ENSEMBLE MICRO-IMAGE

Élément de sécurité (1) comprenant un substrat (2), au moins un ensemble micro-image (3) et au moins une couche de focalisation (4) qui coopère avec l'ensemble micro-image (3) et présente un ensemble d'éléments de focalisation (5), ledit ensemble micro-image (3) comprenant au moins une structure en relief (6). Lorsqu'il est observé à travers la couche de focalisation (4), l'ensemble micro-image (3) produit un effet optique visible. Selon l'invention, ledit ensemble micro-image (3) comprend au moins une couche (7) à changement de couleur disposée sur la ou les structures en relief (6), cette couche (7) présentant un effet interférentiel perceptible à travers la couche de focalisation (4).

Fig.1



CLAIM 1. A security element (1) having a substrate (2) and at least one microimage arrangement (3) as well as at least one focusing layer (4) cooperating with the microimage arrangement (3) and having an arrangement of focusing elements (5), wherein the at least one microimage arrangement (3) comprises at least one relief structure (6), wherein the microimage arrangement (3) generates a visible optical effect when viewed through the focusing layer (4), characterized in that the at least one microimage arrangement (3) comprises at least one color-shifting layer (7) arranged on the at least one relief structure (6) with a color-shifting effect recognizable through the focusing layer (4).

Equivalent: WO2022/268962 A1

Status: Pending

Research Report:

EP 4 108 471 A1

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPÄISCHER RECHERCHENBERICHT

Nummer der Anmeldung
EP 21 18 1145

EINSCHLÄGIGE DOKUMENTE			
Kategorie	Kennzeichnung des Dokuments mit Angabe, soweit erforderlich, der maßgeblichen Teile	Betrifft Anspruch	KLASSIFIKATION DER ANMELDUNG (IPC)
X	US 2015/198749 A1 (YE YAN [CN] ET AL) 16. Juli 2015 (2015-07-16) * Absätze [0001], [0048] - [0052]; Ansprüche; Abbildungen *	1,3-17	INV. B42D25/324 B42D25/36 B42D25/364 B42D25/373
X	CN 205 416 817 U (ZHONGCHAO SPECIAL SECURITY TECHNOLOGY CO LTD ET AL.) 3. August 2016 (2016-08-03)	1-3,7, 9-15	
A	* Absätze [0047], [0054] - [0069], [0073]; Ansprüche; Abbildungen 3-5 *	4-6	
X	FR 3 002 183 A1 (INNOVIA SECURITY PTY LTD [AU]) 22. August 2014 (2014-08-22) * Absätze [0022], [0028], [0042], [0043], [0076], [0078], [0079], [0081], [0083]; Ansprüche; Abbildung 8 *	1-9,16, 17	

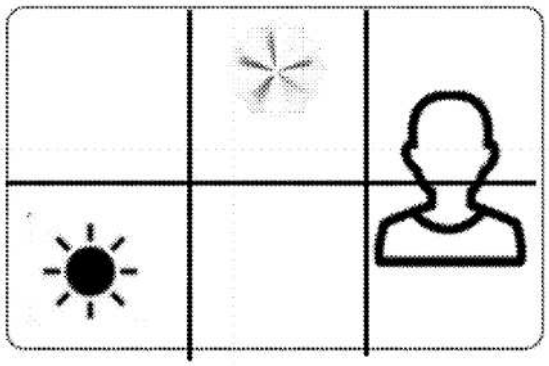
PATENT REFERENCE – See the table at the end of this document

P35967 **CARD**

US20230017185 **INNOV8TIF SOLUTIONS**
Priority Date: **15/07/2021**

METHOD TO DETERMINE AUTHENTICITY OF SECURITY HOLOGRAM

A method to determine authenticity of a security feature of an identification document, characterized by receiving a real-time video feed of the identification document with a light source directed at the identification document to make visible a security hologram; processing the real-time video feed into a plurality of image sequence; analysing each image from the plurality of image sequence for a glare and the security hologram, wherein the glare is a reflection of the light source from the identification document; analysing the position of the glare and the security hologram in each image from the plurality of image sequence; evaluating whether the position of the glare and the position of the security hologram is caused by the light source; and providing authenticity result of the identification document captured from the real-time video feed.



CLAIM 1. A method to determine authenticity of a security feature of an identification document, characterized by: receiving a real-time video feed of the identification document with a light source directed at the identification document to make visible a security hologram; processing the real-time video feed into a plurality of image sequence; analysing each image from the plurality of image sequence for a glare and the security hologram, wherein the glare is a reflection of the light source from the identification document; analysing the position of the glare and the security hologram in each image from the plurality of image sequence; evaluating whether the position of the glare and the position of the security hologram is caused by the light source; and providing authenticity result of the identification document captured from the real-time video feed.

P35995

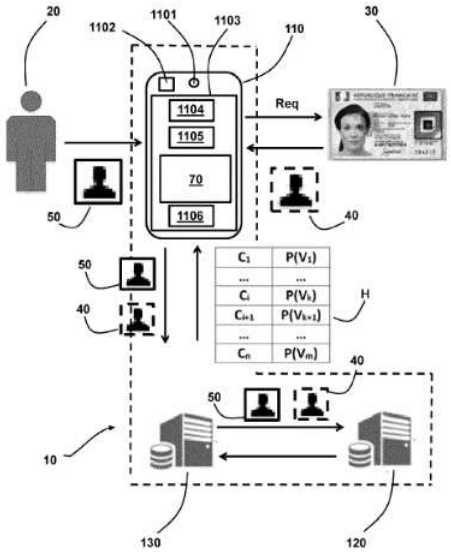
EP4120104 **IMPRIMERIE NATIONAL**
Priority Date: **16/07/2021**

METHOD FOR GENERATING A DIGITAL IDENTITY DOCUMENT OF AN INDIVIDUAL FROM A PHYSICAL OFFICIAL IDENTITY DOCUMENT

The invention relates to a method for generating a digital identity document of an individual from an official physical identity document, said method comprising a step (E1) of extracting a photograph from the official physical identity document, a step (E10) of receiving a plurality of generated image layers of a hologram (H) and a step (E11) of displaying the digital identity document, said digital identity document presenting the extracted photograph and an image layer selected from the plurality of generated image layers.

PROCEDE POUR GENERER UN DOCUMENT NUMERIQUE D'IDENTITE D'UN INDIVIDU A PARTIR D'UN DOCUMENT PHYSIQUE D'IDENTITE OFFICIEL

L'invention concerne un procédé pour générer un document numérique d'identité d'un individu à partir d'un document physique d'identité officiel, ledit procédé comprenant une étape (E1) d'extraction d'une photographie à partir du document d'identité physique officiel, une étape de réception (E10) d'une pluralité de couches d'image générées d'un hologramme (H) et une étape (E11) d'affichage du document numérique d'identité, ledit document numérique d'identité présentant la photo extraite et une couche d'image sélectionnée parmi la pluralité de couches d'image générées.



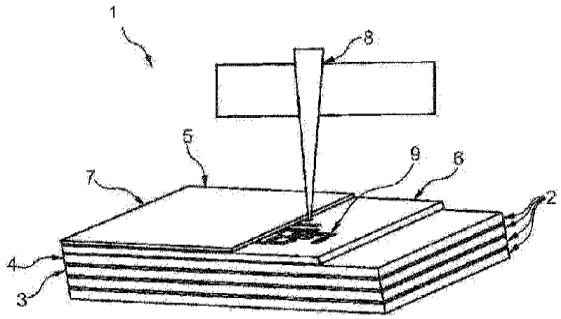
CLAIM 1. A method for generating a digital identity document (70) of an individual (20) from an official physical identity document (30), said digital identity document (30) being a partial or total reproduction of said official physical identity document (30), said official physical identity document (30) comprising a photograph of the individual (20), said digital identity document (70) being intended to be stored on a mobile device (110), said method comprising the following steps implemented in said mobile device (110):- a step (E1) of extracting the photograph of the individual (20) from the official physical identity document (30), referred to as the extracted photograph (40); - a step of acquiring (E2) a photograph of said individual (20) from an optical element (1101) of the mobile device (110), called acquired photograph (50); - a step (E3) of sending the extracted photo (40) and the acquired photo (50) to a processing server (130), in order to generate a hologram (H) comprising a plurality of image layers (C1,..., CI,..., Cn); - a step of receiving (E10) the plurality of image layers (C1,..., CI,..., Cn) generated for said hologram (H), each layer (CI) being derived from the acquired photograph (50) or the extracted photograph (40), each image layer (CI) being associated with a value (VK) a parameter (P) of the mobile device (110); - at an instant t, a step (E11) of displaying the digital identity document (70) on the mobile device (110), said digital identity document displaying the extracted photograph (40) and an image layer (C).I) selected from the plurality of image layers (C1,..., CI,..., Cn) depending on the value (VK) of the parameter (P) of the mobile device (110) at said instant t, another image layer (CI+1) of the plurality of image layers (C1,..., CI,..., Cn) being selected and displayed at a time t+1 if the value of the parameter of the mobile device (110) is modified.

P35996 **BANKNOTE – CARD**

EP4116778 **BUNDESDRUCKEREI**
Priority Date: **08/07/2021**

METHOD FOR PRODUCING SECURITY ELEMENT FOR SECURITY DOCUMENT, METHOD FOR MANUFACTURING SECURITY DOCUMENT, METHOD FOR PERSONALIZING A SECURITY DOCUMENT, SECURITY ELEMENT FOR SECURITY DOCUMENT, SECURITY DOCUMENT AND ID DOCUMENT

The invention relates to a method for producing a security element for a security document, comprising the following steps: providing a hologram layer (6); producing a hologram in the hologram layer (6), wherein in this case light irradiation is irradiated onto the hologram layer (6) and the hologram produced is visible at a viewing angle when viewing the hologram layer (6); and producing defects (9) in the hologram, wherein in this case the hologram is locally disturbed in the hologram layer (6) by means of irradiation with pulsed light beams and the defects (9) are visible at the viewing angle when viewing the hologram layer (6). The invention also relates to a method for producing a security document comprising a security element, to a method for personalizing a security document, to an ID document and to a security element for a security document.



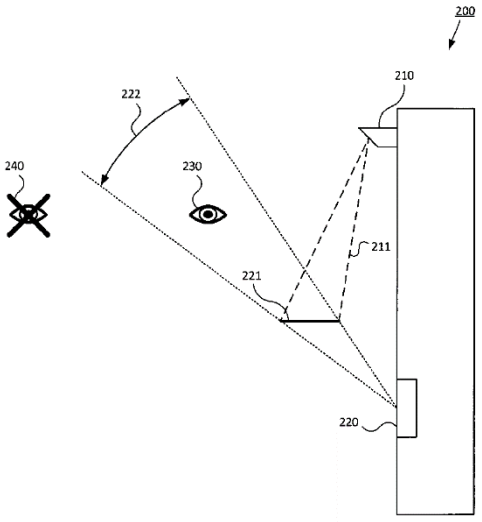
CLAIM 1. A method for producing a security element for a security document, comprising- Providing a hologram layer (6); - Producing a hologram in the hologram layer (6), wherein light irradiation is irradiated onto the hologram layer (6) and the hologram produced is visible at a viewing angle when viewing the hologram layer (6); and - Generating defects (9) in the hologram, wherein in this case the hologram is locally disturbed in the hologram layer (6) by means of irradiation with pulsed light beams and the defects (9) are visible at the viewing angle when viewing the hologram layer (6).

P36001

EP4109420 **CONDUENT BUSINESS SERVICES**
Priority Date: **25/06/2021**

HOLOGRAPHIC BARCODE TARGET GENERATOR

Authentication systems, devices, and methods are provided, which may use a scanner configured to capture an image of an authentication pattern in a predetermined target area; and a hologram generator configured to project a holographic target onto free space in the target area. Moreover, there may be provided a controller configured to process the image and output a determination of whether the authentication pattern meets a predetermined criterion.



CLAIM 1. A verification device, comprising: a scanner configured to capture an image of an authentication pattern in a predetermined target area; and a hologram generator configured to project a holographic target onto free space in the target area.

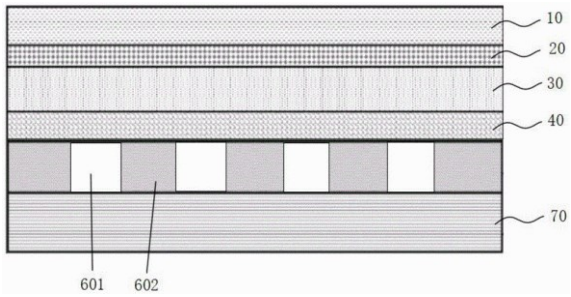
P36011 **RELIEF**

CN218367210U **SVG YANCHENG OPTRONICS**
Priority Date: **13/07/2022**

DOUBLE-COLOR HOLLOW RELIEF FILM

The utility model provides a double-colored fretwork relief (sculpture) film, including dyed layer, holographic anti-fake radium-shine information layer and gum layer, one side of dyed layer is provided with holographic anti-fake radium-shine information layer, holographic anti-fake radium-shine information layer is kept away from one side of dyed layer is provided with the gum layer, be provided with between holographic anti-fake radium-shine information layer and the gum layer and pass through the colour zone and shelter from the district. The utility model discloses an among the two-color fretwork relief (sculpture) film, through setting up the color zone of passing through and sheltering from the district, correspond the color zone of passing through for dyed layer and gum layer superimposed colour, shelter from the colour that the district is the dyed layer, holographic anti-counterfeiting material presents two-colour, and the diversification of pattern can be realized in two-colour setting to can fix a position the distribution of colour according to the design of pattern, the location is accurate, and the machining precision is high, has improved the technical content of research and development, and is difficult to be forged.

CLAIM 1. The utility model provides a double-colored fretwork relief (sculpture) film, its characterized in that, includes dyed layer (30), holographic anti-fake radium-shine information layer (40) and gum layer (70), one side of dyed layer (30) is provided with holographic anti-fake radium-shine information layer (40), one side of holographic anti-fake radium-shine information layer (40) is kept away from dyed layer (30) is provided with gum layer (70), be provided with between holographic anti-fake radium-shine information layer (40) and gum layer (70) and pass through colour zone (601) and shelter from district (602).

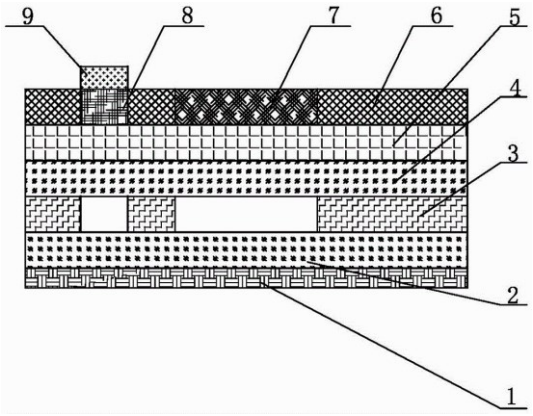


P36014 **PRINTING – BRAND PROTECTION – LABEL**

CN218344272U **SHANDONG TAIBAO PACKAGING PRODUCT**
Priority Date: **28/10/2022**

DIGITAL HOLOGRAPHIC SCRAPING FLOWER

The utility model belongs to the technical field of anti-fake packaging, concretely relates to digital holography of cigarette packing usefulness is scraped and is scraped mouth flower, its characterized in that mouth flower body from bottom to top is base paper layer, transfer glue layer, fretwork aluminized layer, holographic information layer, holographic mould pressing layer in proper order, the cover position printing has printing ink printing layer and digital information layer on the holographic mould pressing layer, the digital information layer includes digital anti-fake code layer and two-dimensional code layer, and digital anti-fake code layer coats to be stamped and scrapes the layer. The utility model discloses a mouth flower collects digital anti-fake technique, thermoprint and scrapes open anti-fake technique, holographic anti-fake technique, cover position printing anti-fake technique, easily tear seam etc. technique in an organic whole, have rational in infrastructure, convenient to use, anti-fake effectual advantage.



CLAIM 1. The digital holographic scraping and scratching port flower is characterized in that a port flower body sequentially comprises a base paper layer, a transfer glue layer, a hollow aluminum-plated layer, a holographic information layer and a holographic mould pressing layer from bottom to top, wherein a printing ink printing layer and a digital information layer are printed on the holographic mould pressing layer in a nesting mode, the digital information layer comprises a digital anti-counterfeiting code layer and a two-dimensional code layer, and the digital anti-counterfeiting code layer is covered with a hot stamping scraping and scratching layer.

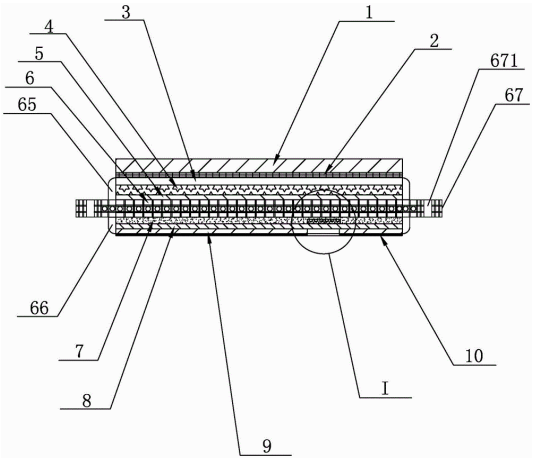
P36019

CN218273806U **ZHEJIANG YUSHI PACKAGE MATERIAL**

Priority Date: **30/08/2022**

NOVEL LASER COLD WAVE MEMBRANE

The utility model discloses a novel laser cold stamping film, which comprises a film layer and a release layer, wherein a transparent protective layer is arranged on the lower surface of the release layer, a laser holographic pattern layer is fixedly arranged on the lower surface of the transparent protective layer, a coloring layer is fixedly arranged on the lower surface of the laser holographic pattern layer, a base film layer is fixedly arranged on the lower surface of the coloring layer, a photosensitive color-changing anti-counterfeiting layer is fixedly arranged on the lower surface of the base film layer, a transparent positioning film layer is fixedly arranged on the lower surface of the photosensitive color-changing anti-counterfeiting layer, an aluminum plating layer is fixedly arranged on the lower surface of the transparent positioning film layer, and anti-counterfeiting information observation through holes are formed in the local position of the aluminum plating layer; the base film layer comprises a rubber positioning layer, warps, wefts and polyester yarns, the wefts are perpendicular to the warps, and the polyester yarns are arranged along the warp or weft direction. Above-mentioned technical scheme, structural design is reasonable, the pattern is clear, of high quality, resistant washing, long service life and practicality are good.



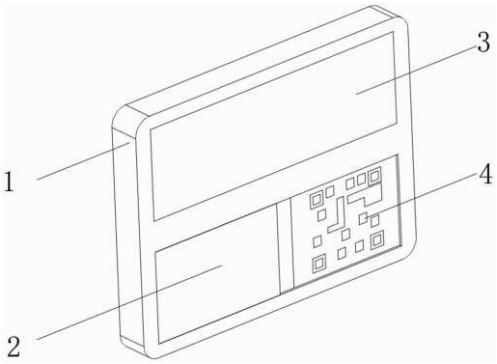
CLAIM 1. The utility model provides a novel laser cold wave membrane, includes thin layer (1) and leaves type layer (2), be provided with transparent protective layer (3), its characterized in that on the lower surface from type layer (2): the lower surface of the transparent protective layer (3) is fixedly provided with a laser holographic pattern layer (4), the lower surface of the laser holographic pattern layer (4) is fixedly provided with a coloring layer (5), the lower surface of the coloring layer (5) is fixedly provided with a base film layer (6), the lower surface of the base film layer (6) is fixedly provided with a photosensitive color-changing anti-counterfeiting layer (7), the lower surface of the photosensitive color-changing anti-counterfeiting layer (7) is fixedly provided with a transparent positioning film layer (8), the lower surface of the transparent positioning film layer (8) is fixedly provided with an aluminum coating layer (9), and the local position of the aluminum coating layer (9) is provided with an anti-counterfeiting information observation through hole (91); base membrane layer (6) include rubber location layer (61), warp (62), weft (63) and dacron silk (64), warp (62) and rubber location layer (61) fixed connection, weft (63) and warp (62) mutually perpendicular set up dacron silk (64) along warp (62) or weft (63) direction, weft (63) and dacron silk (64) all with rubber location layer (61) fixed connection.

P36025 **PRINTING – LABEL**

CN218214150U **HUBEI GEDIAN DEVELOPMENT REGION CHENGUANG INDUSTRIAL**
Priority Date: **17/08/2022**

ANTI-COUNTERFEIT LABEL WITH LOCAL LASER HOLOGRAPHIC TWO-DIMENSIONAL CODE DUAL MARKS

The utility model provides a local holographic two-dimensional code dual marking's of laser antifalsification label relates to antifalsification label technical field, including the label body, the front of label body is equipped with the glued membrane body, be equipped with the two-dimensional code characteristic thing between glued membrane body and the label body, and the two-dimensional code characteristic thing is installed on the surface of label body, and the middle part and the two-dimensional code characteristic thing of glued membrane body bond, the front of label body is equipped with the two-dimensional code anti-fake scanning glued membrane, and two-dimensional code anti-fake scanning glued membrane and label body bond. Adopt two-dimensional code characteristic thing and two-dimensional code anti-fake scanning glued membrane, when carrying out anti-fake operation, at the surperficial glued membrane body that bonds of two-dimensional code characteristic thing to the dyestripping corresponds there is two-dimensional code characteristic thing, and the dyestripping surface has the information of the two-dimensional code characteristic thing that corresponds, and the characteristic information with the two-dimensional code characteristic thing and the combination can form complete information identification two-dimensional code between the two-dimensional code anti-fake scanning glued membrane, can improve the anti-fake effect of label body.



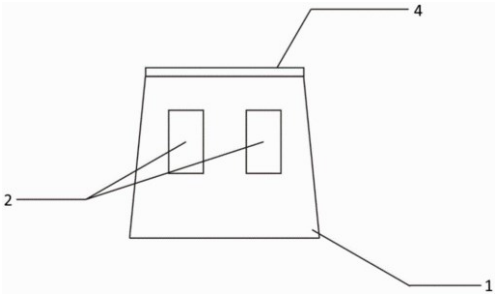
CLAIM 1. The utility model provides an antifalsification label of holographic two-dimensional code dual mark of local laser, includes label body (1), its characterized in that: the front of label body (1) is equipped with glued membrane body (2), be equipped with two-dimensional code characteristic thing (5) between glued membrane body (2) and label body (1), and two-dimensional code characteristic thing (5) are installed on the surface of label body (1), and the middle part and the two-dimensional code characteristic thing (5) of glued membrane body (2) bond, the front of label body (1) is equipped with two-dimensional code anti-fake scanning glued membrane (4), and two-dimensional code anti-fake scanning glued membrane (4) and label body (1) bond, be equipped with between two-dimensional code anti-fake scanning glued membrane (4) and glued membrane body (2) separate layer (6), and separate layer (6) and label body (1) bond, and the tip and separate layer (6) surface bonding of glued membrane body (2).

P36030 **BRAND PROTECTION**

CN218143232U **SHANGHAI TECHSUN PACKING MATERIALS | SHANGHAI TECHSUN RFID TECHNOLGOY | SHANGHAI TIANCHEN MICRO NANO TECHNOLOGY**
Priority Date: **07/09/2022**

ANTI-FAKE WINE BOTTLE RUBBER CAP

The application discloses anti-fake beverage bottle rubber cap includes: the cap comprises a cap body, at least one holographic information layer structure and at least one protective layer structure, wherein the holographic information layer structure is arranged on the cap body, and the protective layer structure is correspondingly arranged on the holographic information layer structure; the holographic information layer structure does not completely cover the cap. The cap body is provided with the holographic information layer structure which can provide the laser holographic anti-counterfeiting identification function, and the protection layer structure is correspondingly arranged outside the holographic information layer structure. The application ensures that the holographic information layer structure is not influenced by the thermal contraction of the cap body, and the protective layer structure can ensure that the holographic anti-counterfeiting effect is not damaged. In addition, because the protective layer structure is arranged, the anti-counterfeiting effect of the anti-counterfeiting wine bottle rubber cap is more three-dimensional, and more visual and tactile feelings are brought to consumers.

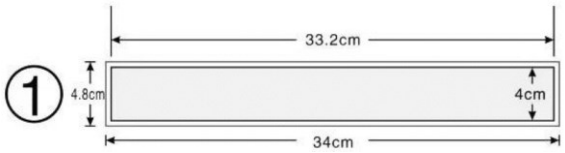


CLAIM 1. The utility model provides an anti-fake beverage bottle rubber cap which characterized in that includes: the cap comprises a cap body, at least one holographic information layer structure and at least one protective layer structure, wherein the holographic information layer structure is arranged on the cap body, and the protective layer structure is correspondingly arranged on the holographic information layer structure; the holographic information layer structure does not completely cover the cap body.

P36045 **PRINTING – SEAL – BRAND PROTECTION**

CN115593129 **REN GUANGZHAO | REN BINGQIN**
Priority Date: **03/11/2022**

METHOD FOR MANUFACTURING HOLOGRAPHIC COLOR ADVERTISEMENT CUSTOMIZED ADHESIVE TAPE



The invention relates to the technical field of packaging materials, and discloses a method for manufacturing a holographic color advertisement customized adhesive tape, which comprises the steps of prepress design and plate combination, substrate processing, electronic engraving, gravure printing, gluing and cutting; the preparation method comprises the following steps: s101, designing before printing and composing a plate; s102, processing the base material and electronically engraving by utilizing an electronic engraving machine; s103, carrying out gravure printing; s104, gluing after the gravure printing is finished; and S105, cutting to obtain a finished product. The adhesive tape product produced by the process method is mainly suitable for the merchant mechanism which pursues perfection and shows personalized willingness to own brand, and has multiple functions of business cards/color pages/anti-counterfeiting/adhesive tapes, so that the adhesive tape product is wide in application industry, and fills the blank state in the field of full-color advertising adhesive tape customization, and the commercial value of exquisite exhibition manufacturers.

CLAIM 1. A method for manufacturing a holographic color advertisement customized adhesive tape is characterized by comprising the following steps: comprises the steps of designing and composing a plate before printing, processing a base material, electronically engraving, gravure printing, gluing and cutting; the manufacturing method comprises the following manufacturing steps: s101, designing before printing and composing a plate; s102, processing the base material and electronically engraving by utilizing an electronic engraving machine; s103, carrying out gravure printing; s104, gluing after the gravure printing is finished; and S105, cutting to obtain a finished product.

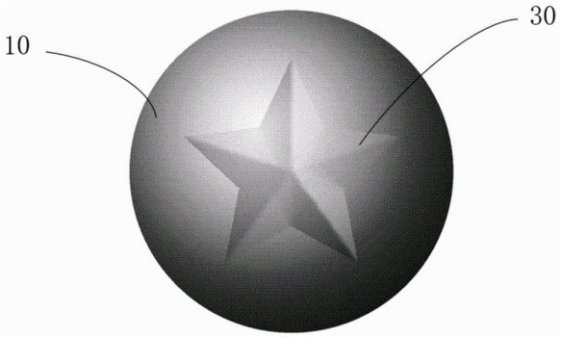
P36050

CN115576179 **HUBEI YIMEITE QUANXI TECHNOLOGY**
Priority Date: **08/10/2022**

HOLOGRAPHIC IMAGE STRUCTURE WITH LAYERED SUPERPOSITION EFFECT AND MANUFACTURING METHOD THEREOF

The invention relates to the technical field of holographic images, and provides a holographic image structure with a hierarchical superposition effect and a manufacturing method thereof, wherein the structure comprises the following components: the holographic image display device comprises a first holographic image structure used for displaying an upper holographic image and a second holographic image structure used for displaying a lower holographic image; and a substrate for fixing the first and second holographic image structures. The invention can simultaneously display two layers of holographic images under the same light source and the same visual angle, furthermore, the two layers of holographic images can be matched according to the needs, can be simultaneously plane holographic images, can also be simultaneously three-dimensional holographic images, and can also be the combination of the plane holographic images and the three-dimensional holographic images, the whole has visual level superposition effect visible to naked eyes, the visual effect and the safety anti-counterfeiting performance of the product can be obviously improved, the batch production can be realized, and the production efficiency is high.

CLAIM 1. A holographic image structure with a layered superimposition effect, comprising: a first holographic image structure for displaying an upper holographic image; the first holographic image structure is provided with convex parts and concave parts which are arranged at intervals; a second holographic image structure for displaying an underlying holographic image; the second holographic image structure is arranged in the concave part of the first holographic image structure; and (c) a second step of, a substrate for holding the first and second holographic image structures; the upper-layer holographic image is superposed on the lower-layer holographic image, and the upper-layer holographic image and the lower-layer holographic image can be displayed simultaneously.



P36053 **BRAND PROTECTION**

CN115559154
Priority Date: **22/10/2022**

ANHUI ZIJIANG METALLIZATION ENVIRONMENTAL PROTECTION MATERIAL | SHANGHAI ZIJIANG METALLIZATION ENVIRONMENTAL PROTECTION MATERIAL

MULTI-MEDIUM COMBINED LOCAL HOLOGRAPHIC ALUMINUM-SPRAYED TRANSFER PAPER AND PREPARATION METHOD THEREOF

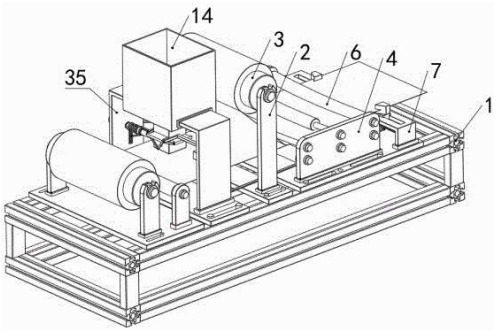
The application relates to a multi-medium combined local holographic aluminum-sprayed transfer paper and a preparation method thereof, relating to the technical field of transfer aluminum-sprayed paper and comprising the following steps: s1, plate making; s2, coating; s3, mould pressing; s4, preparing local zinc sulfide transfer paper; s5, preparing the local aluminum-plated transfer paper. According to the method, two different effects of the aluminized positioning pattern and the galvanized positioning pattern are displayed on one piece of paper, so that the diversity of color patterns is improved, and the anti-counterfeiting performance is improved; during later printing, a large amount of white ink is not needed to cover the aluminum plating layer, so that the production efficiency is improved, the material is saved, and the use amount of the ink is reduced; in addition, aluminum washing is not needed in the preparation process, and the process steps are simple.

P36059 **PRINTING – BRAND PROTECTION**

CN115519917
Priority Date: **29/11/2022**

SHANTOU JIAXIN PACKING MAT

PRODUCTION PROCESS OF ACCURATE DUAL ANTI-COUNTERFEITING LASER TRANSFER PAPERBOARD



The invention relates to a production process of an accurate double anti-counterfeiting laser transfer paperboard, which comprises the following steps: the method comprises the following steps: coating a plateless laser transfer coating on a base film; step two: splicing a tracking detection line and 2 gauge lines on a PET plastic sheet by adopting a UV (ultraviolet) splicing mode on the left side or the right side of a holographic nickel plate area, metalizing the spliced holographic PET plastic sheet, and electroforming a metalized nickel plate to obtain a holographic nickel plate; step three: pressing the base film into a seamless holographic pattern with a tracking detection line and a gauge line, and then carrying out aluminizing operation to prepare a seamless holographic transfer film; step four: engraving the invisible anti-counterfeiting image-text information and the tracking detection line on a metal anilox roller of a coating machine in an electric engraving mode to manufacture an electric engraving anilox roller; step five: and (3) placing the seamless holographic transfer film on a coating machine to obtain a back printing invisible image-text transfer film, trimming the image-text transfer film, and then obtaining the accurate dual anti-counterfeiting laser transfer paper from the image-text transfer film.

CLAIM 1. A production process of an accurate double anti-counterfeiting laser transfer paperboard is characterized by comprising the following steps: selecting a PET transfer film as a base film, and coating a plateless laser transfer coating on the base film; splicing a tracking detection line and 2 gauge lines on a PET plastic sheet by adopting a UV (ultraviolet) splicing mode on the left side or the right side of a holographic nickel plate area of a laser seamless holographic molding press, spraying silver and metalizing the spliced holographic PET plastic sheet, and electroforming the metalized holographic PET plastic sheet in an electroforming machine to obtain a holographic nickel plate with the tracking detection line and the gauge lines; placing the coated base film in a laser seamless holographic die pressing machine, pressing to form a seamless holographic pattern with a tracking detection line and a gauge line, then placing the base film subjected to seamless die pressing on a vacuum aluminum plating machine for aluminum plating operation to prepare a seamless holographic transfer film with a tracking line and a gauge line, and realizing front positioning; fourthly, engraving the invisible anti-counterfeiting image-text information and the tracking detection line on a metal anilox roller of a coating machine in an electric engraving mode according to the size, the positioning size and the image-text repetition period of the anti-counterfeiting image-text on the image-text anti-counterfeiting base paper to manufacture an electric engraving anilox roller with a proper image-text period; and fifthly, placing the aluminized seamless holographic transfer film with the tracking line and the gauge line on a coating machine for positioning coating and fixed-length stretching to obtain a back-printed invisible image-text transfer film with positioning image-text information and positioning tracking detection line, performing necessary trimming treatment on the image-text transfer film to ensure that the position deviation of each roll of base paper positioning image-text from the base paper edge is less than or equal to 0.3mm, and then stretching, positioning compounding and peeling the back-printed invisible image-text transfer film with the positioning cursor, the positioning image-text and the positioning gauge line on a wet compounding machine in a fixed-length manner to obtain the precise dual anti-counterfeiting laser paper, wherein the wet compounding machine can identify the tracking line and the gauge line on the image-text transfer film to realize precise positioning.

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

P35949 **PRINTING – BANKNOTE – BRAND PROTECTION – SMARTPHONE**

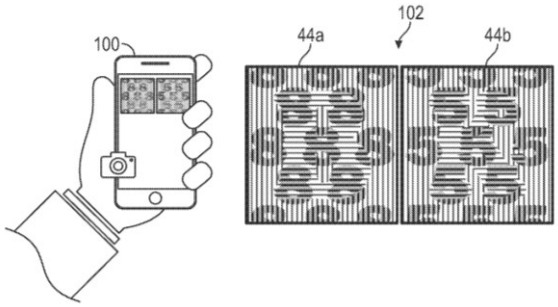
WO2023287785 **TROY**
Priority Date: **13/07/2021**

DYNAMIC SHIFTING IMAGES FOR SECURITY PRINTING APPLICATIONS

Security features that may hold multiple levels or classes of security features in one element. The security features may include a Level 1 feature in combination with a Level 4 feature. The Level 1 feature may be identified using human sense. The Level 4 feature may comprise digital security. Unique codes may be provided for security verification of articles.

DÉCALAGE DYNAMIQUE D'IMAGES POUR APPLICATIONS D'IMPRESSION DE SÉCURITÉ

Des caractéristiques de sécurité qui peuvent contenir de multiples niveaux ou classes de caractéristiques de sécurité dans un élément sont décrites. Les caractéristiques de sécurité peuvent comprendre une caractéristique de niveau 1 en combinaison avec une caractéristique de niveau 4. La caractéristique de niveau 1 peut être identifiée à l'aide d'un sens humain. La caractéristique de niveau 4 peut comprendre une sécurité numérique. Des codes uniques peuvent être fournis pour la vérification de sécurité d'articles.



CLAIM 1. A method comprising: producing a security feature for an article, the security feature including an image element having a first image when the image element is viewed at a first angle and having a second image when the image element is viewed at a second angle, one or more of the first image or the second image comprising a data element for a code that is unique within a set of a plurality of codes.

P35954

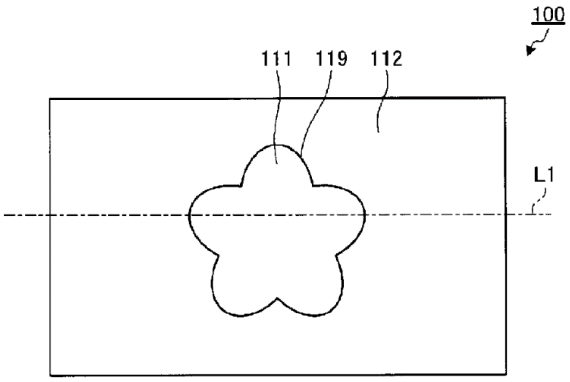
WO2023282063 **ZEON**
Priority Date: **07/07/2021**

OPTICAL DISPLAY MEDIUM

This optical display medium having a display surface comprises: a reflective polarizer layer provided in a reflective region RL which is a part of or the entire region of the display surface; and a birefringent layer provided further to a viewing side than the reflective polarizer layer and provided to a region RA which occupies a part of the reflective region RL. The reflective polarizer layer is a layer that reflects incident light as circularly polarized light or linearly polarized light. The birefringent layer is a layer that contains a flaky birefringent material and exhibits optical properties as a C plate. The reflective polarizer layer is preferably a layer of a material having cholesteric regularity.

SUPPORT D'AFFICHAGE OPTIQUE

L'invention concerne un support d'affichage optique ayant une surface d'affichage comprenant : une couche de polariseur réfléchissant disposée dans une région réfléchissante RL qui est une partie de la région entière de la surface d'affichage ou toute la région de la surface d'affichage ; et une couche biréfringente disposée davantage vers un côté de visualisation que la couche de polariseur réfléchissant et disposée sur une région RA qui occupe une partie de la région réfléchissante RL. La couche de polariseur réfléchissant est une couche qui réfléchit la lumière incidente sous la forme d'une lumière à polarisation circulaire ou d'une lumière polarisée linéairement. La couche biréfringente est une couche qui contient un matériau biréfringent en paillettes et présente des propriétés optiques en tant que plaque C. La couche de polariseur réfléchissante est de préférence une couche d'un matériau ayant une régularité cholestérique.



CLAIM 1. An optical display medium having a display surface, the optical display medium comprising: a reflective polarizer layer provided in a reflection region RL that is a part or all of the display surface; and a birefringence layer provided on a viewing side with respect to the reflective polarizer layer and provided in a region RA that occupies a part of the reflection region RL, wherein Wherein the reflective polarizer layer is a layer that reflects incident light as circularly polarized light or linearly polarized light, and the birefringent layer is a layer that includes a flake-like birefringent material and exhibits optical characteristics as an C plate.

P35957 **BANKNOTE – RELIEF**

WO2023281123 **SURYS**
Priority Date: **09/07/2021**

OPTICAL SECURITY COMPONENTS, MANUFACTURE OF SUCH COMPONENTS AND SECURE DOCUMENTS EQUIPPED WITH SUCH COMPONENTS

The invention notably relates to an optical security component (201) comprising a first layer (213), at least a diffractive first structure (S) etched into the first layer, a reflective second layer (214) at least partially covering the diffractive first structure. The diffractive first structure comprises a first pattern (M1) made up of a collection of facets arranged in such a way as to form a plurality of subsets of facets, each subset of facets comprising one or more facets with symmetry of revolution which are arranged concentrically. Within each group of a plurality of groups of subsets of facets, the subsets of facets exhibit, at discrete regions defined by identical polar coordinates, a local alteration to the surface such as to produce a graphic object that is recognizable for a given angle of tilt and a given azimuth angle. The polar coordinates vary from one group to another so as to produce a dynamic visual effect that can be seen in reflection by changing the tilt and/or the azimuth.

COMPOSANTS OPTIQUES DE SÉCURITÉ, FABRICATION DE TELS COMPOSANTS ET DOCUMENTS SÉCURISÉS ÉQUIPÉS DE TELS COMPOSANTS

L'invention concerne notamment un composant optique de sécurité (201) comprenant une première couche (213), au moins une première structure diffractive (S) gravée sur ladite première couche, une deuxième couche (214) reflective recouvrant au moins en partie ladite première structure diffractive. Ladite première structure diffractive comprend un premier motif (M1) constitué d'un ensemble de facettes agencées pour former une pluralité de sous-ensembles de facettes, chaque sous-ensemble de facettes comprenant une ou plusieurs facettes à symétrie de révolution agencées de façon concentrique. Dans chaque groupe d'une pluralité de groupes de sous-ensemble de facettes, lesdits sous-ensembles de facettes présentent en des régions ponctuelles définies par des coordonnes polaires identiques, une altération locale de la surface, de telle sorte à produire un objet graphique reconnaissable pour un angle de tilt et un angle d'azimut donnés. Les coordonnées polaires varient d'un groupe à l'autre, de telle sorte à produire un effet visuel dynamique observable en réflexion par changement de tilt et/ou d'azimut.

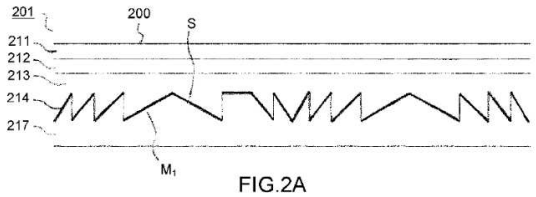


FIG.2A

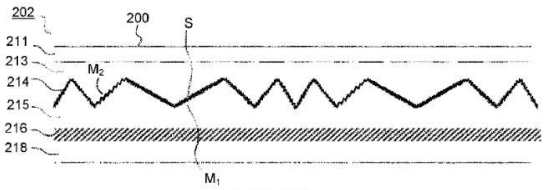


FIG.2B

CLAIM 1. Optical security component (201, 202) configured for authentication in reflection, along at least one first observation face (200), the component comprising: a first layer (213) made of dielectric material, transparent in the visible; at least one first diffractive structure (S) etched on said first layer; and a second layer (214), at least partially covering said first diffractive structure, and having a spectral band of reflection in the visible; and wherein: said first diffractive structure comprises at least one first pattern (Mi) consisting of a set of facets (F)Ki) arranged to form a plurality of subsets of facets, each subset of facets comprising one or more rotationally symmetrical facets arranged concentrically, said facet or facets of each subset of facets each having a slope with an angular value lying in absolute value between a minimum angular value (a.min) and a maximum angular value (otmax) strictly less than 90 °, said facet or facets of each subset of facets each comprising a maximum height (h.m), a maximum lateral dimension of each facet subset being less than about 300 pm; in each of a plurality of facet subset groups, said facet subsets each exhibit, in a point region (Py) defined by an angular sector of polar coordinates comprising an angular coordinate and a radial coordinate, identical for all the subsets of facets of the group, a local alteration of the surface, so as to produce a graphic object recognizable for a given tilt angle and azimuth angle; said polar coordinates vary from one group to another, so as to produce, when the component is illuminated along a given illumination axis, a dynamic visual effect observable in reflection by changing tilt and/or azimuth.

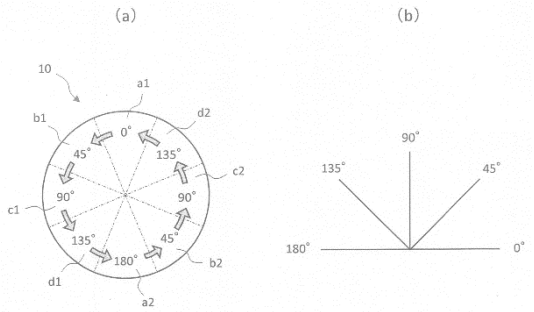
P35978 **CARD**

JP2023004693 **TOPPAN PRINTING**
Priority Date: **28/06/2021**

DIFFRACTION GRATING PATTERN

TOPIC: To provide a diffraction grating pattern in which a diffraction grating pattern can be switched between a latent image and a manifest image state, a special device or the like for visually recognizing and distinguishing the pattern is not required, and authenticity is easily distinguished. INVENTION: a diffraction grating pattern (1) including a plurality of unit pixels arranged in combination with at least two types of diffraction gratings such that a predetermined shape is formed by another type of unit pixel in an array of the unit pixels, wherein a unit pixel (10) includes a plurality of types of diffraction gratings having different diffraction angles, the plurality of types of diffraction gratings having different diffraction angles; The pixels are arranged and formed such that diffraction angles gradually change along a predetermined direction, the predetermined directions are different between different types of unit pixels, and diffraction angles are equal to each other in at least one arrangement portion having a positional relationship corresponding to the arrangement.

CLAIM 1. A diffraction grating pattern in which a plurality of unit pixels each including a diffraction grating are arranged in combination with each other such that a predetermined shape is formed by another type of unit pixel in an array of the unit pixels, wherein the unit pixel includes a plurality of types of diffraction gratings having different diffraction angles, the plurality of types of diffraction gratings having different diffraction angles include: A diffraction grating pattern formed by arranging diffraction angles such that diffraction angles gradually change along a predetermined direction, wherein the predetermined directions are different between different types of unit pixels, and the diffraction angles are equal to each other in at least one arrangement portion having a positional relationship corresponding to the arrangement.



P36002 **PATENT OF THE MONTH**
BANKNOTE – CARD – RELIEF – MICROLENS – LIQUID CRYSTALS

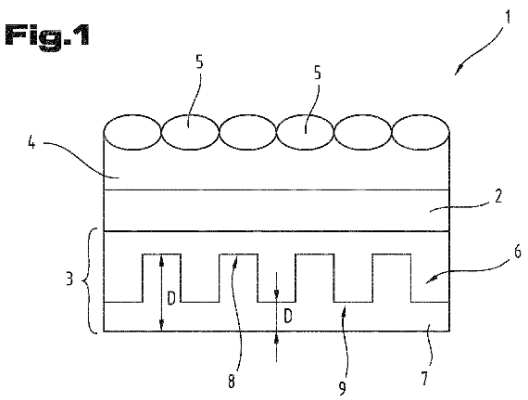
EP4108471 **HUECK FOLIEN**
Priority Date: **23/06/2021**

SECURITY ELEMENT WITH A SUBSTRATE AND AT LEAST ONE MICROIMAGE ARRANGEMENT

A security element (1) having a substrate (2), at least one micromicroimage arrangement (3) and at least one focusing layer (4) cooperating with the micromicroimage arrangement (3) and having an arrangement of focusing elements (5), wherein the at least one micromicroimage arrangement (3) comprises at least one relief structure (6), wherein the micromicroimage arrangement (3) generates a visible optical effect when viewed through the focusing layer (4), wherein the at least one micromicroimage arrangement (3) comprises at least one color-shifting layer (7) arranged on the at least one relief structure (6) and having a color-shifting effect recognizable through the focusing layer (4).

ÉLÉMENT DE SÉCURITÉ COMPRENANT UN SUBSTRAT ET AU MOINS UN ENSEMBLE MICRO-IMAGE

Élément de sécurité (1) comprenant un substrat (2), au moins un ensemble micro-image (3) et au moins une couche de focalisation (4) qui coopère avec l'ensemble micro-image (3) et présente un ensemble d'éléments de focalisation (5), ledit ensemble micro-image (3) comprenant au moins une structure en relief (6). Lorsqu'il est observé à travers la couche de focalisation (4), l'ensemble micro-image (3) produit un effet optique visible. Selon l'invention, ledit ensemble micro-image (3) comprend au moins une couche (7) à changement de couleur disposée sur la ou les structures en relief (6), cette couche (7) présentant un effet interférentiel perceptible à travers la couche de focalisation (4).

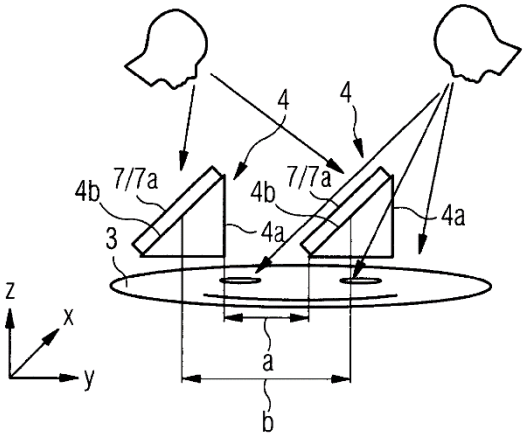


P36004 **CARD – RELIEF**

DE102021003605 **GIESECKE & DEVRIENT MOBILE SECURITY**
Priority Date: **13/07/2021**

IDENTITY DOCUMENT

Identity document 1 with a substrate 2, which is provided with a light image 3 visible on an upper side of the substrate 2 and on which an optically variable structure 4 is applied above the light image 3, which has a plurality of reflecting surfaces (7), which each generate a reflection of light with a degree of reflection of at least 80% from each viewing angle onto the reflecting surface (7) and are inclined relative to the upper side of the substrate (2), when viewed from a first viewing angle onto the light image 3, whereas the reflections are not perceptible when viewed from a second viewing angle different from the first viewing angle onto the light image 3, so that regions of the light image located below the reflecting surfaces are visible when viewed from the second viewing angle and are not visible when viewed from the first viewing angle.



CLAIM 1. Identification document (1) having a substrate (2) which is provided with a light image (3) visible on an upper side of the substrate (2) and to which an optically variable structure (4) is applied above the light image (3), which has a plurality of reflecting surfaces (7) which each generate a reflection of light with a degree of reflection of at least 50% from each viewing angle onto the reflecting surface (7) and are inclined relative to the upper side of the substrate (2) in such a way that, characterized in that the reflections are perceptible on the light image (3) when viewed from a first viewing angle, whereas the reflections are not perceptible on the light image (3) when viewed from a second viewing angle different from the first viewing angle, so that regions of the light image (3) located below the reflecting surfaces (4) are visible when viewed from the second viewing angle and are not visible when viewed from the first viewing angle.

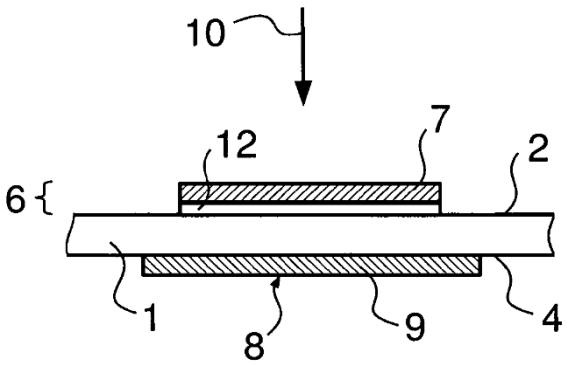
P36005 **PRINTING – BANKNOTE**

DE102021003553 **GIESECKE & DEVRIENT CURRENCY TECHNOLOGY**
Priority Date: **28/06/2021**

SECURITY SUBSTRATE

The invention relates to a security substrate comprising a substrate front side (2) and a substrate rear side (4) opposite said front side. said security substrate comprises a first transfer element (6) which is arranged on the substrate front side (2) and a second transfer element (8) which is arranged on the substrate rear side (4). The first (6) and the second transfer element (8) have a layer sequence (7, 9) comprising a stabilizing layer (20), a transfer adhesive layer (14) and at least one further layer, and the first transfer element (6) is configured asymmetrically with respect to the second transfer element (8). The second transfer element (8) has no carrier layer (12) imparting stability to the transfer element and the first transfer element (6) either has a carrier layer (12) imparting stability to the transfer element, or has no carrier layer (12) imparting stability to the transfer element, and is formed asymmetrically with respect to the second transfer element (8) with respect to its layer sequence (7).

CLAIM 1. Security substrate which has a substrate front side (2) and a substrate rear side (4) opposite the latter, - having a first transfer element (6) which is arranged on the substrate front side (2), and - having a second transfer element (8) which is arranged on the substrate rear side (4), wherein the first (6) and the second transfer element (8) each have a layer sequence (7, 9) comprising a stabilization layer (20), a transfer adhesive layer (14) and at least one further layer, and wherein the first transfer element (6) is formed asymmetrically with respect to the second transfer element (8), characterized in that In that - the second transfer element (8) has no carrier layer (12) imparting stability to the second transfer element, and - the first transfer element (6) either a) has a carrier layer (12) imparting stability to the transfer element, or b) has no carrier layer (12) imparting stability to the transfer element and is formed asymmetrically with respect to the second transfer element (8) with respect to its layer sequence (7).

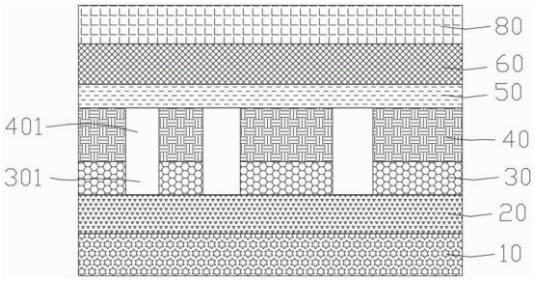


P36010 **PRINTING – BRAND PROTECTION – RELIEF**

CN218367232U **SVG YANCHENG OPTRONICS**
Priority Date: **16/09/2022**

COLOR RELIEF FILM

The utility model provides a colored relief (sculpture) film, including the first base film layer that stacks gradually the setting, from type layer, bond line, printing layer, metal level and information layer, the bond line is UV adhesive layer. In the color embossed film of the utility model, through arranging the printing layer and the information layer, the color embossed film with different color printing and laser anti-counterfeiting environmental protection effects can be formed, and the color embossed film has various effects of beauty and anti-counterfeiting as a material package; the adhesive layer on the outermost side after gold stamping adopts UV glue, so that the protective effect is good, the gold stamping surface of the film has strong adhesive capacity, good gold stamping effect, good hardness after drying and stable molecular structure, the phenomena of cracking, wrinkling, popping, bubbles and the like after gold stamping are effectively reduced, and meanwhile, the film is friction-resistant, alcohol-resistant and water-resistant, and has excellent adhesive force after baking.



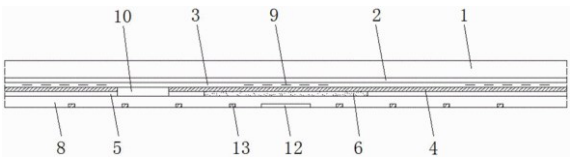
CLAIM 1. The color relief film is characterized by comprising a first base film layer (10), a release layer (20), an adhesive layer (30), a printing layer (40), a metal layer (50) and an information layer (60) which are sequentially stacked, wherein the adhesive layer (30) is a UV adhesive layer.

P36012 **PRINTING – LABEL – LUMINESCENCE**

CN218367126U **SHANGHAI YAOMAO NEW MATERIAL TECHNOLOGY**
Priority Date: **17/10/2022**

ANTI-COUNTERFEITING GOLD STAMPING FILM

The utility model discloses an anti-fake gold stamping film, include, base film, mold release layer, high temperature resistant dyed layer, anti-fake cellosilk, aluminize layer, radium-shine anti-fake picture and text moulded layer, fluorescence anti-fake picture and text printing layer, temperature change anti-fake printing layer, gilt glue film multichannel apposition different image picture layer, anti-fake word membrane and high temperature resistant high glue film. The utility model combines a laser anti-counterfeiting image-text mould pressing layer, a fluorescent anti-counterfeiting image-text printing layer, a temperature-variable anti-counterfeiting printing layer and a plurality of anti-counterfeiting characteristics of a multi-channel homothetic different-image layer, and the multi-channel homothetic different-image layer displays different patterns at different angles, thereby not only increasing the artistic aesthetic feeling, but also enhancing the anti-counterfeiting function and increasing the anti-counterfeiting difficulty; set up anti-fake word membrane and high temperature resistant high viscose layer simultaneously for no matter the anti-fake gilding film can't be intact to tear from product or packaging surface under normal atmospheric temperature or high temperature, promotes anti-fake effect by a wide margin.



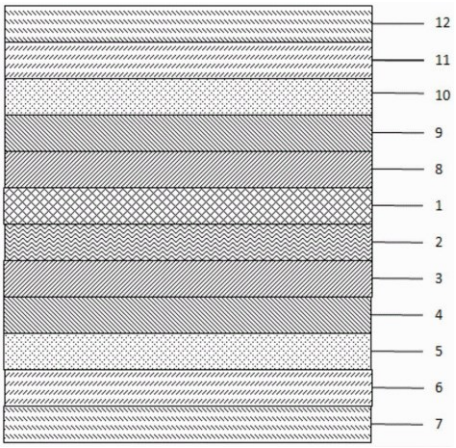
CLAIM 1. An anti-counterfeiting bronzing film is characterized in that: comprises a base film (1), a parting agent layer (2), a high-temperature resistant coloring layer (3), an aluminum-plated layer (4), a laser anti-counterfeiting image-text mould pressing layer (5), a fluorescent anti-counterfeiting image-text printing layer (6), a temperature-variable anti-counterfeiting printing layer (7) and a gold stamping glue layer (8); the utility model discloses a mould release agent for the building decoration, including mould release agent layer (2), high temperature resistant dyed layer (3), aluminized layer (4) and multichannel apposition abnormal image layer (10), the bottom of aluminized layer (4) sets up radium-shine anti-fake picture and text moulded layer (5), fluorescence anti-fake picture and text printed layer (6) and temperature change anti-fake printed layer (7), multichannel apposition abnormal image layer (10), radium-shine picture and text layer (5), fluorescence anti-fake picture and text printed layer (6) and temperature change anti-fake printed layer (7)'s bottom sets up gilt glue film (8), anti-fake word membrane (11) and high temperature resistant high viscose layer (12) are inlayed in gilt glue film (8), high temperature resistant dyed layer (3) sets up the bottom on mould release agent layer (2), and is provided with anti-fake fibre silk (9) in high temperature resistant dyed layer (3).

P36013 **THREAD**

CN218351054U **GUANGZHOU HUADU LIANHUA PACKING MATERIAL**
Priority Date: **03/08/2022**

DOUBLE-SIDED LIGHT ANGLE COLOR-CHANGING MULTIPLE ANTI-COUNTERFEITING SAFETY LINE

The utility model discloses a multiple anti-fake safety line that two-sided light angle discolours relates to anti-fake safety line technical field. The utility model provides a double-sided light angle color-changing multiple anti-counterfeiting safety line, which comprises an original film layer, a color development layer, an information layer, a laser layer, a dielectric layer, an aluminum layer and an ink layer; the information layer comprises a first information layer and a second information layer, the laser layer comprises a first laser layer and a second laser layer, the medium layer comprises a first medium layer and a second medium layer, the aluminum layer comprises a first aluminum layer and a second aluminum layer, and the ink layer comprises a first ink layer and a second ink layer; the color development layer, the first information layer, the first laser layer, the first dielectric layer, the first aluminum layer and the first ink layer are sequentially arranged on one surface of the original film layer, and the second information layer, the second laser layer, the second dielectric layer, the second aluminum layer and the second ink layer are sequentially arranged on the other surface of the original film layer.



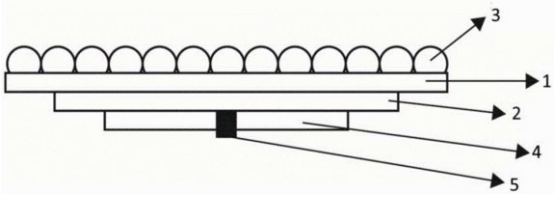
CLAIM 1. A double-sided light angle color-changing multiple anti-counterfeiting safety line is characterized by comprising an original film layer, a color development layer, an information layer, a laser layer, a dielectric layer, an aluminum layer and an ink layer; the information layer comprises a first information layer and a second information layer, the laser layer comprises a first laser layer and a second laser layer, the medium layer comprises a first medium layer and a second medium layer, the aluminum layer comprises a first aluminum layer and a second aluminum layer, and the ink layer comprises a first ink layer and a second ink layer; the color development layer, the first information layer, the first laser layer, the first dielectric layer, the first aluminum layer and the first ink layer are sequentially arranged on one surface of the original film layer, and the second information layer, the second laser layer, the second dielectric layer, the second aluminum layer and the second ink layer are sequentially arranged on the other surface of the original film layer.

P36028 **LABEL – RELIEF – MICROLENS – RFID – TRACK & TRACE**

CN218159063U **SHANGHAI TECHSUN PACKING MATERIALS | SHANGHAI TECHSUN RFID TECHNOLGOY | SHANGHAI TIANCHEN MICRO NANO TECHNOLOGY**
Priority Date: **07/09/2022**

ANTI-COUNTERFEITING STRUCTURE

The application discloses anti-fake structure includes: a visual identification structure and an electronic identification structure; the visual identification structure comprises: the micro-optical information system comprises a micro-optical layer, a supporting layer and an information layer, wherein two sides of the supporting layer are respectively connected with the micro-optical layer and the information layer; the electronic identification structure comprises: the chip is connected with the first antenna layer, and the first antenna layer is connected with the information layer. The application can realize double anti-counterfeiting, namely an anti-counterfeiting structure with a three-dimensional dynamic optical effect and an anti-counterfeiting structure with a radio frequency identification function, wherein the naked eye identification structure adopts a micro-optical array anti-counterfeiting technology, so that a consumer or a market inspector can conveniently check related anti-counterfeiting information directly through naked eyes; the electronic identification structure adopts an RFID anti-counterfeiting technology, and RFID data information anti-counterfeiting traceability inspection can be carried out through electronic equipment.



CLAIM 1. A security device, comprising: a visual identification structure and an electronic identification structure; the visual identification structure includes: the micro-optical information device comprises a micro-optical layer, a supporting layer and an information layer, wherein two sides of the supporting layer are respectively connected with the micro-optical layer and the information layer; the electronic identification structure comprises: the chip is connected with the first antenna layer, and the first antenna layer is connected with the information layer.

P36034 **PRINTING**

CN115637106 **ANHUI SHUNTONG PACKAGING MATERIAL**
Priority Date: **19/07/2021**

ANTI-COUNTERFEITING FILM WITH COLOR-CHANGING EFFECT AND PREPARATION METHOD THEREOF

The invention discloses an anti-counterfeiting film with a color-changing effect and a preparation method thereof, wherein the anti-counterfeiting film comprises a coating and an aluminum plating layer, and the coating comprises the following raw materials: the preparation method comprises the following steps of preparing a polymerizable macromolecular surfactant, nano-cellulose, N-methyldiethanolamine, acrylic acid, hydroxyethyl methacrylate, sodium pyrrolidone carboxylate, polyethylene glycol p-isooctyl phenyl ether and azodiisopropyl imidazoline, wherein the preparation of the coating comprises the following steps: firstly, adding a polymerizable macromolecular surfactant into water, adding glacial acetic acid, dropwise adding into a mixture of nitrogen methyl diethanolamine, acrylic acid and hydroxyethyl methacrylate, and dropwise adding azodiisopropyl imidazoline to obtain an emulsion Z; secondly, adding sodium pyrrolidone carboxylate and polyethylene glycol p-isooctyl phenyl ether, and continuously stirring to obtain an emulsion Q; and thirdly, coating the emulsion Q on a substrate, air-cooling and drying to obtain a coating, applying the polymerizable macromolecular surfactant to polyacrylic acid polymerization, and enabling the coating not to migrate after drying.

CLAIM 1. The anti-counterfeiting film with the color changing effect comprises a coating and an aluminum plating layer, and is characterized in that the coating comprises the following raw materials in parts by weight: 10-15 parts of polymerizable macromolecular surfactant, 30-40 parts of nano cellulose, 1-3 parts of N-methyldiethanolamine, 100-120 parts of acrylic acid, 150-180 parts of hydroxyethyl methacrylate, 5-7 parts of glacial acetic acid, 0.5-0.8 part of sodium pyrrolidone carboxylate, 0.2-0.4 part of polyethylene glycol p-isooctyl phenyl ether, 5-10 parts of azodiisopropyl imidazoline, 30-40 parts of ethyl acetate, 10-13 parts of butanone, 5-8 parts of n-propyl ester, 15-18 parts of methyl ether and 30-45 parts of water; the polymerizable macromolecular surfactant is prepared by the following steps: s11, adding butanone and azobisisobutyronitrile into a flask, sealing the flask, carrying out nitrogen replacement, heating to 75 ℃, dropwise adding dimethylaminoethyl methacrylate and cobalt oxime boron fluoride complex, reacting for 2 hours at constant temperature, cooling to 0 ℃, and removing the solvent and unreacted monomers in vacuum to obtain an intermediate 1; and S12, mixing the intermediate 1, butanone and isopropanol, adding azobisisobutyronitrile, performing nitrogen displacement, adding butyl methacrylate and a cobalt oxime boron fluoride complex dissolved in butanone at the constant temperature of 75 ℃, reacting for 5 hours, cooling to 0 ℃, adding into n-hexane, washing and precipitating to obtain the polymerizable macromolecular surfactant.

P36035

CN115618307 **SHANGHAI GENYAN NETWORK TECHNOLOGY**
Priority Date: **29/09/2022**

ANTI-COUNTERFEITING VERIFICATION METHOD AND DEVICE FOR PRINTOUT FILE, ELECTRONIC EQUIPMENT AND MEDIUM

The embodiment of the disclosure provides an anti-counterfeiting verification method and device for a printout file and a readable storage medium. Wherein, the method comprises the following steps: acquiring raster anti-counterfeiting content and anti-counterfeiting code position information; generating a grating anti-counterfeiting picture according to the grating anti-counterfeiting content; generating an anti-counterfeiting code according to the acquired anti-counterfeiting file access address; writing the grating anti-counterfeiting picture and the anti-counterfeiting code into a corresponding position in an anti-counterfeiting file body uploaded by a user to obtain an anti-counterfeiting file to be printed; and outputting the anti-counterfeiting file to be printed.

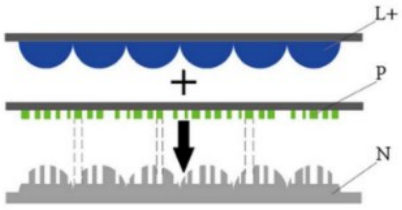
CLAIM 1. An anti-counterfeiting verification method for a printed output file is characterized by comprising the following steps: acquiring raster anti-counterfeiting content and anti-counterfeiting code position information; generating a grating anti-counterfeiting picture according to the grating anti-counterfeiting content; generating an anti-counterfeiting code according to the acquired anti-counterfeiting file access address; writing the grating anti-counterfeiting picture and the anti-counterfeiting code into a corresponding position in an anti-counterfeiting file body uploaded by a user to obtain an anti-counterfeiting file to be printed; and outputting the anti-counterfeiting file to be printed.

P36036 **BRAND PROTECTION – RELIEF – MICROLENS**

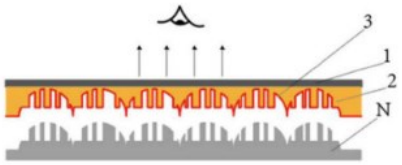
CN115616690 **HOLOTEK TECHNOLOGY | SHENZHEN JINJIA**
Priority Date: **05/05/2022**

OPTICAL ANTI-COUNTERFEITING ELEMENT WITH INTERSECTED MICRO-RELIEF THREE-DIMENSIONAL STRUCTURE, PRODUCT AND PREPARATION METHOD

The invention relates to an optical anti-counterfeiting element with an intersected micro-relief three-dimensional structure, a product and a preparation method, wherein the preparation method comprises the following steps: s1, manufacturing a micro-relief three-dimensional structure array, enabling the micro-image-text array and the fixed point of the micro-lens array to be basically superposed, then synthesizing and superposing to obtain an intersected micro-relief three-dimensional structure array, and generating a corresponding micro-relief photoetching file; s2, preparing a metal nickel plate; s3, preparing a composite die metal nickel plate; s4, preparing an optical anti-counterfeiting film; s5, manufacturing a reflecting medium layer: and arranging a reflecting medium layer on the surface of the micro-relief three-dimensional structure array layer of the optical anti-counterfeiting film prepared in the step S4. The invention reduces the production difficulty, simplifies the process flow and ensures that the quality of the optical anti-counterfeiting element is more stable.



3a



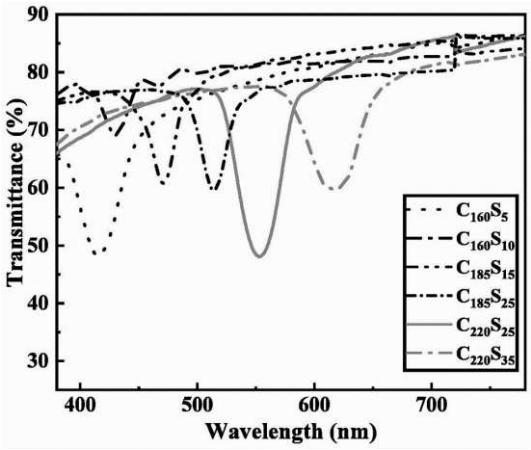
3b

CLAIM 1. A preparation method of an optical anti-counterfeiting element with an intersected micro-relief three-dimensional structure is characterized by comprising the following steps: s1, manufacturing a micro relief three-dimensional structure array: designing a micro image-text array and a micro lens array, carrying out space three-dimensional framework modulation on the micro image-text array and the micro lens array to ensure that the fixed points of the micro image-text array and the micro lens array are basically superposed, then synthesizing and superposing to obtain an intersected micro relief three-dimensional structure array, and generating a micro relief photoetching file corresponding to the intersected micro relief three-dimensional structure array; the synthesis superposition specifically comprises the following steps: intersecting and superposing the surface topography and the curvature of the micro image-text array and the micro lens array, so that the micro image-text array is nested in the micro lens array; s2, preparing a metal nickel plate: exposing and cleaning a photosensitive adhesive layer on the photoetching glass according to the micro-relief photoetching file generated in the step S1 to obtain a micro-relief three-dimensional structure array A recorded on the photosensitive adhesive layer, then performing chemical plating on the surface of the micro-relief three-dimensional structure array A to form a conductive silver layer, and then immersing the conductive silver layer into an electrolytic bath for electroplating to obtain a metal nickel plate; s3, preparing a composite die metal nickel plate: copying the micro-relief three-dimensional structure array A on the metal nickel plate by adopting an embossing method, and combining the array A with other arrays according to the design requirements of packaging Holographic laser junction The structures are combined and arranged to obtain a composite die with a micro-relief three-dimensional structure array B, then the surface of the micro-relief three-dimensional structure array B is chemically plated to form a conductive silver layer, and the conductive silver layer is immersed in an electrolytic bath for electroplating to obtain a composite die metal nickel plate; s4, preparing an optical anti-counterfeiting film: copying the micro-relief three-dimensional structure array B on the composite mold metal nickel plate obtained in the step S3 onto one side surface of a base material by adopting an imprinting method, curing, and forming a micro-relief three-dimensional structure array layer on one side surface of the base material to obtain an optical anti-counterfeiting film; s5, manufacturing a reflecting medium layer: and arranging a reflecting medium layer on the surface of the micro-relief three-dimensional structure array layer of the optical anti-counterfeiting film prepared in the step S4.

P36037

CN115616686 **JIANGNAN UNIVERSITY**
Priority Date: **22/08/2022**

PHOTONIC CRYSTAL FILM AND PREPARATION METHOD AND APPLICATION THEREOF



The invention discloses a preparation method and application of a photonic crystal self-supporting film, and belongs to the technical field of nano materials and functional polymer materials. The invention ingeniously utilizes the high refractive index of the polystyrene in the core of the polystyrene @ silicon dioxide photonic crystal and the solvent resistance of the shell silicon dioxide, and combines with the proper viscosity, wettability and volatilization rate of polymer solutions such as cellulose acetate and the like to successfully prepare various polymer photonic crystal films. The method is applicable to various polymer solutions, and can prepare complex patterns through injection printing, and the prepared photonic crystal film has excellent self-supporting property. The anti-counterfeiting pattern prepared by the method is bright in color and wide in coverage, and the application of the photonic crystal film in the fields of anti-counterfeiting, detection, intelligent windows, color-changing coatings and the like can be expanded.

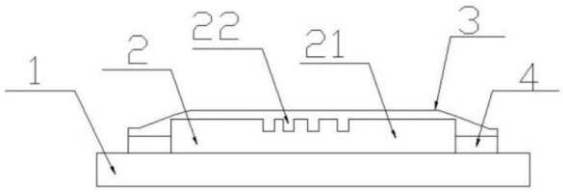
CLAIM 1. A photonic crystal film is characterized by being prepared by the following method: (1) Preparing polystyrene @ silicon dioxide core-shell nano particles by using small-size polystyrene nano particles, and growing polystyrene @ silicon dioxide photonic crystals on a substrate through vertical deposition; (2) And (2) coating a polymer solution on the photonic crystal film obtained in the step (1), evaporating the solvent, and preparing the photonic crystal film with self-supporting performance at room temperature.

P36046 **PRINTING – LABEL**

CN115586696 **DONGGUAN JIAYI INDUSTRY | LIJIA PACKAGING**
Priority Date: **28/09/2022**

ELECTRON BEAM INVISIBLE ANTI-COUNTERFEITING PRINTING LABEL AND MANUFACTURING METHOD THEREOF

The invention relates to the technical field of invisible anti-counterfeiting labels, in particular to an electron beam invisible anti-counterfeiting printing label and a manufacturing method thereof, which specifically comprise the following steps: s1: generating an anti-counterfeiting code electronic graph; s2: manufacturing a mask plate; s3: preparing a nano zinc oxide photonic crystal film concentrated solution; s4: and printing and packaging the electron beam invisible anti-counterfeiting printing label. According to the electron beam invisible anti-counterfeiting printing label, the nano zinc oxide photonic crystal film is adopted, so that the label can be hidden, a high-resolution microscopic pattern can be obtained by adopting a finer mask, the process difficulty is high, the imitation can be effectively avoided, and the anti-counterfeiting performance is ensured.



CLAIM 1. An electron beam invisible anti-counterfeiting printing label and a manufacturing method thereof are characterized in that: the method comprises the following steps: s1: generating an anti-counterfeiting code electronic graph; s2: manufacturing a mask plate; s3: preparing a nano zinc oxide photonic crystal film concentrated solution; s4: and printing and packaging the electron beam invisible anti-counterfeiting printing label.

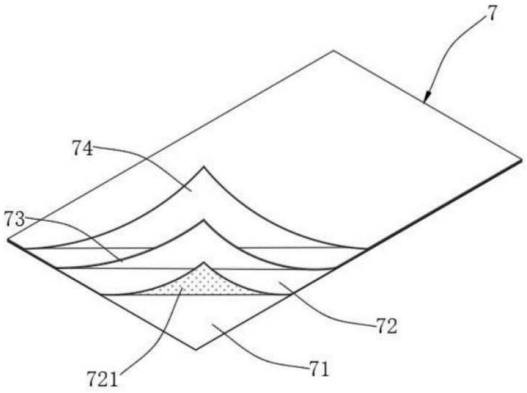
P36051 **LABEL**

CN115573195 **GUANGDONG GREEN COLOR TECHNOLOGY**

Priority Date: **24/10/2022**

ANTI-COUNTERFEITING 3D (THREE-DIMENSIONAL) DYNAMIC ORNAMENTATION PRODUCTION PROCESS

The invention discloses an anti-counterfeiting 3D three-dimensional dynamic pattern production process, which comprises the steps of compounding a surface layer material belt, a three-dimensional anti-counterfeiting layer material belt and a bottom paper material belt in a hot pressing mode, then passing the compounded material through a coating mechanism, coating glue on the bottom surface of the compounded material by the coating mechanism, finally adhering a release film material belt to the bottom of the material coated with the glue, covering the glue coated part on the bottom surface of the bottom paper material belt by the release film material belt, and then feeding the formed whole sheet into a die cutting device to cut the whole sheet material into individual labels so as to obtain a release film layer with the 3D three-dimensional dynamic pattern. According to the invention, through the transfer roller arranged on the coating mechanism, the glue on the surface of the transfer roller can be uniformly smeared by the scraper and then transferred to the bottom surface of the base paper material belt, so that the glue can be uniformly coated on the bottom surface of the base paper material belt, the waste of the glue is avoided, the glue consumption is reduced, and the production cost is reduced.



CLAIM 1. An anti-counterfeiting 3D three-dimensional dynamic texture production process is characterized by comprising the following steps: the method comprises the following steps:

s1, in a composite mechanism (1), carrying out hot-press composite on the end parts of a surface layer material belt (3), a three-dimensional anti-counterfeiting layer material belt (4) and a base paper material belt (5) from a pair of hot-press rollers (1151) to form an integral structure;

s2, passing the multilayer materials which are formed by hot-pressing and compounding the surface layer material belt (3), the three-dimensional anti-counterfeiting layer material belt (4) and the base paper material belt (5) through the coating mechanism (2), and clamping the materials between a transfer roller (232) and a press roller (233) to pass through;

s3, opening a conveying pump (22) in the coating mechanism (2), enabling the conveying pump (22) to extract the glue stored in the storage tank (21) and spray the glue into the adhering and coating structure (23) through a spray pipe (234), enabling the glue to be adhered to the surface of the transfer roller (232), enabling the roll to drive the transfer roller (232) to rotate along with the continuous movement of the rolled material after lamination, and enabling the glue adhered to the surface of the transfer roller (232) to be transferred to the bottom surface of the base paper material belt (5);

s4, the tail end of the uncovering film material belt (6) is attached to the lower portion of the base paper material belt (5) after bypassing the lower portion of the sticking structure (23), and the attaching position is located on the front side of the coating mechanism (2), so that the uncovering film material belt (6) is attached to the surface of the glue on the bottom surface of the base paper material belt (5) after the surface layer material belt (3), the three-dimensional anti-counterfeiting layer material belt (4) and the base paper material belt (5) are pressed by a hot-pressing roller (1151) and coated by the glue of the coating mechanism (2), and the glued part on the bottom surface of the base paper material belt (5) is covered by the uncovering film material belt (6);

s5, after the surface layer material belt (3), the three-dimensional anti-counterfeiting layer material belt (4) and the base paper material belt (5) are compounded and coated with glue and the uncovering film material belt (6) is attached to the bottom surface, a flaky overall structure formed by the surface layer material belt (3), the three-dimensional anti-counterfeiting layer material belt (4), the base paper material belt (5) and the uncovering film material belt (6) is discharged from the front side of the compounding mechanism (1), the formed flaky overall material can be cut into individual labels by introducing the flaky overall structure into die cutting equipment, so that the uncovering film layer (71) with the 3D three-dimensional dynamic ornamentation is obtained, and when the uncovering film layer (71) is used, the uncovering film layer (71) can be directly uncovered to enable a finished label (7) to be adhered to a required position;

the composite mechanism (1) comprises a base (11) and a plurality of mounting seats (12) fixed at the tail end of the top surface of the base (11), coiled materials of the surface layer material strip (3), the three-dimensional anti-counterfeiting layer material strip (4), the base paper material strip (5) and the uncovering film material strip (6) are respectively mounted on the mounting seats (12), and the tail ends of the surface layer material strip (3), the three-dimensional anti-counterfeiting layer material strip (4) and the base paper material strip (5) are concentrated at the head end of the composite mechanism (1) and are combined together after being overlapped;

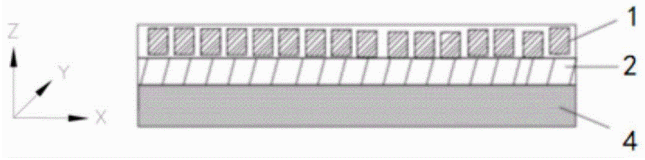
coating mechanism (2) sets up on combined mechanism (1), coating mechanism (2) is including holding vessel (21) that is used for storing glue, install delivery pump (22) at base (11) top surface and with pasting of base paper material area (5) cartridge scribble structure (23), it includes fixing base (231) to glue structure (23), transfer rod (232) of setting on fixing base (231), be located compression roller (233) that transfer rod (232) top and install spray tube (234) in fixing base (231), base paper material area (5) are passed from transferring between rod (232) and compression roller (233), a plurality of orifices have been seted up on the surface of spray tube (234), spray tube (234) are connected with the output of delivery pump (22) through the pipeline.

P36056 **BANKNOTE – MAGNETISM**

CN115527303 **BEIJING KESIYUAN TECHNOLOGY**
Priority Date: **19/08/2022**

MULTILAYER MAGNETIC SHEET ANTI-COUNTERFEITING STRUCTURE

The invention relates to a multilayer magnetic sheet anti-counterfeiting structure which at least comprises a substrate layer and at least two magnetic sheet layers in partial areas, wherein in an XYZ coordinate system, the substrate layer is parallel to an XY plane; the human eye sequentially comprises a first magnetic sheet layer and a second magnetic sheet layer from the opposite direction of the Z axis; the surface of the magnetic sheet of the first magnetic sheet layer is vertical to the XY plane and parallel to the ZX plane; the magnetic sheet surface of the second magnetic sheet layer is vertical to the ZX plane; the substrate layer is located the Z axle positive direction side of first magnet piece layer, or between first magnet piece layer and second magnet piece layer, or the Z axle negative direction side of second magnet piece layer. The invention can not only see different visual characteristics when observing in the same plane in the switching direction, but also see other visual characteristics when observing in the switching different planes, and also ensure that the magnetic sheets of the first magnetic sheet layer do not influence the display of the visual characteristics of other layers.

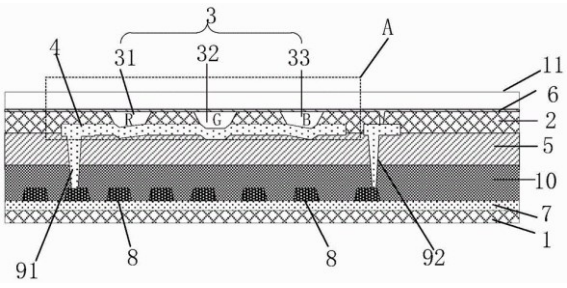


CLAIM 1. A multilayer magnetic sheet anti-counterfeiting structure is characterized by comprising a substrate layer and at least two magnetic sheet layers in at least partial areas, wherein in an XYZ coordinate system, the substrate layer is parallel to an XY plane; a first magnetic sheet layer and a second magnetic sheet layer are sequentially arranged along the opposite direction of the Z axis; the surface of the magnetic sheet of the first magnetic sheet layer is vertical to the XY plane and parallel to the ZX plane; the magnetic sheet surface of the second magnetic sheet layer is vertical to the ZX plane; the substrate layer is located the Z axle positive direction side of first magnet piece layer, or between first magnet piece layer and second magnet piece layer, or the Z axle negative direction side of second magnet piece layer.

P36060 **PRINTING – LABEL – RELIEF**

CN115513267 **BOE TECHNOLOGY GROUP**
Priority Date: **29/09/2022**

DISPLAY SUBSTRATE AND DISPLAY DEVICE



The invention relates to the technical field of display, and discloses a display substrate and a display device, wherein the display substrate comprises: the pixel definition layer is positioned on one side of the substrate base plate and is provided with a plurality of openings; and the organic light emitting structures are positioned at the openings, and at least one side of the organic light emitting structures, which faces the substrate, is provided with a first concave-convex structure. The pixel definition layer that sets up on substrate base plate one side, pixel definition layer has a plurality of openings that are used for holding a plurality of organic light emitting structure, and a plurality of organic light emitting structure are located a plurality of openings promptly, and at least some organic light emitting structure in a plurality of organic light emitting structure have first concave-convex structure towards one side of substrate base plate, and the first concave-convex structure of organic light emitting structure leads to luminous angle difference, increases the luminous angle of organic light emitting structure, for current fixed single two-dimensional image, increases anti-fake characteristic.

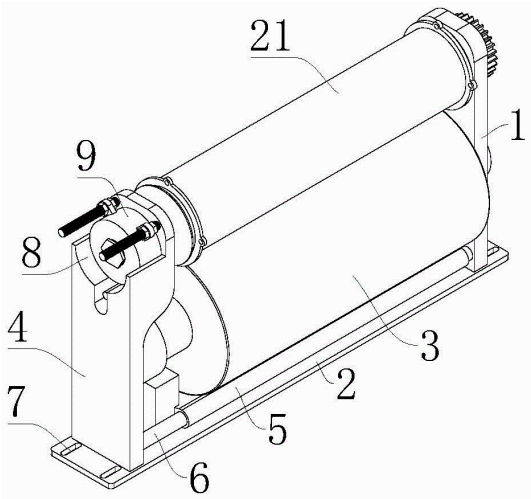
CLAIM 1. A display substrate, comprising: a substrate base plate, a first substrate, the pixel definition layer is positioned on one side of the substrate base plate and is provided with a plurality of openings; and the organic light-emitting structures are positioned at the openings, and at least one side, facing the substrate base plate, of at least part of the organic light-emitting structures is provided with a first concave-convex structure.

P36062 **PRINTING – BRAND PROTECTION**

CN115503336 **CHANGSHA YAGUAN NEW MATERIAL TECHNOLOGY**
Priority Date: **01/11/2022**

ANTI-COUNTERFEITING LASER DIRECT PLATING PAPER PRODUCTION EQUIPMENT

The invention provides anti-counterfeiting laser direct plating paper production equipment, which relates to the technical field of laser printing and comprises an underframe, wherein the top part of the underframe and the parts, close to the two ends, of the underframe are respectively and fixedly connected with a first support and a second support, the first support and the second support are arranged in parallel, and an auxiliary roller is movably connected between the first support and the second support; the side surface of the first support is movably connected with a second connecting shaft through a bearing, one end of the second connecting shaft is fixedly connected with a transmission gear, and the other end of the second connecting shaft is fixedly connected with a fixed end seat; the outer side of the second support is connected with a connecting disc in a sliding mode, a control mechanism is arranged between the connecting disc and the second support, one end of the connecting disc is movably connected with a first connecting shaft through a bearing, and one end of the first connecting shaft penetrates through the second support. Through the design of the slidable connecting disc controlled by the control mechanism, the first connecting shaft can move outwards along with the adjustment of the connecting disc, so that the laser roller can be quickly taken out, and the laser roller can be replaced.



CLAIM 1. The utility model provides a radium-shine paper production facility that directly plates of anti-fake, includes chassis (2), its characterized in that: a first support (1) and a second support (4) are fixedly connected to the top of the underframe (2) and close to the two ends of the underframe respectively, the first support (1) and the second support (4) are arranged in parallel, and an auxiliary roller (3) is movably connected between the first support (1) and the second support (4); the side surface of the first support (1) is movably connected with a second connecting shaft (18) through a bearing, one end of the second connecting shaft (18) is fixedly connected with a transmission gear (19), and the other end of the second connecting shaft is fixedly connected with a fixed end seat (17); a connecting disc (9) is connected to the outer side of the second support (4) in a sliding mode, a control mechanism is arranged between the connecting disc (9) and the second support (4), one end of the connecting disc (9) is movably connected with a first connecting shaft (15) through a bearing, and one end of the first connecting shaft (15) penetrates through the second support (4) and is fixedly connected with a movable end seat (16); a laser roller (20) is arranged between the movable end seat (16) and the fixed end seat (17), and a replaceable roller cylinder body (21) is fixedly connected to the outer side of the laser roller (20); the laser printing roller (20) comprises a first cylinder body (22) and a second cylinder body (26), wherein a first hole chamber (23) is formed in one end of the first cylinder body (22), a first connecting port (25) is formed in the other end of the first cylinder body, a second hole chamber (28) is formed in one end of the second cylinder body (26), a second connecting port is formed in the other end of the second cylinder body, an air guide cylinder body (30) is arranged between the second connecting port and the second hole chamber (28), and an air pumping/exhausting connecting port is formed in one end, located inside the second connecting port, of the air guide cylinder body (30); the first pore chamber (23) corresponds to the second pore chamber (28) and can form a closed chamber.

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

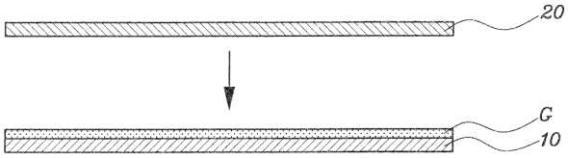
N9146

KR102486816 **YEOM, KYEONG SEOK**

Priority Date: **01/04/2022**

METHOD FOR PRODUCING DECORATIVE TRANSFER FILM

The present invention relates to a method for producing a transfer film, and more particularly, to a method for producing a transfer film, in which a hologram pattern formed on the hologram film is formed after bonding the hologram film to a surface of a polyethylene terephthalate (pet) film with a polyurethane (PU): Polyurethane film to prepare a transfer film, so that various colors can be displayed according to an angle, so that even when the elongation is pulled due to excellent elongation, a hologram pattern, i.e., The present invention relates to a method for preparing a decorative transfer film capable of enhancing a product and extending a lifetime of a product by maintaining the pattern of hologram fringes transferred to the polyurethane (PU) film as it is not damaged or broken, and a transfer film using the same, "An adhesive (g) is applied to a surface of a polyethylene terephthalate (pet) film (10) formed by a step of forming a polyethylene terephthalate (pet) film on which a silicone or fluorine coated release paper is formed, and a hologram film forming step capable of displaying various colors depending on the viewing angle; A bonding step of adhesively bonding the hologram film 20 formed by the hologram film forming step; a coating layer forming step of forming a coating layer 30 on the surface of the hologram film 20 by using a coating agent; and a hot melt 40 on the back surface of the polyethylene terephthalate (pet) film 10 formed by the bonding step; A transfer printing step of transferring a hologram pattern formed on the hologram film onto the coating layer formed by the coating layer forming step by using a hot-pressing apparatus so that a hologram pattern formed on the hologram film is transferred; a separation step of separating the hot-pressed coating layer by the transfer printing step; A laminated step of laminating a silicone protective film (50) on the surface of the separated coating layer (30), and a completion step of completing the laminated step, cutting the silicone protective film (50) along a predetermined shape or gland formed design, removing the silicone protective film (50) and then applying a UV coating to the surface of the coating layer (30) to complete, Wherein the coating layer (30) comprises polyurethane (PU: Forming a polyurethane (PU) film 300 by coating polyurethane resin to a thickness of 10 μm to 60 μm; The coating comprises 40 to 87% by weight of water and 5 to 10% by weight of either poly (acrylic ACID-CO-MALEIC ACID) sodium salt (poly) or poly (4-STYRENESULFONIC ACID-CO-MALEIC ACID) sodium salt (poly) or poly (4-STYRENESULFONIC ACID-CO-MALEIC ACID) sodium salt (poly) and 5 to 10% By weight of polyurethane resin with 5 to 30% by weight of polyurethane resin and 3 to 20% by weight of polyvinyl alcohol are coated, Said coating coated UV coating comprises 44 to 54% by weight of trimethylolpropane EO modified triacrylate, 17 to 27% by weight of 2-propenediyl 1,6-hexanediyl, 4 to 14% by weight of 2-hydroxy-2-methyl-1-phenyl-1-propanone, 1 to 10% by weight of benzophenone and 0.1 to 4% by weight of an aromatic light naphtha solvent, wherein the UV coating agent is coated with a UV coating agent comprising 1 to 10% by weight of benzophenone, Wherein the adhesive (g) is a urethane adhesive, the transfer printing step comprises applying heat to the coating layer (30) at a temperature between 50 and 200 °C., and a method for preparing a decorative transfer film comprising interdigitated release paper made of 75 μm to 150 μm thick, A method for manufacturing a decorative transfer film manufactured according to the present invention and a transfer film using the same are provided, in which a hologram film is bonded to a surface of a polyethylene terephthalate (pet) film, and then a hologram pattern formed on the hologram film is formed of polyurethane (PU: A transfer film is prepared by transferring the transfer film to a polyurethane film, so that various colors can be displayed depending on the angle, so that even when the elongation is pulled, the hologram pattern is a hologram pattern, i.e., the polyurethane (PU: The hologram pattern transferred to the polyurethane film remains intact without being damaged or broken, thereby exhibiting effects of enhancing the product and extending the lifetime of the product.



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

N9130

WO202302221 **VIVIDQ**

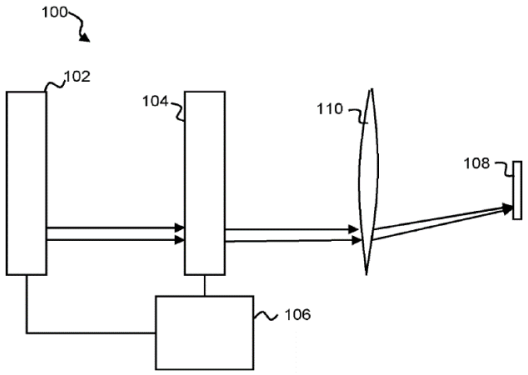
Priority Date: **23/07/2021**

HOLOGRAPHIC DISPLAYS AND METHODS

A method of generating a computer-generated hologram from a three-dimensional image comprising a plurality of two-dimensional image layers is provided. The method comprises generating hologram data for each layer of the image, and updating the hologram data of at least one layer of the image based on the hologram data of the other layers of the image.

DISPOSITIFS D'AFFICHAGE HOLOGRAPHIQUES ET PROCÉDÉS

L'invention concerne un procédé permettant de générer un hologramme généré par ordinateur à partir d'une image tridimensionnelle comprenant une pluralité de couches d'image bidimensionnelle. Le procédé consiste à générer des données d'hologramme pour chaque couche de l'image et à mettre à jour les données d'hologramme d'au moins une couche de l'image sur la base des données d'hologramme des autres couches de l'image.



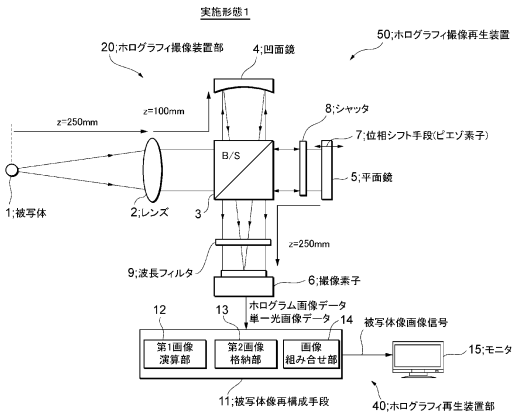
CLAIM 1. A method of generating a computer-generated hologram from a three- dimensional image comprising a plurality of two-dimensional image layers, the method comprising: generating hologram data for each layer of the image; and updating the hologram data of at least one layer of the image based on the hologram data of the other layers of the image.

N9149

JP2023007531 **JAPAN BROADCASTING**
Priority Date: **01/07/2021**

INCOHERENT DIGITAL HOLOGRAPHIC IMAGING DEVICE AND METHOD OF IMAGING

TOPIC: To provide an incoherent digital holographic imaging apparatus and an imaging method capable of easily and accurately forming an image of a new object of a desired image quality from a reconstructed image of the object obtained by using holographic technology. INVENTION: An imaging device including: a first imaging function unit that captures a hologram image by incoherent light from a subject 1 and forms a first image that is a reconstructed image of the subject 1; and a second imaging function unit that forms an image of a single luminous flux from the subject 1 and captures a second image that is an image of the subject 1; Provided is an image combining unit 14 configured to acquire position information of each portion of a subject 1 on the basis of a first image that is a reconstructed image of the subject 1 acquired by a first imaging function unit, cut out and position each portion of the second image corresponding to each portion of the first image acquired by a second imaging function unit on the basis of the acquired position information, and form a new first image.



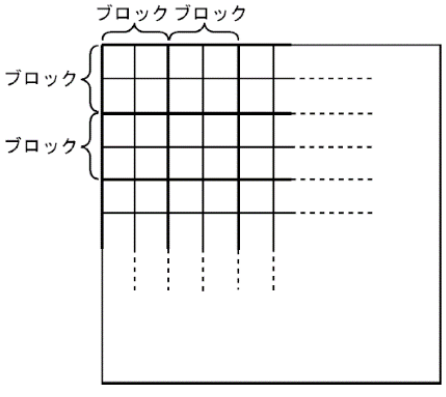
CLAIM 1. An imaging device comprising: a first imaging function unit configured to capture a hologram image formed by causing incoherent light from a subject split into two systems to interfere with each other and form a first image that is a reconstructed image of the subject; and a second imaging function unit configured to form an image of a single luminous flux from the subject and obtain a second image that is an image of the subject simultaneously or sequentially with the first image; An image combining unit configured to combine information included in the first image with information included in the second image to form a new image of the subject.

N9150

JP2023007262 **KDDI**
Priority Date: **01/07/2021**

COMPUTER COMPOSITE HOLOGRAM GENERATION APPARATUS, METHOD, AND PROGRAM

TOPIC: To provide an apparatus, a method, and a program capable of reducing the number of determinations for blocking each pixel in computer composite holography and generating the computer composite hologram at high speed. INVENTION: In a computer composite hologram generation apparatus 1 that generates a computer composite hologram by performing interference calculation between object light and reference light on a hologram surface, a 3 D point cloud acquisition unit 10 acquires a 3 D point cloud of the object. The representative point setting unit 201 sets a representative point for each virtually divided block of the hologram surface. The block-unit blocking determination unit 20 performs blocking determination on the representative point of each block for each point light source of the 3 D point cloud, and applies the result of the blocking determination to all the pixels in the block. Based on a result of the occlusion determination, the light wave propagation calculation unit 30 performs propagation calculation of the object light wave only for non-occluded pixels on the hologram surface.



CLAIM 1. A computer composite hologram generation apparatus configured to generate a computer composite hologram by performing interference calculation between object light and reference light on a hologram surface, the apparatus comprising: a 3 D point cloud acquisition unit configured to acquire a 3 D point cloud of an object; a representative point setting unit configured to set a representative point for each virtually divided block of the hologram surface; Block-by-block occlusion determination means for performing occlusion determination on a representative point of each block for each point light source of the 3 D point cloud and applying a result of the occlusion determination to all pixels in the block; A light wave propagation calculation unit configured to perform propagation calculation of an object light wave for a non-blocked pixel on a hologram surface based on a result of the blocking determination.

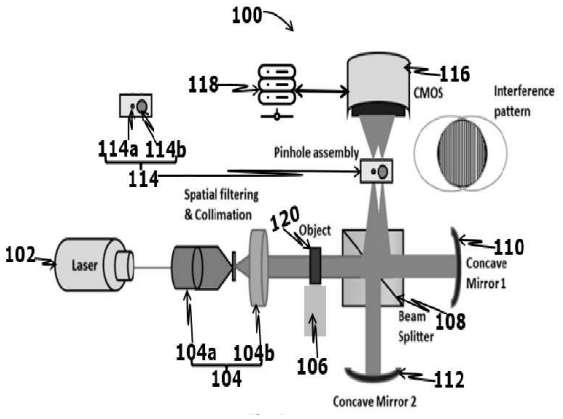
N9152

IN202311000321
Priority Date: **03/01/2023**

SHEORAN GYANENDRA | KUMARI VINEETA | BARAK NEELAM | SHARMA AJAY KUMAR

COMMON-PATH DIGITAL HOLOGRAPHIC CONFIGURATION FOR QUANTITATIVE IMAGING

The proposed optical system incorporates a paradigm of plurality of functional elements which are systemically and systematically arranged to generate digital holographic image to record the digital holograms for quantitative anaylsis. The proposed optical system comprises a laser to illuminate a test object. A collimating arrangement is configured in an optical path of the laser to transmit collimated light. A platform is arranged to receive the test object. A beam splitter is configured to split the object beam into a first split beam and a second split beam. A first and second concave mirror to reflect a focussed first split beam and second split beam, respectively with a small offaxis angle between the two focused beams. A pinhole assembly to generate a reference beam and divergent object beam. Additionally, a complementary metal oxide semiconductor (CMOS) camera is arranged to receive the reference beam and the divergent object beam. Furthermore, a processor is configured to generate the digital holographic image of the test object.



CLAIM 1. An optical system to record a digital hologram, the system comprising: a laser is arranged to illuminate a test object; a collimating arrangement arranged in an optical path of the laser, wherein the collimating arrangement is arranged to receive illuminate light from the laser and transmits collimated light and wherein the collimating arrangement comprises: a spatial filter; and a collimating lens; a platform arranged in an optical path of the collimated light, wherein the platform receives the test object and wherein the collimated light passing through the test object is transmitted as an object beam; a beam splitter arranged in an optical path of the object beam, wherein the beam splitter is configured to split the object beam into a first split beam and a second split beam; a first concave mirror arranged in front of the beam splitter substantially rectilinearly to the object beam, wherein the first concave mirror is configured to reflect a focussed first split beam; a second concave mirror arranged towards a first side of the beam splitter substantially orthogonally to the object beam, wherein the second concave mirror is configured to reflect a focussed second split beam; a pinhole assembly arranged towards a second side of the beam splitter opposite to the first side of the beam splitter and substantially orthogonally to the object beam, wherein the pinhole assembly comprises: a pinhole is arranged to receive the first focussed first split beam to spatially filter the received first focus split beam to generate a reference beam; and an opening is arranged to receive the second focussed split beam to transmit as a divergent object beam; a complementary metal oxide semiconductor (CMOS) camera is arranged to receive the reference beam and the divergent object beam; and a processor operably coupled with the CMOS camera, wherein the processor is configured to apply Fourier transformation to the received interference of the reference beam and the divergent object beam to generate the digital holographic image of the test object.

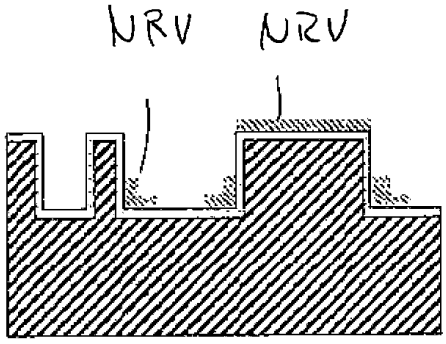
N9155

DE102021206850 **CARL ZEISS SMT**
Priority Date: **30/06/2021**

METHOD FOR PRODUCING A DIFFRACTIVE OPTICAL ELEMENT AND DIFFRACTIVE OPTICAL ELEMENT

In a method for producing a diffractive optical element (DOE), in particular a computer-generated hologram, for use in an interferometric measuring device for interferometrically measuring a shape of a surface of a test object, a substrate (SUB) for the diffractive optical element is provided and a diffractive structure (DIFF) is produced on a surface of the substrate, said structure having a plurality of raised ridges (ST) and depressions (VT) between the ridges. A removable cover layer (DKS) with a predetermined layer thickness is then produced on the diffractive structure (DIFF) by controlled coating of the diffractive structure with a removable cover layer material. After handling of the diffractive optical element provided with the cover layer, this is removed again before the intended use of the diffractive optical element, optionally together with impurities grown on the cover layer.

CLAIM 1. Method for producing a diffractive optical element (DOE), in particular a computer-generated hologram (CGH), for use in an interferometric measuring device (100) for interferometrically measuring a shape of a surface (112) of a test object (110), comprising the steps of: providing a substrate (SUB) for the diffractive optical element (DOE); generating a diffractive structure (DIFF) on a surface of the substrate, the diffractive structure having a plurality of raised ridges (ST) and depressions (VT) between the ridges; characterized by Producing a removable cover layer (DKS) with a predetermined layer thickness (SD) on the diffractive structure (DIFF) by controlled coating of the diffractive structure with a removable cover layer material.



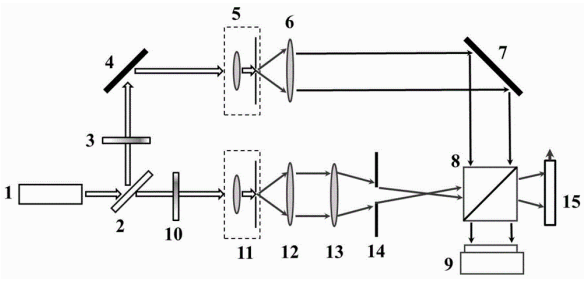
N9174

CN115598955 **JIANGNAN UNIVERSITY**
Priority Date: **11/10/2022**

DIGITAL HOLOGRAPHIC DEPTH RESOLUTION IMAGING DEVICE AND IMAGING METHOD

The invention discloses a digital holographic depth resolution imaging device and an imaging method, and belongs to the technical field of digital holographic three-dimensional imaging. The device and the method of the invention continuously change the wavefront curvature of the illumination light by translating the sample in one-dimensional direction in the reflection holographic optical path, and the holographic method is adopted to obtain the reflection light information when the sample is translated in the reflection holographic optical path, so that the imaging device and the image obtaining process are relatively simple, the complex amplitude information of the sample with high transmittance can be effectively separated according to the depth, the required calculation time is short, and the time required by reconstructing the three-dimensional image can be effectively shortened. The device has the advantages of simple structure, high calculation efficiency and improved imaging speed, and can be applied to the field of high-precision three-dimensional measurement.

CLAIM 1. A digital holographic depth-resolved imaging apparatus, characterized in that the digital holographic depth-resolved imaging apparatus comprises a laser (1), a beam splitter (2) is arranged along a laser beam direction of the laser (1), the beam splitter (2) splits the laser beam into a reflected beam and a transmitted beam; a first optical attenuation sheet (3), a first reflector (4), a first spatial filter (5), a first collimating lens (6), a second reflector (7), a beam splitter prism (8) and an imaging device (9) are sequentially arranged along the direction of the reflected light beam; a second optical attenuation sheet (10), a second spatial filter (11), a second collimating lens (12), a focusing lens (13), an aperture diaphragm (14), a beam splitter prism (8) and a translation platform (15) are sequentially arranged along the direction of the transmitted light beam; the first spatial filter (5), the first collimating lens (6), the second spatial filter (11), the second collimating lens (12), the focusing lens (13), the small aperture diaphragm (14) and the light splitting prism (8) are all perpendicular to the laser beam, and the centers of the two are kept on an optical axis.



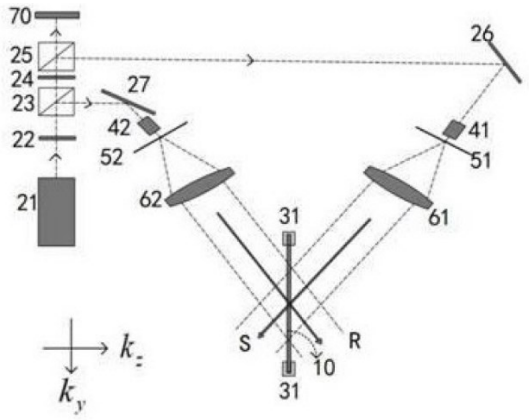
N9167

CN115639643 **SHENZHEN LOCHN OPTICS HI TECHNOLOGY**

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

VOLUME HOLOGRAPHIC GRATING AND EXPOSURE PARAMETER DETERMINATION METHOD, MANUFACTURING METHOD AND SYSTEM THEREOF

The invention provides a volume holographic grating and an exposure parameter determination method, a manufacturing method, a system, an optical waveguide and a display device thereof; the determining method comprises the steps of determining a first rotation angle of a vector triangle formed by a first vector, a second vector and a grating vector rotating around a rotation axis according to a total reflection critical angle, a target reflection angle when an exposure beam is totally reflected and transmitted in a volume holographic grating and a target direction angle of the exposure beam; and obtaining a first refraction angle of the first light beam transmitted to the photosensitive material and a second refraction angle of the second light beam transmitted to the photosensitive material according to the first rotation angle, the target reflection angle and the target direction angle. The light beams are controlled through the obtained rotation angle and refraction angle to expose the photosensitive material, so that the exposure light beams are refracted into the photosensitive material to expose under a non-total reflection condition, a coupling prism is not needed in the exposure process, the defect of a double-beam interference exposure body holographic grating based on the coupling prism is avoided, and the complexity, the manufacturing difficulty and the cost of a manufacturing system are reduced.



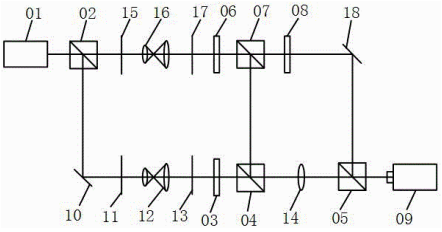
CLAIM 1. A method for determining exposure parameters of a volume holographic grating, wherein the volume holographic grating is a reflective volume holographic grating and is prepared by exposing a photosensitive material with an exposure beam, wherein the exposure beam comprises a first beam and a second beam which can interfere with each other, and the method comprises the following steps: acquiring a target reflection angle of the exposure light beam when the exposure light beam is totally reflected and propagated in the volume holographic grating, a target direction angle of the exposure light beam and a total reflection critical angle of the photosensitive material; obtaining a grating vector according to a first vector corresponding to the target reflection angle and a second vector corresponding to the target direction angle; determining a first rotation angle of a vector triangle formed by the first vector, the second vector and the grating vector rotating around a rotation axis according to the critical angle of total reflection, the target reflection angle and the target direction angle, wherein the rotation axis is a straight line which passes through the intersection point of the first vector and the second vector and is parallel to the grating vector; according to the first rotation angle, the target reflection angle and the target direction angle, obtaining a first refraction angle of the first light beam transmitted to the photosensitive material and a second refraction angle of the second light beam transmitted to the photosensitive material, wherein the first refraction angle and the second refraction angle are respectively angles of a first vector and a second vector after rotation and a corresponding normal of the surface of the holographic photosensitive material, and the first refraction angle and the second refraction angle are both smaller than the critical angle of total reflection; determining the first rotation angle, the first refraction angle, and the second refraction angle as the exposure parameters.

N9177

CN115585752 **XI AN CHENGLI AVIATION MANUFACTURING**

Priority Date: **29/11/2022**

DETECTION SYSTEM AND METHOD FOR THREE-DIMENSIONAL QUANTITATIVE DIGITAL HOLOGRAPHIC IMAGING



The invention provides a detection system and a method for three-dimensional quantitative digital holographic imaging, wherein in the detection system, after a laser emits detection laser, a first polarization beam splitter prism divides the detection laser into first polarized light and second polarized light, and the first polarized light is transmitted on a first light path; the second polarized light propagates on a second optical path; three polarized lights with different wavelengths are transmitted from the first light path and the second light path, are mutually overlapped and offset in a third polarization beam splitter prism, and are shot by an image acquisition module to obtain a three-dimensional quantitative digital hologram; in the detection system, three polarized lights with different wavelengths are superposed and offset, so that the three-dimensional quantitative digital hologram of the object to be detected can be accurately obtained, and the detection precision of the detection system can reach the micron level.

CLAIM 1. A detection system for three-dimensional quantitative digital holographic imaging, the detection system comprising: a laser; the laser is used for emitting detection laser; the first polarization beam splitter prism is positioned on one side of the laser; the first polarization beam splitter prism is used for splitting the detection laser into first polarized light and second polarized light; the first polarized light propagates on a first optical path; the second polarized light propagates on a second optical path; the first light path comprises an object to be detected, a second polarization beam splitter prism and a third polarization beam splitter prism; the second optical path comprises a first half-wave plate, a polarization beam splitter and a second half-wave plate; the first half-wave plate is used for processing the second polarized light and obtaining third polarized light; the polarization beam splitter is used for splitting the third polarized light into fourth polarized light and fifth polarized light; the second half-wave plate is used for processing the fifth polarized light and obtaining sixth polarized light; the second polarization beam splitter prism is used for processing the first polarized light penetrating through the object to be detected and processing the fourth polarized light; wherein the wavelengths of the first polarized light, the fourth polarized light and the sixth polarized light are different from each other; the third polarization beam splitter prism is used for mutually superposing and offsetting the first polarized light, the fourth polarized light and the sixth polarized light, and shooting the three-dimensional quantitative digital hologram through the image acquisition module to obtain the three-dimensional quantitative digital hologram.

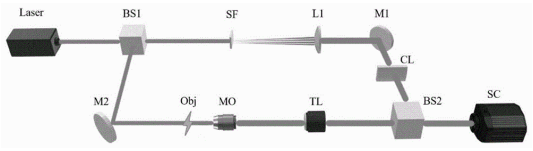
N9180

CN115561983 **SHANDONG NORMAL UNIVERSITY**

Priority Date: **17/10/2022**

ULTRAFAST COMPRESSION HOLOGRAPHIC IMAGING SYSTEM AND METHOD BASED ON STRIPE CAMERA

The invention discloses an ultrafast compression holographic imaging system and method based on a stripe camera, and relates to the technical field of holographic imaging. The method comprises the following steps: the device comprises a laser emission unit, an object light optical path unit, a reference light optical path unit and a hologram compression unit; the laser emission unit divides the emitted laser into two paths, one path is used as object light to enter the object light optical path unit, the other path is used as reference light to enter the reference optical path unit, the reference light optical path unit codes the reference light, the coded reference light and the object light output by the object light optical path unit at different moments are respectively coherent to form a sequence hologram, and the hologram forms a compressed hologram after passing through the hologram compression unit. And finally, restoring the complex amplitude distribution of the object light at different moments by using a compressed sensing-based restoration algorithm. The imaging speed of the system can reach dozens of trillion frames per second, hundreds of holographic images can be recorded once, and a new technical means is provided for real-time observation and research of various transient processes in physics, chemistry and biology.



CLAIM 1. An ultrafast compression holographic imaging system based on a streak camera, comprising: the device comprises a laser emission unit, an object light optical path unit, a reference light optical path unit and a hologram compression unit; the laser emission unit divides the emitted laser into two paths, one path is used as object light to enter the object light path unit, the other path is used as reference light to enter the reference light path unit, the reference light path unit encodes the reference light, the sequence holograms are respectively interfered with the object light at different moments output by the object light path unit to form sequence holograms, and the sequence holograms are compressed by the hologram compression unit to obtain compressed holograms.

Click on the title to return to table of contents

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

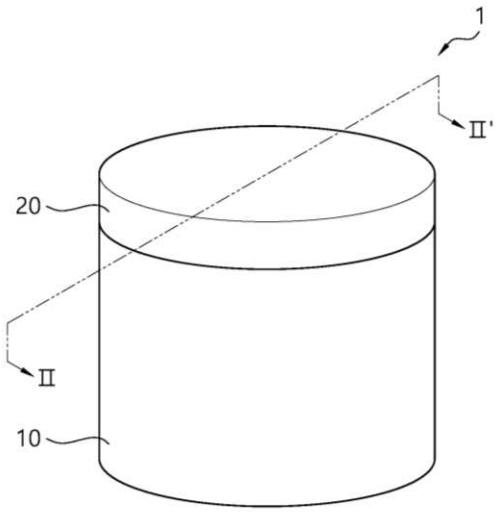
N9142

KR20230008418 **KOREA SECURITY PRINTING & MINTING**

Priority Date: **07/07/2021**

IMPRESSION MOLD FOR FORMING IMPRESSION PRODUCT AND METHOD OF MANUFACTURING THE SAME

The present invention relates to a printing mold for forming a printing product and a method of manufacturing the same. The imprinted product includes: a mold body; and a coating layer disposed on the mold body and having a transfer pattern formed thereon, wherein the coating layer includes a metal nitride.



CLAIM 1. A press mold for forming a press product, comprising: a mold body; and a coating layer located on the mold body and having a transfer pattern formed thereon, wherein the coating layer comprises a metal nitride.

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

N9123

WO2023287015 **LG CHEM**

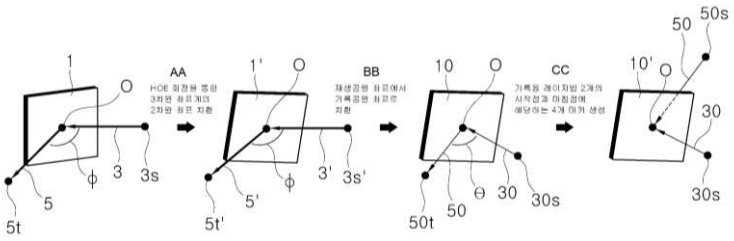
Priority Date: **15/07/2021**

HOLOGRAPHIC INTERFERENCE PATTERN RECORDING APPARATUS AND RECORDING METHOD USING SAME

The present invention relates to a holographic interference pattern recording apparatus and a recording method using same. Particularly, the present invention relates to a holographic interference pattern recording apparatus and a recording method using same, which simplifies a process of aligning a light source and a photosensitive material in order to record a holographic interference pattern in a three-dimensional coordinate system and then realigning the light source and the photosensitive material in order to record another holographic interference pattern.

APPAREIL D'ENREGISTREMENT DE MOTIF D'INTERFÉRENCE HOLOGRAPHIQUE ET PROCÉDÉ D'ENREGISTREMENT L'UTILISANT

La présente invention concerne un appareil d'enregistrement de motif d'interférence holographique et un procédé d'enregistrement l'utilisant. En particulier, la présente invention concerne un appareil d'enregistrement de motif d'interférence holographique et un procédé d'enregistrement l'utilisant qui simplifient un processus d'alignement d'une source de lumière et d'un matériau photosensible afin d'enregistrer un motif d'interférence holographique dans un système de coordonnées tridimensionnelles, puis de réalignement de la source de lumière et du matériau photosensible afin d'enregistrer un autre motif d'interférence holographique.



AA ... Substitution of three-dimensional coordinate system into two-dimensional coordinates through HOE rotation
BB ... Substitution of reproduction light source coordinates into recording light source coordinates
CC ... Generation of four markers corresponding to two starting points and two end points of recording laser beam

CLAIM 1. Irradiating the photosensitive material sample on which the first holographic interference pattern is recorded with reproduction light at a predetermined position to identify an optical path formed by a path of reproduction light and a path of diffraction light; Rotating the photosensitive material sample to place the optical path in a two-dimensional coordinate system; Deriving a path of reference light and a path of object light so as to be able to record a second holographic interference pattern in which the same optical path as the optical path arranged in the two-dimensional coordinate system is implemented; and And recording the second holographic interference pattern by irradiating the second holographic interference pattern with reference light and object light at predetermined positions of the path of the reference light and the path of the object light, respectively.

N9129

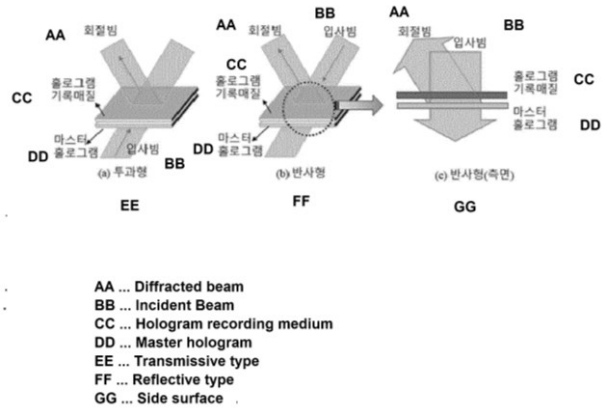
WO202303091 **HOLOLAB**
Priority Date: **23/07/2021**

METHOD FOR DUPLICATING LARGE-AREA COLOR HOLOGRAM

The present invention relates to a system for duplicating a large-area color hologram, comprising: a light source unit including a laser, a lens, a mirror and an optical shutter so as to form a reference beam and a duplicated beam; a beam relay unit including a mirror, a structure and adjuncts; a recording medium movement unit including a hologram recording medium, an xy-axis movement stage and adjuncts; a master movement unit including a master hologram and a z-axis movement stage; and a control unit for controlling the xy-axis movement stage, the z-axis movement stage and the optical shutter. In addition, the present invention relates to a method for duplicating a large-area color hologram, comprising the steps of: raising an HM to be in close contact with (1,1); exposing a duplicated beam to the hologram recording medium (1,1) and duplicating same; lowering a master hologram to be separated from the hologram recording medium (1,1); moving a glass plate so that a hologram recording medium (1,2) is moved to a duplicate position; and raising the master hologram so that same is in close contact with the hologram recording medium (1,2). The present invention uses the z-axis movement stage so as to dispose the master hologram so that the hologram recording mediums and the master hologram are in close contact with each other, thereby enabling the execution of correct duplication, horizontally disposes the master hologram and the hologram recording mediums and allows a duplicated beam (or reference beam) to be incident from the top to the bottom, thereby quickly reducing rotational vibration and other vibration in the section caused by gravity, and performs small-area duplication MxN times by using a tiling technique while horizontally moving the hologram recording medium by means of xy-axis stages, and thus has the remarkable effect of enabling large-area duplication to be completed.

PROCÉDÉ DE DUPLICATION D'HOLOGRAMME EN COULEUR DE GRANDE SURFACE

La présente invention concerne un système de duplication d'hologramme en couleur de grande surface qui comprend : une unité de source de lumière comprenant un laser, une lentille, un miroir et un obturateur optique de façon à former un faisceau de référence et un faisceau dupliqué ; une unité de relais de faisceau comprenant un miroir, une structure et des auxiliaires ; une unité de déplacement de support d'enregistrement comprenant un support d'enregistrement d'hologramme, une platine de déplacement d'axes xy et des auxiliaires ; une unité de déplacement maître comprenant un hologramme maître et une platine de déplacement d'axe z ; et une unité de commande servant à commander la platine de déplacement d'axes xy, la platine de déplacement d'axe z et l'obturateur optique. De plus, la présente invention concerne un procédé de duplication d'hologramme en couleur de grande surface qui comprend les étapes consistant à : élever un HM pour qu'il soit en contact étroit avec (1,1) ; exposer un faisceau dupliqué au support d'enregistrement d'hologramme (1,1) et le dupliquer ; abaisser un hologramme maître pour le séparer du support d'enregistrement d'hologramme (1,1) ; déplacer une plaque de verre de façon à ce qu'un support d'enregistrement d'hologramme (1,2) soit déplacé vers une position dupliquée ; et élever l'hologramme maître de façon à ce qu'il soit en contact étroit avec le support d'enregistrement d'hologramme (1,2). La présente invention utilise la platine de déplacement d'axe z pour positionner l'hologramme maître de façon à ce que les supports d'enregistrement d'hologramme et l'hologramme maître soient en contact étroit les uns avec les autres, ce qui permet l'exécution d'une duplication adéquate, elle dispose l'hologramme maître et les supports d'enregistrement d'hologramme de façon horizontale et permet qu'un faisceau dupliqué (ou un faisceau de référence) soit incident de haut en bas, ce qui permet de réduire rapidement les vibrations de rotation et autres vibrations dans la section provoquées par la gravité, et elle effectue une duplication de petite surface M x N fois en utilisant une technique de pavage tout en déplaçant horizontalement le support d'enregistrement d'hologramme au moyen des platines d'axe xy, et elle a ainsi pour effet remarquable de permettre la réalisation d'une duplication de grande surface.



CLAIM 1. A light source unit (20) comprising a laser (21), a lens (4), a mirror (1), and an optical shutter (24) to form a reference beam and a replica beam; A display device comprising: a beam relay unit (10) including a mirror (1); A hologram recording apparatus comprising: a hologram recording medium 3; a recording medium moving unit 50 composed of an xyaxis moving stage; A master moving unit (40) including a master hologram (41) and a z-axis moving stage (52); And a control unit for controlling an xyaxis movement stage 51, a zaxis movement stage 52, and an optical shutter.

N9143

KR20230006301 **LG CHEM**
Priority Date: **02/07/2021**

PHOTOPOLYMER COMPOSITION

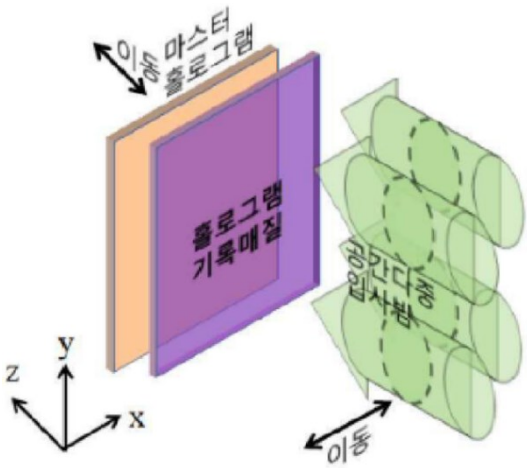
Provided are a photopolymer composition for hologram formation, including: a polymer matrix or a precursor thereof; a photoreactive monomer; a photoinitiator; and a compound having a predetermined structure; a hologram recording medium, an optical device, and a holographic recording method using the same.

CLAIM 1. A photopolymer composition for hologram formation, comprising: a polymer matrix or a precursor thereof; a photoreactive monomer; a photoinitiator; and a compound of formula (1): Wherein, in formula (1), R1 And R2May be the same as or different from each other and each is perfluoro-alkylene having 1 to 5 carbon atoms, n and m are integers of 1 to 10, and R.3 And R4May be the same as or different from each other and each is perfluoro-alkylene having 1 to 5 carbon atoms, X.1 And x2May 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 represented by the following general formula (2), and X.1 And x2 Is a functional group of Formula 2 Wherein in formula (2), y1Is a linear or branched alkylene group having 1 to 10 carbon atoms, and Y.2Is a linear or branched alkyl group having 1 to 20 carbon atoms, a linear or branched alkyl group having 1 to 10 carbon atoms to which alkoxy groups having 1 to 10 carbon atoms are bonded, or a linear or branched alkyl group having 2 to 10 carbon atoms and having 1 or more oxygen bonded thereto.

N9144

KR20230001821 **HOLOLAB**
Priority Date: **29/06/2021**

HOLOGRAM CLOSE REPLICATION METHOD AND SYSTEM



The present invention relates to a hologram close replication system, comprising: a light source unit spatially arranging a plurality of parallel beams to form spatially multiplexed incident beams; a mirror moving unit including a mirror, a motor-driven moving stage, and an accessory; a hologram recording medium, A coating body moving unit including a motor-driven moving stage; and a radiation body moving unit including a master hologram, a motor-driven moving stage, and an accessory, so that the entire replication region can be uniformly replicated by only a one-dimensional linear scan. The present invention relates to a hologram close replication method, comprising the steps of: connecting a computer and a stage by a Stage Connect key input; connecting a shutter and a computer by selecting Shutter COM Port and Baud Ratewhen XY and Z Connected are displayed; Moving each stage to initial coordinates by Origin Move and Z Home key input; performing a Z Start Point, experimental variables of each stage speed; Sending each stage to an experimental position by a Setup Positionkey input; inputting the number of times and proceeding the experiment by a Times Multiple Scanningkey input, According to the present invention, an incident beam is scanned one-dimensionally by keeping a gap between a master hologram and a recording medium on the basis of mirror movement so that friction caused by contact is prevented from occurring while at the same time being close to coalescence, thereby making it possible to replicate a large-area hologram and to uniformly replicate an entire replicated area.

CLAIM 1. A display apparatus comprising: a light source unit spatially arranging a plurality of parallel beams to form spatially multiplexed incident beams; a mirror moving unit including a mirror, a motor-driven moving stage, and an accessory; a cladding body moving unit including a hologram recording medium, a motor-driven moving stage; And a radiator moving unit including a master hologram, a motor-driven moving stage, and an accessory, and capable of uniformly replicating the entire replicating area by only a one-dimensional linear scan.

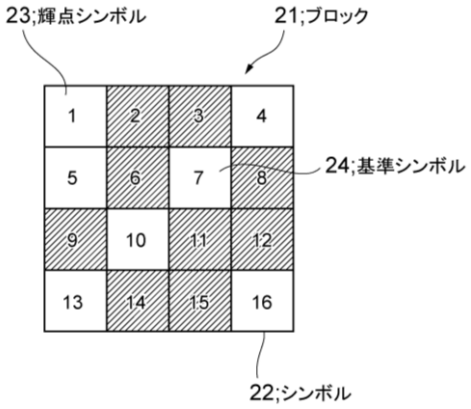
N9151

JP2022189643 **JAPAN BROADCASTING**
Priority Date: **11/06/2021**

MODULATION CODE CREATION METHOD AND HOLOGRAM RECORDING/REPRODUCTION DEVICE

TOPIC: To provide a modulation code creation method and a hologram recording/reproduction device for creating an efficient modulation code for amplitude/phase multi-level recording, the modulation code being capable of favorably suppressing inter-code interference while reducing a bright spot area ratio and increasing coding efficiency. INVENTION: a modulation code creation method for forming a block 21 by grouping a plurality of symbols 22 adjacent to each other, the plurality of symbols 22 being configured as image elements of page data based on an input signal, the plurality of symbols 22 being recorded on a hologram recording medium and having at least binary gray scales, the method comprising: A block 21 is formed of 16 symbols 22 arranged four in the vertical direction and four in the horizontal direction, each symbol 22 being assigned a complex amplitude value, and the number of bright spot symbols 23 out of the 16 symbols 22 is determined for each block 21 on the basis of an equation with coding efficiency and bright spot area ratio as factors.

CLAIM 1. A method of creating a modulation code configured as image elements of page data based on an input signal to be recorded on a hologram recording medium for information recording, the modulation code forming blocks by grouping a plurality of symbols adjacent to each other, the plurality of symbols having at least binary gray scales, the method comprising: dividing the blocks into a plurality of symbols including four symbols in a vertical direction, The modulation code creation method comprising: forming the plurality of 16 symbols arranged in the horizontal direction, each of the 16 symbols having a complex amplitude value, and determining, for each of the blocks, the number of symbols serving as bright spots among the 16 symbols, based on bit bright spot speed efficiency E obtained based on Equation (A) below: Where a is the number of bright spot symbols, b is the number of bits, p is the total number of symbols (=16), (b/p) is the coding efficiency, and (a/p) is the bright spot area ratio.

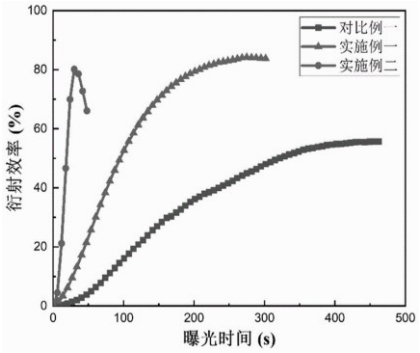


N9173

CN115602201 **FUJIAN NORMAL UNIVERSITY**
Priority Date: **28/10/2022**

PHOTOPOLYMER HOLOGRAPHIC STORAGE MATERIAL, HOLOGRAPHIC OPTICAL DISK AND PREPARATION METHOD THEREOF

The invention belongs to the technical field of holographic polymer materials, and particularly relates to a photopolymer holographic storage material, a holographic optical disk and a preparation method thereof. The photopolymer holographic storage material is prepared from the following raw materials in percentage by mass: MMA: NMP: AIBN: PQ =100:5 to 25:0.7 to 1:1 to 1.5. The photopolymer holographic storage material is prepared by doping NMP (N-methyl pyrrolidone) in PQ/PMMA (phenanthrenequinone/polymethyl methacrylate) to improve the optical performance of the material obviously.



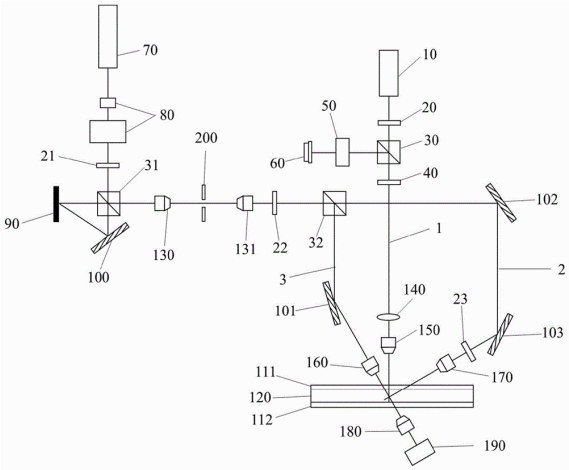
CLAIM 1. The photopolymer holographic storage material is characterized by being prepared from the following raw materials in percentage by mass: MMA:NMP:AIBN:PQ=100:5~25:0.7~1:1~1.5.

N9169

CN115631774 **GUANGDONG ZIJING INFORMATION STORAGE TECHNOLOGY**
Priority Date: **27/09/2022**

INDEPENDENTLY CALIBRATED HOLOGRAPHIC STORAGE OPTICAL PATH SYSTEM

The invention relates to the field of holographic storage, and discloses an independently calibrated holographic storage light path system. The system includes a signal optical path, a reference optical path, a reproduction optical path, a servo optical path, and a storage medium; the storage medium comprises a recording layer and an address layer, wherein a plurality of calibration holographic bit marks and data holographic bit marks are arranged on a light path of the address layer; the signal light path and the reference light path both comprise relay lens groups, and the relay lens groups are used for adjusting the irradiation angles and positions of the signal light and the reference light; the servo light path is independent of the signal light path and the reference light path and is used for identifying the calibration holographic bit mark and the data holographic bit mark; the servo light path includes a collimating lens for adjusting the position of the servo light impinging on the storage medium and a photodetector for receiving and analyzing the servo light reflected back from the address layer of the storage medium. The method is used for solving the problem of how to calibrate and optimize the relative positions of the reference light and the servo light when the holographic storage light path system is reproduced.



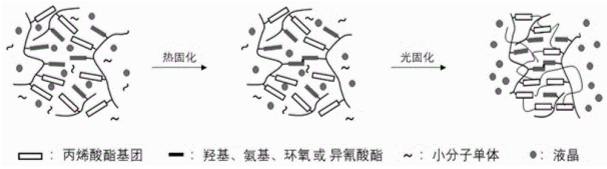
CLAIM 1. An independently calibrated holographic storage optical path system comprises a signal optical path, a reference optical path, a reproduction optical path, a servo optical path and a storage medium; the signal light path and the reference light path respectively generate signal light and reference light, the signal light and the reference light respectively irradiate the storage medium at a certain angle, and the interference exposure is carried out to generate a hologram; the reproduction light path is used for converting the reproduction signal light diffracted by the reference light into a data page image and collecting the data page image; the storage medium comprises a recording layer and an address layer, wherein the recording layer is used for storing the hologram, and the address layer consists of a plurality of light paths; it is characterized in that the preparation method is characterized in that, a plurality of calibration holographic bit marks and data holographic bit marks are arranged on the light path; the calibration holographic bit mark is used for positioning and recording the calibrated hologram; the data holographic bit mark is used for positioning a hologram for recording data; the signal light path and the reference light path both comprise relay lens groups, and the relay lens groups are used for adjusting the irradiation angles and positions of the signal light and the reference light; the servo light path is independent of the signal light path and the reference light path and is used for identifying the calibration holographic bit mark and the data holographic bit mark; the servo optical path includes a servo laser for generating servo light, a collimating lens for adjusting an irradiation position of the servo light on the storage medium, and a photodetector for receiving and analyzing the servo light reflected from the address layer of the storage medium.

N9175

CN115595001 **HANGZHOU GUANGLI TECHNOLOGY**
Priority Date: **09/09/2022**

PHOTOSENSITIVE POLYMER COMPOSITION, PREPARATION METHOD THEREOF AND HOLOGRAPHIC DIFFRACTION GRATING ELEMENT

The invention provides a photosensitive polymer composition, a preparation method thereof and a holographic diffraction grating element, wherein the composition comprises the following components in percentage by mass: 5 to 30 percent of light-cured monomer, 5 to 30 percent of dual-cured monomer, 0.1 to 5 percent of photoinitiator, 0.5 to 5 percent of coinitiator, 20 to 50 percent of liquid crystal, 10 to 50 percent of solvent and 0.1 to 5 percent of additive; the dual curing monomer comprises an acrylate monomer containing a hydroxyl group, an amino group or an epoxy group; and an isocyanate-containing acrylate monomer. According to the invention, the flexible HPDLC can be obtained by adopting a dual-curing monomer and performing thermal curing before photocuring; while not affecting subsequent photocurability. The preparation method of the composition has simple process, is beneficial to mass production and processing, and has the advantages of low cost, light weight, good controllability, good liquid crystal stability, difficult agglomeration and the like.



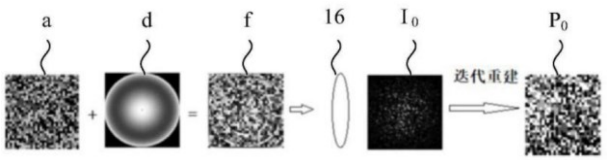
CLAIM 1. A photopolymer composition comprises the following components in parts by mass: 5 to 30 percent of light-cured monomer, 5 to 30 percent of dual-cured monomer, 0.1 to 5 percent of photoinitiator, 0.5 to 5 percent of coinitiator, 20 to 50 percent of liquid crystal, 10 to 50 percent of solvent and 0.1 to 5 percent of additive; the dual curing monomer comprises an acrylate monomer containing a hydroxyl group, an amino group or an epoxy group; and an isocyanate-containing acrylate monomer.

N9184

CN115512726 **FUJIAN NORMAL UNIVERSITY**
Priority Date: **19/09/2022**

ABERRATION COMPENSATION METHOD AND APPARATUS

The invention discloses an aberration compensation method and device, wherein the method comprises the following steps: s1, compensating and superposing a conjugate wave front aberration phase on an initial input phase to obtain a precompensation phase; s2, superposing the pre-compensated phase by the wavefront aberration phase distortion of the optical element to obtain a compensated phase, and carrying out Fourier transform on the compensated phase to obtain the Fourier surface intensity after aberration compensation; after aberration compensation, the Fourier surface intensity information has low error rate and good reconstruction effect; the method is a numerical compensation method, and optical components do not need to be additionally arranged; therefore, the using number of optical elements in the optical system is reduced, the complexity of the optical system is reduced, good technical support is provided for aberration compensation in the field of holographic storage, and the optical system has good application prospect in the field of holographic data storage research; can be applied to the fields of holographic storage, biomedical image processing, digital holographic microscopic imaging and the like.



CLAIM 1. An aberration compensation method, comprising the steps of: s1, compensating and superposing a conjugate wave front aberration phase on an initial input phase to obtain a precompensation phase; and S2, superposing the pre-compensated phase by the wavefront aberration phase distortion of the optical element to obtain a compensated phase, and carrying out Fourier transform on the compensated phase to obtain the Fourier surface intensity after aberration compensation.

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

N9124

WO2023285619 **CARL ZEISS JENA**

Priority Date: **15/07/2021**

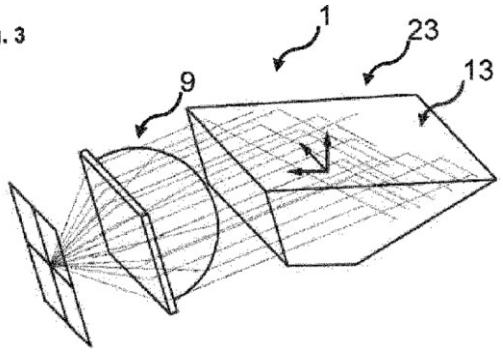
HOLOGRAPHIC LIGHTING DEVICE

The invention relates to a lighting device (1) for a vehicle (3) having at least one lighting channel (26) for generating a holographic light function assigned to this lighting channel (26) by lighting a holographic structure (15) of the lighting channel (26). Each channel has a lighting assembly and a coupling-in surface of a light guide body (23) disposed along a main beam direction of the lighting assembly. The lighting device also comprises a holographic structure (15) disposed on the coupling-out surface (13) of the light guide body (23). The coupling-out surface (13) is disposed in a beam path of the coupled-in light beams, so that lighting of the coupling-out surface (15) takes place at an angle which is greater than a critical angle of the total reflection. The invention also relates to a corresponding rear light for a vehicle (3) and to the vehicle (3) per se.

DISPOSITIF D'ÉCLAIRAGE HOLOGRAPHIQUE

L'invention concerne un dispositif d'éclairage (1) pour un véhicule (3) comportant au moins un canal d'éclairage (26) destiné à générer une fonction de lumière holographique attribuée à ce canal d'éclairage (26) par éclairage d'une structure holographique (15) du canal d'éclairage (26). Chaque canal comporte un ensemble d'éclairage et une surface de couplage d'entrée d'un corps de guide de lumière (23) disposé dans une direction de faisceau principal de l'ensemble d'éclairage. Le dispositif d'éclairage comprend également une structure holographique (15) disposée sur la surface de couplage de sortie (13) du corps du guide de lumière (23). La surface de couplage de sortie (13) est disposée sur un trajet de faisceau des faisceaux lumineux de couplage d'entrée, de sorte que l'éclairage de la surface de couplage de sortie (15) se fait selon un angle qui est supérieur à un angle critique de la réflexion totale. L'invention concerne également un feu arrière correspondant pour un véhicule (3) et le véhicule (3) lui-même.

Fig. 3



CLAIM 1. Illumination device (1) for a vehicle having at least one illumination channel (26) for generating a holographic illumination function assigned to this illumination channel (26) by illuminating a holographic structure (15) of the illumination channel (26), comprising: an illumination arrangement of the illumination channel (26) for generating an illumination light, a light guide body (23) with a coupling-in surface (11) arranged along a radiation main direction of the illumination arrangement, a coupling-out surface (13) of the light-guiding body (23) on which the holographic structure (15) is present in an arranged manner, wherein the coupling-out surface (13) is arranged in a beam path (21) of light beams of the illumination light coupled into the light-guiding body (23) for illumination of the coupling-out surface (13) at an angle (19) greater than a critical angle of total reflection.

N9127

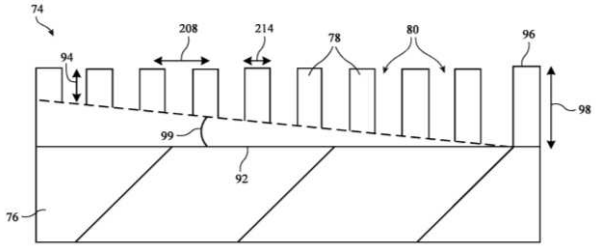
WO202303854 **RANKOR INDUSTRIAL**
Priority Date: **23/07/2021**

OPTICAL SYSTEMS WITH HOLOGRAPHIC GRATINGS

An electronic device may have a display system. The display system may include a waveguide, an input coupler, and a surface relief grating (SRG) structure. The SRG structure may be formed from a high-index material that includes titanium dioxide nanoparticles. To increase the refractive index of the high-index material, the ratio of the size of the nanoparticle core to the size of the capping layer may be increased. The high-index material may also include nanoparticles of different sizes to increase the packing density of the nanoparticles. The SRG structure may be depth modulated in a lateral direction to maximize efficiency. The SRG structure may include slanted ridges covered by an encapsulant. The SRG structure may include a blazed grating with ridges that are covered by a coating and encapsulated by an encapsulant.

SYSTÈMES OPTIQUES À RÉSEAUX HOLOGRAPHIQUES

Un dispositif électronique peut comporter un système d'affichage. Le système d'affichage peut comprendre un guide d'ondes, un coupleur d'entrée et une structure de réseau à relief de surface (SRG). La structure SRG peut être formée à partir d'un matériau à indice élevé qui comprend des nanoparticules de dioxyde de titane. Pour augmenter l'indice de réfraction du matériau à indice élevé, le rapport de la taille du cœur de nanoparticule à la taille de la couche de recouvrement peut être augmenté. Le matériau à indice élevé peut également comprendre des nanoparticules de différentes tailles pour augmenter la densité de tassement des nanoparticules. La structure SRG peut être modulée en profondeur dans une direction latérale pour maximiser l'efficacité. La structure SRG peut comprendre des crêtes inclinées recouvertes par un encapsulant. La structure SRG peut comprendre un réseau blazé ayant des crêtes qui sont recouvertes d'un revêtement et encapsulées par un encapsulant.

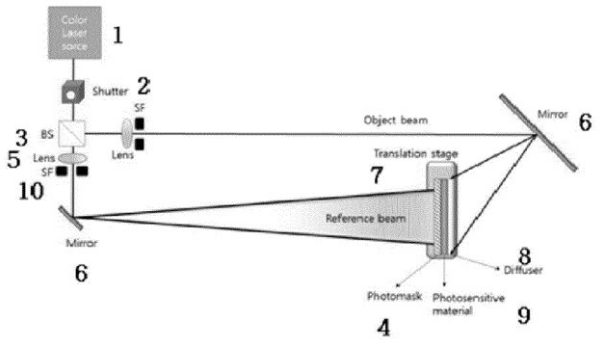


CLAIM 1. A display system comprising: a waveguide configured to propagate image light in a first direction via total internal reflection; and a surface relief grating structure at the waveguide, wherein the surface relief grating structure comprises a plurality of ridges separated by a plurality troughs, wherein each one of the plurality of ridges has an upper surface that is separated from an upper surface of the waveguide by a distance, wherein the distance is the same magnitude for each one of the plurality of ridges, and wherein a depth of the plurality of troughs changes in the first direction.

N9128

WO202303092 **HOLOLAB**
Priority Date: **23/07/2021**

METHOD AND SYSTEM FOR FABRICATING DIGITAL HOLOGRAPHIC SCREEN ON BASIS OF MULTI-HOGEL PRINTING



The present invention relates to a system for fabricating a digital holographic screen on the basis of multi-hogel printing, the system comprising: a light source unit comprising a laser, a dichroic mirror for RGB three-color registration, a mirror, a beam splitter, an optical shutter, and the like; an object beam unit for converting one of two beams coming from the light source unit into an object beam or signal beam, the object beam unit comprising a spatial filter, a lens, a mirror, and the like; a reference beam unit for converting the other of the two beams coming from the light source unit into a reference beam, the reference beam unit comprising a spatial filter, a lens, a mirror, and the like; a diffuser retainer positioned between the object beam unit and a recording medium, the diffuser retainer comprising a diffuser for scattering an object beam and thus diffusing the beam, and a diffuser cradle; a photomask mover positioned between the reference beam unit and the recording medium, the photomask mover comprising a photomask having an on/off binary pattern printed thereon in a grid type, a photomask cradle, and an XY-moving stage; and a controller for controlling the optical shutter and the moving state. In addition, the present invention relates to a method for fabricating a digital holographic screen on the basis of multi-hogel printing. In connection with fabricating a digital holographic screen made of hogels, a photomask having an on/off binary pattern is used such that a hogel is constructed in an RGB sub pixel structure. Multiple hogels can be printed simultaneously such that multi-hogel unit-based high-speed printing is possible on the basis of such multi-hogel printing technology. The method and system for fabricating a digital holographic screen on the basis of multi-hogel printing according to the present invention are advantageous as follows: a photomask having an on/off binary pattern is used such that a hogel is constructed in an RGB sub pixel structure; multiple hogels can be printed simultaneously such that high-speed printing based on a unit of multiple hogels (hogel array or hogel block) is possible on the basis of such multi-hogel printing technology; instead of a high-speed shutter (for example, AOM), an affordable shutter is sufficient; no spatial light modulator (SLM) is used; the system has a simplified optical configuration; the system can be fabricated with reduced costs; the structure of sub pixels constituting a hogel can be variously changed; and same is appropriate for large-area holographic screen fabrication.

PROCÉDÉ ET SYSTÈME DE FABRICATION D'UN ÉCRAN HOLOGRAPHIQUE NUMÉRIQUE SUR LA BASE D'UNE IMPRESSION MULTI-HOGEL

La présente invention concerne un système de fabrication d'un écran holographique numérique sur la base d'une impression multi-hogel, le système comprenant : une unité de source de lumière comprenant un laser, un miroir dichroïque pour un enregistrement tricolore RVB, un miroir, un diviseur de faisceau, un obturateur optique et similaire(s) ; une unité de faisceau d'objet destinée à convertir l'un de deux faisceaux provenant de l'unité de source de lumière en un faisceau d'objet ou en un faisceau de signal, l'unité de faisceau d'objet comprenant un filtre spatial, une lentille, un miroir et similaire(s) ; une unité de faisceau de référence destinée à convertir l'autre des deux faisceaux provenant de l'unité de source de lumière en un faisceau de référence, l'unité de faisceau de référence comprenant un filtre spatial, une lentille, un miroir et similaire(s) ; un dispositif de retenue de diffuseur positionné entre l'unité de faisceau d'objet et un support d'enregistrement, le dispositif de retenue de diffuseur comprenant un diffuseur pour diffuser un faisceau d'objet et diffuser ainsi le faisceau, et un berceau de diffuseur ; un dispositif de déplacement de masque photographique positionné entre l'unité de faisceau de référence et le support d'enregistrement, le dispositif de déplacement de masque photographique comprenant un masque photographique sur lequel un motif binaire de marche/d'arrêt est imprimé dans un type de grille, un berceau de masque photographique et un étage de déplacement XY ; et un dispositif de commande pour commander l'obturateur optique et l'état de déplacement. De plus, la présente invention concerne un procédé de fabrication d'un écran holographique numérique sur la base d'une impression multi-hogel. En connexion avec la fabrication d'un écran holographique numérique constitué de hogels, un masque photographique présentant un motif binaire de marche/d'arrêt est utilisé de telle sorte qu'un hogel est construit dans une structure de sous-pixels RVB. De multiples hogels peuvent être imprimés simultanément de telle sorte qu'une impression à grande vitesse basée sur une unité multi-hogel est possible sur la base d'une telle technologie d'impression multi-hogel. Le procédé et le système de fabrication d'un écran holographique numérique sur la base d'une impression multi-hogel selon la présente invention présentent les avantages suivants : un masque photographique présentant un motif binaire de marche/d'arrêt est utilisé de telle sorte qu'un hogel est construit dans une structure de sous-pixels RVB ; de multiples hogels peuvent être imprimés simultanément de telle sorte qu'une impression à grande vitesse basée sur une unité de multiples hogels (réseau de hogels ou bloc de hogels) est possible sur la base d'une telle technologie d'impression multi-hogel ; plutôt qu'un obturateur à grande vitesse (par exemple, AOM), un obturateur abordable est suffisant ; aucun modulateur spatial de lumière (SLM) n'est utilisé ; le système présente une configuration optique simplifiée ; le système peut être fabriqué à coûts réduits ; la structure de sous-pixels constituant un hogel peut être modifiée de diverses manières ; et le système est approprié pour la fabrication d'écran holographique à grande surface.

N9131

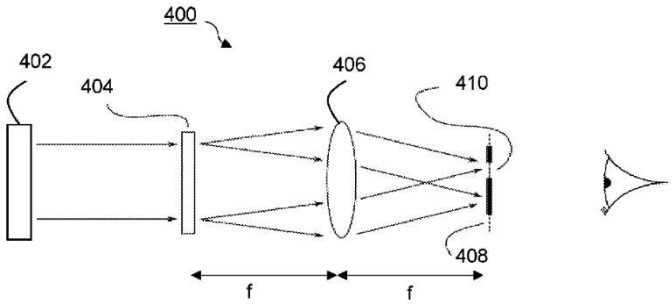
WO202302175 **VIVIDQ**
Priority Date: **21/07/2021**

HOLOGRAPHIC DISPLAY SYSTEM AND METHOD FOR REDUCING EFFECTS OF QUANTISATION NOISE

A holographic display system (400) comprises a light source (420) configured to emit at least partially coherent light; a modulator (404) arranged to be illuminated by the at least partially coherent light and to generate a light field which is a quantised representation of a target light field, H; and a spatial filter delimiting an aperture (410) in a Fourier plane. A Fourier transform of the target light field, F(H), substantially does not overlap (i) a Fourier transform of a complex conjugate of the target light field, F(H*), (ii) a Fourier transform of the target light field multiplied by the complex conjugate of the target light field, F(HH*), (iii) a Fourier transform of a square of the target light field, F(H2), and (iv) a Fourier transform of a square of the complex conjugate of the light field F(H*2). The aperture substantially corresponds to F(H) in the Fourier plane.

SYSTÈME D'AFFICHAGE HOLOGRAPHIQUE ET PROCÉDÉ DE RÉDUCTION DES EFFETS DU BRUIT DE QUANTIFICATION

Système d'affichage holographique (400) comprenant une source de lumière (420) conçue pour émettre une lumière au moins partiellement cohérente ; un modulateur (404) conçu pour être éclairé par la lumière au moins partiellement cohérente et pour générer un champ lumineux qui est une représentation quantifiée d'un champ lumineux cible, H ; et un filtre spatial délimitant une ouverture (410) dans un plan de Fourier. Une transformée de Fourier du champ lumineux cible, F(H), ne chevauche sensiblement pas (i) une transformée de Fourier d'un conjugué complexe du champ lumineux cible, F(H*), (ii) une transformée de Fourier du champ lumineux cible multipliée par le conjugué complexe du champ lumineux cible, F(HH*), (iii) une transformée de Fourier d'un carré du champ lumineux cible, F(H2), et (iv) une transformée de Fourier d'un carré du conjugué complexe du champ lumineux F(H*2). L'ouverture correspond sensiblement à F(H) dans le plan de Fourier.



CLAIM 1. A holographic display system comprising: a light source configured to emit at least partially coherent light; a modulator arranged to be illuminated by the at least partially coherent light and to generate a light field which is a quantised representation of a target light field, H; and a spatial filter delimiting an aperture in a Fourier plane; wherein a Fourier transform of the target light field, F(H), substantially does not overlap (i) a Fourier transform of a complex conjugate of the target light field, F(H*), (ii) a Fourier transform of the target light field multiplied by the complex conjugate of the target light field, F(HH*), (iii) a Fourier transform of a square of the target light field, F(H2), and (iv) a Fourier transform of a square of the complex conjugate of the light field F(H*2); and the aperture substantially corresponds to F(H) in the Fourier plane.

N9132

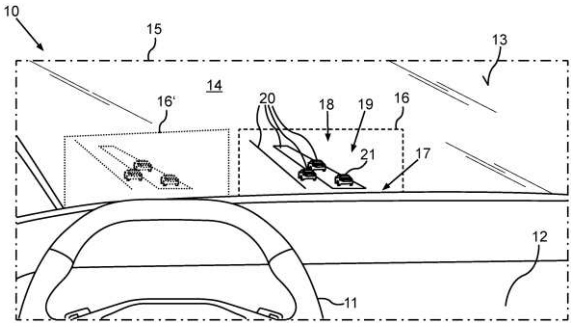
WO202301594 **AUDI**
Priority Date: **19/07/2021**

MOTOR VEHICLE WITH A DISPLAY DEVICE FOR PROJECTING A HOLOGRAPHIC DISPLAY CONTENT INTO A FIELD OF VIEW OF AT LEAST ONE VEHICLE OCCUPANT AND DISPLAY DEVICE FOR A MOTOR VEHICLE

The invention relates to a motor vehicle (10) comprising a display device (28) for projecting a holographic display content (18) into a field of view (15) of at least one vehicle occupant located in a respective vehicle seat (22), said field of view being directed towards a windscreen (13) of the motor vehicle (10), wherein a display surface (39) of a holographic light field emitter (17) is configured as a planar or as a curved surface and a holding arrangement (29) of the display device is configured to hold the holographic light field emitter (17), hold the light field emitter (17) in a vehicle console of the motor vehicle (10) below the windscreen (13) at a predetermined angle of incidence (30) and thus direct the light (32) which has passed through a light field unit (63) directly onto the windscreen (13), so that the light (32) representing the display content (18) strikes the windscreen (13) on a direct, reflection-free light path (33) and reflects from there to the respective vehicle seat (22).

VÉHICULE AUTOMOBILE COMPRENANT UN DISPOSITIF D'AFFICHAGE POUR PROJETER UN CONTENU D'AFFICHAGE HOLOGRAPHIQUE DANS UN CHAMP DE VISION D'AU MOINS UN OCCUPANT D'UN VÉHICULE, ET DISPOSITIF D'AFFICHAGE POUR UN VÉHICULE AUTOMOBILE

L'invention concerne un véhicule automobile (10) comprenant un dispositif d'affichage (28) pour projeter un contenu d'affichage holographique (18) dans un champ de vision (15), dirigé sur un pare-brise (13) du véhicule automobile (10), d'au moins un occupant de véhicule situé dans un siège de véhicule (22), une surface d'affichage (39) d'un émetteur de champ lumineux holographique (17) étant conçu sous la forme d'une surface plate ou d'une surface incurvée, et un ensemble de maintien (29) du dispositif d'affichage étant conçu pour maintenir l'émetteur de champ lumineux (17) dans une console de véhicule du véhicule automobile (10) sous le pare-brise (13) à un angle d'incidence (30) prédéfini et ainsi pour diriger la lumière (32), qui a traversé une unité de champ lumineux (63), directement sur le pare-brise (13) de telle sorte que la lumière (32) représentant le contenu d'affichage (18) frappe le pare-brise (13) sur un trajet de lumière directe sans réflexion (33) et est réfléchie depuis celui-ci vers le siège de véhicule (22).



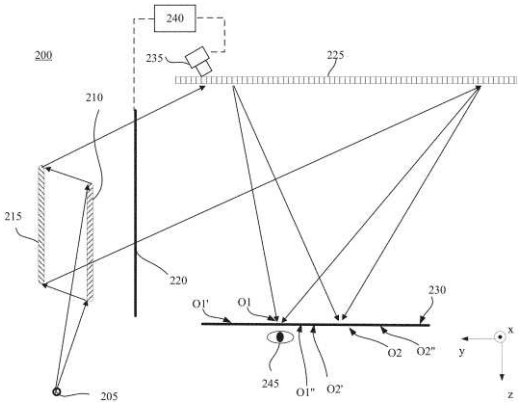
CLAIM 1. Motor vehicle (10) having a display device (28) for projecting a holographic display content (18) into a field of view (15) of at least one vehicle occupant located in a respective vehicle seat (22), wherein, for displaying the display content (18), a light field emitter (17) is provided in the display device (28), in that the light field emitter (17) has a pixel matrix (60) and a light field unit (63) arranged on the pixel matrix (60), wherein a control circuit (41) is configured to drive pixels (61) of the pixel matrix (60) and thereby illuminate the light field unit (63) with a light (32) of the pixels (61) representing the display content (18), characterized in that Characterized in that a display surface (39) of the light field emitter (17) is configured as a flat or as a curved surface and a holding arrangement (29) of the display device is configured to hold the light field emitter (17), hold the light field emitter (17) in a vehicle console (12) of the motor vehicle (10) below the windscreen (13) at a predetermined angle of incidence (30) and thus direct the light (32) which has passed through the light field unit directly onto the windscreen (13), so that the light (32) representing the display content (18) strikes the windscreen (13) on a direct light path (33) and reflects it from there to the respective vehicle seat (22).

N9137

US11561510 **META PLATFORMS TECHNOLOGIES**
Priority Date: **19/07/2019**

HOLOGRAPHIC NEAR-EYE DISPLAY HAVING PUPIL STEERING

An optical device includes a light source configured to provide a light beam. The optical device includes a light source configured to generate a light beam, and a spatial light modulator ("SLM") configured to modulate the light beam to provide a hologram for generating a display image. The optical device includes a polarization-selective steering assembly configured to provide a plurality of steering states for the modulated light beam. The optical device includes an image combiner configured to focus the modulated light beam steered by the polarization-selective steering assembly to generate an array of spots at an eye-box of the optical device.



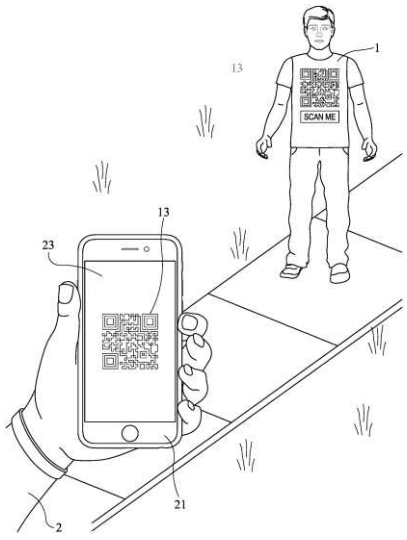
CLAIM 1. An optical device, comprising: a light source configured to provide a light beam; a spatial light modulator ("SLM") configured to modulate the light beam for generating a display image; a polarization-selective steering assembly configured to provide a plurality of steering angles for the modulated light beam received from the SLM; and a holographic optical element ("HOE") image combiner configured to receive the modulated light beam steered by the polarization-selective steering assembly, wherein for the modulated light beam incident onto the HOE image combiner at each of the steering angles, the HOE image combiner is configured to backwardly diffract the modulated light beam to a plurality of exit pupils at an eye-box of the optical device.

N9138

US11556727 **QR ME**
Priority Date: **23/08/2021**

PERSONAL USER QR CODE-HOLOGRAPHIC SYSTEM

The invention is a system allowing an individual user to display a readable unique QR code, which code can be read by the mobile devices of customers, whose devices will thereby be connected to an online user profile.



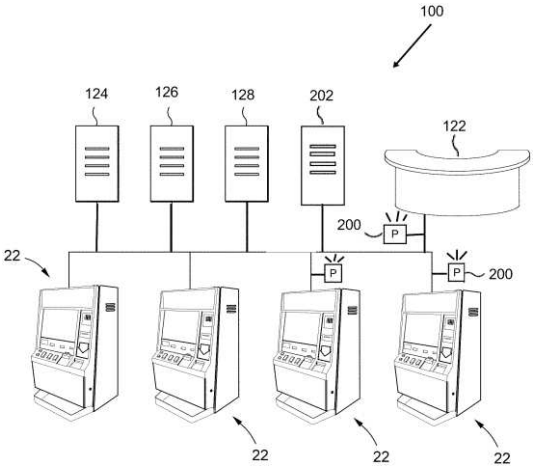
CLAIM 1. A system comprising a projection device with a projector held or worn by a user, a customer mobile device with a camera and mobile application connecting the customer mobile device to a server algorithm located on a memory residing on one or more internet servers, wherein the projector projects a visible image containing a unique QR Code that is read by the camera, providing the customer with a link to a user profile on the customer mobile device, and wherein the algorithm uses location-based superimposition to provide the user with a digital image signifying the user together with an alert.

N9139

US11544989 **SEELIG JERALD | TOWNSEND TARA**
Priority Date: **04/06/2019**

GAMING SYSTEM AND GAMING DEVICES WITH HOLOGRAPHIC PROJECTION FEATURE

A gaming system is provided that includes a gaming device which has at least one input device to receive an input from a player and at least one display device to relay gaming information to the player. The gaming system further includes a holographic image system configured to project a holographic image into a space outside of the gaming device. The holographic image system may be associated with a single gaming device, or which a plurality of gaming devices, such as a bank of gaming machines.



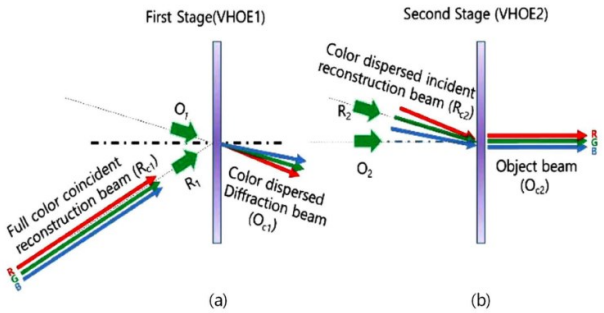
CLAIM 1. A gaming system comprising: at least two adjacent gaming devices, the gaming devices comprising at least one input device to receive an input from a player and at least one display device to relay gaming information to the player, and a holographic image system configured to project a holographic image into a space outside of the gaming devices and where the holographic image is projected and formed horizontally outwardly spaced from a frontmost vertical plane of one of the gaming devices, wherein the at least two adjacent gaming devices are arranged in a bank of gaming devices, wherein the holographic image system projects a plurality of holographic images with at least one holographic image being associated with a bonus event, and wherein the holographic images are projected into a space vertically above player's playing positions surrounding the bank of gaming devices.

N9145

KR20220168817 **KWANGWOON UNIVERSITY INDUSTRY ACADEMIC COLLABORATION FOUNDATION**
Priority Date: **17/06/2021**

VHOE-BASED COMPUTER HOLOGRAPHIC IMAGING DEVICE FOR COLOR COMPENSATED HOLOGRAPHIC AUGMENTED REALITY DISPLAYS

The present embodiments provide a holographic imaging device applicable to a holographic augmented reality display through a numerical holographic imaging model in which color dispersion according to two-stage Bragg diffraction can be eliminated using a combination of multiple volume holographic optical elements (VHOE) designed in advance.



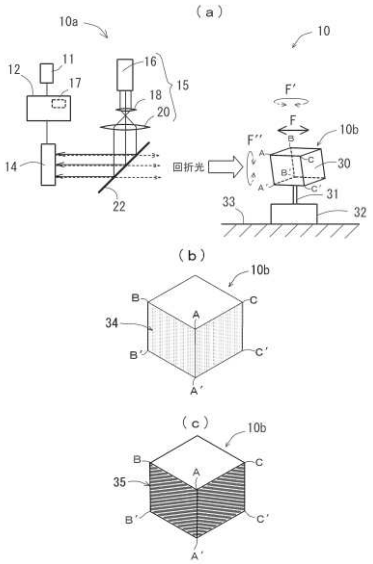
CLAIM 1. A holographic imaging device comprising: a control unit for adjusting an angle of incidence of a reconstruction beam; a panel for emitting the reconstruction beam; a first holographic optical element having a first diffraction grating in which a first interference fringe by a first reference beam and a first object beam is recorded, the first holographic optical element diffracting the reconstruction beam; And a second holographic optical element having a second diffraction grating in which a second interference fringe by a second reference beam and a second object beam is recorded, the second holographic optical element diffracting the diffracted reconstructed beam to output an output beam.

N9147

JP2023008931 **KOCHI UNIVERSITY**
Priority Date: **29/06/2021**

GUIDE METHOD FOR PROJECTION OBJECT AND GUIDE DEVICE FOR PROJECTION OBJECT OBJECT

TOPIC: To provide a guiding method that uses a holographic projector having a simple structure and that reliably guides a projection target object to an imaging position of the holographic projector so that a sharp image can be reliably projected on the projection target object such as a screen. INVENTION: a method for guiding a projection target object uses a holographic projector including a holographic projector unit 10 a in which an imaging position is adjusted so that a video of a predetermined shape having a dotted line pattern 34 as a pattern with a narrow gap is projected to a predetermined spatial position, When the video image is projected from the holographic projector unit 10 a onto the stereoscopic screen 10 b as a projection target object disposed near the spatial position, the stereoscopic screen 10 b is guided to the spatial position where the pattern of image formation projected on the stereoscopic screen 10 b matches the dotted line pattern 34 of the video image.



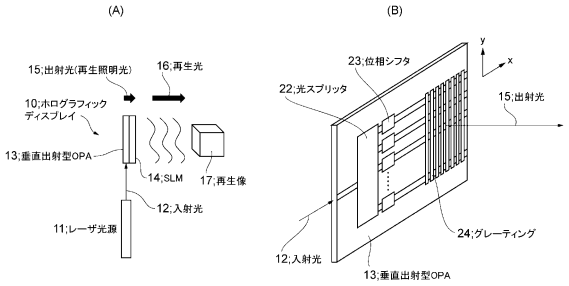
CLAIM 1. Using a holographic projector whose image formation position is adjusted so that a video of a predetermined shape having a narrow gap pattern is projected to a predetermined spatial position, and for a projection target object arranged near the spatial position, When the video is projected from the holographic projector, guiding the projection target object to a spatial position where a pattern of image formation reflected on the projection target object matches a pattern of the video.

N9148

JP2023008330 **JAPAN BROADCASTING**
Priority Date: **05/07/2021**

REPRODUCTION ILLUMINATION ILLUMINATION ILLUMINATION DEVICE FOR HOLOGRAPHIC AND HOLOGRAPHIC DISPLAY

TOPIC: To provide an illumination light irradiation device for holographic reproduction and a display that allow a plurality of persons to visually recognize a reproduction image of a hologram at the same time and that solve the problem of the related art in which the visual field is narrow. INVENTION: a holographic display 10 that causes light from a light source 11 to be incident from the side, and causes zero-order light of the incident light 12 to be repeatedly internally reflected by front and rear surfaces while propagating the zero-order light to the opposite side, and In accordance with a hologram pattern displayed on the spatial light modulation element (SLM) 14 disposed in close contact with the front surface or the back surface, the vertical emission type OPA13 configured to emit, to an external air layer, light used as the reproduction light 16 among the light incident on the interface with the spatial light modulation element 14. This vertical emission type OPA13 has a grating structure extending in the propagation direction of zero-order light, and diffracts and emits incident light in both the front and back directions.



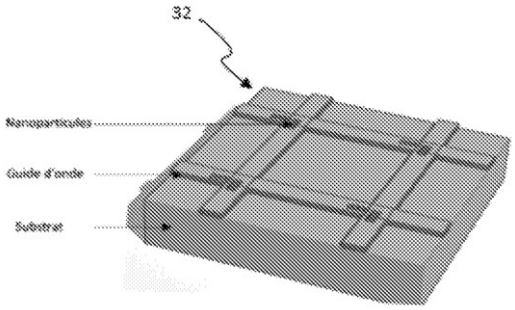
CLAIM 1. A light emitting device, comprising: a light source; and a light source, wherein light from the light source is incident from a side, zero-order light of the incident light is repeatedly internally reflected by a front surface and a back surface, and is propagated to the side opposite to the incident side of the light, and In accordance with a hologram pattern displayed on a spatial light modulation element disposed in close contact with the front surface or the back surface, the light utilized as reproduction light among the light incident on an interface with the spatial light modulation element from the inside is converted to the hologram pattern by: An optical phased array configured to emit light to an air layer outside the front surface side, wherein the optical phased array has a grating structure extending in a propagation direction of the zero-order light, and is configured to diffract light incident on the optical phased array at predetermined angles in the front surface direction and the back surface direction.

N9153

FR3124865
Priority Date: **05/07/2021**

CNRS - CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE | PSA AUTOMOBILES | UNIVERSITE PARIS SACLAY

SPATIAL LIGHT MODULATOR FOR HOLOGRAPHIC IMAGE PROJECTION DEVICE



The present invention relates to a spatial light modulator (32) intended to be illuminated by coherent light sources in order to form a holographic image, said modulator comprising:- a substrate on which is formed at least one grating of waveguides defining a resolution of the holographic image; and-at each intersection between two waveguides of a grating, two nanoparticle chains of a plasmonic material and nanodrops of an optically controllable index-changing material are deposited, each of said nanoparticle chains being aligned in the direction of one of the two waveguides of the intersection and said nanodrops being deposited above said nanoparticle chains.

MODULATEUR SPATIAL DE LUMIÈRE POUR DISPOSITIF DE PROJECTION D'IMAGE HOLOGRAPHIQUE

La présente invention concerne un modulateur spatial de lumière (32) destiné à être illuminé par des sources de lumière cohérente pour former une image holographique, ledit modulateur comprenant :- un substrat sur lequel est formé au moins un treillis de guides d'onde définissant une résolution de l'image holographique ; et- à chaque intersection entre deux guides d'onde d'un treillis, sont déposées deux chaînes de nanoparticules d'un matériau plasmonique et des nano-gouttes d'un matériau à changement d'indice contrôlable optiquement, chacune desdites chaînes de nanoparticules étant alignée dans la direction de l'un des deux guides d'ondes de l'intersection et lesdits nano-gouttes étant déposées au-dessus desdites chaînes de nanoparticules.

CLAIM 1. A spatial light modulator (32) intended to be illuminated by coherent light sources to form a holographic image, said modulator comprising: - a substrate on which is formed at least one grating of waveguides defining a resolution of the holographic image; and - at each intersection between two waveguides of a grating, two nanoparticle chains of a plasmonic material and nanodrops of an optically controllable index-changing material are deposited, each of said nanoparticle chains being aligned in the direction of one of the two waveguides of the intersection and said nanodrops being deposited above said nanoparticle chains.

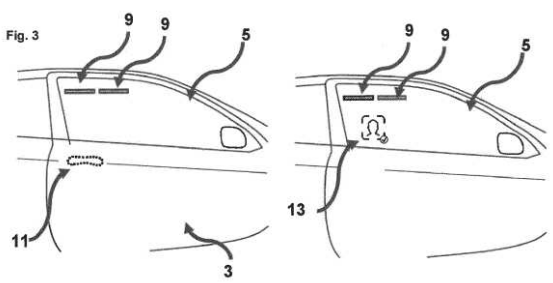
N9154

EP4122765
Priority Date: **23/07/2021**

CARL ZEISS JENA

HOLOGRAPHIC ACCESS CONTROL

The invention relates to a system for a functionalized pane of a door, by means of which a person-and/or object-bound authorization check can be carried out. A holographically based, stereoscopic Holocam, which can be integrated into the pane, can be included for the person-bound control. Furthermore, a holographic display can be included, which can also be integrated into the pane. By means of corresponding methods, the authorization control can be carried out in a controlled manner by the control device and a closing mechanism of a door and a holographic display can be controlled.



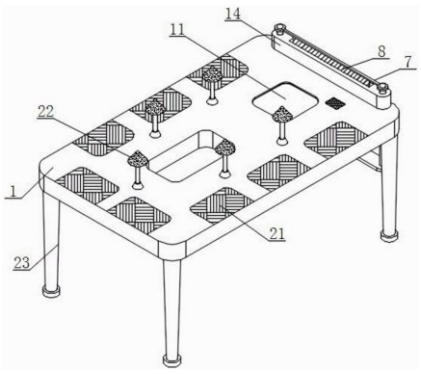
CLAIM 1. A system for a door opening control of a door or a flap with a functionalized pane (5), comprising:- a transparent base body (30) with a front side (33) and a rear side (32) for the functionalized pane (5) - a first holographic display (7) for a display of an image directed to a Person in a defined first display area opposite the front side (33) and/or the rear side (32) of the transparent base body (30) - a control device (23) - a first communication means for transmitting and receiving signalswherein first communication means and control device (23) are set up for object-bound authorization control of an associated, second communication means for transmitting and receiving signals, wherein the object-bound authorization control is based on a position and/or movement of the second communication means with respect to a predefined proximity range of the first communication means and on properties of signals exchanged between the first and second communication means, wherein holographic display (7) and control device (23) are configured to generate the display of the image during the object-bound authorization of the second communication means, wherein the control device (23) is furthermore set up to output an unlocking signal (25) for opening the door in the event of at least one object-bound authorization.

N9156

CN218383643U **CHONGQING SHUANGQING INDUSTRY GROUP**

Priority Date: **24/08/2022**

CONFERENCE TABLE WITH HOLOGRAPHIC PROJECTION FUNCTION



The utility model discloses a conference table with holographic projection function, including conference table, servo motor an and servo motor b, the below of conference table is provided with servo motor a, one side of conference table inner wall is provided with servo motor b, servo motor a's output is connected with the threaded rod through the dwang, one side threaded connection on threaded rod surface has the mounting panel, the connecting rod is all installed to the both sides at mounting panel top, fixed horizontal pole is installed through the limiting plate in one side on connecting rod surface, the bottom on fixed horizontal pole surface is connected with dark curtain, servo motor b's output is connected with the lead screw through the connecting rod, one side threaded connection on lead screw surface has threaded sleeve. The utility model discloses a conference table, servo motor a, threaded rod, mounting panel, connecting rod, fixed horizontal pole and the setting of dark curtain to reached and carried out the effect of automatic rising with dark curtain, made things convenient for the staff to observe the projection.

CLAIM 1. The utility model provides a conference table with holographic projection function, includes conference table (1), servo motor a (2) and servo motor b (3), its characterized in that: a servo motor a (2) is arranged below the conference table (1), and a servo motor b (3) is arranged on one side of the inner wall of the conference table (1); the output end of the servo motor a (2) is connected with a threaded rod (4) through a rotating rod, one side of the surface of the threaded rod (4) is in threaded connection with a mounting plate (5), connecting rods (6) are mounted on two sides of the top of the mounting plate (5), a fixed cross rod (7) is mounted on one side of the surface of each connecting rod (6) through a limiting plate, and the bottom of the surface of each fixed cross rod (7) is connected with a dark curtain (8); the output end of the servo motor b (3) is connected with a screw rod (9) through a lapping rod, and one side of the surface of the screw rod (9) is in threaded connection with a threaded sleeve (10).

N9158

CN218273940U **HENAN NORMAL UNIVERSITY**

Priority Date: **03/05/2022**

3D HOLOGRAPHIC PROJECTION MAN-MACHINE INTELLIGENT INTERACTION DISPLAY DEVICE

The utility model discloses a 3D holographic projection human-computer intelligence interaction display device, including the device chassis, the outer wall on device chassis rotates and is connected with a plurality of support box of accomodating, and is a plurality of the inner wall of accomodating the support box is equipped with two motors, and is a plurality of the inner wall of accomodating the support box rotates and is connected with a plurality of pivots, and is a plurality of the pivot falls into two sets ofly, two the output and a plurality of the output of motor wherein two fixed connection of pivot, it is a plurality of the equal fixedly connected with runner of outer wall of pivot, it is a plurality of the outer wall transmission of runner is connected with the storage belt. The rotating shaft which is fixedly connected with the starting motor is driven to rotate, the rotating shaft drives the storage belt to rotate, when the display glass enters and is attached to the storage belt, the display glass is clamped by the two storage belts, the display glass is conveyed to the bottom of the storage support box, the display glass can be stored and protected, and the whole device is convenient to move and transport.

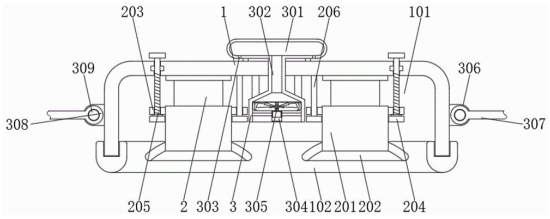
CLAIM 1. The utility model provides a 3D holographic projection human-computer intelligence interaction display device, includes device chassis (1), its characterized in that: the device is characterized in that a plurality of accommodating support boxes (2) are rotatably connected to the periphery of the outer wall of the device chassis (1), two motors are arranged on the inner walls of the accommodating support boxes (2), a plurality of rotating shafts (3) are rotatably connected to the inner walls of the accommodating support boxes (2), the rotating shafts (3) are divided into an upper group and a lower group, the output ends of the two motors are fixedly connected with two of the rotating shafts (3), rotating wheels (4) are fixedly connected to the outer walls of the rotating shafts (3), and accommodating belts (5) are in transmission connection with the outer walls of the rotating wheels (4); supporting columns (9) are fixedly connected to four included angles at the top of the device chassis (1), top supporting blocks (10) are fixedly connected to the outer walls of the tops of the supporting columns (9), and an electromagnetic device (11) is fixedly connected to the center of the bottom of each top supporting block (10); show glass (12) are arranged between the upper and lower two storage belts (5), iron strips are inlaid at the top edges of the show glass (12), and the electromagnetic devices (11) are used for fixing the iron strips.

N9159

CN218272938U **HARBIN YINENG COMMUNICATION TECHNOLOGY DEVELOPMENT**
Priority Date: **30/09/2022**

HOLOGRAPHIC WAVEGUIDE LENS AR GLASSES

The utility model discloses a holographic waveguide lens AR glasses, including the casing, be located the display head of the inside one end both sides of casing and be located the suction head of the inside one end intermediate position department of casing, the casing includes: the setting is at the inside mounting groove of casing, and the outside of casing one end is provided with the protection and fills up, and is two sets of the outside of display head all is provided with the camera lens, and is two sets of the camera lens is kept away from the one end of display head all is provided with the protection head. The utility model discloses a protection pad makes wearing of AR glasses more comfortable, prevent through the protection head that the camera lens from causing the injury to human eye, fix the motor inside the first of induced draught through the mounting bracket, the motor drives the pivot and takes place to rotate, the pivoted pivot drives the flabellum and takes place to rotate, carry the inside air of mounting groove to the wind inslot portion through the connecting pipe, the rethread exhaust vent carries the air out, realize that the inside air phase with the external world of AR glasses flows through, prevent that the inside high temperature of AR glasses, make the use of AR glasses more comfortable.



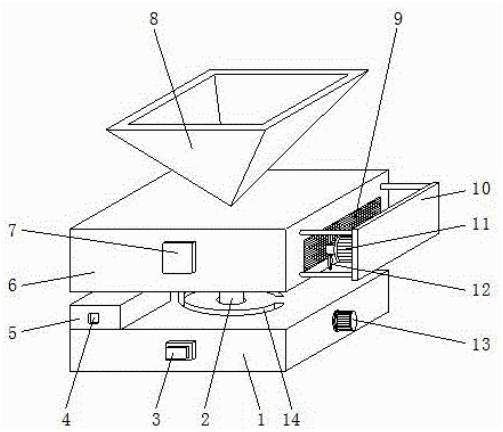
CLAIM 1. Holographic waveguide lens AR glasses, comprising: including casing (1), be located display head (2) of the inside one end both sides of casing (1) and be located convulsions head (3) of the inside one end intermediate position department of casing (1), casing (1) includes: the installation groove (101) is arranged in the shell (1), and a protective pad (102) is arranged on the outer side of one end of the shell (1).

N9160

CN218213796U **RONGWEIYUAN SHENZHEN TECHNOLOGY**
Priority Date: **16/08/2022**

ADOPT HOLOGRAPHIC SHOW CUPBOARD OF VERTICAL 3D OF 3D

The utility model discloses an adopt holographic show cupboard of vertical 3D of 3D, the on-line screen storage device comprises a base, the mounting groove has been seted up to the inner chamber of base, the bottom of mounting groove inner chamber is rotated through the bearing and is connected with the bull stick, the lower part fixedly connected with driven gear of bull stick surface, the right side fixedly connected with second motor of base, the output shaft fixedly connected with driving gear of second motor, the driving gear is connected with the driven gear meshing, the top fixedly connected with casing of bull stick, the holographic projection screen of top fixedly connected with of casing, the inner chamber fixedly connected with mainboard of casing, the left end fixedly connected with temperature-sensing ware at casing inner chamber top. The utility model discloses a bull stick, casing, first motor, flabellum, second motor, spout, driving gear, driven gear, slide bar, through-hole, temperature-sensing ware and opening mutually support, and it is not good to have solved present 3D holographic show cupboard radiating effect, and the problem that people adjusted not convenient for.

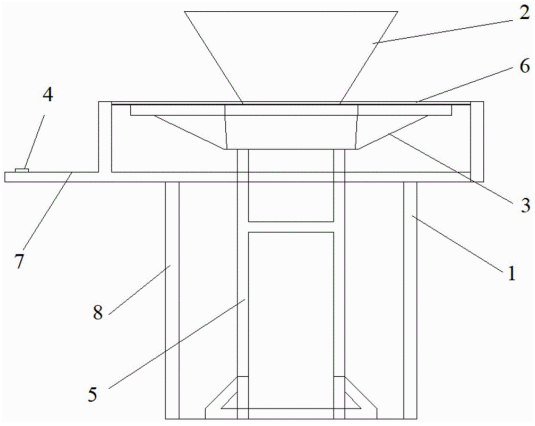


CLAIM 1. The utility model provides an adopt holographic show cupboard of vertical 3D of 3D, includes base (1), its characterized in that: mounting groove (16) have been seted up to the inner chamber of base (1), the bottom of mounting groove (16) inner chamber is rotated through the bearing and is connected with bull stick (2), lower part fixedly connected with driven gear (18) of bull stick (2) surface, right side fixedly connected with second motor (13) of base (1), the output shaft fixedly connected with driving gear (17) of second motor (13), driving gear (17) are connected with driven gear (18) meshing, top fixedly connected with casing (6) of bull stick (2), the top fixedly connected with holographic projection screen (8) of casing (6), the inner chamber fixedly connected with mainboard (15) of casing (6), the left end fixedly connected with temperature-sensing ware (21) at casing (6) inner chamber top, support fixedly connected with mounting panel (10) is passed through on the right side of casing (6), first motor (11) of left side fixedly connected with of mounting panel (10), the output shaft fixedly connected with flabellum (12) of first motor (11).

N9161

CN218159578U **BEIJING SHUIMU QINGMEI DECORATION ENGINEERING**
Priority Date: **08/08/2022**

GESTURE INTERACTION HOLOGRAPHIC DISPLAY DEVICE



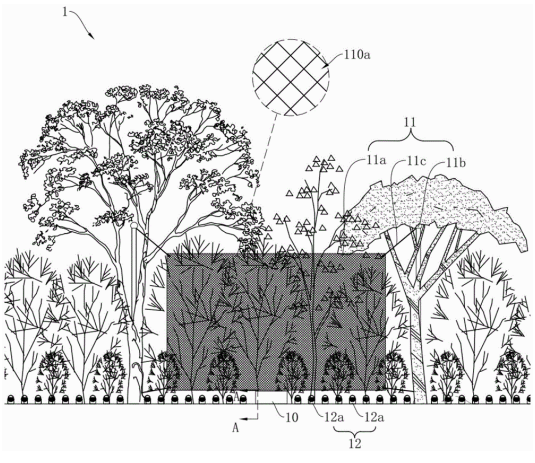
The embodiment of the application discloses interactive holographic display device of gesture has included the rack subassembly, holographic reflection glass cover, screen and interactive sensor, in the use, the screen can show the image, and then reflect in order to show the image through holographic reflection glass cover, the user can interact through interactive sensor and the interactive holographic display device of gesture, the interactive holographic display device of gesture that this application embodiment provided passes through the contained angle of screen and horizontal plane and is greater than or equal to 25, and the distance on the horizontal direction between interactive sensor and the screen is greater than or equal to 19cm, when the user uses the interactive holographic display device of gesture, can let the viewing distance be closer, the content volume of watching has been improved. Meanwhile, the problem of interactive visual angle is considered, on the premise of not wearing the upper, the optimal viewing angle of the human body under interactive operation is met as much as possible, looking up or down is not performed, the immersion is enhanced, and the accidental situation of viewing the base screen is reduced as much as possible under the condition of ensuring the operation experience.

CLAIM 1. A gesture interaction holographic display device, comprising: a gantry assembly; the holographic reflection glass cover is arranged on the rack assembly; the screen is arranged on the peripheral side of the holographic reflection glass cover, and the included angle between the screen and the horizontal plane is larger than or equal to 25 degrees; and the interaction sensor is arranged on the rack assembly, and the distance between the interaction sensor and the screen in the horizontal direction is greater than or equal to 19cm.

N9162

CN218158745U **GUANGZHOU LEAFUN CULTURE TECHNOLOGY**
Priority Date: **31/08/2022**

PROJECTION SYSTEM



The utility model discloses a projection system, including projection arrangement, holographic projection curtain and lighting fixture, projection arrangement is used for sending holographic image light, and holographic projection curtain is used for receiving the holographic image light that projection arrangement sent in order to show holographic image, and holographic projection curtain still is used for seeing through partial light, and lighting fixture is located one side that holographic projection curtain deviates from projection arrangement and is used for the background object who deviates from projection arrangement one side towards holographic projection curtain and gives out light. Adopt the utility model discloses a scheme can show holographic image on holographic projection screen, and can see through holographic projection screen and see the background object that is located holographic projection screen and deviates from projection arrangement one side, reaches the visual effect that virtual reality of virtual image and outdoor scene combines, can improve the sight of outdoor scene, brings rich visual experience for the sight.

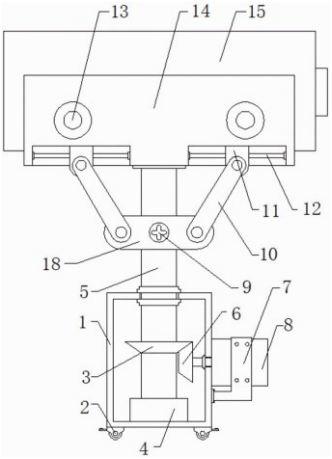
CLAIM 1. A projection system, comprising A projection device for emitting holographic image light; the holographic projection screen is used for receiving the holographic image light emitted by the projection device to display a holographic image, and is also used for transmitting part of light; and and the lighting device is positioned on one side of the holographic projection screen deviating from the projection device and is used for facing the holographic projection screen deviating from the background object on one side of the projection device to emit light.

N9163

CN218153394U **SHENZHEN HAIYUN XINSHENG TECHNOLOGY**

Priority Date: **18/08/2022**

HOLOGRAPHIC IMAGE SCREEN PROJECTION DEVICE CAPABLE OF BEING FREELY DETACHED AND ADJUSTED



The utility model discloses a holographic image that can freely dismantle regulation throws screen device, include throw the screen base and be located throw the installation base directly over the screen base, the installation base is U type structure, holographic projector has been placed in the installation base, be equipped with installation mechanism between holographic projector and the installation base, it is equipped with driving motor on the lateral wall of screen base to throw, the inside of throwing the screen base is equipped with the drive chamber, driving motor's output shaft end extends to drive intracavity and the first bevel gear of fixedly connected with, the drive intracavity is equipped with the axis of rotation, fixedly connected with and first bevel gear intermeshing's second taper tooth in the axis of rotation. This holographic image that can freely dismantle regulation throws screen device easily ann tears when throwing the screen and tear open, and the dismantlement of the equipment of being convenient for is overhauld, and can freely adjust, is applicable to the not screen use of throwing of co-altitude of different regions, has improved the availability factor of equipment.

CLAIM 1. The utility model provides a holographic image that can freely dismantle regulation throws screen device, includes and throws screen base (1) and be located throw installation base (14) directly over screen base (1), its characterized in that: the installation base (14) is U type structure, holographic projector (15) have been placed in installation base (14), be equipped with installation mechanism between holographic projector (15) and installation base (14), be equipped with driving motor (8) on the lateral wall of throwing screen base (1), the inside of throwing screen base (1) is equipped with the drive chamber, the output shaft end of driving motor (8) extends to the drive intracavity and first bevel gear (6) of fixedly connected with, be equipped with axis of rotation (5) in the drive chamber, fixedly connected with and first bevel gear (6) intermeshing's second bevel gear (3) on axis of rotation (5), the upper end of axis of rotation (5) extend the drive chamber and with the lower extreme lateral wall butt of installation base (14), axis of rotation (5) with be equipped with adjustment mechanism between installation base (14).

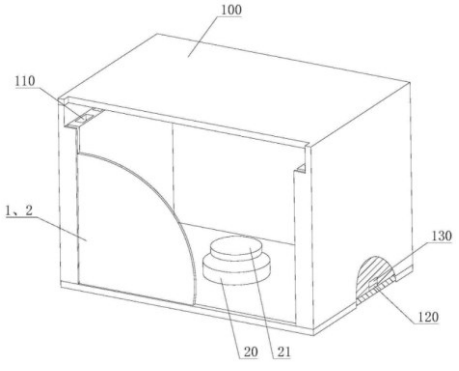
N9164

CN218124835U **XIANG CHENGLIN**

Priority Date: **04/05/2022**

HOLOGRAPHIC BOX

The utility model discloses a holographic box, including control circuit, control circuit includes transparent display layer and installs the touch layer on transparent display layer, transparent display layer with the touch layer is connected with screen drive module, screen drive module passes through bluetooth power amplifier sound module and is connected with audio amplification module, audio amplification module is connected with sound production module, screen drive module still through HDMI switching controller respectively with HDMI plug-in connector and throw the screen display module and be connected, throw the screen module and be connected with the battery after passing through WIFI module, steady voltage output module, the battery still is connected with audio voltage amplification module, bluetooth power amplifier sound module, screen drive module respectively, steady voltage output module still is connected with the board that is shaded through the voltage regulation module. The 3D holographic image projection system can achieve projection of 3D holographic images, and is compact in structure and multifunctional.

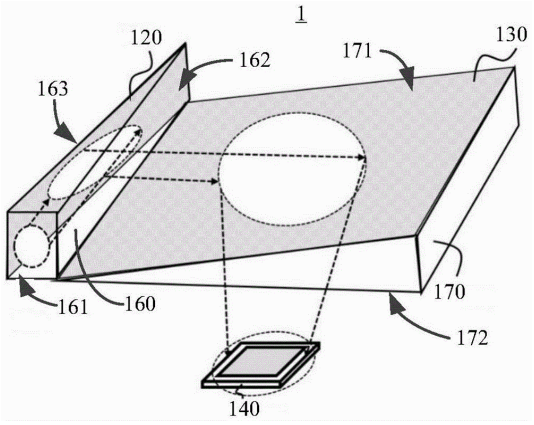


CLAIM 1. The utility model provides a holographic box, includes control circuit, its characterized in that, control circuit includes transparent display layer and installs the touch layer on transparent display layer, transparent display layer with the touch layer is connected with screen drive module, screen drive module passes through bluetooth power amplifier sound module and is connected with audio amplification module, audio amplification module is connected with sound production module, screen drive module still through HDMI switching controller respectively with HDMI plug-in wire seat with throw the screen display module and be connected, throw the screen module and be connected with the battery after passing through WIFI module, steady voltage output module, the battery still is connected with audio voltage amplification module, bluetooth power amplifier sound module, screen drive module respectively, steady voltage output module still is connected with the board that is shaded through the pressure regulating module.

N9165

CN218122454U **APPOTRONICS**
Priority Date: **08/06/2022**

PROJECTION LIGHT MACHINE



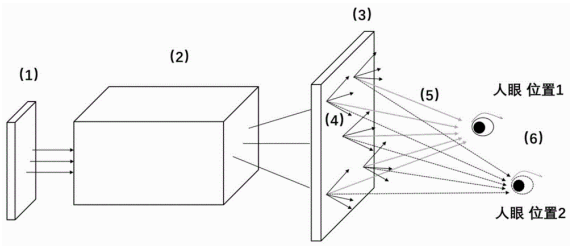
The application provides a projection ray apparatus, includes: the optical system includes a light source, a first holographic optical element, a second holographic optical element, a display device, and a lens. The first holographic optical element is arranged on an emergent light path of the light source and is used for diffracting illuminating light emitted by the light source along a first direction to form a first diffracted light beam and expanding the first diffracted light beam. The second holographic optical element is disposed on a diffracted light path of the first holographic optical element, and the display device is disposed on a light path of the second diffracted light beam. And the converged second diffracted light beam enters the lens after being reflected by the display equipment and converged again by the second holographic optical element. The holographic optical element of the projection light machine provided by the embodiment of the application replaces a thick and heavy traditional illumination lens combination, the diffracted light beams are converged and diffracted, the reflected light beams of the display equipment are converged, the size of a front lens is reduced, and the projection system is lighter and thinner.

N9166

CN115639735 **SOUTHEAST UNIVERSITY**
Priority Date: **02/11/2022**

LARGE-SIZE HOLOGRAPHIC DISPLAY SYSTEM CAPABLE OF BEING WATCHED FREELY

The invention relates to a large-size holographic display system capable of being freely viewed, which comprises a hologram control unit, an optical projection system and a diffraction screen; the computer generated hologram and uploaded to the hologram control unit for modulation. The holographic complex amplitude obtained by modulating the hologram control unit is projected to the surface of a large-size diffraction screen through an optical projection system, each space position on the diffraction screen modulates incident holographic complex amplitude wavefront, and the wavefront at each space position is diffracted into discretized diffracted light with a plurality of direction orders, so that the field range is expanded. The emergent light of different orders is coherently superposed at any position when the position is viewed behind the diffraction screen, human eyes are similar to a small optical filtering system, the diffraction order of which the diffraction angle deviates from the pupil position is filtered, the diffracted light of different orders is received aiming at different spatial positions of the large-size diffraction screen, and coherent imaging is carried out on the retina, so that large-size holographic display in a free range is realized.



CLAIM 1. A freely viewable large-size holographic display system, characterized in that the system comprises: a hologram control unit (1), an optical projection system (2) and a diffraction screen (3); the computer generates a computer-generated hologram and uploads the computer-generated hologram to a hologram control unit (1) for modulation to obtain a holographic complex amplitude, the holographic complex amplitude modulated by the hologram control unit (1) is projected to the surface of a large-size diffraction screen (3) through an optical projection system (2), each spatial position (4) on the diffraction screen (3) modulates an incident holographic complex amplitude wavefront, and the wavefront at each spatial position (4) is diffracted into a plurality of discretized direction-order diffracted lights (5) and respectively emits to different directions; at a viewing position (6) behind the diffraction screen (3), different orders of diffracted light (5) at different spatial positions (4) on the diffraction screen (3) are converged, and by modulating the complex amplitude of the different spatial positions (4) on the diffraction screen (3), coherent superposition of the different orders of diffracted light (5) at the viewing position (6) is realized, so that a holographic image is generated on the retina of a human eye.

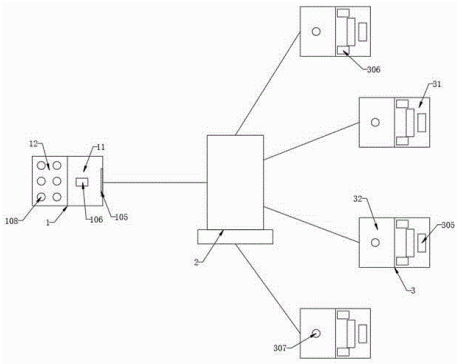
N9168

CN115633152 **HARBIN ENGINEERING UNIVERSITY**

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

REMOTE VIDEO HOLOGRAPHIC PROJECTION SYSTEM

The invention discloses a remote video holographic projection system, which belongs to the technical field of holographic projection and comprises a conference host end, a server and a plurality of conference receiving ends, wherein the conference host end comprises a conference host station, an audience station and a first information station, a host tool and a first image pickup unit are arranged in the conference host station, a plurality of first projection units are arranged in the audience station, the first projection units are respectively in one-to-one correspondence with the conference receiving ends, the first image pickup unit and the first projection unit are in physical connection or network connection with the first information station, and the conference receiving end comprises a conference recording station, a virtual conference host station and a second information station.



CLAIM 1. A long-range video holographic projection system, includes meeting host side (1), server (2) and a plurality of meeting receiving terminal (3), its characterized in that: the conference host end (1) comprises a conference host station (11), an audience station (12) and a first information station, a host tool (105) and a first image pickup unit (106) are arranged in the conference host station (11), a plurality of first projection units (108) are arranged in the audience station (12), the first projection units (108) are respectively in one-to-one correspondence with a plurality of conference receiving ends (3), and the first image pickup unit (106) and the first projection unit (108) are both in physical connection or network connection with the first information station; the conference receiving end (3) comprises a conference recording station (31), a virtual conference host station (32) and a second information station, a recording tool (305) and a second image pickup unit (306) are arranged in the conference recording station (31), a second projection unit (307) is arranged in the virtual conference host station (32), and the second image pickup unit (306) and the second projection unit (307) are both in physical connection or network connection with the second information station; the first information station and the second information station are connected with the server (2) through a network.

N9170

CN115616790 **COAL SCIENTIFIC RESEARCH GENERAL INSTITUTE**

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

HOLOGRAM DISPLAY SYSTEM BASED ON VOLUME HOLOGRAPHIC OPTICAL WAVEGUIDE

The application provides a hologram display system based on volume holographic optical waveguide, wherein, the system includes: the volume holographic optical waveguide component comprises an input coupling volume holographic grating component, an optical waveguide component and an output coupling volume holographic grating component; the input coupling body holographic grating component comprises a first input coupling body holographic grating layer, a second input coupling body holographic grating layer and a third input coupling body holographic grating layer, and the optical waveguide component comprises a first optical waveguide layer and a second optical waveguide layer, and the output coupling body holographic grating component comprises a first output coupling body holographic grating layer, a second output coupling body holographic grating layer and a third output coupling body holographic grating layer. According to the method and the device, the degree of mutual interference between the light waves is reduced, the transmission quality of the light waves is optimized, the color reduction degree of the hologram is improved, the display quality of the hologram is optimized, and dynamic holographic display of the three-dimensional image based on the volume holographic optical waveguide and the spatial light modulator is realized.

CLAIM 1. A volume holographic optical waveguide-based hologram display system, said system comprising: the volume holographic optical waveguide component comprises an input coupling volume holographic grating component, an optical waveguide component and an output coupling volume holographic grating component; the input coupling body holographic grating component comprises a first input coupling body holographic grating layer, a second input coupling body holographic grating layer and a third input coupling body holographic grating layer, the optical waveguide component comprises a first optical waveguide layer and a second optical waveguide layer, and the output coupling body holographic grating component comprises a first output coupling body holographic grating layer, a second output coupling body holographic grating layer and a third output coupling body holographic grating layer; the first input coupling body holographic grating layer and the second input coupling body holographic grating layer are arranged on one side, away from the second optical waveguide layer, of the first optical waveguide layer, and the third input coupling body holographic grating layer is arranged between the first optical waveguide layer and the second optical waveguide layer; the first output coupling body holographic grating layer and the second output coupling body holographic grating layer are arranged on one side, away from the second optical waveguide layer, of the first optical waveguide layer, and the third output coupling body holographic grating layer is arranged between the first optical waveguide layer and the second optical waveguide layer; the first input coupling body holographic grating layer, the second input coupling body holographic grating layer, the first output coupling body holographic grating layer and the second output coupling body holographic grating layer have a first interval therebetween, and the third input coupling body holographic grating layer and the third output coupling body holographic grating layer have a second interval therebetween.

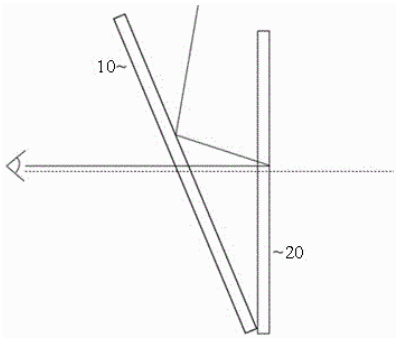
N9171

CN115616788 **HANGZHOU GUANGLI TECHNOLOGY**

Priority Date: **02/12/2022**

HOLOGRAPHIC OPTICAL MODULE, NEAR-TO-EYE DISPLAY SYSTEM AND AUGMENTED REALITY WEARING EQUIPMENT

The utility model provides a holographic optical module, nearly eye display system and augmented reality wearing equipment, relate to optics technical field, holographic optical module, include first holographic device group and the second holographic device group that sets gradually along image beam transmission direction, the image beam incides first holographic device group with predetermineeing the contained angle, deviate from one side of second holographic device group by first holographic device group after diffraction through first holographic device group and second holographic device group in proper order, the ambient light that one side of second holographic device group deviates from first holographic device group passes through second holographic device group and the emergence of first holographic device group in proper order. Can effectual improvement digital image and the transmissivity of external scene, improve augmented reality display effect to can make the compact structure of module small and exquisite.



CLAIM 1. The holographic optical module is characterized by comprising a first holographic device group and a second holographic device group which are sequentially arranged along the transmission direction of an image beam, wherein the second holographic device group is arranged on a diffraction light path of the first holographic device group, the image beam enters the first holographic device group at a preset included angle, the image beam is emergent from one side, deviating from the second holographic device group, of the first holographic device group after being diffracted by the first holographic device group and the second holographic device group in sequence, and ambient light from one side, deviating from the first holographic device group, of the second holographic device group penetrates through the second holographic device group and the first holographic device group in sequence to be emergent.

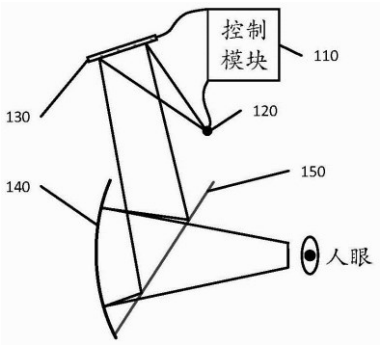
N9172

CN115616767 **JITONG TECHNOLOGY BEIJING**

Priority Date: **12/07/2021**

HOLOGRAPHIC NEAR-TO-EYE THREE-DIMENSIONAL DISPLAY SYSTEM

The embodiment of the application discloses a holographic near-to-eye three-dimensional display system. The system comprises: the device comprises a control module, a light source, a spatial light modulator, a concave semi-transparent semi-reflecting mirror and a spectroscope; the control module is used for calculating the three-dimensional image information into a two-dimensional hologram and sending the two-dimensional hologram to the spatial light modulator; a light source for emitting divergent light to be incident to the spatial light modulator; the spatial light modulator is used for modulating the divergent light and diffracting the two-dimensional hologram into a three-dimensional imaging light beam; and the spectroscope is used for reflecting the three-dimensional imaging light beam to the concave surface semi-transparent and semi-reflective mirror, and the three-dimensional imaging light beam is reflected by the concave surface semi-transparent and semi-reflective mirror to enter human eyes. According to the technical scheme, three-dimensional image information is calculated into a two-dimensional hologram through a holographic algorithm and is loaded on a spatial light modulator, and a three-dimensional imaging light beam image is projected to human eyes by utilizing the modulation capability of the spatial light modulator. The chromatic aberration of the three-dimensional imaging light beam can be eliminated, the imaging quality is improved, and light-weight holographic near-to-eye display is realized.



CLAIM 1. A holographic near-eye three-dimensional display system is characterized by comprising a control module, a light source, a spatial light modulator, a concave semi-transparent and semi-reflective mirror and a spectroscope; the control module is used for calculating three-dimensional image information into a two-dimensional hologram and sending the two-dimensional hologram to the spatial light modulator; the light source is used for emitting divergent light and enabling the divergent light to be incident to the spatial light modulator; the spatial light modulator is used for modulating the divergent light and diffracting the two-dimensional hologram into a three-dimensional imaging light beam; the spectroscope is used for reflecting the three-dimensional imaging light beam to the concave surface semi-transparent semi-reflective mirror, and the three-dimensional imaging light beam is reflected by the concave surface semi-transparent semi-reflective mirror to enter human eyes.

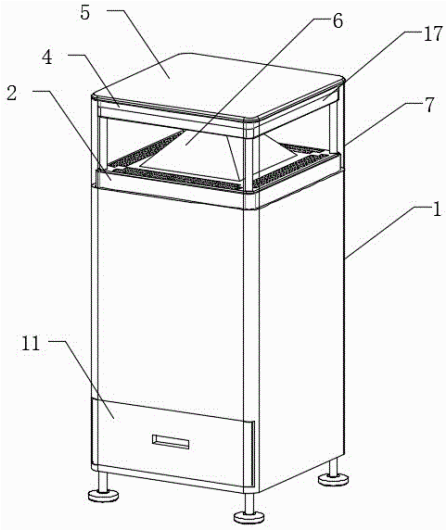
N9178

CN115576180 **ZHEJIANG INTERNATIONAL MARITIME COLLEGE**

Priority Date: **28/11/2022**

3D HOLOGRAPHIC PROJECTION DISPLAY DEVICE

The invention relates to the technical field of D holographic projection display, and discloses D holographic projection display equipment, which comprises: the novel projection screen comprises a main shell and a support frame, wherein a wiring support pipe is fixedly inserted into the inner wall of the support frame, a projection screen is fixedly installed at the top end of the wiring support pipe, the top of the projection screen is fixedly connected with a top plate, and the upper surface of the support frame is fixedly connected with a transparent refractor. This 3D holographically projected display device, can seal transparent refractor parcel in inside through setting up transparent dust hood, avoid transparent refractor surface to be infected with the dust, utilize transparent dust hood as the isolation, avoided producing great angle of inclination makes the dust adhere to easily, utilize elevating system drive device to go up and down to clean the dust removal to transparent dust hood surface through sponge cleaning strip and rubber wiping strip, can wash the cleanness that the sponge cleaning strip guaranteed the sponge cleaning strip surface through washing the mechanism simultaneously, thereby projection definition has been ensured.



CLAIM 1. A 3D holographic projection display apparatus, comprising: the liquid storage device comprises a main shell (1) and a support frame (2), wherein a wiring support pipe (3) is fixedly inserted into the inner wall of the support frame (2), a projection screen (4) is fixedly installed at the top end of the wiring support pipe (3), the top of the projection screen (4) is fixedly connected with a top plate (5), the upper surface of the support frame (2) is fixedly connected with a transparent refractor (6), the top plate (5) and the support frame (2) are fixedly connected with a transparent dust hood (7), the projection screen (4) and the transparent refractor (6) are both positioned in the transparent dust hood (7), the inner wall of the main shell (1) is respectively and fixedly connected with a sponge wiping strip (8) and a rubber water wiping strip (9), the rubber water wiping strip (9) is positioned above the sponge wiping strip (8), the surface of the sponge wiping strip (8) and the surface of the rubber water wiping strip (9) are both in sliding connection with the outer wall of the transparent dust hood (7), a liquid changing port (10) is formed in one side of the main shell (1), the inner wall of the main shell (1) is connected with a sliding liquid bearing strip (11), and a small liquid bearing groove (11) and a small liquid bearing groove (12) matched with a motor (11) are formed in the inner wall of the support frame (11) and is formed in a fixed with the support frame (11), the motor installation plate is characterized in that a lifting mechanism and a washing mechanism are respectively arranged below the motor installation plate (12), an installation opening (15) is formed in the upper surface of the support frame (2) in a penetrating mode, and a water mist eliminating mechanism is arranged inside the installation opening (15).

N9181

CN115542705 **SHENZHEN TIANCHI INNOVATION RESEARCH & DEVELOPMENT**
Priority Date: **18/09/2022**

HOLOGRAPHIC IMAGING INTERACTION DEVICE AND INTERACTION METHOD THEREOF

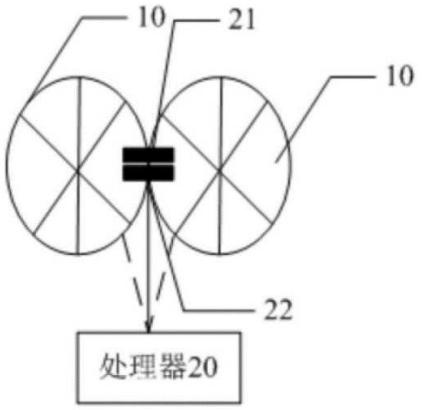
The invention discloses a holographic imaging interaction device and a holographic imaging interaction method, which comprise the following steps: the device comprises a screen 1, a first object 24), an illuminating lamp 5, a semi-transparent reflector 3 and a transparent entity 4, wherein the transparent entity 4 comprises a first refraction surface 6; the first object 24, the first refraction surface 6 and the transflector 3 are arranged in sequence, or the first object 24, the screen 1, the first refraction surface 6 and the transflector 3 are arranged in sequence; connecting the corresponding image displayed on the screen 1 with the semi-transparent reflector 3, wherein at least one straight line of all the connecting lines between the corresponding image displayed on the screen 1 and the semi-transparent reflector 3 passes through the first real object 24; through the interaction of the first real object 24, the illuminating lamp 5 and the screen 1, the immersive visual effect of interactive conversion of true holography and false holography is finally realized.

CLAIM 1. A holographic imaging interactive device, comprising: the system comprises a screen (1), a first object (24), an imager and an illuminating lamp (5), wherein the screen (1) and the first object (24) are used for imaging at corresponding positions through the imager; the imager comprises a transparent solid body (4) and a partial reflector (3), the transparent solid body (4) comprising a transparent liquid and/or a transparent solid body, the partial reflector (3) being in contact with the transparent solid body (4), the transparent solid body (4) comprising a first refractive surface (6), the first refractive surface (6) being one refractive surface of the transparent solid body (4); the illuminating lamp (5) is used for illuminating the first real object (24); it is characterized by comprising the following steps: if the screen (1) is an opaque screen, setting positions according to the sequence of the screen (1), the first object (24), the first refraction surface (6) and the semi-transparent reflector (3); if the screen (1) is a transparent screen, the positions of the first real object (24), the screen (1), the first refraction surface (6) and the semi-transparent reflector (3) are arranged in sequence.

N9182

CN115542704 **HAIER SMART HOME | QINGDAO HAIER AIR CONDITIONING ELECTRONICS | QINGDAO HAIER AIRCONDITIONER**
Priority Date: **26/08/2022**

DISPLAY CONTROL METHOD AND DEVICE OF 3D HOLOGRAPHIC DISPLAY SCREEN AND STORAGE MEDIUM



The invention provides a display control method, a display control device and a storage medium of a 3D holographic display screen, wherein a first sensor and a second sensor which are arranged at a 3D holographic fan are used for respectively detecting light information of the environment where the 3D holographic display screen is located and whether a person exists in a preset range or not in real time, and a processor is used for controlling the 3D holographic fan to be started when the person exists in the preset range; and under the working state of the 3D holographic display screen, the processor generates first control information according to the light information and controls the 3D holographic fan to adjust the brightness of the 3D holographic display screen based on the first control information. In the embodiment of the invention, whether the brightness of the 3D holographic display screen needs to be adjusted according to the light of the environment in the working state or not is respectively detected in real time through the two types of sensors, and the 3D holographic fan is started in time when the condition that someone watches the 3D holographic display screen is detected, so that the 3D holographic display screen can normally display. Based on this, realize the purpose of reasonable power saving in the process of using 3D holographic display screen.

CLAIM 1. The display control method of the 3D holographic display screen is applied to the 3D holographic display screen provided with the display control device, the display control device comprises a processor, a first sensor and a second sensor, the first sensor and the second sensor are arranged at a 3D holographic fan, and the method comprises the following steps: the processor acquires the light information of the environment where the 3D holographic display screen is located, which is detected by the first sensor in real time, and the second sensor detects whether a person exists in a preset range or not in real time and detects the result of the existence of preset time; when the detection result indicates that people exist in a preset range and a preset time length exists, the processor generates a starting instruction based on the detection result and controls the 3D holographic fan to be started based on the starting instruction; and the processor generates control information according to the light information and controls the 3D holographic fan to adjust the brightness of the 3D holographic display screen based on the control information.

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

N9125

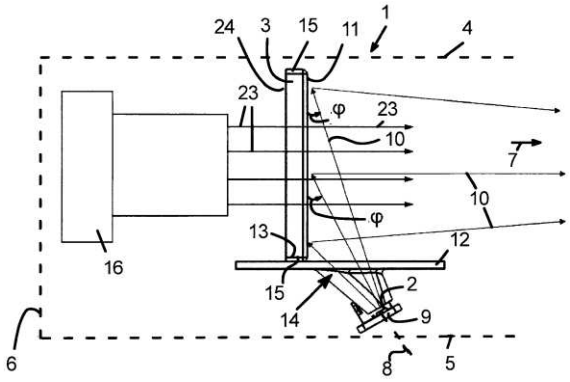
WO2023285346 **HELLA**
Priority Date: **12/07/2021**

HEADLIGHT FOR VEHICLES COMPRISING A REFLECTION HOLOGRAM ELEMENT

The invention relates to a headlamp for vehicles with a hologram module (1, 1') containing a number of light sources (18) and containing a number of hologram elements (3) for generating a predetermined light distribution, wherein the hologram element (3) is designed as a transparent reflection hologram element (3), in that the light source (2) assigned to the reflection hologram element (3) is arranged in front of the reflection hologram element (3) in the light emission direction (7) of the headlamp and in that a light module (16, 17, 21, 29) for generating a further light distribution or for generating an additional light distribution supplementing the light distribution of the hologram module (1, 1') or for generating a display function.

PHARE DE VÉHICULES COMPORTANT UN ÉLÉMENT HOLOGRAMME PAR RÉFLEXION

L'invention concerne un phare de véhicules comprenant un module d'hologramme (1, 1') contenant un certain nombre de sources de lumière (18) et contenant un certain nombre d'éléments hologrammes (3) pour générer une distribution de lumière prédéfinie, l'élément hologramme (3) étant conçu en tant qu'élément hologramme par réflexion transparent (3), la source de lumière (2) associée à l'élément hologramme par réflexion (3) étant disposée devant l'élément hologramme par réflexion (3) dans le sens de rayonnement de lumière (7) du phare, et un module lumineux (16, 17, 21, 29) étant disposé derrière l'élément hologramme par réflexion (3) dans le sens de rayonnement de lumière (7) du phare pour générer une autre distribution de lumière, ou pour générer une distribution de lumière supplémentaire en plus de la distribution de lumière du module d'hologramme (1, 1'), ou pour générer une fonction d'affichage.



CLAIM 1. Headlamp for vehicles with a hologram module (1, 1') containing a number of light sources (18) and containing a number of hologram elements (3) for generating a predetermined light distribution, characterized in that In that the hologram element (3) is designed as a transparent reflection hologram element (3), in that the light source (2) assigned to the reflection hologram element (3) is arranged in front of the reflection hologram element (3) in the light emission direction (7) of the headlamp, and in that a light module (16, 17, 21, 29) for generating a further light distribution or for generating an additional light distribution supplementing the light distribution of the hologram module (1, 1') or for generating a display function.

N9126

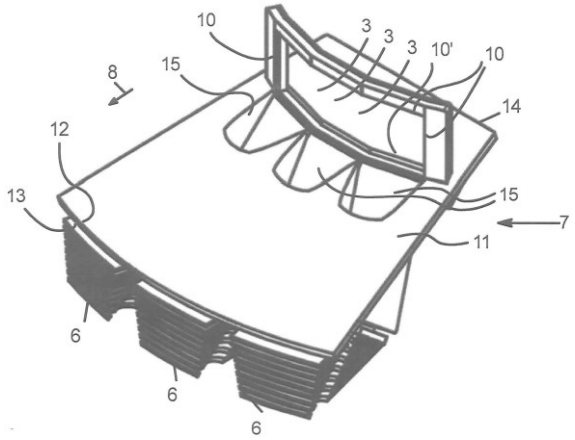
WO2023285339 **HELLA**
Priority Date: **12/07/2021**

HEADLAMP FOR VEHICLES

The invention relates to a headlamp for vehicles having a light source unit (1) with a plurality of light sources (4, 4 '; 20, 20', 20 ") and having a hologram unit (2) with a plurality of hologram segments (3) for generating a predetermined light distribution, wherein the hologram segments (3) are each assigned at least one light source (4, 4 '; 20, 20', 20 "), wherein the hologram segments are designed as reflection hologram segments (3), which are arranged behind the respectively associated light sources (4, 4 '; 20, 20', 20 ") in the light emission direction (8) of the headlamp, on which light sources (4, 4 '; 20, 20', 20") a light emitted by the light sources (4, 20 ") and is reflected in the light emission direction (8) in accordance with the holographic diffraction information stored in the respective reflection hologram segments (3).

PHARE POUR VÉHICULES

L'invention concerne un phare pour véhicules, comprenant une unité de source de lumière (1) ayant une pluralité de sources de lumière (4, 4' ; 20, 20', 20") et comprenant une unité d'hologramme (2) ayant une pluralité de segments d'hologramme (3) pour produire une distribution lumineuse spécifiée, les segments d'hologramme (3) étant chacun associé à au moins une source de lumière (4, 4' ; 20, 20', 20") et les segments d'hologramme étant conçus en tant que segments d'hologramme par réflexion (3) qui sont disposés en aval des sources de lumière (4, 4' ; 20, 20', 20") respectivement attribuées dans la direction d'émission de lumière (8) du phare et sur lesquels la lumière émise par les sources de lumière (4, 4' ; 20, 20', 20") est incidente à un angle aigu et réfléchie dans la direction d'émission de lumière (8) conformément aux informations de diffraction holographique stockées dans les segments d'hologramme par réflexion (3) respectifs.



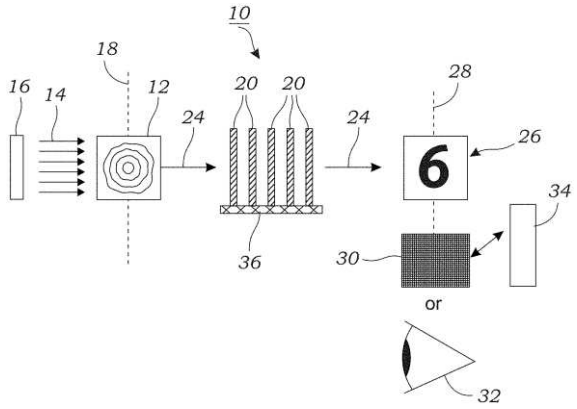
CLAIM 1. Headlamp for vehicles with a light source unit (1) with a plurality of light sources (4, 4 '; 20, 20', 20 ") and with a hologram unit (2) with a plurality of hologram segments (3) for generating a predetermined light distribution, wherein at least one light source (4, 4 '; 20, 20', 20") is assigned to each hologram segment (3), characterized in that In that the hologram segments are in the form of reflection hologram segments (3) which are arranged in the light emission direction (8) of the headlamp behind the respectively associated light sources (4, 4 '; 20, 20', 20 ") on which a light emitted by the light sources (4, 4 '; 20, 20', 20 ") impinges at an acute angle and is reflected in the light emission direction (8) in accordance with the holographic diffraction information stored in the respective reflection hologram segments (3).

N9133

US20230024787 **REGENTS OF THE UNIVERSITY OF CALIFORNIA**
Priority Date: **16/07/2021**

DIFFRACTIVE OPTICAL NETWORK FOR RECONSTRUCTION OF HOLOGRAMS

An all-optical hologram reconstruction system and method is disclosed that can instantly retrieve the image of an unknown object from its in-line hologram and eliminate twin-image artifacts without using a digital processor or a computer. Multiple transmissive diffractive layers are trained using deep learning so that the diffracted light from an arbitrary input hologram is processed all-optically to reconstruct the image of an unknown object at the speed of light propagation and without the need for any external power. This passive diffractive optical network, which successfully generalizes to reconstruct in-line holograms of unknown, new objects and exhibits improved diffraction efficiency as well as extended depth-of-field at the hologram recording distance. The system and method can find numerous applications in coherent imaging and holographic display-related applications owing to its major advantages in terms of image reconstruction speed and computer-free operation.



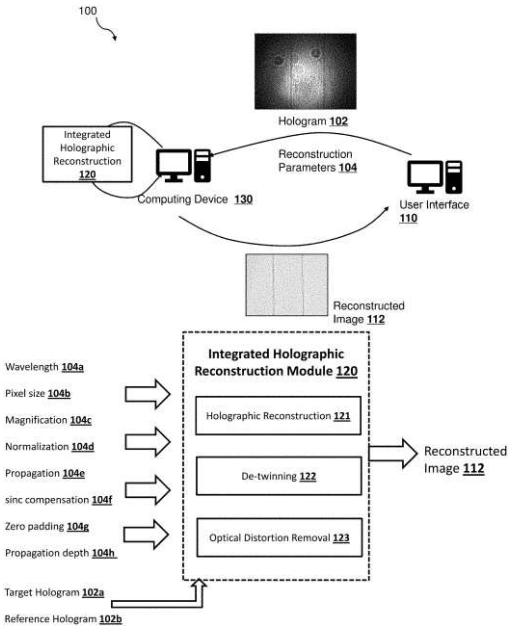
CLAIM 1. A method of forming a physical embodiment of a diffractive optical network that reconstructs input holograms to reveal accurate optical images, optical signals, or optical data comprising: training with at least one computing device a diffractive optical network model formed by one or more diffractive layers to reconstruct at least one optical image, optical signal, or optical data input to the diffractive optical network as one or more holograms, the one or more diffractive layers having a plurality of optically transmissive and/or optically reflective physical features located in different locations therein or thereon, wherein the training comprises feeding an input plane of the diffractive optical network model with training holograms of optical images, optical signals, or optical data and computing an optical output of the diffractive optical network model through optical transmission and/or reflection resulting from the one or more diffractive layers and iteratively adjusting transmission and/or reflection properties for the one or more diffractive layers of the diffractive optical network model until optimized transmission/reflection coefficients are obtained to reconstruct the at least one optical image, optical signal, or optical data from the hologram(s) input to the diffractive optical network model, wherein the at least one optical image, optical signal, or optical data that is/are reconstructed is/are substantially free of twin-image noise or artifacts; and manufacturing or having manufactured a physical embodiment of the diffractive optical network model comprising one or more transmissive and/or reflective diffractive layers having physical features that match the optimized transmission/reflection coefficients obtained by the training of the diffractive optical network model.

N9134

US20230020038 **METROLASER**
Priority Date: **13/07/2021**

SYSTEMS AND METHODS FOR AN INTEGRATED HOLOGRAPHIC REOCNSTURCTION TOOL WITH OPTICAL DISTORTION REMOVAL AND DE-TWINNING

Embodiments described herein provide an integrated holographic reconstruction platform that enables a user to perform three-dimensional visualization of a phenomenon by reconstructing holograms using a combination of normalization and propagation algorithms, which yields better results with significantly less demanding processing time and computing resources. Specifically, the integrated holographic reconstruction platform may be implemented as an all-in-one computer software that includes software components of digital holographic reconstruction, de-twining and optical distortion removal via a user-friendly graphical interface.



CLAIM 1. A method for reconstructing an image of an object from a hologram of the object, the method comprising: obtaining, via a user interface, a target hologram of an object and a selection of a reference beam hologram; receiving, via the user interface, one or more reconstruction parameters configured by a user, wherein the one or more reconstruction parameters include a selected propagation procedure; configuring a de-twining setting that includes iteratively updating a complex-valued wavefront in a detector plane during reconstruction; and reconstructing an image of the object from the target hologram and the reference beam hologram according to the one or more reconstruction parameters and the de-twining setting.

N9135

US20220413434 **META PLATFORMS TECHNOLOGIES**
Priority Date: **28/06/2021**

HOLOGRAPHIC CALLING FOR ARTIFICIAL REALITY

A holographic calling system can capture and encode holographic data at a sender-side of a holographic calling pipeline and decode and present the holographic data as a 3D representation of a sender at a receiver-side of the holographic calling pipeline. The holographic calling pipeline can include stages to capture audio, color images, and depth images; densify the depth images to have a depth value for each pixel while generating parts masks and a body model; use the masks to segment the images into parts needed for hologram generation; convert depth images into a 3D mesh; paint the 3D mesh with color data; perform torso disocclusion; perform face reconstruction; and perform audio synchronization. In various implementations, different of these stages can be performed sender-side or receiver side. The holographic calling pipeline also includes sender-side compression, transmission over a communication channel, and receiver-side decompression and hologram output.

CLAIM 1. A method for adjusting one or more images of a sending user in a holographic call by densification, segmentation, and body modeling, the method comprising: obtaining a machine learning model trained to perform densification, segmentation, and body modeling, wherein the machine learning model was trained by: obtaining computer-generated images of people in various poses and in various environments, each computer-generated image automatically assigned tags with per-pixel depth data, segmentation data, and a body model specifying a pose of a depicted person; and for each particular image of the computer generated images: applying the particular image to the machine learning model; comparing output of the machine learning model to the tags for the particular image; and based on the comparing, applying one or more loss functions to update parameters of the machine learning mode; obtaining depth and color data depicting the sending user; configuring the depth and color data for application to the machine learning model; obtaining previous frame data from output of the machine learning model from one or more previous frames of the holographic call; executing a backbone portion of the machine learning model against the configured depth and color data and the previous frame data to obtain backbone output; and executing A) a densification decoder on the backbone output to generate a densified version of the input image, B) a segmentation decoder on the backbone output to generate masks that identify areas of the input image, and C) a body modeling decoder that generates a body model of the current pose of the sending user.

N9136

US20220413433 **META PLATFORMS TECHNOLOGIES**
Priority Date: **28/06/2021**

HOLOGRAPHIC CALLING FOR ARTIFICIAL REALITY

A holographic calling system can capture and encode holographic data at a sender-side of a holographic calling pipeline and decode and present the holographic data as a 3D representation of a sender at a receiver-side of the holographic calling pipeline. The holographic calling pipeline can include stages to capture audio, color images, and depth images; densify the depth images to have a depth value for each pixel while generating parts masks and a body model; use the masks to segment the images into parts needed for hologram generation; convert depth images into a 3D mesh; paint the 3D mesh with color data; perform torso disocclusion; perform face reconstruction; and perform audio synchronization. In various implementations, different of these stages can be performed sender-side or receiver side. The holographic calling pipeline also includes sender-side compression, transmission over a communication channel, and receiver-side decompression and hologram output.

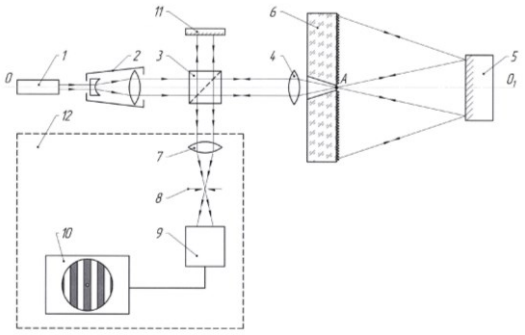
CLAIM 1. A method for conducting a holographic call using a holographic call pipeline, the method comprising: establishing a communication channel between a sending device and at least one receiving device; capturing, at the sending device, color, depth, and audio data and using the color and depth data to generate one or more color images and one or more depths images; generating one or more masks for the one or more color images and one or more depth images; applying the one or more masks to the one or more color images and one or more depth images to obtain masked portions of the one or more color images and one or more depth images; compressing the masked portions of the one or more color images and one or more depth images; and synchronizing and transmitting, over the communication channel, the one or more color images, one or more depth images, and the audio data; wherein the receiving device, in response to the transmitting: decompresses the compressed portions; converts the portions of the one or more depth images into a 3D mesh; paints the portions of the one or more color images onto the 3D mesh; synchronizes the audio data with the painted 3D mesh; performs torso disocclusion on the 3D mesh; performs facial reconstruction on the 3D mesh; and outputs the painted 3D mesh as a hologram with synchronized audio.

N9140

RU2786688 **NAUCHNO PROIZVODSTVENNOE OBEDINENIE GOSUDARSTVENNYJ INSTITUT PRIKLADNOJ OPTIKI**
Priority Date: **01/02/2022**

HOLOGRAPHIC DEVICE FOR SHAPE CONTROL OF ASPHERICAL OPTICAL SURFACES

FIELD: aspherical optical surfaces.



SUBSTANCE: invention can be used to control the shape of aspherical optical surfaces (AOP). The holographic device contains a laser light source, a light beam expander, a beam splitter, measuring and reference channels, and an image registration and processing channel. The reference channel contains a flat mirror, and the measuring channel contains an axial synthesized hologram optical element (ASHOE) and a lens that forms a monochromatic point light source on the optical axis at a given distance from the top of the controlled AOP. ASHOE is a hologram reflective autocollimation compensator with a central hole. The current radius of the coaxial annular diffractive structure of the ASHOE ρ is calculated taking into account the condition: $2\sin\phi(\rho)=\lambda\nu(\rho)$, where $\phi(\rho)$ is the angle between the light beam incident on the ASHOE and the normal to its working surface in the zone with the current radius ρ; λ is the wavelength of a monochromatic point light source; $\nu(\rho)$ is the spatial frequency of ASHOE in the zone with current radius ρ.

EFFECT: increasing the sensitivity of the control of the shape of the AOP with the exclusion of the distorting influence of the ASHOE on the form of interference and shadow patterns obtained in the process of control.

CLAIM 1. The holographic device for the control of the shape of the aspherical optical surfaces, containing a laser light source, an extender of the beam, a light blower to divide the light beams into the measuring and support channels, and the coupling of the light beams of the measuring and support channels and the direction of the transmission and processing of the image, with the support channel containing a flat mirror and the measuring channel containing the center synthesized golds The photometric optical element (OSSSE) with the working surface of the coaxial ring diffraction structure and the lens forming a monochromatic point source located on the optical axis at a specified distance from the top of the controlled aspherical optical surface, distinguishing the GSSE from a hologram reflecting autocollimation A center with a central hole, with The current radius of the coaxial ring diffraction structure of the SSE is calculated according to the condition: $2\sin\phi(\rho) = \lambda\nu(\rho)$

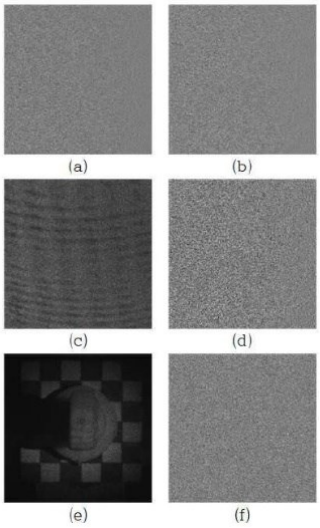
N9141

KR20230011162
Priority Date: **13/07/2021**

KWANGWOON UNIVERSITY INDUSTRY ACADEMIC COLLABORATION FOUNDATION

COMPRESSION CODING SYSTEM FOR PHASE COMPONENTS OF HOLOGRAMS

In order to solve the disadvantages of the method of compressing phase components of a full-complex hologram and compressing real and imaginary parts independently, Disclosed is a compression coding system for a phase component of a hologram. the compression coding system includes a divider configured to divide a phase component of an original hologram (hereinafter, a phase component hologram) into a plurality of sub-phase blocks, A spreading unit configured to perform phase unwrapping on the corresponding sub-phase block; and an encoding unit configured to encode the corresponding phase component hologram with respect to the phase component hologram in which each sub-phase block is spread to generate a bitstream, by applying a phase unwrapping method in consideration of intra prediction, compression ratio can be increased by utilizing attributes of HEVC intra coding well.



CLAIM 1. A compression coding system for a phase component of a hologram, the compression coding system comprising: a dividing unit configured to divide a phase component of an original hologram (hereinafter, a phase component hologram) into a plurality of sub-phase blocks; a spreading unit configured to perform phase unwrapping for each sub-phase block; And an encoding unit for encoding the phase component hologram to generate a bitstream by encoding the phase component hologram with respect to the phase component hologram in which each sub-phase block is spread.

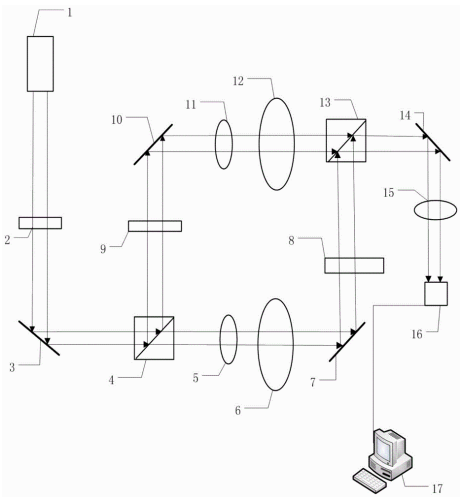
N9157

CN218382464U
Priority Date: **24/08/2022**

KUNMING UNIVERSITY OF SCIENCE & TECHNOLOGY

SEMICONDUCTOR ELEMENT INTERNAL DAMAGE DETECTION SYSTEM

The utility model discloses an inside damage detecting system of semiconductor element belongs to engineering material, infrared holographic technical field, and the device includes laser instrument, first decay piece, first speculum, beam splitter, first space filter, first collimating mirror, the second mirror, the semiconductor element that awaits measuring, second decay piece, third speculum, second space filter, second collimating mirror, beam combiner, fourth speculum, lens, CCD camera, computer. The detection system of the utility model utilizes the infrared holographic method, obtains the digital hologram of the semiconductor element through the experiment, calculates the obtained digital hologram to obtain the phase diagram, and analyzes the defect in the interior if the phase has the non-uniform area; the system of the utility model has simple light path, convenient test, low cost and can realize light path multiplexing; the longer the wavelength of the infrared light is, the lower the requirement on the environmental stability is, and the object to be detected cannot be damaged in the detection process.

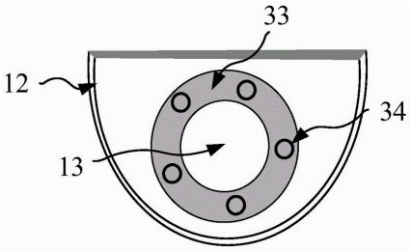


CLAIM 1. A semiconductor device internal damage detection system, characterized by: the device comprises a laser (1), a first attenuation sheet (2), a first reflector (3), a beam splitter (4), a first spatial filter (5), a first collimating mirror (6), a second reflector (7), a semiconductor element to be tested (8), a second attenuation sheet (9), a third reflector (10), a second spatial filter (11), a second collimating mirror (12), a beam combiner (13), a fourth reflector (14), a lens (15), a CCD camera (16) and a computer (17); the laser beam emitted by the laser (1) reaches the first reflector (3) through the first attenuation sheet (2), the laser beam is divided into two beams through the beam splitter (4), one beam of laser beam is used as object light and reaches the second reflector (7) through the first spatial filter (5) and the first collimating mirror (6), and the incident semiconductor element to be detected reaches the beam combiner (13); the other beam of light is used as reference light and enters a third reflector (10) through a second attenuation sheet (9) to enter a second spatial filter (11) and a second collimating mirror (12), then enters a beam combining mirror (13) through the second collimating mirror (12), interferes with object light to reach a fourth reflector (14), and then enters a CCD camera (16) through a lens (15), and the CCD camera (16) is connected with a computer (17).

N9176

CN115586660 **FUTURE OPTICAL SHANGRAO RESEARCH INSTITUTE**
Priority Date: **09/10/2022**

HOLOGRAPHIC OUT-OF-FOCUS LENS, MANUFACTURING METHOD AND EQUIPMENT



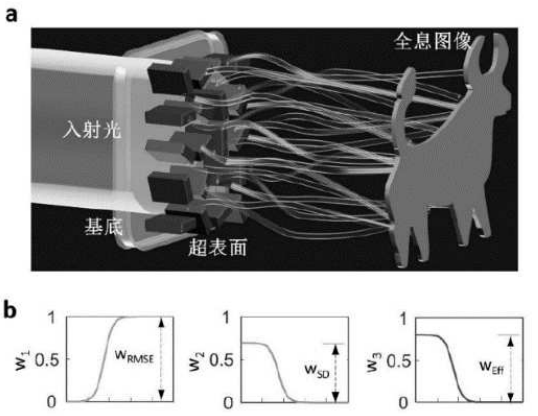
The invention belongs to the technical field of visual optics, and particularly relates to a holographic out-of-focus lens, a manufacturing method and equipment, wherein the lens comprises: the holographic film layer is arranged on the substrate; forming a plurality of holographic lenses in the holographic film layer; the lens comprises a central visual field area, and the holographic lenses are discretely distributed on the periphery of the central visual field area and used for reflecting light rays which come from the user side and contain correction pattern information to form convergent light rays so as to form a plurality of discrete correction pattern virtual images on the front side of the retina of the user and form defocusing stimulation. The holographic out-of-focus lens is combined with an image source arranged on the user side, so that a plurality of discrete correction pattern virtual images are formed on the front side of the retina when the retina of a user normally receives external environment light, out-of-focus stimulation is formed, the increase of the axis of the eye is restrained, and myopia regulation and control are achieved.

N9179

CN115561984 **UNIVERSITY OF SCIENCE & TECHNOLOGY OF CHINA**
Priority Date: **01/11/2022**

METHOD FOR ELIMINATING COMPUTED HOLOGRAPHIC SPECKLE BY USING PHASE PROBABILITY REGULATION AND CONTROL OPTIMIZATION ALGORITHM

The invention relates to a method for eliminating and calculating holographic speckles by utilizing a phase probability regulation and optimization algorithm, which is characterized by calculating holographic image key parameters, wherein the holographic image key parameters comprise the square root mean square error, the standard deviation and the optical efficiency of a holographic image, and updating a cost function; updating a mask phase, calculating diffraction from an input surface to a target surface by utilizing Rayleigh-Sophia diffraction integral based on the mask phase, and determining whether a holographic image of an output surface contains speckles; and if the speckle exists, carrying out the next iteration to finally obtain the speckle-free holographic image. The invention can effectively eliminate the inherent speckles in the computed holographic imaging, designs and processes the speckle-eliminating phase type device by utilizing the proposed holographic optimization algorithm, and uses the speckle-eliminating phase type device in holographic lithography to expand the practical application scene of the computed holographic technology.



CLAIM 1. A method for eliminating computed holographic speckle by utilizing a phase probability regulation and optimization algorithm is characterized by comprising the following implementation steps: step 1, calculating key parameters of the holographic image, wherein in the ith iteration, the key parameters of the holographic image comprise the Root Mean Square Error (RMSE) of the holographic image i Standard deviation SD i And optical efficiency eta i ; Step 2, dynamically adjusting the key parameters of the holographic image obtained in the step 1, and updating the cost function CF i ; The cost function CF i =w 1 (i).RMSE i +w 2 (i).SD i +w 3 (i).(1-η i) I is the number of iterations, w 1 (i),w 2 (i) And w 3 (i) Are each RMSE i ,SD i And η i The weighting factor of (2), wherein the weighting factor dynamically changes with the iteration number i, and the change of the weighting factor adopts the following formula: w 1 (i)=w RMSE {tanh[(i-i 0)/D 0]+1}/2, w 2 (i)=w SD {tanh[-(i-i 0)/D 0]+1}/2, w 3 (i)=w Eff {tanh[-(i-i 0)/D 0]+1}/2. in the formula, w RMSE ,w SD And w Eff As the range of variation of the weight factor, i 0 Points mutated for weighting factors, D 0 For the length of the discontinuity duration, tanh is the hyperbolic tangent function; step 3, according to the cost function CF i Updating the mask phase; step 4, based on the updated mask phase Calculating diffraction from an input surface to a target surface by utilizing Rayleigh-Sophia diffraction integral, and determining whether a holographic image of an output surface contains speckles; if the speckle exists, the next iteration is carried out, and the speckle-free holographic image is finally obtained.

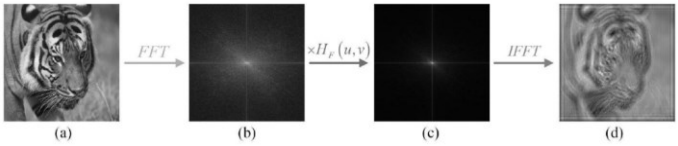
N9183

CN115542703
Priority Date: **20/09/2022**

CHINESE PEOPLE S LIBERATION GROUND FORCE ARMORED TROOP ACADEMY

METHOD, SYSTEM, EQUIPMENT AND MEDIUM FOR OPTIMIZING PRIMARY REPRODUCTION IMAGE OF HOLOGRAM

The invention discloses a method, a system, equipment and a medium for optimizing primary reconstructed images of holograms, which relate to the field of image processing and comprise the following steps: acquiring a target image; determining a target image light field according to the target image; calculating a target diffraction field after a target image light field reversely propagates for a set distance; constructing a U-Net network model; and inputting the target diffraction field into the trained U-Net network model to obtain the optimized hologram. According to the invention, the trained U-Net network model is obtained by constructing the U-Net network model and training and optimizing the U-Net network model, so that the quality of the zero-order reproduction image of the initial hologram can be continuously improved, and the effect of optimizing the first-order reproduction image of the hologram is finally achieved.



CLAIM 1. A method of optimizing a primary reconstructed image of a hologram, the method comprising: acquiring a target image; determining a target image light field from the target image; calculating a target diffraction field after the light field of the target image reversely propagates for a set distance; constructing a U-Net network model; and inputting the target diffraction field into a trained U-Net network model to obtain an optimized hologram.

IHMA - JANUARY 2023 - 95 ISSUED PATENTS - PAGE 1

HOLOGRAMS - 13 PATENTS

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P35967	US	20230017185	19/01/2023	INNOV8TIF SOLUTIONS	MY	15/07/2021	MY2021000004026	US20230017185	METHOD TO DETERMINE AUTHENTICITY OF SECURITY HOLOGRAM	
P35995	EP	4120104	18/01/2023	IMPRIMERIE NATIONAL	FR	16/07/2021	FR2021000007680	EP4120104 FR3125345	METHOD FOR GENERATING A DIGITAL IDENTITY DOCUMENT OF AN INDIVIDUAL FROM A PHYSICAL OFFICIAL IDENTITY DOCUMENT	
P35996	EP	4116778	11/01/2023	BUNDESDRUCKEREI	DE	08/07/2021	DE202110117699	EP4116778 DE102021117699	METHOD FOR PRODUCING SECURITY ELEMENT FOR SECURITY DOCUMENT, METHOD FOR MANUFACTURING SECURITY DOCUMENT, METHOD FOR PERSONALIZING A SECURITY DOCUMENT, SECURITY ELEMENT FOR SECURITY DOCUMENT, SECURITY DOCUMENT AND ID DOCUMENT	
P36001	EP	4109420	28/12/2022	CONDUENT BUSINESS SERVICES	EP	25/06/2021	EP2021000290041	EP4109420 US20220413435	HOLOGRAPHIC BARCODE TARGET GENERATOR	
P36011	CN	218367210	24/01/2023	SVG YANCHENG OPTRONICS	CN	13/07/2022	CN2022001801759	CN218367210U	DOUBLE-COLOR HOLLOW RELIEF FILM	
P36014	CN	218344272	20/01/2023	SHANDONG TAIBAO PACKAGING PRODUCT	CN	28/10/2022	CN2022002868039	CN218344272U	DIGITAL HOLOGRAPHIC SCRAPING FLOWER	
P36019	CN	218273806	10/01/2023	ZHEJIANG YUSHI PACKAGE MATERIAL	CN	30/08/2022	CN2022002329596	CN218273806U	NOVEL LASER COLD WAVE MEMBRANE	
P36025	CN	218214150	03/01/2023	HUBEI GEDIAN DEVELOPMENT REGION CHENGUANG INDUSTRIAL	CN	17/08/2022	CN2022002170845	CN218214150U	ANTI-COUNTERFEIT LABEL WITH LOCAL LASER HOLOGRAPHIC TWO-DIMENSIONAL CODE DUAL MARKS	
P36030	CN	218143232	27/12/2022	SHANGHAI TECHSUN PACKING MATERIALS | SHANGHAI TECHSUN RFID TECHNOLGOY | SHANGHAI TIANCHEN MICRO NANO TECHNOLOGY	CN	07/09/2022	CN2022002379964	CN218143232U	ANTI-FAKE WINE BOTTLE RUBBER CAP	
P36045	CN	115593129	13/01/2023	REN GUANGZHAO | REN BINGQIN	CN	03/11/2022	CN2022001365714	CN115593129	METHOD FOR MANUFACTURING HOLOGRAPHIC COLOR ADVERTISEMENT CUSTOMIZED ADHESIVE TAPE	
P36050	CN	115576179	06/01/2023	HUBEI YIMEITE QUANXI TECHNOLOGY	CN	08/10/2022	CN2022001223698	CN115576179	HOLOGRAPHIC IMAGE STRUCTURE WITH LAYERED SUPERPOSITION EFFECT AND MANUFACTURING METHOD THEREOF	
P36053	CN	115559154	03/01/2023	ANHUI ZIJIANG METALLIZATION ENVIRONMENTAL PROTECTION MATERIAL | SHANGHAI ZIJIANG METALLIZATION ENVIRONMENTAL PROTECTION MATERIAL	CN	22/10/2022	CN2022001297829	CN115559154	MULTI-MEDIUM COMBINED LOCAL HOLOGRAPHIC ALUMINUM-SPRAYED TRANSFER PAPER AND PREPARATION METHOD THEREOF	
P36059	CN	115519917	27/12/2022	SHANTOU JIAXIN PACKING MAT	CN	29/11/2022	CN2022001507901	CN115519917	PRODUCTION PROCESS OF ACCURATE DUAL ANTI-COUNTERFEITING LASER TRANSFER PAPERBOARD	

VARIOUS OPTICAL EFFECTS - 20 PATENTS

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P35949	WO	2023287785	19/01/2023	TROY	US	13/07/2021	US2021063221353	WO2023287785	DYNAMIC SHIFTING IMAGES FOR SECURITY PRINTING APPLICATIONS	Smartphone
P35954	WO	2023282063	12/01/2023	ZEON	JP	07/07/2021	JP2021000113021	WO2023282063	OPTICAL DISPLAY MEDIUM	
P35957	WO	2023281123	12/01/2023	SURYS	FR	09/07/2021	FR2021000007518	WO2023281123 FR3124980	OPTICAL SECURITY COMPONENTS, MANUFACTURE OF SUCH COMPONENTS AND SECURE DOCUMENTS EQUIPPED WITH SUCH COMPONENTS	Microlens
P35978	JP	2023004693	17/01/2023	TOPPAN PRINTING	JP	28/06/2021	JP2021000106554	JP2023004693	DIFFRACTION GRATING PATTERN	
P36002	EP	4108471	28/12/2022	HUECK FOLIEN	EP	23/06/2021	EP2021000181145	EP4108471 WO2022268962	SECURITY ELEMENT WITH A SUBSTRATE AND AT LEAST ONE MICROIMAGE ARRANGEMENT	Microlens
P36004	DE	102021003605	19/01/2023	GIESECKE & DEVRIENT MOBILE SECURITY	DE	13/07/2021	DE202110003605	DE102021003605	IDENTITY DOCUMENT	

IHMA - JANUARY 2023 - 95 ISSUED PATENTS - PAGE 2

VARIOUS OPTICAL EFFECTS - 20 PATENTS (continuation)

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P36005	DE	102021003553	29/12/2022	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	28/06/2021	DE202110003324	DE102021003553	SECURITY SUBSTRATE	
P36010	CN	218367232	24/01/2023	SVG YANCHENG OPTRONICS	CN	16/09/2022	CN2022002463756	CN218367232U	COLOR RELIEF FILM	
P36012	CN	218367126	24/01/2023	SHANGHAI YAOMAO NEW MATERIAL TECHNOLOGY	CN	17/10/2022	CN2022002744573	CN218367126U	ANTI-COUNTERFEITING GOLD STAMPING FILM	
P36013	CN	218351054	20/01/2023	GUANGZHOU HUADU LIANHUA PACKING MATERIAL	CN	03/08/2022	CN2022002035221	CN218351054U	DOUBLE-SIDED LIGHT ANGLE COLOR-CHANGING MULTIPLE ANTI-COUNTERFEITING SAFETY LINE	
P36028	CN	218159063	27/12/2022	SHANGHAI TECHSUN PACKING MATERIALS | SHANGHAI TECHSUN RFID TECHNOLGOY | SHANGHAI TIANCHEN MICRO NANO TECHNOLOGY	CN	07/09/2022	CN2022002379315	CN218159063U	ANTI-COUNTERFEITING STRUCTURE	Microlens
P36034	CN	115637106	24/01/2023	ANHUI SHUNTONG PACKAGING MATERIAL	CN	19/07/2021	CN2021000814950	CN115637106	ANTI-COUNTERFEITING FILM WITH COLOR-CHANGING EFFECT AND PREPARATION METHOD THEREOF	
P36035	CN	115618307	17/01/2023	SHANGHAI GENYAN NETWORK TECHNOLOGY	CN	29/09/2022	CN2022001205082	CN115618307	ANTI-COUNTERFEITING VERIFICATION METHOD AND DEVICE FOR PRINTOUT FILE, ELECTRONIC EQUIPMENT AND MEDIUM	
P36036	CN	115616690	17/01/2023	HOLOTEK TECHNOLOGY | SHENZHEN JINJIA	CN	05/05/2022	CN2022000480753	CN115616690	OPTICAL ANTI-COUNTERFEITING ELEMENT WITH INTERSECTED MICRO-RELIEF THREE-DIMENSIONAL STRUCTURE, PRODUCT AND PREPARATION METHOD	Microlens
P36037	CN	115616686	17/01/2023	JIANGNAN UNIVERSITY	CN	22/08/2022	CN2022001009416	CN115616686	PHOTONIC CRYSTAL FILM AND PREPARATION METHOD AND APPLICATION THEREOF	
P36046	CN	115586696	10/01/2023	DONGGUAN JIAYI INDUSTRY | LIJIA PACKAGING	CN	28/09/2022	CN2022001194175	CN115586696	ELECTRON BEAM INVISIBLE ANTI-COUNTERFEITING PRINTING LABEL AND MANUFACTURING METHOD THEREOF	
P36051	CN	115573195	06/01/2023	GUANGDONG GREEN COLOR TECHNOLOGY	CN	24/10/2022	CN2022001303817	CN115573195	ANTI-COUNTERFEITING 3D (THREE-DIMENSIONAL) DYNAMIC ORNAMENTATION PRODUCTION PROCESS	
P36056	CN	115527303	27/12/2022	BEIJING KESIYUAN TECHNOLOGY	CN	19/08/2022	CN2022000999905	CN115527303	MULTILAYER MAGNETIC SHEET ANTI-COUNTERFEITING STRUCTURE	
P36060	CN	115513267	23/12/2022	BOE TECHNOLOGY GROUP	CN	29/09/2022	CN2022001196434	CN115513267	DISPLAY SUBSTRATE AND DISPLAY DEVICE	
P36062	CN	115503336	23/12/2022	CHANGSHA YAGUAN NEW MATERIAL TECHNOLOGY	CN	01/11/2022	CN2022001355400	CN115503336	ANTI-COUNTERFEITING LASER DIRECT PLATING PAPER PRODUCTION EQUIPMENT	

NON SECURITY HOLOGRAMS - 62 PATENTS

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
N9123	WO	2023287015	19/01/2023	LG CHEM	KR	15/07/2021	KR2021000092621	WO2023287015	HOLOGRAPHIC INTERFERENCE PATTERN RECORDING APPARATUS AND RECORDING METHOD USING SAME	
N9124	WO	2023285619	19/01/2023	CARL ZEISS JENA	DE	15/07/2021	DE202110207574	WO2023285619 DE102021207574	HOLOGRAPHIC LIGHTING DEVICE	
N9125	WO	2023285346	19/01/2023	HELLA	DE	12/07/2021	DE202110117912	WO2023285346 DE102021117912	HEADLIGHT FOR VEHICLES COMPRISING A REFLECTION HOLOGRAM ELEMENT	
N9126	WO	2023285339	19/01/2023	HELLA	DE	12/07/2021	DE202110117908	WO2023285339 DE102021117908	HEADLAMP FOR VEHICLES	
N9127	WO	202303854	26/01/2023	RANKOR INDUSTRIAL	US	23/07/2021	US2021063225299	WO202303854	OPTICAL SYSTEMS WITH HOLOGRAPHIC GRATINGS	
N9128	WO	202303092	26/01/2023	HOLOLAB	KR	23/07/2021	KR2021000097301	WO202303092	METHOD AND SYSTEM FOR FABRICATING DIGITAL HOLOGRAPHIC SCREEN ON BASIS OF MULTI-HOGEL PRINTING	
N9129	WO	202303091	26/01/2023	HOLOLAB	KR	23/07/2021	KR2021000097267	WO202303091	METHOD FOR DUPLICATING LARGE-AREA COLOR HOLOGRAM	

IHMA - JANUARY 2023 - 95 ISSUED PATENTS - PAGE 3

NON SECURITY HOLOGRAMS - 62 PATENTS (continuation)

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
N9130	WO	202302221	26/01/2023	VIVIDQ	GB	23/07/2021	GB2021000010606	WO202302221 GB202110606	HOLOGRAPHIC DISPLAYS AND METHODS	
N9131	WO	202302175	26/01/2023	VIVIDQ	GB	21/07/2021	GB2021000010495	WO202302175 GB202110495	HOLOGRAPHIC DISPLAY SYSTEM AND METHOD FOR REDUCING EFFECTS OF QUANTISATION NOISE	
N9132	WO	202301594	26/01/2023	AUDI	DE	19/07/2021	DE202110118582	WO202301594 DE102021118582	MOTOR VEHICLE WITH A DISPLAY DEVICE FOR PROJECTING A HOLOGRAPHIC DISPLAY CONTENT INTO A FIELD OF VIEW OF AT LEAST ONE VEHICLE OCCUPANT AND DISPLAY DEVICE FOR A MOTOR VEHICLE	
N9133	US	20230024787	26/01/2023	REGENTS OF THE UNIVERSITY OF CALIFORNIA	US	16/07/2021	US2021063222849	US20230024787	DIFFRACTIVE OPTICAL NETWORK FOR RECONSTRUCTION OF HOLOGRAMS	
N9134	US	20230020038	19/01/2023	METROLASER	US	13/07/2021	US2021017374670	US20230020038	SYSTEMS AND METHODS FOR AN INTEGRATED HOLOGRAPHIC REOCNSTURCTION TOOL WITH OPTICAL DISTORTION REMOVAL AND DE-TWINNING	
N9135	US	20220413434	29/12/2022	META PLATFORMS TECHNOLOGIES	US	28/06/2021	US2021017360735	US20220413434	HOLOGRAPHIC CALLING FOR ARTIFICIAL REALITY	
N9136	US	20220413433	29/12/2022	META PLATFORMS TECHNOLOGIES	US	28/06/2021	US2021017360693	US20220413433 WO2023278082	HOLOGRAPHIC CALLING FOR ARTIFICIAL REALITY	
N9137	US	11561510	24/01/2023	META PLATFORMS TECHNOLOGIES	US	19/07/2019	US2019016517535	US11561510	HOLOGRAPHIC NEAR-EYE DISPLAY HAVING PUPIL STEERING	
N9138	US	11556727	17/01/2023	QR ME	US	23/08/2021	US2021017409385	US11556727	PERSONAL USER QR CODE-HOLOGRAPHIC SYSTEM	
N9139	US	11544989	03/01/2023	SEELIG JERALD | TOWNSEND TARA	US	04/06/2019	US2019062857251	US11544989	GAMING SYSTEM AND GAMING DEVICES WITH HOLOGRAPHIC PROJECTION FEATURE	
N9140	RU	2786688	23/12/2022	NAUCHNO PROIZVODSTVENNOE OBEDINENIE GOSUDARSTVENNYJ INSTITUT PRIKLADNOJ OPTIKI	RU	01/02/2022	RU2022000102418	RU2786688	HOLOGRAPHIC DEVICE FOR SHAPE CONTROL OF ASPHERICAL OPTICAL SURFACES	
N9141	KR	20230011162	20/01/2023	KWANGWOON UNIVERSITY INDUSTRY ACADEMIC COLLABORATION FOUNDATION	KR	13/07/2021	KR2021000091851	KR20230011162	COMPRESSION CODING SYSTEM FOR PHASE COMPONENTS OF HOLOGRAMS	
N9142	KR	20230008418	16/01/2023	KOREA SECURITY PRINTING & MINTING	KR	07/07/2021	KR2021000089037	KR20230008418	IMPRESSION MOLD FOR FORMING IMPRESSION PRODUCT AND METHOD OF MANUFACTURING THE SAME	
N9143	KR	20230006301	10/01/2023	LG CHEM	KR	02/07/2021	KR2021000087342	KR20230006301	PHOTOPOLYMER COMPOSITION	
N9144	KR	20230001821	05/01/2023	HOLOLAB	KR	29/06/2021	KR2021000084833	KR20230001821	HOLOGRAM CLOSE REPLICATION METHOD AND SYSTEM	
N9145	KR	20220168817	26/12/2022	KWANGWOON UNIVERSITY INDUSTRY ACADEMIC COLLABORATION FOUNDATION	KR	17/06/2021	KR2021000078777	KR20220168817	VHOE-BASED COMPUTER HOLOGRAPHIC IMAGING DEVICE FOR COLOR COMPENSATED HOLOGRAPHIC AUGMENTED REALITY DISPLAYS	
N9146	KR	102486816	10/01/2023	YEOM, KYEONG SEOK	KR	01/04/2022	KR2022000040994	KR102486816	METHOD FOR PRODUCING DECORATIVE TRANSFER FILM	
N9147	JP	2023008931	19/01/2023	KOCHI UNIVERSITY	JP	29/06/2021	JP2021000107812	JP2023008931	GUIDE METHOD FOR PROJECTION OBJECT AND GUIDE DEVICE FOR PROJECTION OBJECT OBJECT	
N9148	JP	2023008330	19/01/2023	JAPAN BROADCASTING	JP	05/07/2021	JP2021000111809	JP2023008330	REPRODUCTION ILLUMINATION ILLUMINATION ILLUMINATION DEVICE FOR HOLOGRAPHIC AND HOLOGRAPHIC DISPLAY	
N9149	JP	2023007531	19/01/2023	JAPAN BROADCASTING	JP	01/07/2021	JP2021000110409	JP2023007531	INCOHERENT DIGITAL HOLOGRAPHIC IMAGING DEVICE AND METHOD OF IMAGING	
N9150	JP	2023007262	18/01/2023	KDDI	JP	01/07/2021	JP2021000110399	JP2023007262	COMPUTER COMPOSITE HOLOGRAM GENERATION APPARATUS, METHOD, AND PROGRAM	
N9151	JP	2022189643	22/12/2022	JAPAN BROADCASTING	JP	11/06/2021	JP2021000098337	JP2022189643	MODULATION CODE CREATION METHOD AND HOLOGRAM RECORDING/REPRODUCTION DEVICE	
N9152	IN	202311000321	13/01/2023	SHEORAN GYANENDRA | KUMARI VINEETA | BARAK NEELAM | SHARMA AJAY KUMAR	IN	03/01/2023	IN2023011000321	IN202311000321	COMMON-PATH DIGITAL HOLOGRAPHIC CONFIGURATION FOR QUANTITATIVE IMAGING	

IHMA - JANUARY 2023 - 95 ISSUED PATENTS - PAGE 4

NON SECURITY HOLOGRAMS - 62 PATENTS (continuation)

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
N9153	FR	3124865	06/01/2023	CNRS - CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE | PSA AUTOMOBILES | UNIVERSITE PARIS SACLAY	FR	05/07/2021	FR2021000007238	FR3124865	SPATIAL LIGHT MODULATOR FOR HOLOGRAPHIC IMAGE PROJECTION DEVICE	
N9154	EP	4122765	25/01/2023	CARL ZEISS JENA	DE	23/07/2021	DE202110207987	EP4122765 DE102021207987	HOLOGRAPHIC ACCESS CONTROL	
N9155	DE	102021206850	05/01/2023	CARL ZEISS SMT	DE	30/06/2021	DE202110206850	DE102021206850	METHOD FOR PRODUCING A DIFFRACTIVE OPTICAL ELEMENT AND DIFFRACTIVE OPTICAL ELEMENT	
N9156	CN	218383643	24/01/2023	CHONGQING SHUANGQING INDUSTRY GROUP	CN	24/08/2022	CN2022002222825	CN218383643U	CONFERENCE TABLE WITH HOLOGRAPHIC PROJECTION FUNCTION	
N9157	CN	218382464	24/01/2023	KUNMING UNIVERSITY OF SCIENCE & TECHNOLOGY	CN	24/08/2022	CN2022002223498	CN218382464U	SEMICONDUCTOR ELEMENT INTERNAL DAMAGE DETECTION SYSTEM	
N9158	CN	218273940	10/01/2023	HENAN NORMAL UNIVERSITY	CN	03/05/2022	CN2022001036294	CN218273940U	3D HOLOGRAPHIC PROJECTION MAN-MACHINE INTELLIGENT INTERACTION DISPLAY DEVICE	
N9159	CN	218272938	10/01/2023	HARBIN YINENG COMMUNICATION TECHNOLOGY DEVELOPMENT	CN	30/09/2022	CN2022002606647	CN218272938U	HOLOGRAPHIC WAVEGUIDE LENS AR GLASSES	
N9160	CN	218213796	03/01/2023	RONGWEIYUAN SHENZHEN TECHNOLOGY	CN	16/08/2022	CN2022002146306	CN218213796U	ADOPT HOLOGRAPHIC SHOW CUPBOARD OF VERTICAL 3D OF 3D	
N9161	CN	218159578	27/12/2022	BEIJING SHUIMU QINGMEI DECORATION ENGINEERING	CN	08/08/2022	CN2022002074337	CN218159578U	GESTURE INTERACTION HOLOGRAPHIC DISPLAY DEVICE	
N9162	CN	218158745	27/12/2022	GUANGZHOU LEAFUN CULTURE TECHNOLOGY	CN	31/08/2022	CN2022002341862	CN218158745U	PROJECTION SYSTEM	
N9163	CN	218153394	27/12/2022	SHENZHEN HAIYUN XINSHENG TECHNOLOGY	CN	18/08/2022	CN2022002180951	CN218153394U	HOLOGRAPHIC IMAGE SCREEN PROJECTION DEVICE CAPABLE OF BEING FREELY DETACHED AND ADJUSTED	
N9164	CN	218124835	23/12/2022	XIANG CHENGLIN	CN	04/05/2022	CN2022001059993	CN218124835U	HOLOGRAPHIC BOX	
N9165	CN	218122454	23/12/2022	APPOTRONICS	CN	08/06/2022	CN2022001434859	CN218122454U	PROJECTION LIGHT MACHINE	
N9166	CN	115639735	24/01/2023	SOUTHEAST UNIVERSITY	CN	02/11/2022	CN2022001362718	CN115639735	LARGE-SIZE HOLOGRAPHIC DISPLAY SYSTEM CAPABLE OF BEING WATCHED FREELY	
N9167	CN	115639643	24/01/2023	SHENZHEN LOCHN OPTICS HI TECHNOLOGY	CN	23/12/2022	CN2022001660955	CN115639643	VOLUME HOLOGRAPHIC GRATING AND EXPOSURE PARAMETER DETERMINATION METHOD, MANUFACTURING METHOD AND SYSTEM THEREOF	
N9168	CN	115633152	20/01/2023	HARBIN ENGINEERING UNIVERSITY	CN	19/12/2022	CN2022001629154	CN115633152	REMOTE VIDEO HOLOGRAPHIC PROJECTION SYSTEM	
N9169	CN	115631774	20/01/2023	GUANGDONG ZIJING INFORMATION STORAGE TECHNOLOGY	CN	27/09/2022	CN2022001184389	CN115631774	INDEPENDENTLY CALIBRATED HOLOGRAPHIC STORAGE OPTICAL PATH SYSTEM	
N9170	CN	115616790	17/01/2023	COAL SCIENTIFIC RESEARCH GENERAL INSTITUTE	CN	20/12/2022	CN2022001638232	CN115616790	HOLOGRAM DISPLAY SYSTEM BASED ON VOLUME HOLOGRAPHIC OPTICAL WAVEGUIDE	
N9171	CN	115616788	17/01/2023	HANGZHOU GUANGLI TECHNOLOGY	CN	02/12/2022	CN2022001534880	CN115616788	HOLOGRAPHIC OPTICAL MODULE, NEAR-TO-EYE DISPLAY SYSTEM AND AUGMENTED REALITY WEARING EQUIPMENT	
N9172	CN	115616767	17/01/2023	JITONG TECHNOLOGY BEIJING	CN	12/07/2021	CN2021000784177	CN115616767	HOLOGRAPHIC NEAR-TO-EYE THREE-DIMENSIONAL DISPLAY SYSTEM	
N9173	CN	115602201	13/01/2023	FUJIAN NORMAL UNIVERSITY	CN	28/10/2022	CN2022001337119	CN115602201	PHOTOPOLYMER HOLOGRAPHIC STORAGE MATERIAL, HOLOGRAPHIC OPTICAL DISK AND PREPARATION METHOD THEREOF	
N9174	CN	115598955	13/01/2023	JIANGNAN UNIVERSITY	CN	11/10/2022	CN2022001241938	CN115598955	DIGITAL HOLOGRAPHIC DEPTH RESOLUTION IMAGING DEVICE AND IMAGING METHOD	
N9175	CN	115595001	13/01/2023	HANGZHOU GUANGLI TECHNOLOGY	CN	09/09/2022	CN2022001102962	CN115595001	PHOTOSENSITIVE POLYMER COMPOSITION, PREPARATION METHOD THEREOF AND HOLOGRAPHIC DIFFRACTION GRATING ELEMENT	
N9176	CN	115586660	10/01/2023	FUTURE OPTICAL SHANGRAO RESEARCH INSTITUTE	CN	09/10/2022	CN2022001228792	CN115586660	HOLOGRAPHIC OUT-OF-FOCUS LENS, MANUFACTURING METHOD AND EQUIPMENT	

IHMA - JANUARY 2023 - 95 ISSUED PATENTS - PAGE 5

NON SECURITY HOLOGRAMS - 62 PATENTS (continuation)

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
N9177	CN	115585752	10/01/2023	XI AN CHENGLI AVIATION MANUFACTURING	CN	29/11/2022	CN2022001504099	CN115585752	DETECTION SYSTEM AND METHOD FOR THREE-DIMENSIONAL QUANTITATIVE DIGITAL HOLOGRAPHIC IMAGING	
N9178	CN	115576180	06/01/2023	ZHEJIANG INTERNATIONAL MARITIME COLLEGE	CN	28/11/2022	CN2022001498046	CN115576180	3D HOLOGRAPHIC PROJECTION DISPLAY DEVICE	
N9179	CN	115561984	03/01/2023	UNIVERSITY OF SCIENCE & TECHNOLOGY OF CHINA	CN	01/11/2022	CN2022001355981	CN115561984	METHOD FOR ELIMINATING COMPUTED HOLOGRAPHIC SPECKLE BY USING PHASE PROBABILITY REGULATION AND CONTROL OPTIMIZATION ALGORITHM	
N9180	CN	115561983	03/01/2023	SHANDONG NORMAL UNIVERSITY	CN	17/10/2022	CN2022001267409	CN115561983	ULTRAFAST COMPRESSION HOLOGRAPHIC IMAGING SYSTEM AND METHOD BASED ON STRIPE CAMERA	
N9181	CN	115542705	30/12/2022	SHENZHEN TIANCHI INNOVATION RESEARCH & DEVELOPMENT	CN	18/09/2022	CN2022001133420	CN115542705	HOLOGRAPHIC IMAGING INTERACTION DEVICE AND INTERACTION METHOD THEREOF	
N9182	CN	115542704	30/12/2022	HAIER SMART HOME | QINGDAO HAIER AIR CONDITIONING ELECTRONICS | QINGDAO HAIER AIRCONDITIONER	CN	26/08/2022	CN2022001032716	CN115542704	DISPLAY CONTROL METHOD AND DEVICE OF 3D HOLOGRAPHIC DISPLAY SCREEN AND STORAGE MEDIUM	
N9183	CN	115542703	30/12/2022	CHINESE PEOPLE S LIBERATION GROUND FORCE ARMORED TROOP ACADEMY	CN	20/09/2022	CN2022001143458	CN115542703	METHOD, SYSTEM, EQUIPMENT AND MEDIUM FOR OPTIMIZING PRIMARY REPRODUCTION IMAGE OF HOLOGRAM	
N9184	CN	115512726	23/12/2022	FUJIAN NORMAL UNIVERSITY	CN	19/09/2022	CN2022001136128	CN115512726	ABERRATION COMPENSATION METHOD AND APPARATUS	